Eos Family
User Manual

Version 3.3.6

Eos Apex

Eos Ti, Gio, Gio@5

Ion Xe, Ion Xe 20

Element 2

Ion Classic & Element Classic

4250M1210-3.3.6 RevA

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Some software or hardware features may not be available depending on your product configuration or region.

The images provided in this document are for illustrative purposes only. Depending on the product details and market region, the information in this document may appear slightly different from your product.

ETC intends this document, whether printed or electronic, to be provided in its entirety.

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Using This Manual

This manual is a comprehensive resource for users of all Eos Family hardware and software, including the Apex, Eos Ti, Gio, Gio @5, Ion Xe, Ion Xe 20, Element 2, Ion Classic, & Element Classic control systems.

The best and most up-to-date Eos Family manual user experience is available on the ETC website at etcconnect.com/eos-manual.

Please email comments about this manual to techcomm@etcconnect.com.

Manual [Tab 100]

The manual can be opened within the Eos application via the *Workspace Layout Menu* or by using **[Tab] & [1][0][0]**.

Naming and Text Conventions

Bold text is used generally in paragraphs and lists throughout the manual to indicate key terms.

In order to be specific about where features and commands are found, the following naming and text conventions will be used:

- Browser menus and commands are indicated in **bold text**. For example, in the **File** menu, select **Open**.
- Alphanumeric keyboard buttons are indicated in all CAPS. For example, ALT or CTRL.
- Face panel buttons (hardkeys) are indicated in bold **[brackets]**. For example, **[Live]** or **[Enter]**.
- Softkeys, direct selects, and other virtual buttons are indicated in bold **{braces}**. For example, **{Address}**.
- Optional keys which don't have to be pressed are indicated in **<angle brackets>**. For example, **<Cue>** or **<0>**.
- Non-specific syntax is indicated with descriptive italic text within bold brackets. For example, **[***Channels***]** to indicate a selection of a range of channels, or **[***Cue Number***]** to indicate an unspecified cue.
- Keys which are intended to be pressed or held simultaneously are indicated with an ampersand (**&**). For example, **[Load] & [Timing Disable]**.
- Links to other topics are indicated in bold underlined blue; use the link to jump to that section of the manual. For example, *Important Concepts*.

Examples and Callouts

Syntax tables provide examples indicating how to use *The Command Line* to enter and perform specific operations.

Action	Syntax	*Notes*
The operation to be performed.	**How to enter the operation on the command line.**	*Additional information.*

Notes indicate useful information supplemental to the main text.

Note: *If you're reading this, we appreciate you.*

Caution and warning callouts are used to call your attention to important information:

CAUTION: ***Cautions indicate situations where there may be undefined or unwanted consequences of an action, potential for data loss, or an equipment problem.***

WARNING: Warnings indicate situations where damage may occur, people may be harmed, or there are serious or dangerous consequences of an action.

Eos Family Resources

Eos [Home]

etcconnect.com/eos-home

ETC offers a comprehensive online hub for the Eos Family featuring resources, software, support, the Eos community forums. and more. If you're new to Eos, training videos and documentation will get you started. For seasoned professionals, in-depth dives into advanced features will help you keep getting the most out of your Eos console.

ETC Knowledge Management System (KMS)

support.etcconnect.com/eos-family

Maintained by ETC's excellent Technical Services team, the KMS provides a wealth of explanatory and troubleshooting resources for current and legacy ETC, High End, and RAYN products.

- For Eos Family information, see support.etcconnect.com/ETC/Consoles/Eos_Family.
- For frequently asked questions, see support.etcconnect.com/ETC/FAQ.

The KMS should be the primary resource used for troubleshooting ETC equipment and products.

Eos Family Community Forums

community.etcconnect.com

You are encouraged to visit and participate in the Eos Family Community Forums. This gives you access to an online community of Eos Family users where you can read about other users' experiences, suggestions, and questions regarding the product as well as submit your own.

You may register for the forum by clicking the **Join** link in the upper right corner of the page and following the provided registration instructions.

Register Your Console

etcconnect.com/MyETC/Account-Management/My-Registered-Products.aspx

Registering your console with ETC ensures that you will be notified of software and library updates, as well as any product advisories.

Registering your console requires an ETC One account. Log in or sign up at etcconnect.com/MyETC/.

Help from ETC Technical Services

If you have questions that are not answered by this document, try the ETC support website at support.etcconnect.com or the main ETC website at etcconnect.com. If none of these resources are sufficient, visit etcconnect.com/contactETC and contact ETC Technical Services. Emergency service is available from all ETC offices outside of normal business hours.

When calling for help, take these steps first:

- Prepare a detailed description of the problem.
- Go near the equipment for troubleshooting.
- Find your ticket number if you have called in previously.

Other Reference Materials

Key Help

Press **[Help]** to open the Eos key help in the *Central Information Area (CIA)*. Holding **[Help]** and pressing any hard or softkey will display the following information:

- The name of the key.
- A description of the key's function.
- Applicable syntax examples for using the key.
- Links to relevant topics in the manual.

Element Prompts

Element 2 and Element Classic provide additional onscreen prompts in the CIA help area to aid with programming. These prompts dynamically change with the current display or key input to give context-sensitive instructions and options. The prompts can be enabled or disabled via **Setup > User > Displays >** *{Display Help Prompts}*.

Chapter 1

Eos Family Product Overview and Setup

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Eos Family Consoles

This section provides overviews and setup information for Eos Family consoles.

Eos Apex 5

The Eos Apex 5 console is the compact powerhouse of ETC's flagship lighting controllers, and is engineered for comfort and customization on the go. The condensed programming surface provides access to all of the same tools as the larger Apex desks, in a portable form factor.

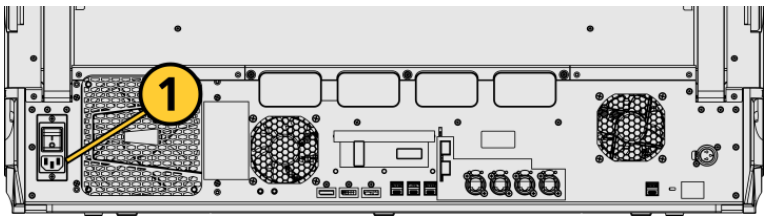
- *Setup Guide* - get started with Eos Apex 5.
- *Physical Overview* - Eos Apex 5 hardware layout.
- *Features, Specifications, and Requirements* - Eos Apex 5 capabilities.

Setup Guide

Prepare your Eos Apex 5 for use with the following setup steps.

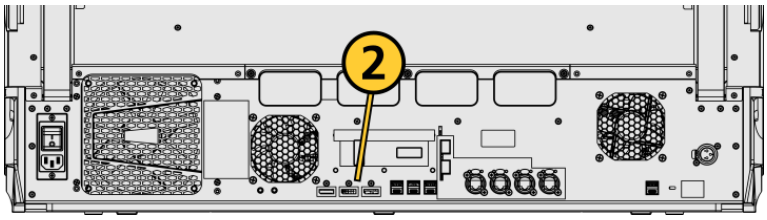
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Apex 5.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Apex 5. Connect the other end of the cord to wall power.

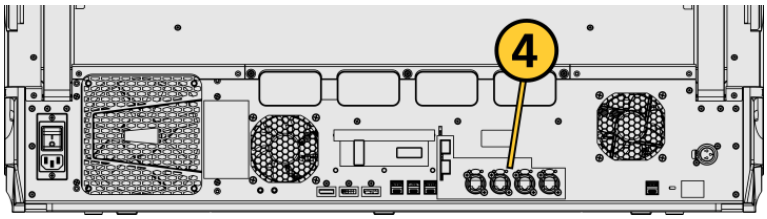


CAUTION: ***Power cord must be connected using an earth ground connection.***

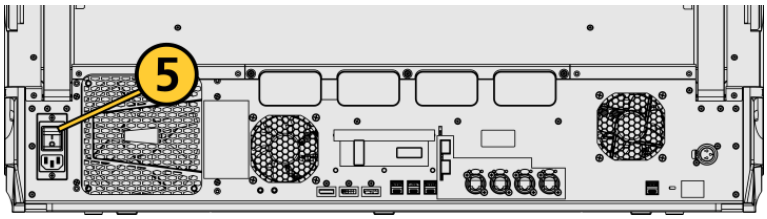
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



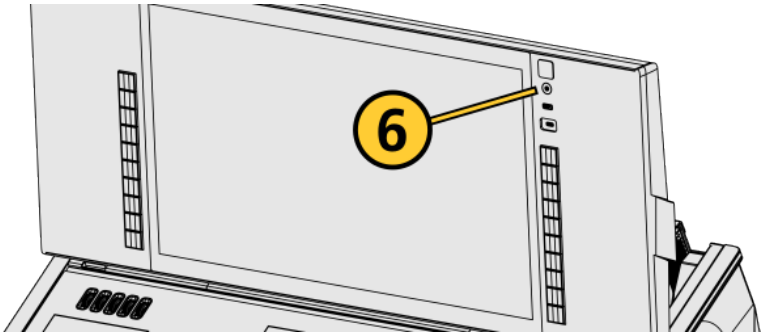
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



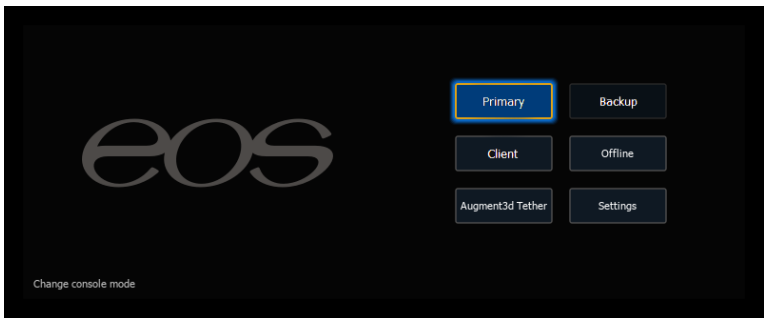
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Apex 5.

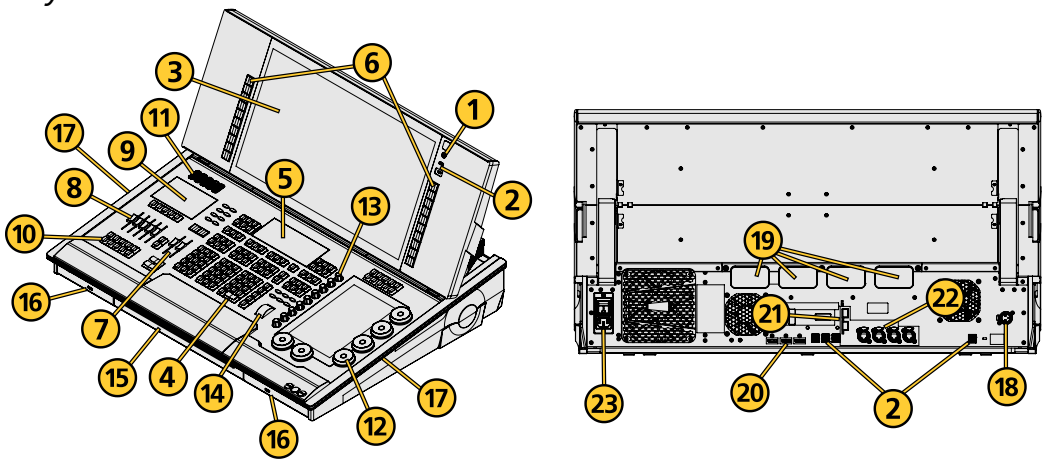


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Apex 5 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Power Button	9	Fader Touchscreen	17	Book Lights
2	USB-A and USB-C (Data)	10	Fader Buttons	18	Littlites
3	Internal Touchscreen	11	Endless Fader Wheels	19	IO Garage
4	Hardkeys	12	Encoders	20	Display Port
5	Keypad Touchscreen	13	Mini Encoders	21	SFP+
6	Target Keys	14	Level Wheel	22	Ethernet
7	Main Playbacks	15	Keyboard and Accessory Tray	23	Hard Power Switch
8	Motorized Faders	16	USB-A (Power)		IEC Socket

Power

Power Button

The soft power button on the front of the Eos Apex 5 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Internal Touchscreens

Apex consoles are designed with one (Apex 5) or two (Apex 10 and 20) internal touchscreen displays, supporting haptic feedback or pressure-sensitive touch. The main touchscreens may be used to display and control show data. They may also be used as a variety of other virtual controls and displays.

Touchscreen position can be changed by freely adjusting the screen panel's height and angle.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Apex consoles support up to three external Display Port monitors compatible with Windows 7 or later.

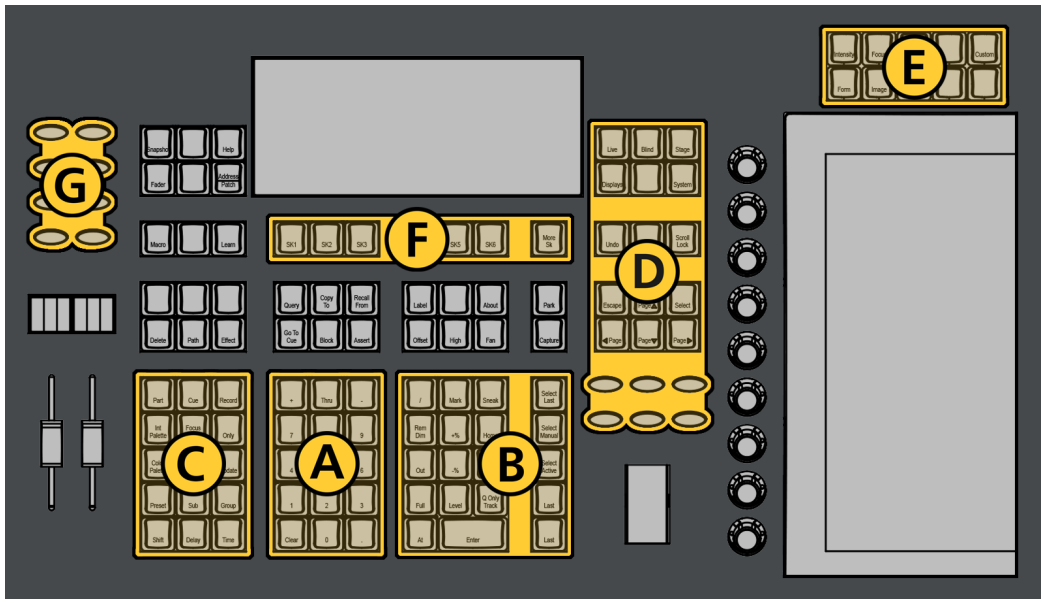
Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to Setup > Device > *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Encoder Categories**	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	**Softkeys**	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.
G	**Fader Controls**	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Keypad Touchscreen

Apex consoles include a haptic touch-enabled screen above the keypad that can be configured to control custom direct selects or magic sheets.

Softkeys and a gear icon to access screen settings are docked at the bottom of this display.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Target Keys

Apex consoles offer multiple banks of *Target Keys*, physical buttons with built-in high-resolution displays.

- **Apex 5** - 20 Target Keys (2 banks of 10).
- **Apex 10** - 40 Target Keys (4 banks of 10).
- **Apex 20** - 50 Target Keys (5 banks of 10).

All Apex consoles also offer two target keys over the main playback faders for dedicated load functionality, as well as local status of playback content.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, five, ten, or twenty slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Touchscreens

Each bank of five faders has a dedicated multi-touch display for local status of playback content.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Endless Fader Wheels

Apex consoles offer five, ten, or twenty detented, color-changing fader wheels, adding an endless fader and additional button to each overall fader slot. When *Changing Fader Pages*, each fader wheel and button is paged independently of the faders below them, effectively doubling the control capabilities of each fader slot.

Encoders

Haptic-feedback encoders and an associated touchscreen for control of non-intensity parameters are provided on the lower right of the console. The two larger encoders at the bottom are dedicated pan and tilt controls. The remaining four encoders on the right side of the console are pageable controls. By default, these encoders are populated on the touchscreen with the parameters used in your show. They can also be custom mapped.

Mini Encoders

Apex consoles also offer nine RGB-backlit mini encoders to the left of the encoder touchscreen. Eight of the mini encoders can be fully configured for expanded control of the large encoder parameters, or can have custom mapping. The bottom encoder is dedicated to mini encoder paging and configuration.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

IO Garage

Apex consoles come equipped with four input / output bays for custom configuration of the available data ports on the back of the console, collectively known as the IO garage.

Any ETC Gadget II or Response Show Control Gateway can be added to the garage and connected internally via USB for local input / output of DMX, MIDI, SMPTE, and other protocols.

Network Ports

Ethernet

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

All ports provide PoE++, with up to 100W per port, and 120W total across all ports.

Enhanced Small Form Factor Pluggable (SFP+)

SFP+ ports are provided for direct-to-core connection, or high-speed links between session devices, and can take a variety of sled options. Sleds are field changeable for easy reconfiguration.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

Data Ports

USB A and C ports are provided on the front and rear of your device, and in the keyboard tray, when present. USB ports can be used to connect peripherals such as storage devices, alphanumeric keyboards, pointing devices, and touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

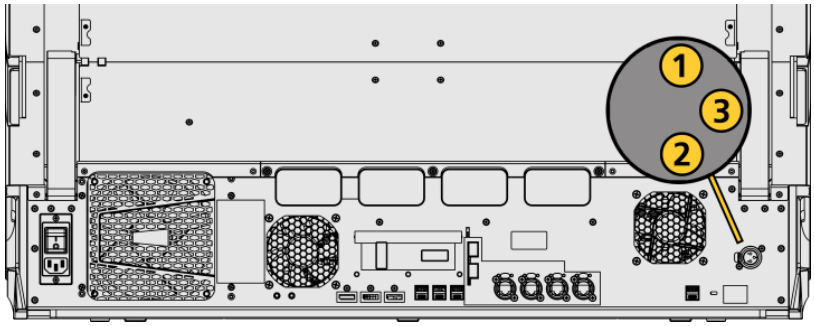
Charging Ports

Two USB A ports, capable of delivering 5A / 12.5W of power each, are available for charging devices. One is located under the encoder display on the front right of the desk. The other is located under the faders on the front left of the desk (Apex 5), or inside the accessory drawer (Apex 10 and 20).

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Book Lights

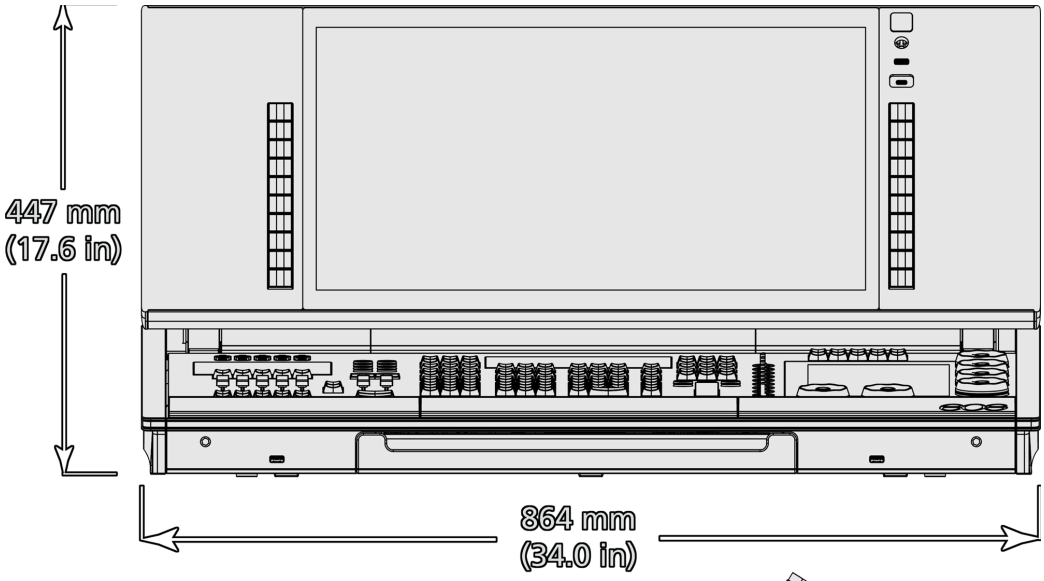
Two independently-controlled, warm-white work lights are available on the left and right sides of Apex consoles for illumination of nearby work surfaces.

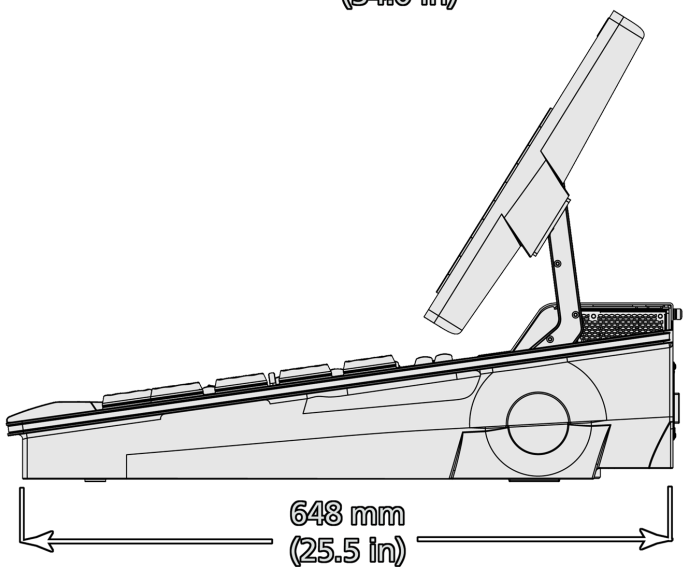
Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights





Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex 5	447	17.6	864	34.0	648	25.5	44	97

Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex 5 in shipping container	318	12.5	966	48.0	794	31.3	TBD	TBD
Eos Apex 5 in travel case	926	36.4	1023	40.3	388	15.3	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- One 24-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Apex 5 requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Apex 5 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Apex 5 is available with 24,576 outputs.

Capacities

- **Output Parameters** - 24,576.
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.

- Record Targets
  - Groups - 10,000.
  - Palettes - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 10,000.
  - Effects - 10,000.
  - Macros - 99,999.
  - Snapshots - 10,000.
  - Curves - 10,000.
  - Color Paths - 10,000
- Faders
  - Motorized Main Playback - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - Motorized Faders - 5 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 5 A at 120 V or 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Apex 10

The Eos Apex 10 console is engineered for comfort and customization, with generous programming surfaces and the power to run complex lighting and media rigs. As the mid-sized console in the Apex class of lighting controllers, the Eos Apex 10 offers a hands-on, professional workspace.

- *Setup Guide* - get started with Eos Apex 10.
- *Physical Overview* - Eos Apex 10 hardware layout.
- *Features, Specifications, and Requirements* - Eos Apex 10 capabilities.

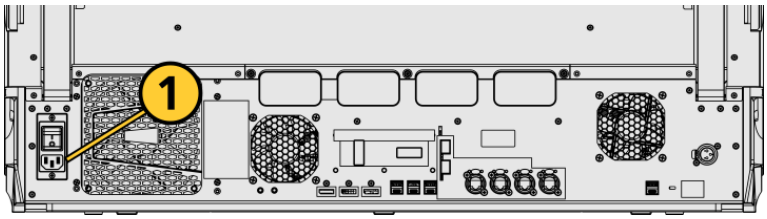
Setup Guide

Prepare your Eos Apex 10 for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Apex 10.*

---

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Apex 10. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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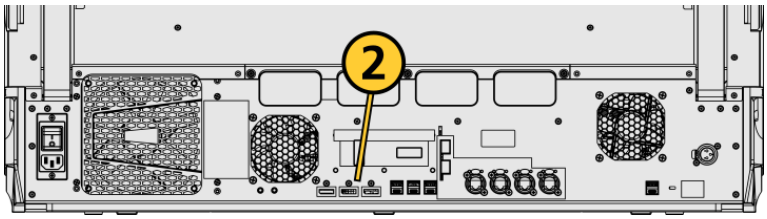
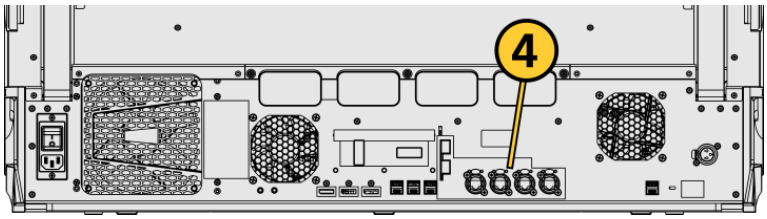
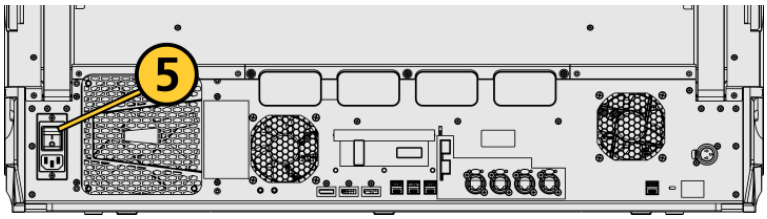
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



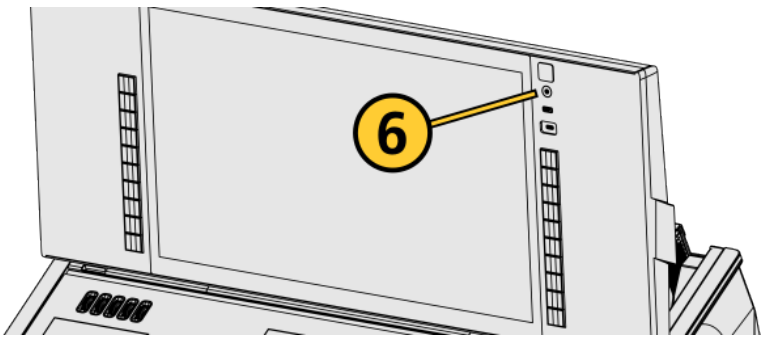
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



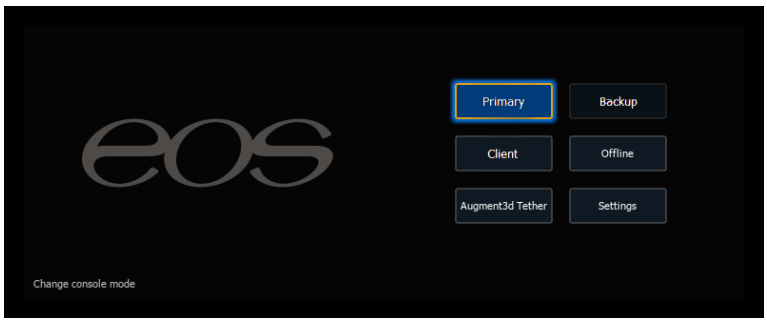
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Apex 10.

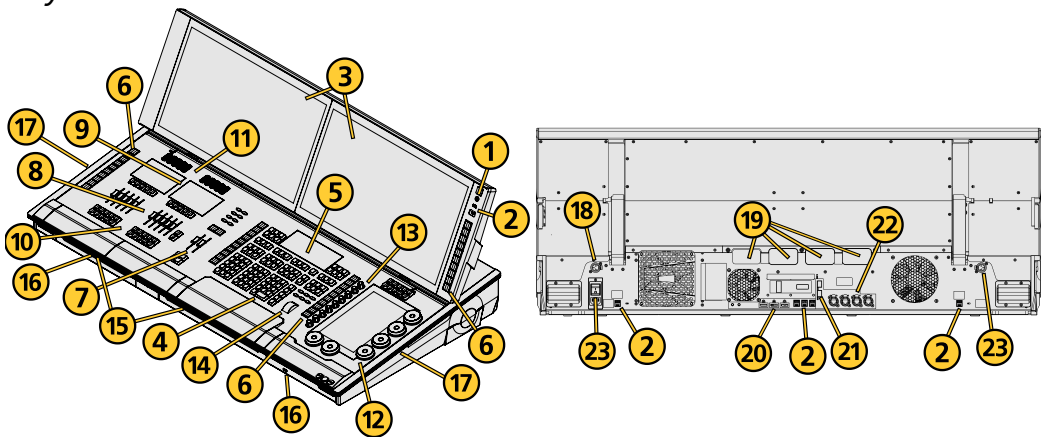


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Apex 10 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Power Button	9	Fader Touchscreen	17	Book Lights
2	USB-A and USB-C (Data)	10	Fader Buttons	18	Littlites
3	Internal Touchscreen	11	Endless Fader Wheels	19	IO Garage
4	Hardkeys	12	Encoders	20	Display Port
5	Keypad Touchscreen	13	Mini Encoders	21	SFP+
6	Target Keys	14	Level Wheel	22	Ethernet
7	Main Playbacks	15	Keyboard and Accessory Tray	23	Hard Power Switch
8	Motorized Faders	16	USB-A (Power)		IEC Socket

Power

Power Button

The soft power button on the front of the Eos Apex 10 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Internal Touchscreens

Apex consoles are designed with one (Apex 5) or two (Apex 10 and 20) internal touchscreen displays, supporting haptic feedback or pressure-sensitive touch. The main touchscreens may be used to display and control show data. They may also be used as a variety of other virtual controls and displays.

Touchscreen position can be changed by freely adjusting the screen panel's height and angle.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Apex consoles support up to three external Display Port monitors compatible with Windows 7 or later.

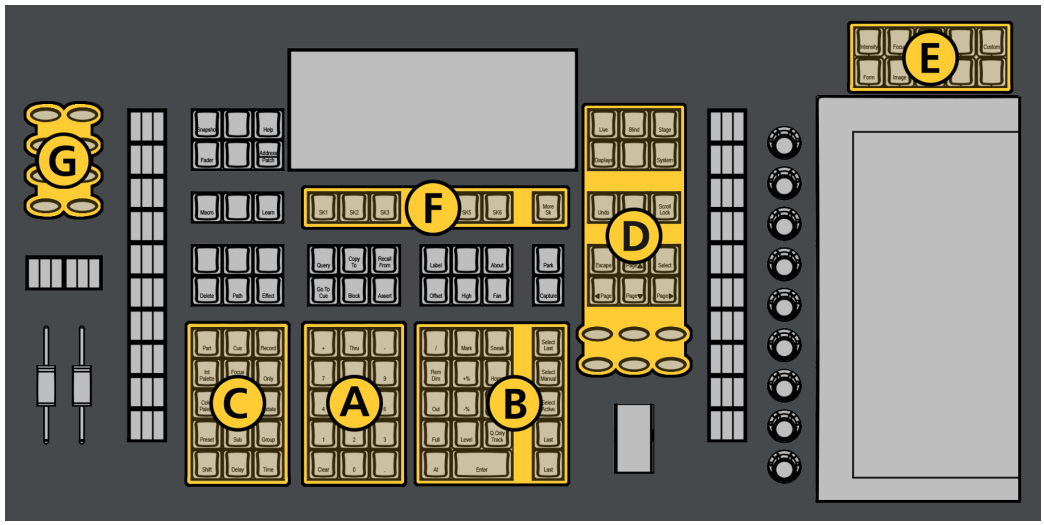
Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to Setup > Device > *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Encoder Categories**	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	**Softkeys**	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.
G	**Fader Controls**	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Keypad Touchscreen

Apex consoles include a haptic touch-enabled screen above the keypad that can be configured to control custom direct selects or magic sheets.

Softkeys and a gear icon to access screen settings are docked at the bottom of this display.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Target Keys

Apex consoles offer multiple banks of *Target Keys*, physical buttons with built-in high-resolution displays.

- **Apex 5** - 20 Target Keys (2 banks of 10).
- **Apex 10** - 40 Target Keys (4 banks of 10).
- **Apex 20** - 50 Target Keys (5 banks of 10).

All Apex consoles also offer two target keys over the main playback faders for dedicated load functionality, as well as local status of playback content.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, five, ten, or twenty slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Touchscreens

Each bank of five faders has a dedicated multi-touch display for local status of playback content.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Endless Fader Wheels

Apex consoles offer five, ten, or twenty detented, color-changing fader wheels, adding an endless fader and additional button to each overall fader slot. When *Changing Fader Pages*, each fader wheel and button is paged independently of the faders below them, effectively doubling the control capabilities of each fader slot.

Encoders

Haptic-feedback encoders and an associated touchscreen for control of non-intensity parameters are provided on the lower right of the console. The two larger encoders at the bottom are dedicated pan and tilt controls. The remaining four encoders on the right side of the console are pageable controls. By default, these encoders are populated on the touchscreen with the parameters used in your show. They can also be custom mapped.

Mini Encoders

Apex consoles also offer nine RGB-backlit mini encoders to the left of the encoder touchscreen. Eight of the mini encoders can be fully configured for expanded control of the large encoder parameters, or can have custom mapping. The bottom encoder is dedicated to mini encoder paging and configuration.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

IO Garage

Apex consoles come equipped with four input / output bays for custom configuration of the available data ports on the back of the console, collectively known as the IO garage.

Any ETC Gadget II or Response Show Control Gateway can be added to the garage and connected internally via USB for local input / output of DMX, MIDI, SMPTE, and other protocols.

Network Ports

Ethernet

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

All ports provide PoE++, with up to 100W per port, and 120W total across all ports.

Enhanced Small Form Factor Pluggable (SFP+)

SFP+ ports are provided for direct-to-core connection, or high-speed links between session devices, and can take a variety of sled options. Sleds are field changeable for easy reconfiguration.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

Data Ports

USB A and C ports are provided on the front and rear of your device, and in the keyboard tray, when present. USB ports can be used to connect peripherals such as storage devices, alphanumeric keyboards, pointing devices, and touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

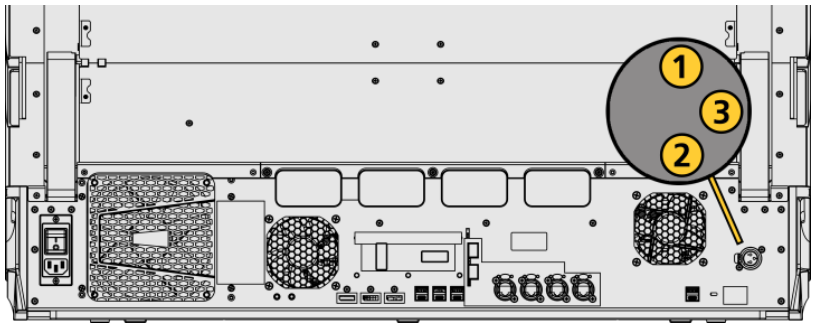
Charging Ports

Two USB A ports, capable of delivering 5A / 12.5W of power each, are available for charging devices. One is located under the encoder display on the front right of the desk. The other is located under the faders on the front left of the desk (Apex 5), or inside the accessory drawer (Apex 10 and 20).

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Book Lights

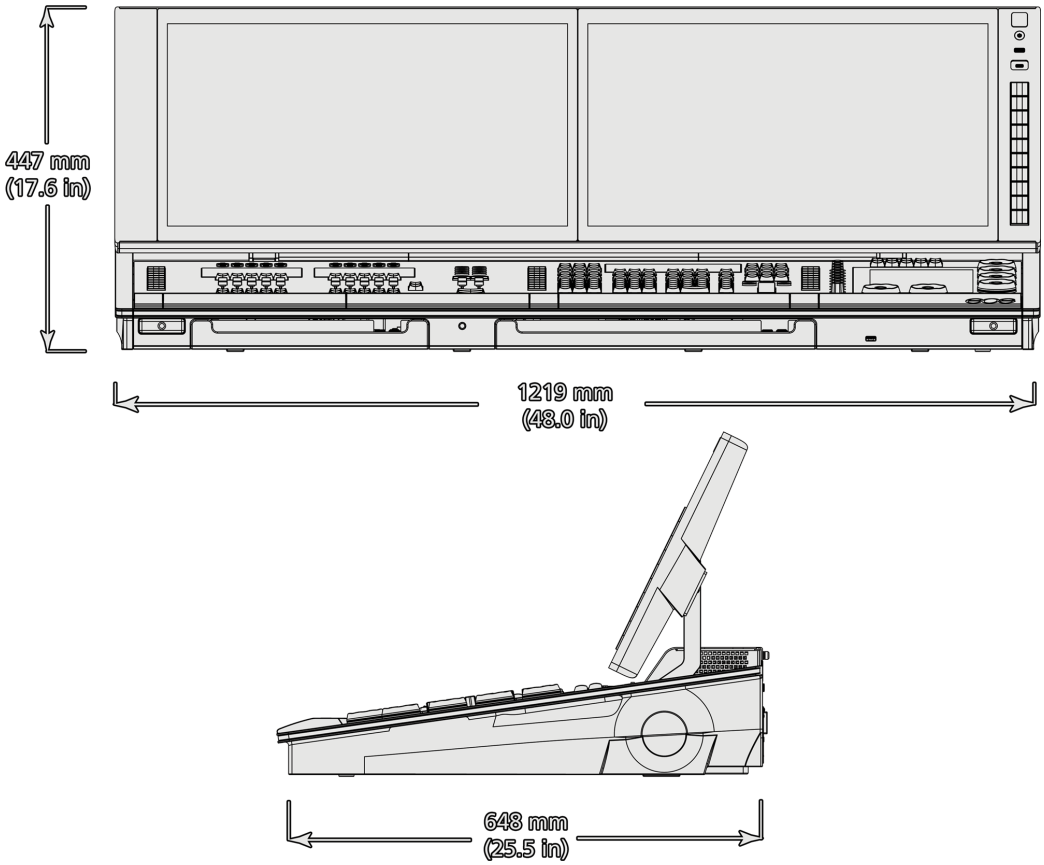
Two independently-controlled, warm-white work lights are available on the left and right sides of Apex consoles for illumination of nearby work surfaces.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex 10	447	17.6	1219	48.0	648	25.5	61.24	135
Eos Apex 10 in shipping container	318	12.5	1330	52.4	794	31.3	TBD	TBD
Eos Apex 10 in travel case	926	36.5	388	15.3	1377	54.3	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two 24-inch LED gooseneck Littlites.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Apex 10 requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Apex 10 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - **Backup Eos Expansion Processor (BEEP)** - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.
- *Offline w/viz* - allows output for visualizers only in Eos for Windows and macOS.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Apex 10 is available with 24,576 outputs.

Capacities

- **Output Parameters** - 24,576.
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

- Faders
  - Motorized Main Playback - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - Motorized Faders - 10 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 6 A at 120 V or 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Apex 20

The Eos Apex 20 console is engineered for comfort and customization, with generous programming surfaces and the power to run complex lighting and media rigs. As the largest and most luxurious of ETC's flagship lighting control line, the Eos Apex 20 is the ultimate hands-on, professional workspace.

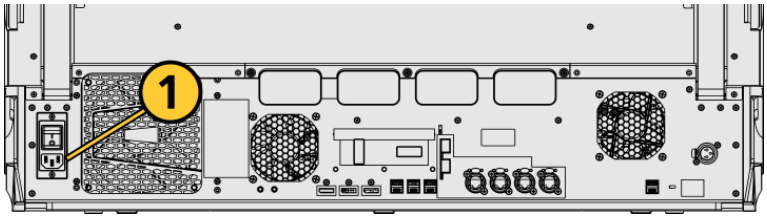
- *Setup Guide* - get started with Eos Apex 20.
- *Physical Overview* - Eos Apex 20 hardware layout.
- *Features, Specifications, and Requirements* - Eos Apex 20 capabilities.

Setup Guide

Prepare your Eos Apex 20 for use with the following setup steps.

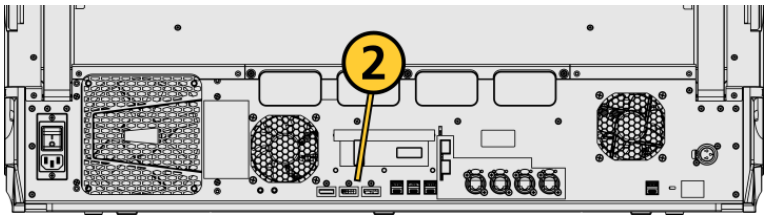
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Apex 20.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Apex 20. Connect the other end of the cord to wall power.

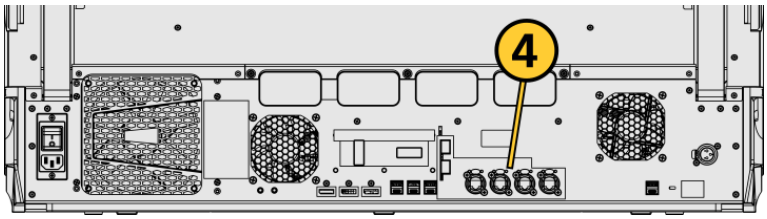


CAUTION: ***Power cord must be connected using an earth ground connection.***

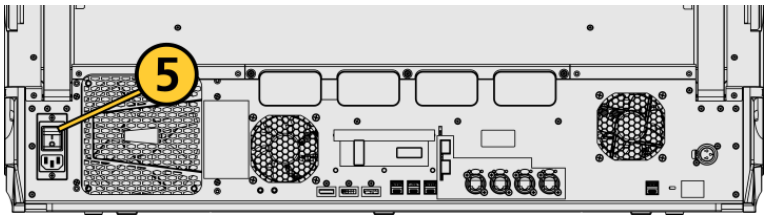
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



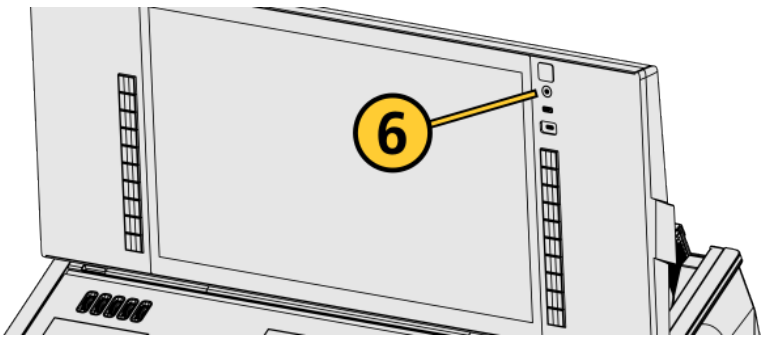
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



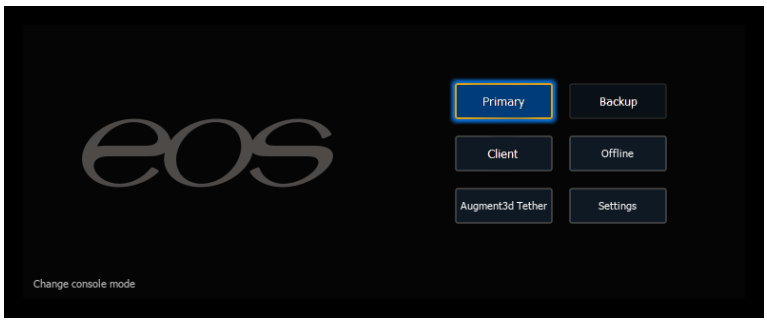
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Apex 20.

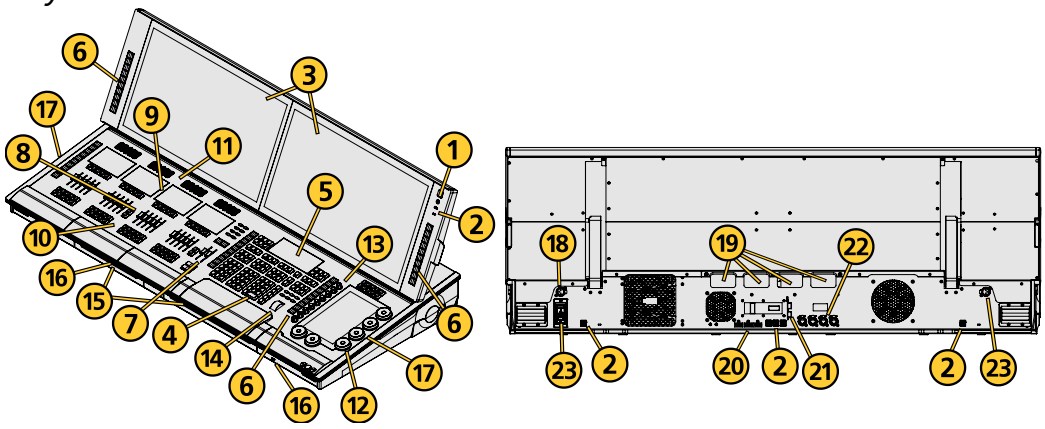


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Apex 20 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Power Button	9	Fader Touchscreen	17	Book Lights
2	USB-A and USB-C (Data)	10	Fader Buttons	18	Littlites
3	Internal Touchscreen	11	Endless Fader Wheels	19	IO Garage
4	Hardkeys	12	Encoders	20	Display Port
5	Keypad Touchscreen	13	Mini Encoders	21	SFP+
6	Target Keys	14	Level Wheel	22	Ethernet
7	Main Playbacks	15	Keyboard and Accessory Tray	23	Hard Power Switch
8	Motorized Faders	16	USB-A (Power)		IEC Socket

Power

Power Button

The soft power button on the front of the Eos Apex 20 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Internal Touchscreens

Apex consoles are designed with one (Apex 5) or two (Apex 10 and 20) internal touchscreen displays, supporting haptic feedback or pressure-sensitive touch. The main touchscreens may be used to display and control show data. They may also be used as a variety of other virtual controls and displays.

Touchscreen position can be changed by freely adjusting the screen panel's height and angle.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Apex consoles support up to three external Display Port monitors compatible with Windows 7 or later.

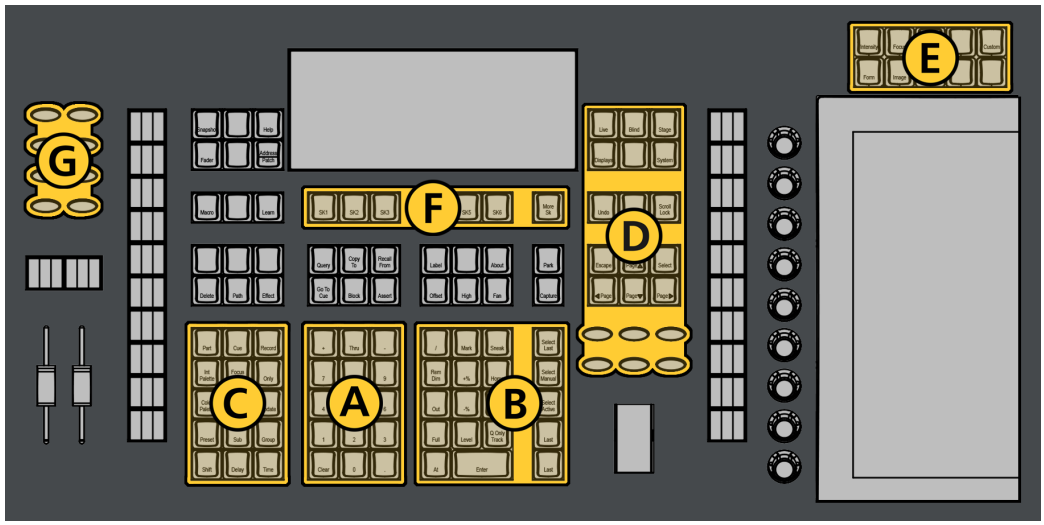
Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to Setup > Device > *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Encoder Categories**	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	**Softkeys**	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.
G	**Fader Controls**	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Keypad Touchscreen

Apex consoles include a haptic touch-enabled screen above the keypad that can be configured to control custom direct selects or magic sheets.

Softkeys and a gear icon to access screen settings are docked at the bottom of this display.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Target Keys

Apex consoles offer multiple banks of *Target Keys*, physical buttons with built-in high-resolution displays.

- **Apex 5** - 20 Target Keys (2 banks of 10).
- **Apex 10** - 40 Target Keys (4 banks of 10).
- **Apex 20** - 50 Target Keys (5 banks of 10).

All Apex consoles also offer two target keys over the main playback faders for dedicated load functionality, as well as local status of playback content.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, five, ten, or twenty slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Touchscreens

Each bank of five faders has a dedicated multi-touch display for local status of playback content.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Endless Fader Wheels

Apex consoles offer five, ten, or twenty detented, color-changing fader wheels, adding an endless fader and additional button to each overall fader slot. When *Changing Fader Pages*, each fader wheel and button is paged independently of the faders below them, effectively doubling the control capabilities of each fader slot.

Encoders

Haptic-feedback encoders and an associated touchscreen for control of non-intensity parameters are provided on the lower right of the console. The two larger encoders at the bottom are dedicated pan and tilt controls. The remaining four encoders on the right side of the console are pageable controls. By default, these encoders are populated on the touchscreen with the parameters used in your show. They can also be custom mapped.

Mini Encoders

Apex consoles also offer nine RGB-backlit mini encoders to the left of the encoder touchscreen. Eight of the mini encoders can be fully configured for expanded control of the large encoder parameters, or can have custom mapping. The bottom encoder is dedicated to mini encoder paging and configuration.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

IO Garage

Apex consoles come equipped with four input / output bays for custom configuration of the available data ports on the back of the console, collectively known as the IO garage.

Any ETC Gadget II or Response Show Control Gateway can be added to the garage and connected internally via USB for local input / output of DMX, MIDI, SMPTE, and other protocols.

Network Ports

Ethernet

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

All ports provide PoE++, with up to 100W per port, and 120W total across all ports.

Enhanced Small Form Factor Pluggable (SFP+)

SFP+ ports are provided for direct-to-core connection, or high-speed links between session devices, and can take a variety of sled options. Sleds are field changeable for easy reconfiguration.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

Data Ports

USB A and C ports are provided on the front and rear of your device, and in the keyboard tray, when present. USB ports can be used to connect peripherals such as storage devices, alphanumeric keyboards, pointing devices, and touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

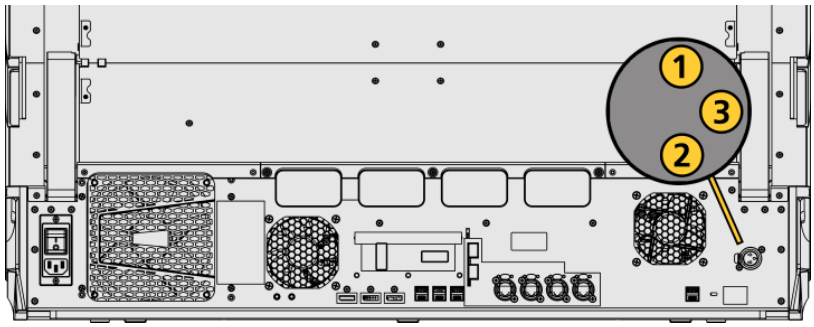
Charging Ports

Two USB A ports, capable of delivering 5A / 12.5W of power each, are available for charging devices. One is located under the encoder display on the front right of the desk. The other is located under the faders on the front left of the desk (Apex 5), or inside the accessory drawer (Apex 10 and 20).

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Book Lights

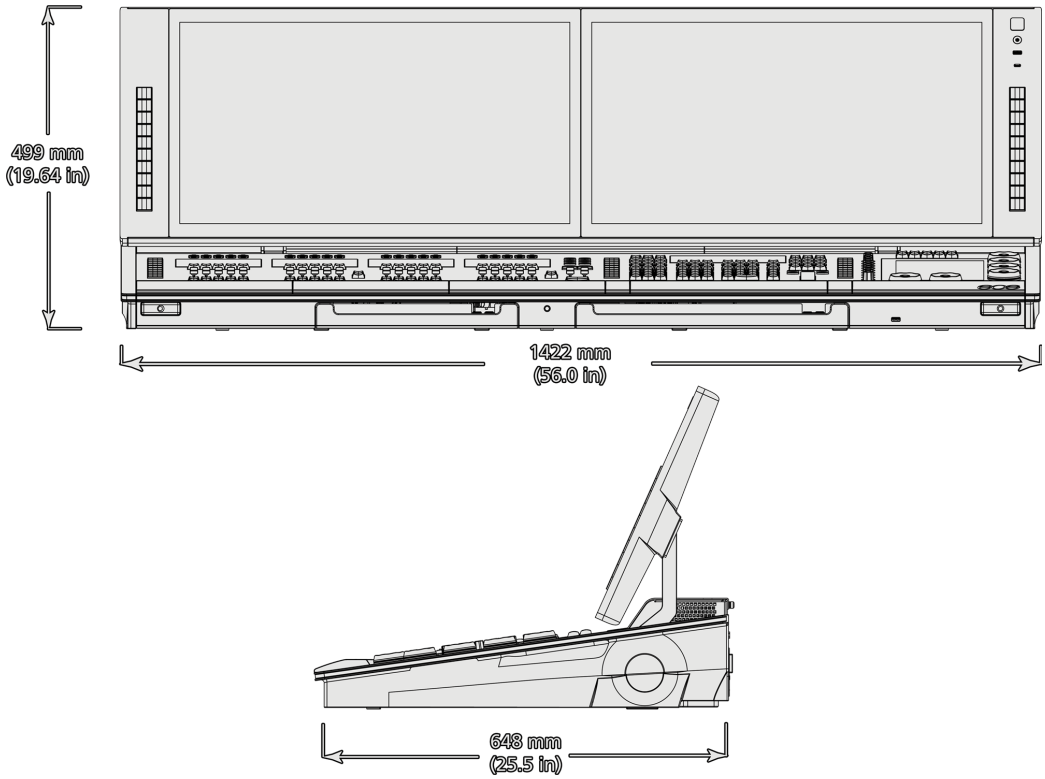
Two independently-controlled, warm-white work lights are available on the left and right sides of Apex consoles for illumination of nearby work surfaces.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex 20	499	19.64	1422	56.00	648	25.53	66.68	147
Eos Apex 20 in shipping container	324	12.75	1524	60.00	794	31.25	TBD	TBD
Eos Apex 20 in travel case	926	36.45	388	15.25	1582	62.25	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two 24-inch LED gooseneck Littlites.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Apex 20 requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Apex 20 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Apex 20 is available with 24,576 outputs.

Capacities

- **Output Parameters** - 24,576.
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000
- **Faders**
  - **Motorized Main Playback** - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - **Motorized Faders** - 20 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - **Virtual Faders** - 100 virtual pages of 10 faders each.
  - **Playbacks** - 200 configurable cue playbacks, with Go and Stop/Back.
  - **Submasters** - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- **Power Consumption** - approximately 6 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked

- FCC compliant
- RoHS compliant
- WEEE

Eos Apex FP

The Eos Apex Face Panel (FP) brings the same power and customization as the rest of ETC's flagship Apex consoles. With all displays being external, Apex FP has a smaller form factor and weight, making it perfect for sites that prioritize portability and flexibility.

- *Setup Guide* - get started with Eos Apex FP.
- *Physical Overview* - Eos Apex FP hardware layout.
- *Features, Specifications, and Requirements* - Eos Apex FP capabilities.

Setup Guide

Prepare your Eos Apex FP for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Apex FP.*

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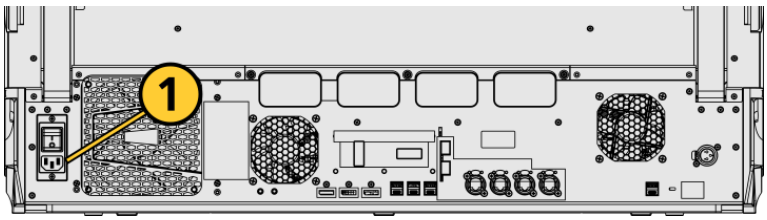
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Apex FP. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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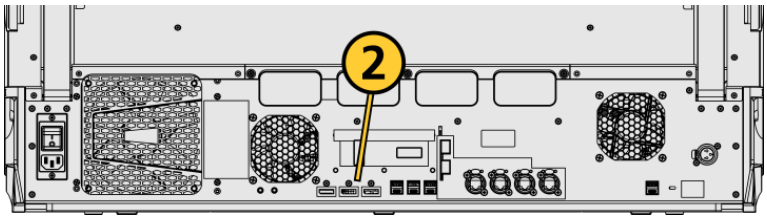
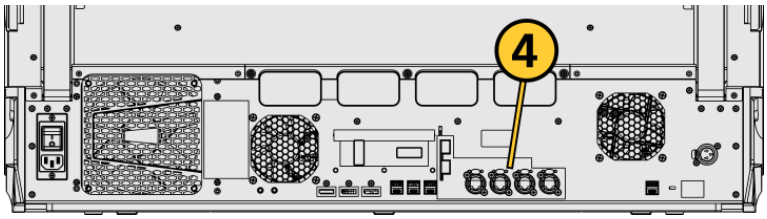
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

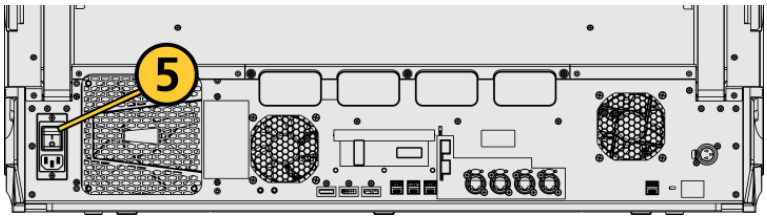


3. Connect any USB devices, such as an external mouse or the included keyboard.

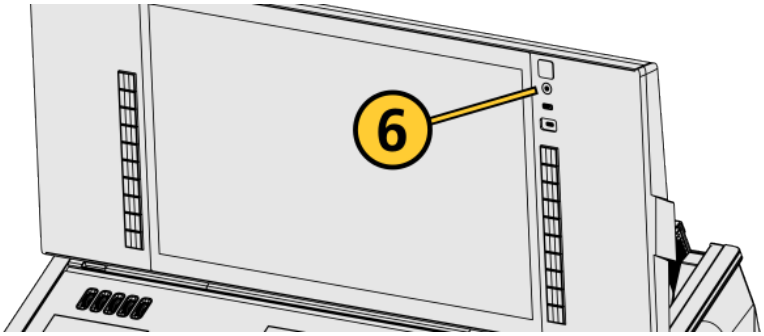
4. Connect any network cabling to the appropriate Ethernet port.



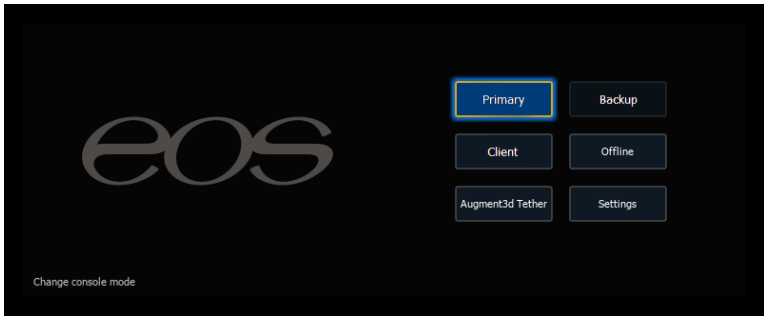
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Apex FP.

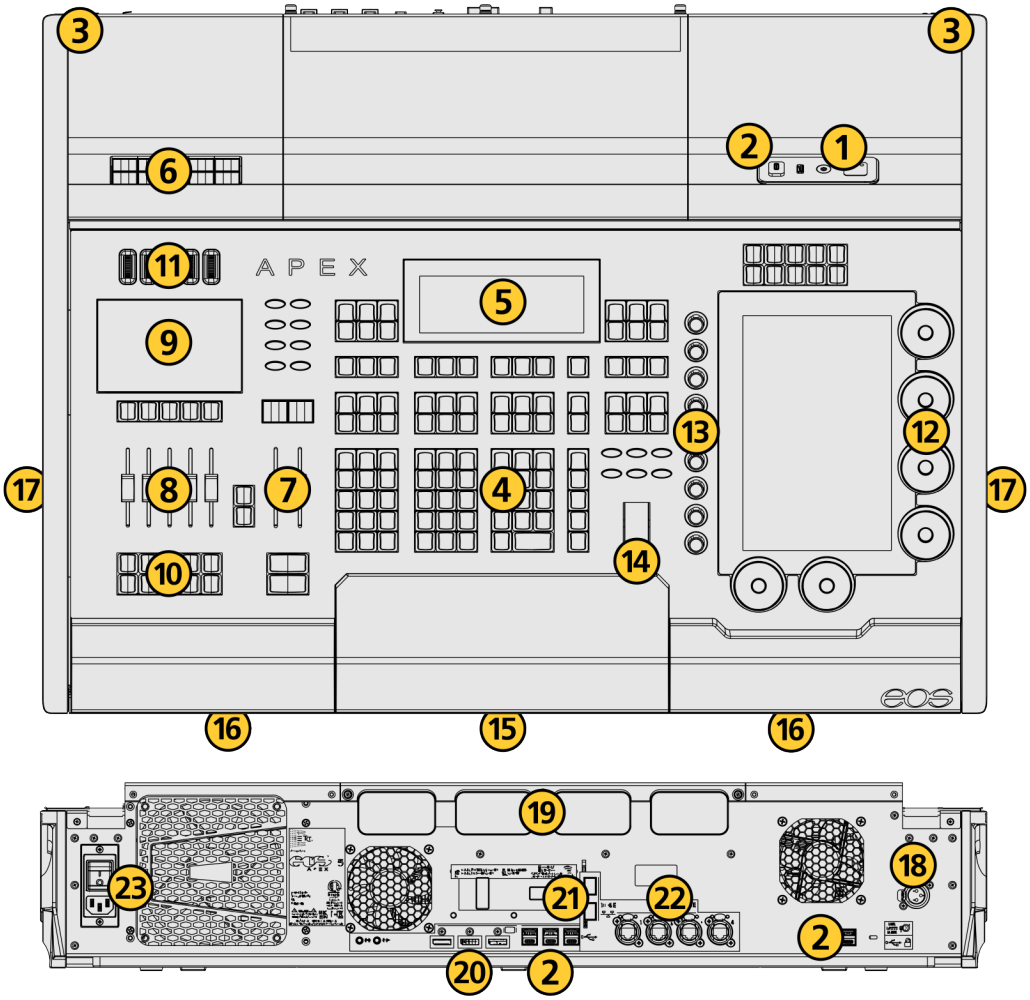


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Apex FP is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Power Button	9	Fader Touchscreen	17	Book Lights
2	USB-A and USB-C (Data)	10	Fader Buttons	18	Littlites
3	Monitor Mounts	11	Endless Fader Wheels	19	IO Garage
4	Hardkeys	12	Encoders	20	Display Port
5	Keypad Touchscreen	13	Mini Encoders	21	SFP+
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The soft power button on the front of the Eos Apex FP is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

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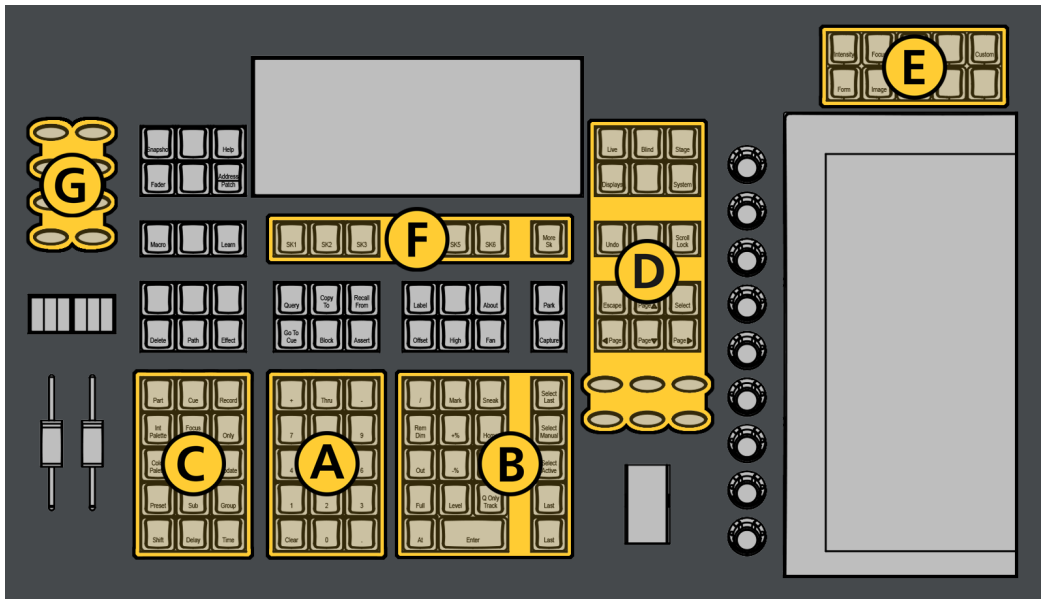
Hardkeys



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Data Ports

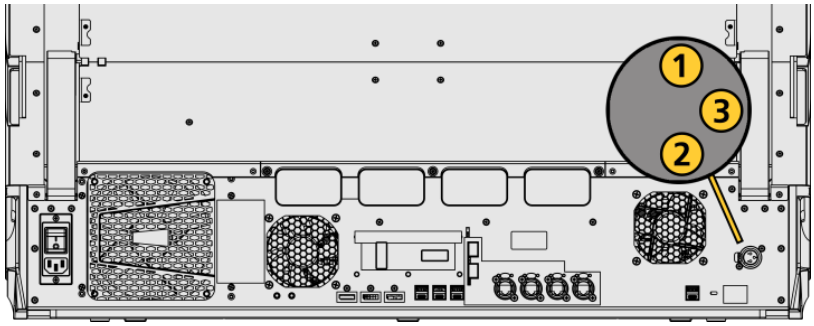
USB A and C ports are provided on the front and rear of your device, and in the keyboard tray, when present. USB ports can be used to connect peripherals such as storage devices, alphanumeric keyboards, pointing devices, and touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

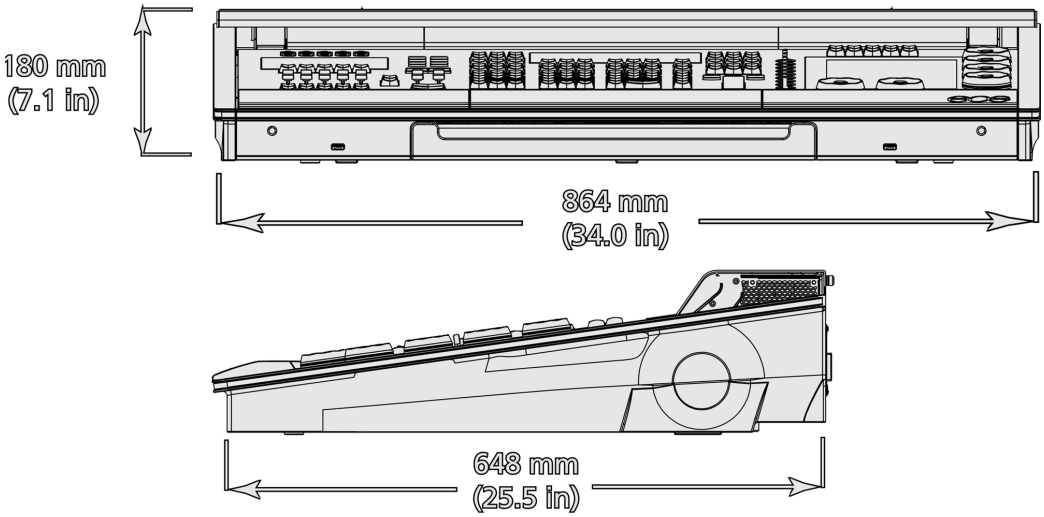
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex FP	180	7.1	864	34.0	648	25.5	31.3	69.0
Eos Apex FP in shipping container	286	11.3	966	38.0	794	31.3	36.3	80.0
Eos Apex FP in travel case	902	35.5	1023	40.3	388	15.3	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- One 24-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Available Outputs

The Eos Apex FP is available with 24,576 outputs.

Minimum Eos Software Version

The Eos Apex FP requires Eos software v3.3.0 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Apex FP supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as Disconnected.

Capacities

- Output Parameters - 24,576.
- Channels - 32,768 (can be any number from 1 to 99,999).
- Cues - 10,000.
- Cue Lists - 999.
- Record Targets
  - Groups - 10,000.
  - Palettes - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 10,000.
  - Effects - 10,000.
  - Macros - 99,999.
  - Snapshots - 10,000.
  - Curves - 10,000.
  - Color Paths - 10,000
- Faders
  - Motorized Main Playback - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - Motorized Faders - 5 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 5 A at 120 V or 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Ti

Eos Titanium (Ti) provides complete control of conventional and moving lights, LEDs and media servers. It supports multiple users with partitioned parameter control and full backup, multiple playback faders and cue lists in a tracking, move-fade environment, with unique tactile response encoders.

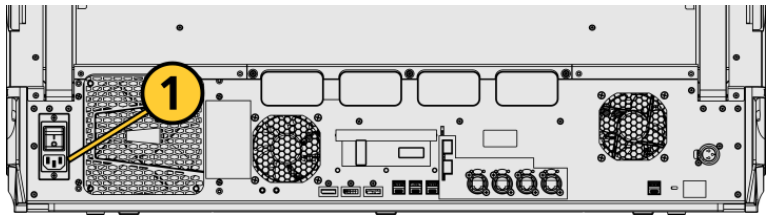
- *Setup Guide* - get started with Eos Ti.
- *Physical Overview* - Eos Ti hardware layout.
- *Features, Specifications, and Requirements* - Eos Ti capabilities.

Setup Guide

Prepare your Eos Ti for use with the following setup steps.

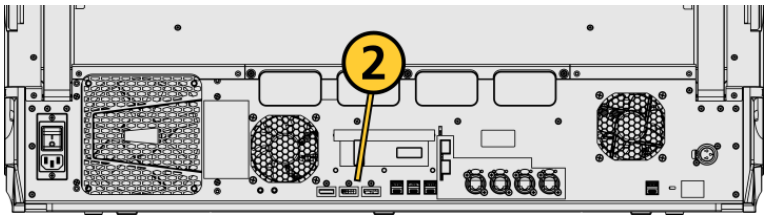
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Ti.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Ti. Connect the other end of the cord to wall power.

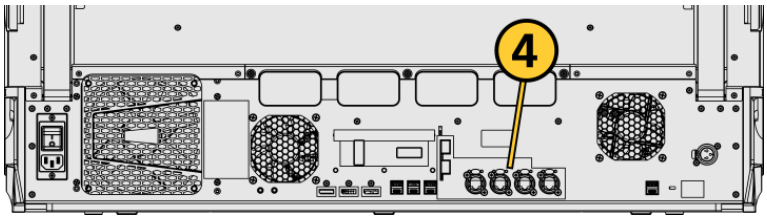


CAUTION: ***Power cord must be connected using an earth ground connection.***

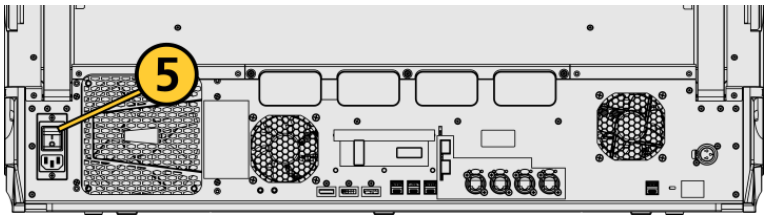
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



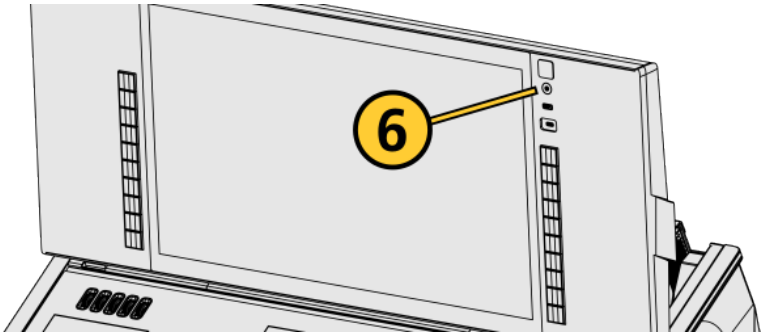
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



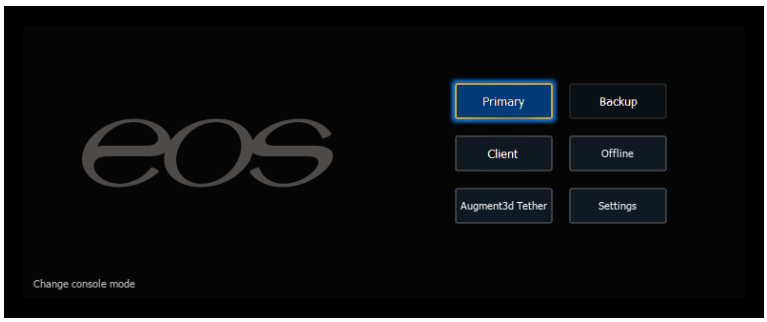
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Ti.

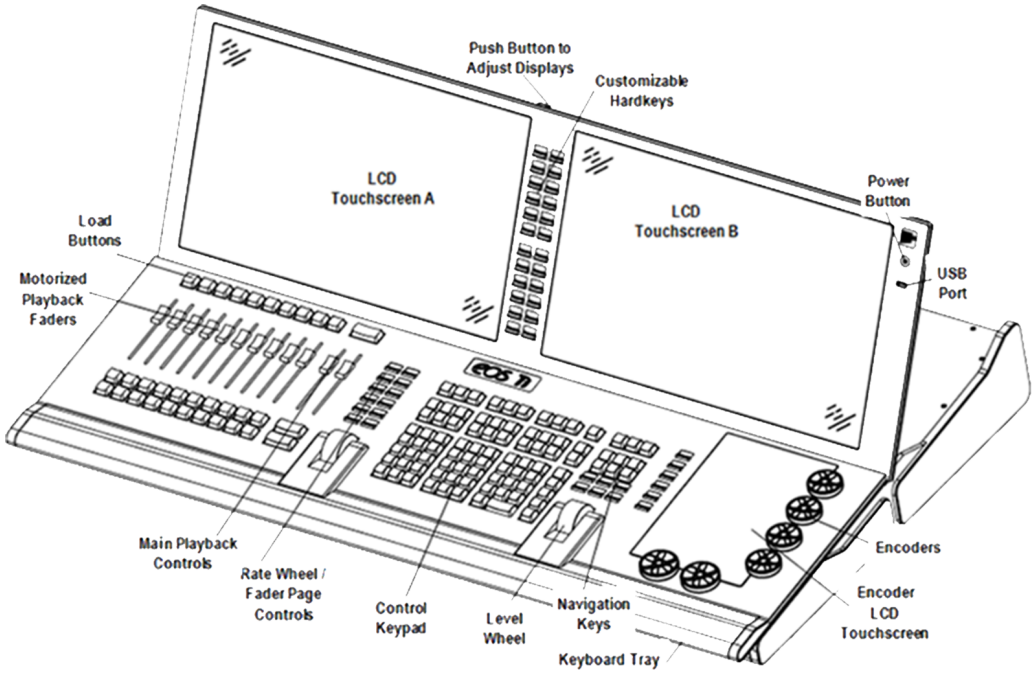


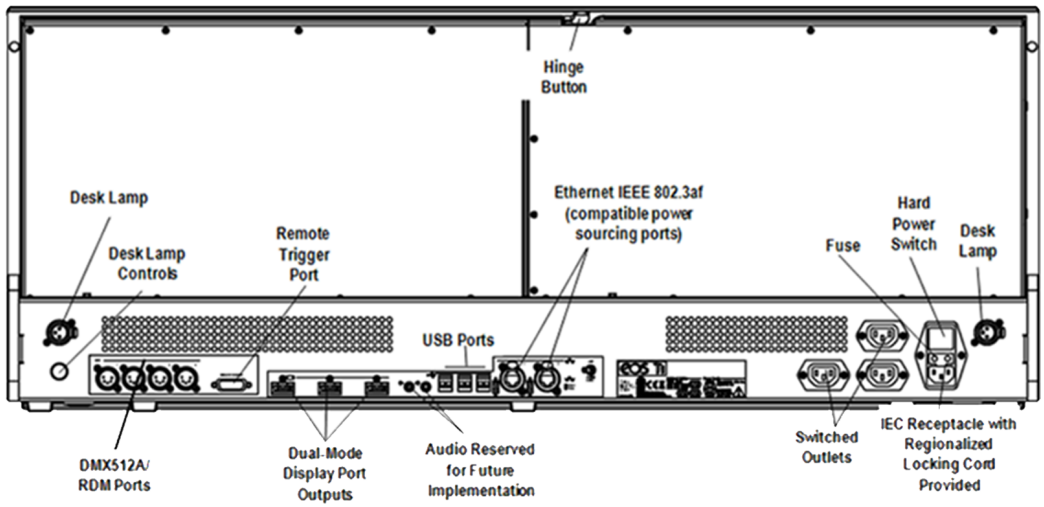
7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Ti is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview





Power

Power Button

The soft power button on the front of the Eos Ti is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Fuse

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

Internal Touchscreens

Eos Ti is designed with three internal touchscreen displays.

- The two main touchscreens may be used to display and control show data. They may also be used as a variety of other virtual controls and displays.
- The encoder touchscreen offers additional touch-based controls for encoder parameters.

The touchscreen angle can be adjusted by pushing the button in the center top of the display and moving the panel up or down.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Eos Ti and Gio consoles support up to three external Display Port or DVI monitors compatible with Windows 7 or later.

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

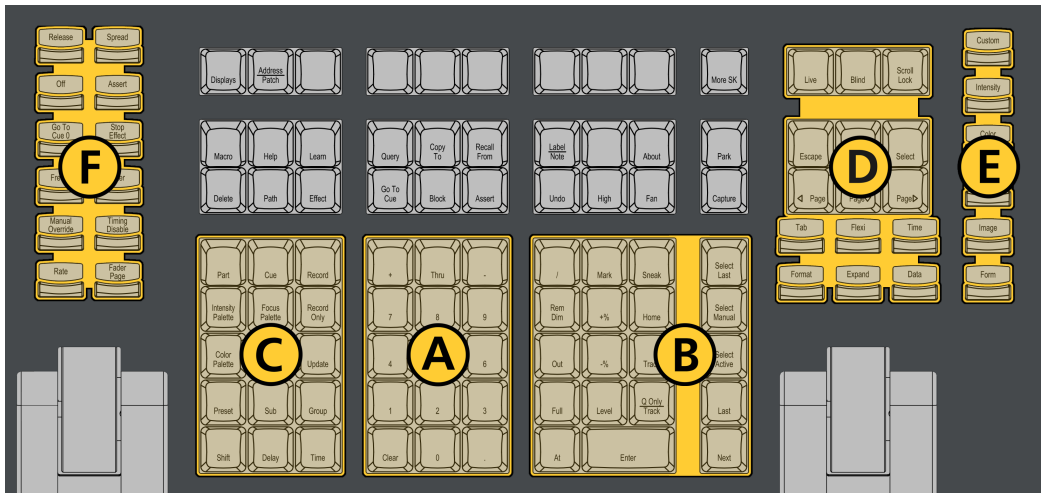
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to **Setup > Device >** *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Encoder Categories**	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	**Fader Controls**	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Customizable Hardkeys

Eos Ti has twenty-one customizable hardkeys. Twenty are located between the two main touchscreens, and default to macros 801-820. The other is between **[Label/Note]** and **[About]** on the face panel, and defaults to macro 821.

Functionality for the hardkeys can be defined in **ECU >** *Buttons* **> Ti Face Panel Buttons**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, ten slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Encoders

Haptic-feedback encoders and an associated touchscreen for control of non-intensity parameters are provided on the lower right of the console. The two larger encoders at the bottom are dedicated pan and tilt controls. The remaining four encoders on the right side of the console are pageable controls. By default, these encoders are populated on the touchscreen with the parameters used in your show. They can also be custom mapped.

Six hardkeys are also available for encoder control. These encoder paging keys control intensity, focus, color, shutter, image, and form. Pressing any of these will change the parameters controlled by the encoders. To view other available encoder pages, simply press the encoder paging keys to advance the pages.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

Rate Wheel

The rate wheel can be used to provide dynamic rate adjustments for multiple playbacks.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

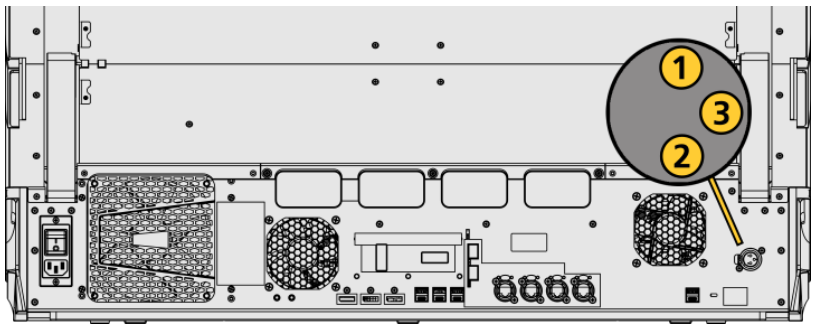
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

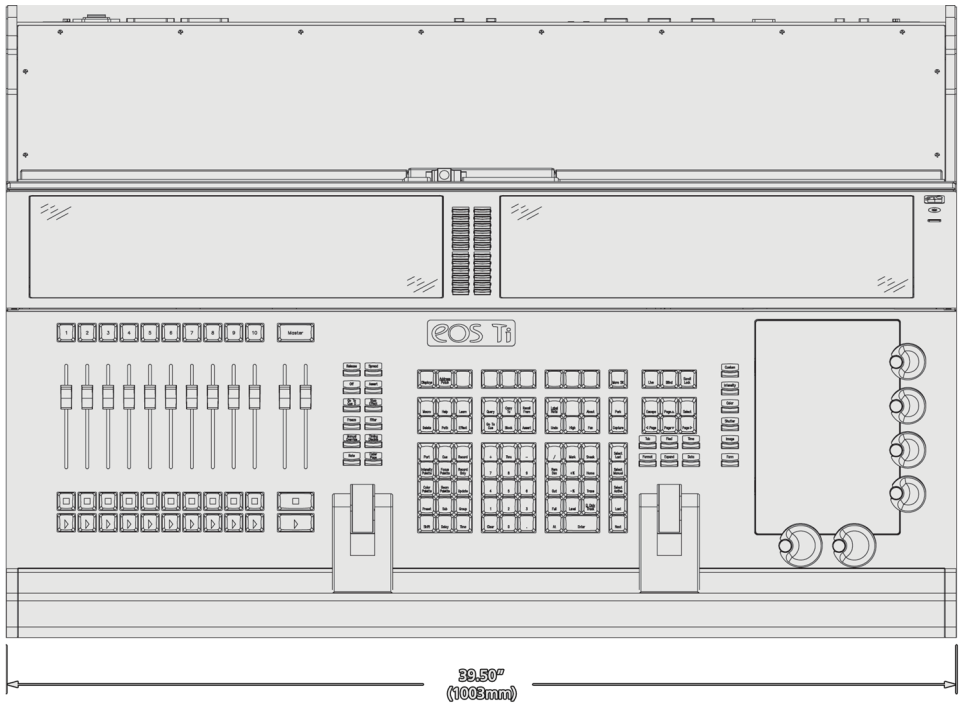
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

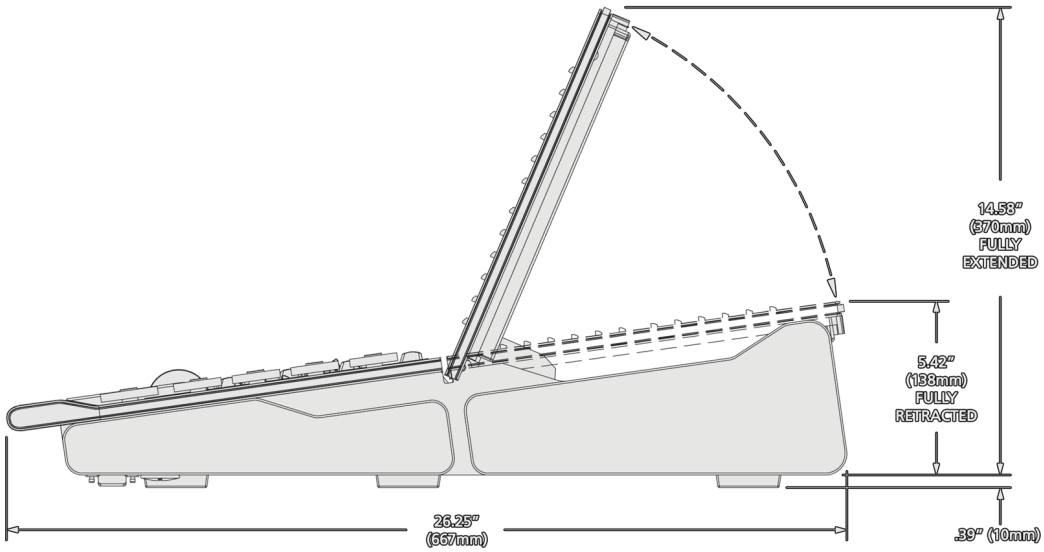
Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights





Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Ti	370	14.58	1003	39.50	667	26.25	38.5	85
Eos Ti in shipping container	356	14	1143	45	787	31	54.5	120
Eos Ti in travel case	940	37	1155	45.5	270	10.6	68	150

Ships With

- Dust cover.
- Two Littlites.
- Mouse and mousepad.
- Backlit external alphanumeric keyboard.
- Three female-to-female IEC cables.
- Three active Display Port to DVI adapters.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Ti requires Eos software v2.0.0 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Ti supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Ti is available with 4,096 (minimum) or 24,576 (maximum) outputs.

Capacities

- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

- Faders
  - Motorized Main Playback - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - Motorized Faders - 10 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 6.3 A at 120 V or 3.2 A at 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Gio @5

Gio @5 brings the high-end control of the larger Eos Family consoles to venues with tighter spaces. This portable console packs all the control necessities into a compact footprint, so external monitors and accessories are optional.

- *Setup Guide* - get started with Gio @5.
- *Physical Overview* - Gio @5 hardware layout.
- *Features, Specifications, and Requirements* - Gio @5 capabilities.

Setup Guide

Prepare your Gio @5 for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Gio @5.*

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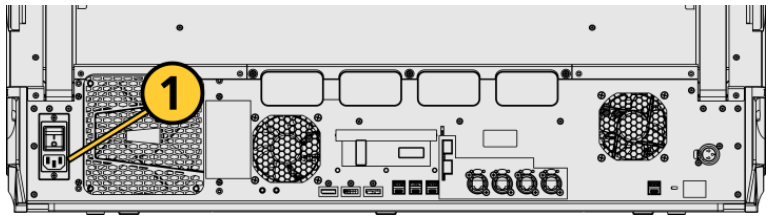
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Gio @5. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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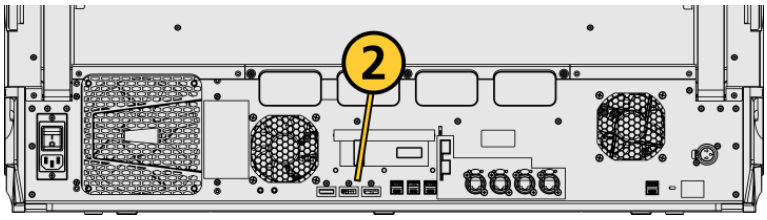
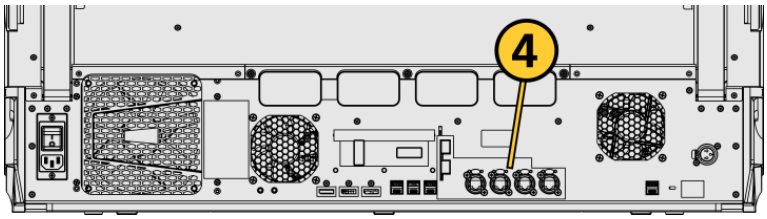
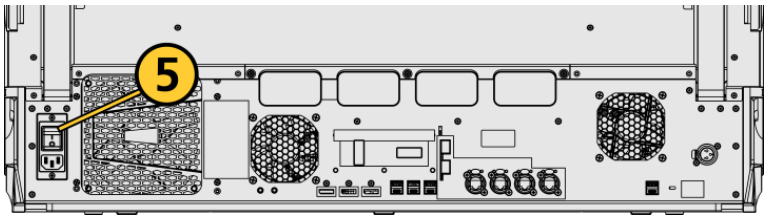
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



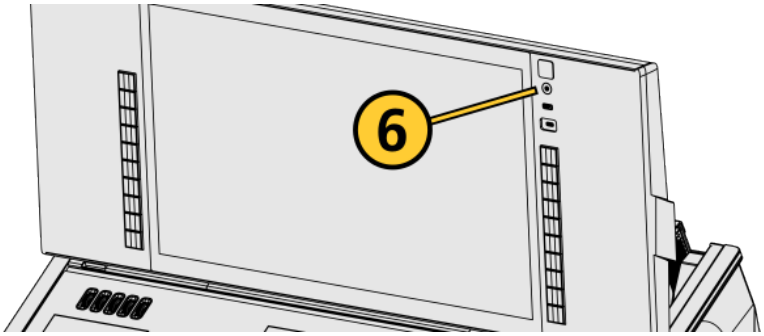
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



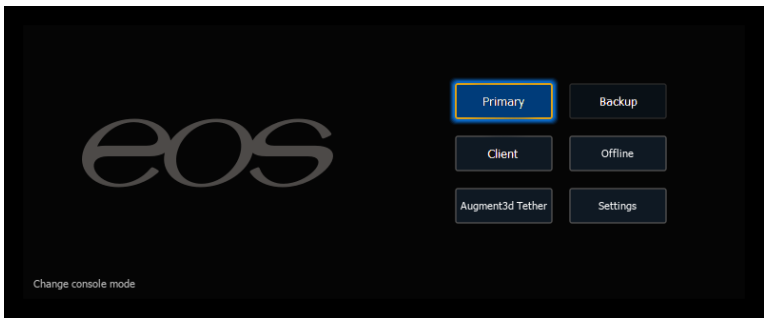
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Gio @5.

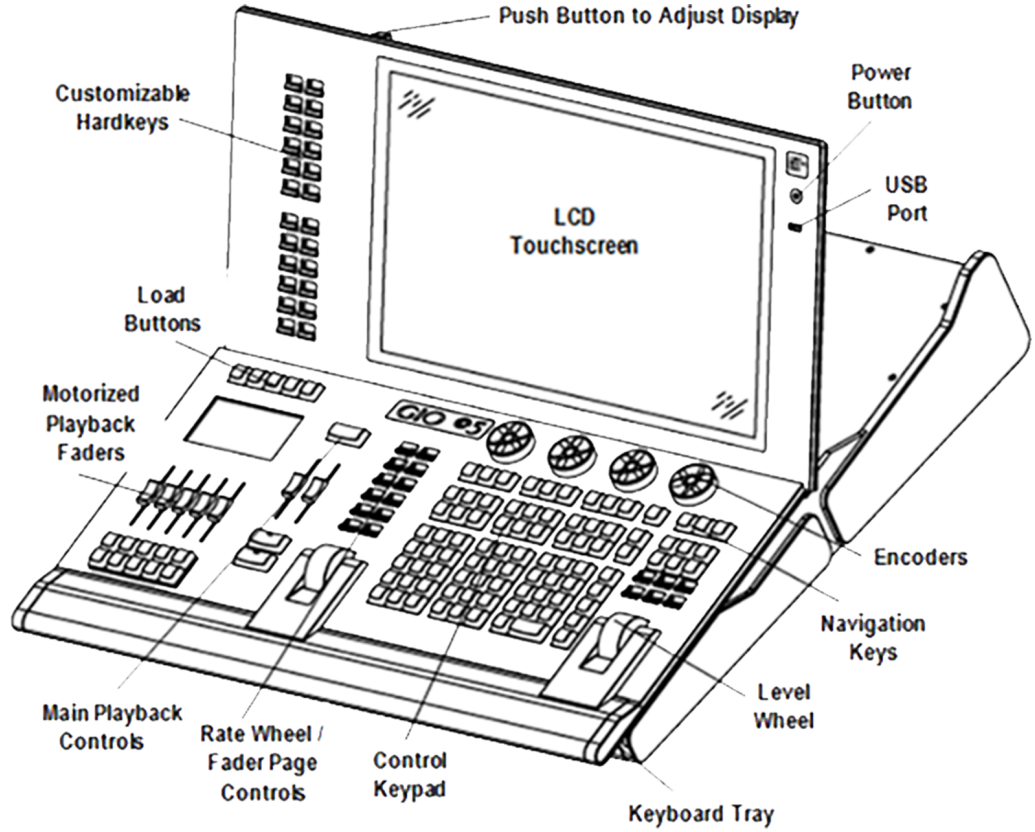


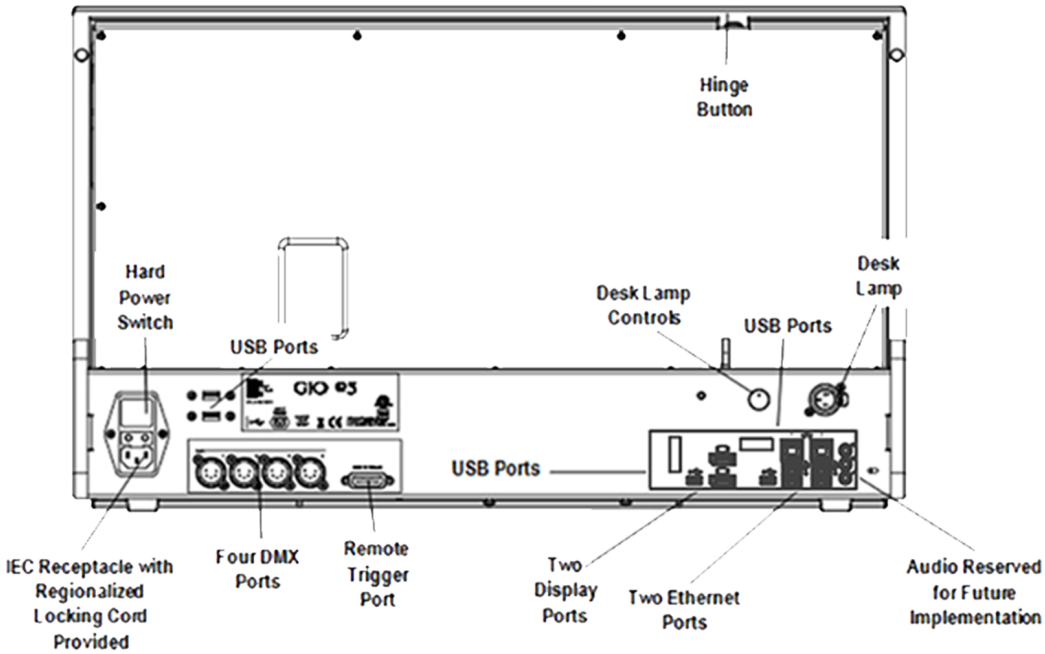
7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Gio @5 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview





Power

Power Button

The soft power button on the front of the Gio @5 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Fuse

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Internal Touchscreens

Gio @ 5 is designed with a single internal touchscreen display. The touchscreen may be used to display and control show data. It can also be used as a variety of other virtual controls and displays.

The touchscreen angle can be adjusted by pushing the button in the left side top of the display and moving the panel up or down.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Gio @ 5, Ion Xe, and Element 2 consoles support up to two external Display Port monitors compatible with Windows 7 or later.

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

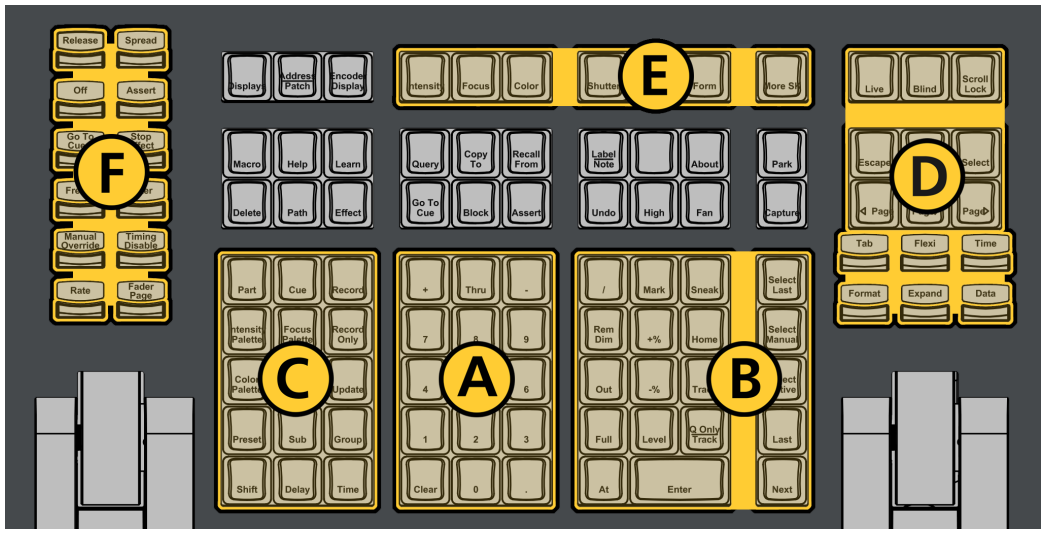
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to **Setup > Device >** *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	Keypad	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	Level Controls	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	Targets	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	Display and Navigation	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	Encoder Categories	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	Fader Controls	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Customizable Hardkeys

Gio @ 5 has twenty one customizable hardkeys. Twenty are located to the left of the main touchscreen, and default to macros 801-820. The other is between **[Label/Note]** and **[About]** on the face panel, and defaults to macro 821.

Functionality for the hardkeys can be defined in **ECU >** *Buttons* **> Gio @5 Face Panel Buttons**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, five slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

The fader bank has a dedicated LCD display for local status of playback content.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Encoders

Haptic-feedback encoders are provided above the control keypad. The four encoders are pageable controls, which are populated with the parameters used in your show. Current encoder mapping is indicated at all times, and the **[Encoder Display]** button opens full control on the screen.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

Rate Wheel

The rate wheel can be used to provide dynamic rate adjustments for multiple playbacks.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

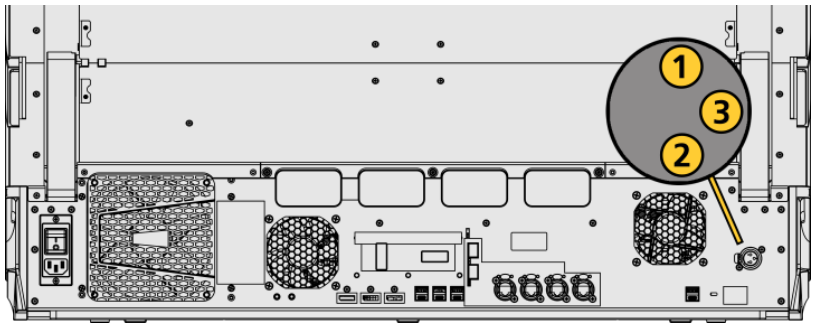
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

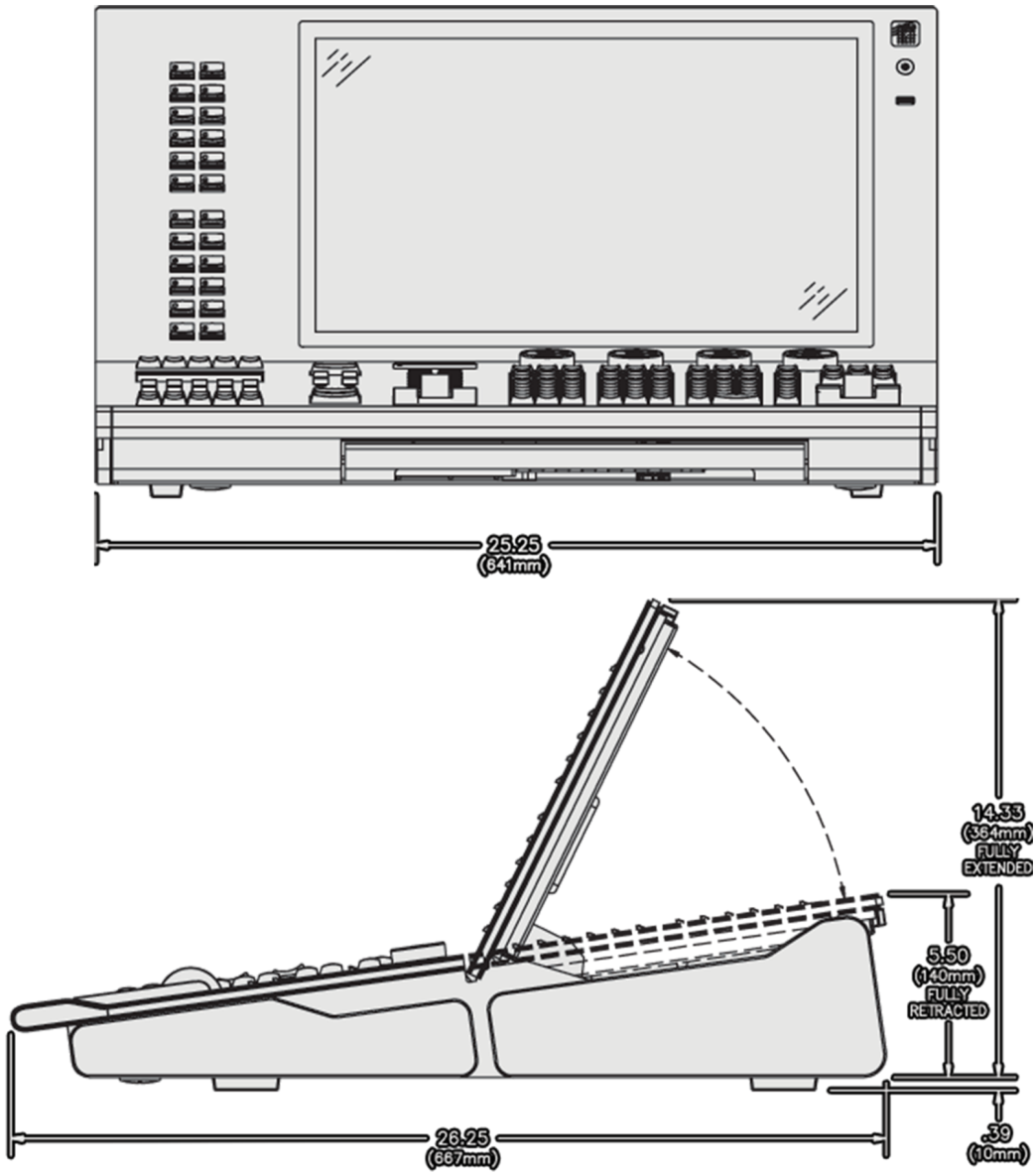
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Gio @5	364	14.3	641	25.3	667	26.3	23.59	52.0
Gio @5 in shipping container	342	13.5	769	30.3	775	30.5	27.67	61.0
Gio @5 in travel case	292	11.5	781	30.8	813	32.0	42.52	93.8

Ships With

- One three-button scroll mouse and mousepad.
- Backlit alpha-numeric keyboard.

- Locking regionalized IEC power cord.
- Two active Display Port to DVI adapters.
- One 18-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Gio @5 requires Eos software v2.5 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Gio @5 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Gio @5 is available with 4,096 (minimum) or 24,576 (maximum) outputs.

Capacities

- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000
- **Faders**
  - **Motorized Main Playback** - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - **Motorized Faders** - 5 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - **Virtual Faders** - 100 virtual pages of 10 faders each.
  - **Playbacks** - 200 configurable cue playbacks, with Go and Stop/Back.
  - **Submasters** - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- **Power Consumption** - approximately 2 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Gio

Gio provides complete control of conventional and moving lights, LEDs and media servers, with unique force-feedback encoders, two integral articulating multi-touch displays, and backlit keys.

- *Setup Guide* - get started with Gio.
- *Physical Overview* - Gio hardware layout.
- *Features, Specifications, and Requirements* - Gio capabilities.

Setup Guide

Prepare your Gio for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Gio.*

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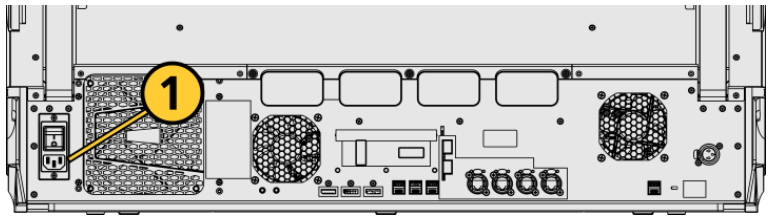
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Gio. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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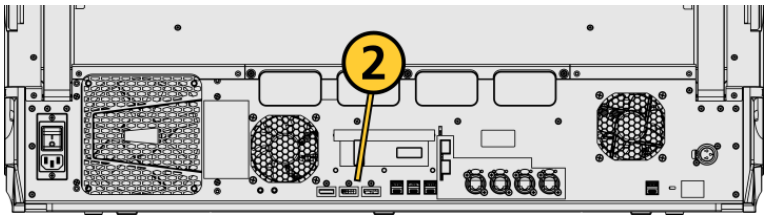
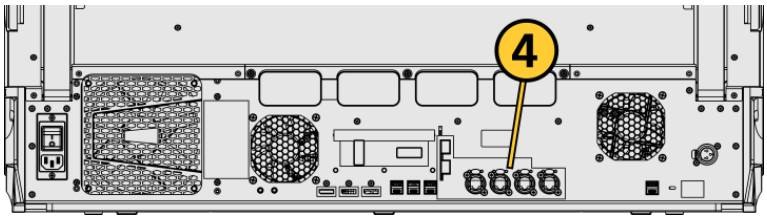
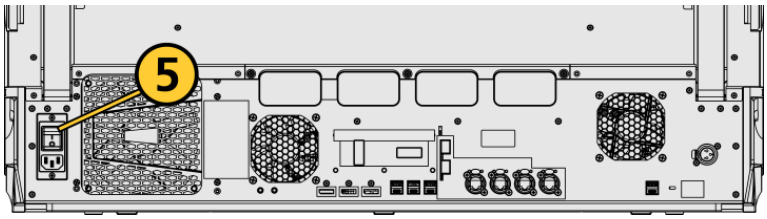
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



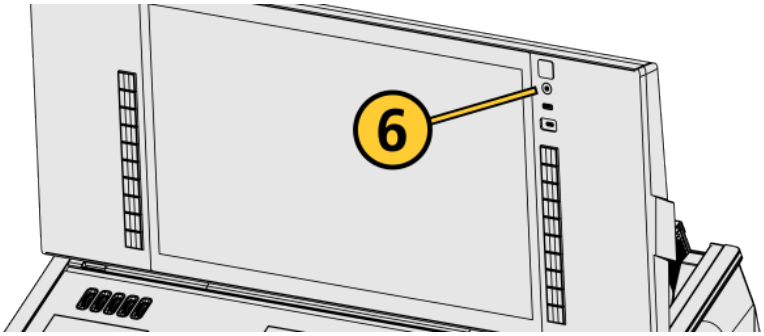
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



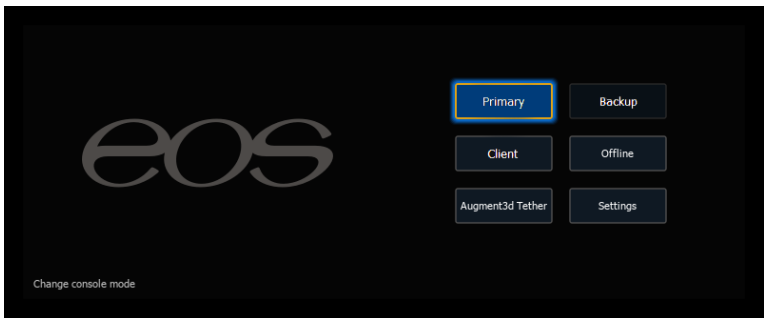
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Gio.

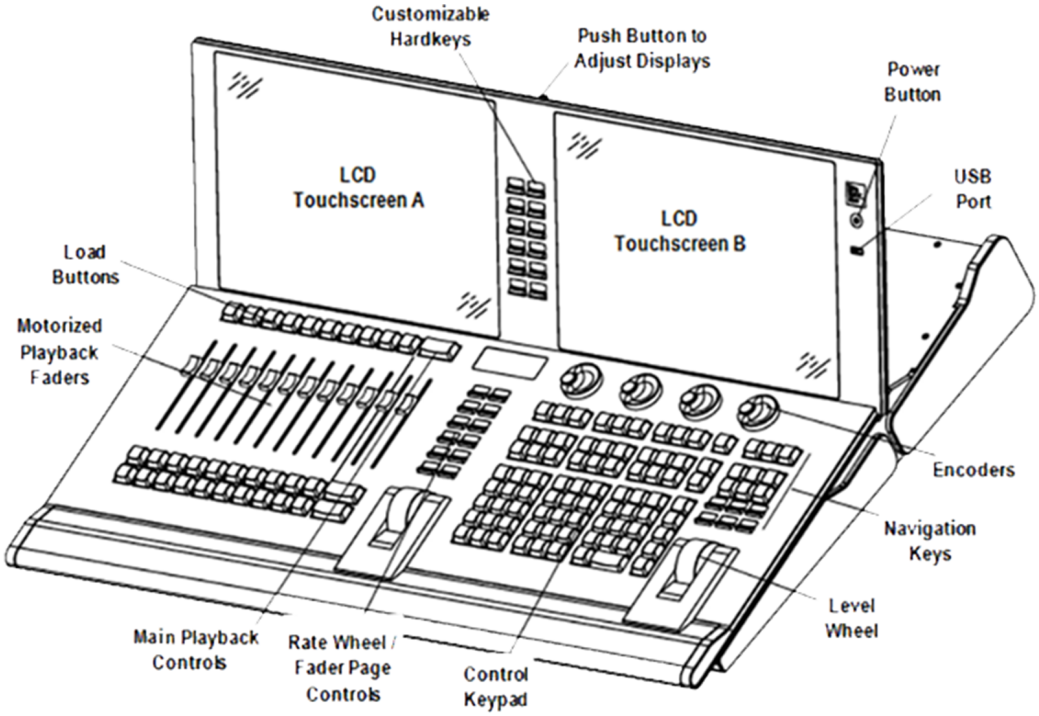


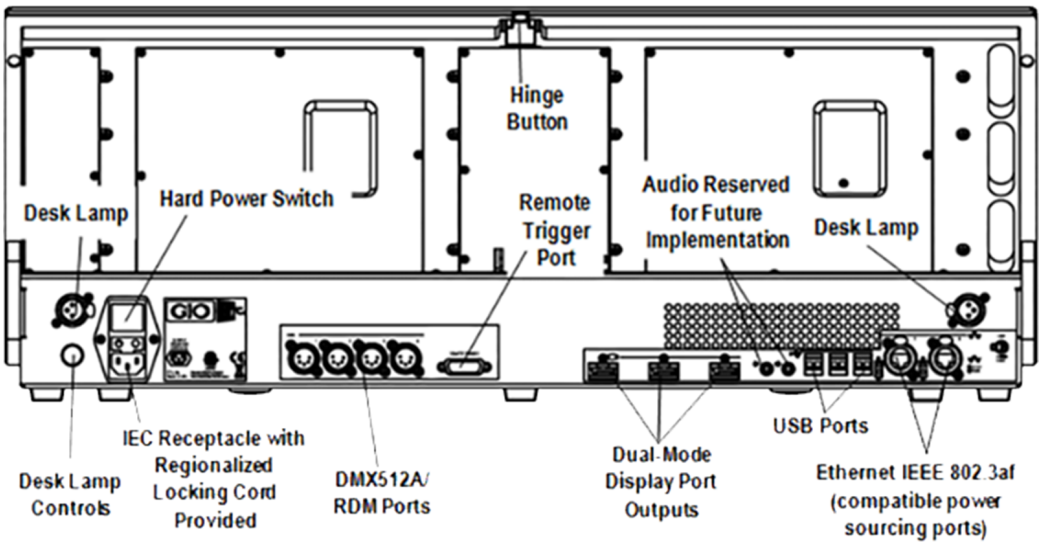
7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Gio is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview





Power

Power Button

The soft power button on the front of the Gio is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Fuse

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Internal Touchscreens

Gio is designed with two internal touchscreen displays. Each touchscreen may be used to display and control show data. They may also be used as a variety of other virtual controls and displays.

The touchscreen angle can be adjusted by pushing the button in the center top of the display and moving the panel up or down.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

Eos Ti and Gio consoles support up to three external Display Port or DVI monitors compatible with Windows 7 or later.

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

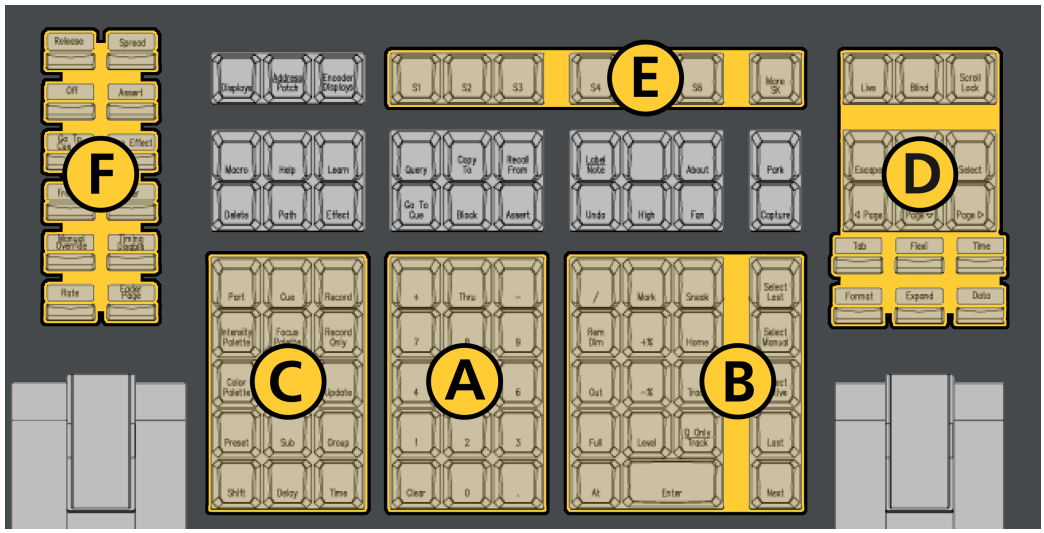
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to **Setup > Device >** *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	Keypad	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	Level Controls	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	Targets	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	Display and Navigation	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	Encoder Categories	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	Fader Controls	The fader control buttons provide additional options for easy local control of fader behavior.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Customizable Hardkeys

Gio has nine customizable hardkeys. Eight are located between the two main touchscreens, and default to macros 801-808. The other is between **[Label/Note]** and **[About]** on the face panel, and defaults to macro 821.

Functionality for the hardkeys can be defined in **ECU >** *Buttons* **> Gio Face Panel Buttons**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Motorized Faders

In addition to the main playbacks, ten slots of configurable motorized faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Encoders

Haptic-feedback encoders are provided above the control keypad. The four encoders are pageable controls, which are populated with the parameters used in your show. Current encoder mapping is indicated at all times, and the **[Encoder Display]** button opens full control on the screen.

Six hardkeys are also available for encoder control. These encoder paging keys control intensity, focus, color, shutter, image, and form. Pressing any of these will change the parameters controlled by the encoders. To view other available encoder pages, simply press the encoder paging keys to advance the pages.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

Rate Wheel

The rate wheel can be used to provide dynamic rate adjustments for multiple playbacks.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

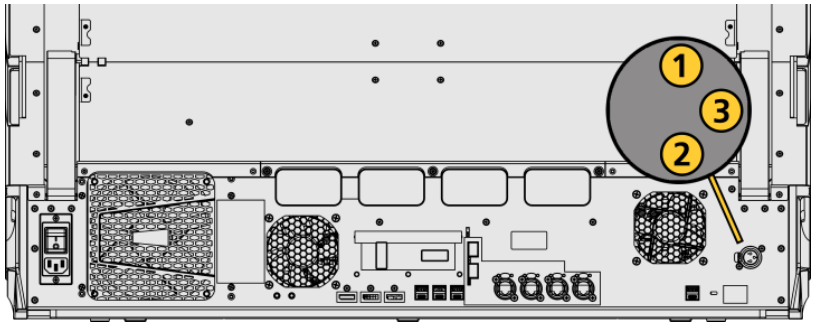
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

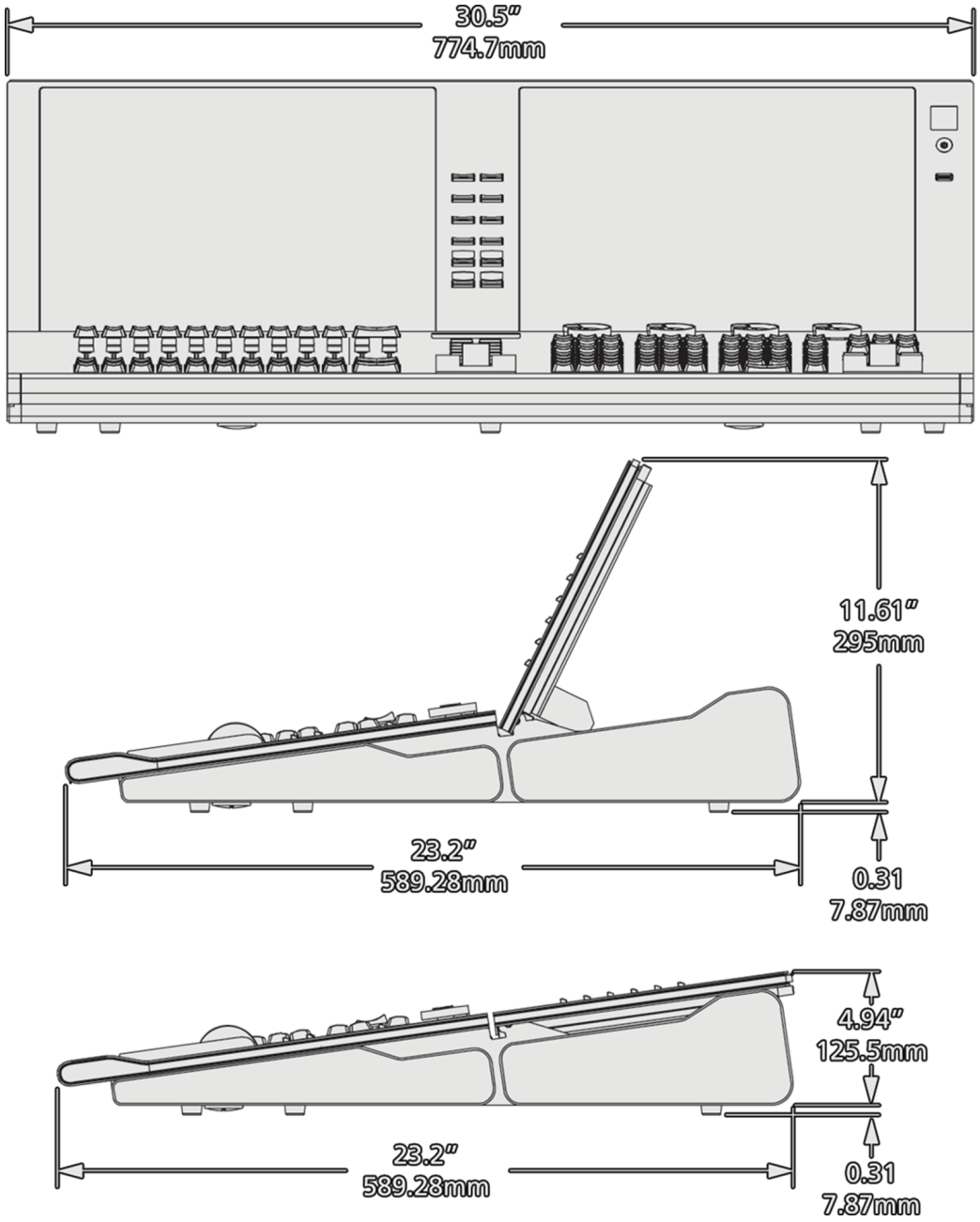
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Gio	295	11.61	774.7	30.5	589.28	23.2	20.5	45
Gio in shipping container	876.3	34.5	692.2	27.3	257.2	10.1	27.2	60
Gio in travel case	863.6	34	919.5	36.2	234.2	9.3	36.3	80

Ships With

- Dust cover.
- Two Littlites.
- Mouse and mousepad.
- Backlit external alphanumeric keyboard.
- Three active Display Port to DVI adapters.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Gio requires Eos software v1.9.9 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The NAME supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Gio is available with 4,096 (minimum) or 24,576 (maximum) outputs.

Capacities

- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

- Faders
  - Motorized Main Playback - 1 dedicated motorized main playback pair, with Go and Stop/Back.
  - Motorized Faders - 10 motorized fader slots configurable as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 2 A at 120 V or 1 A at 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Ion Xe

Ion Xe is the compact workhorse of the Eos Family. With the same backlit keyboard layout and full-featured software as larger consoles in the family, Ion Xe gives you the complete Eos experience in a budget-friendly and portable package.

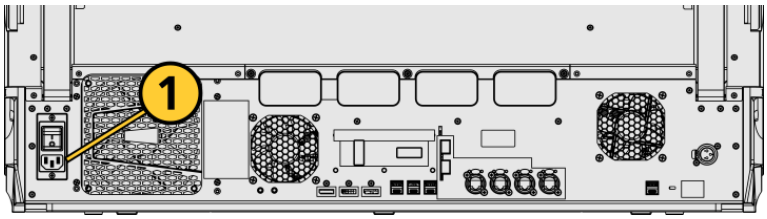
- *Setup Guide* - get started with Ion Xe.
- *Physical Overview* - Ion Xe hardware layout.
- *Features, Specifications, and Requirements* - Ion Xe capabilities.

Setup Guide

Prepare your Ion Xe for use with the following setup steps.

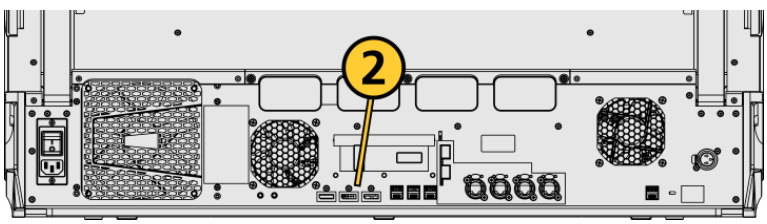
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Ion Xe.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Ion Xe. Connect the other end of the cord to wall power.



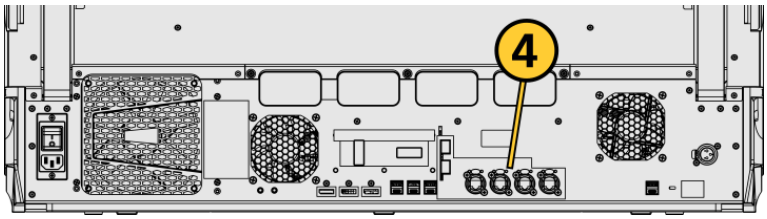
CAUTION: ***Power cord must be connected using an earth ground connection.***

2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

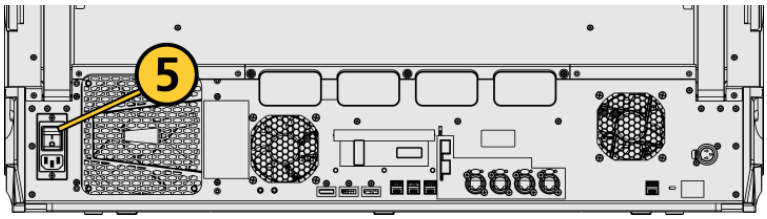


3. Connect any USB devices, such as an external mouse or the included keyboard.

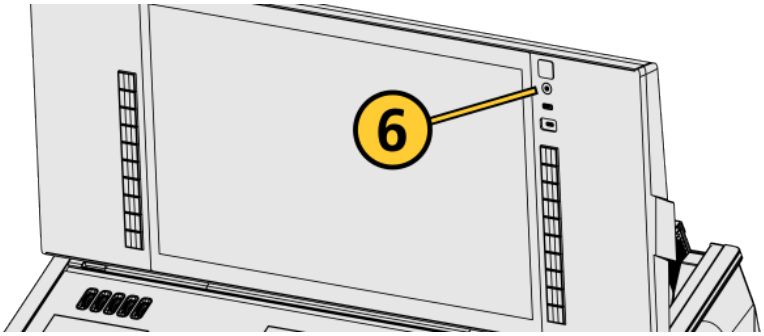
4. Connect any network cabling to the appropriate Ethernet port.



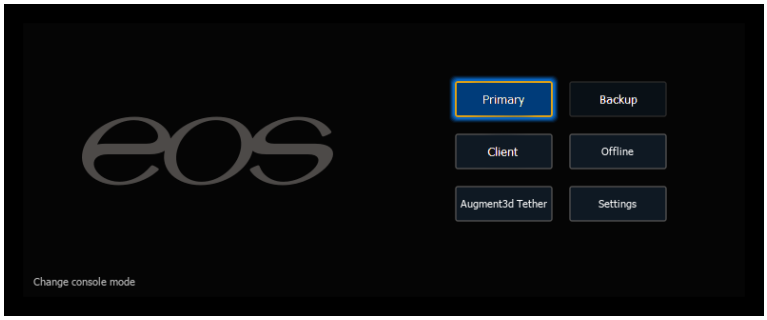
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Ion Xe.

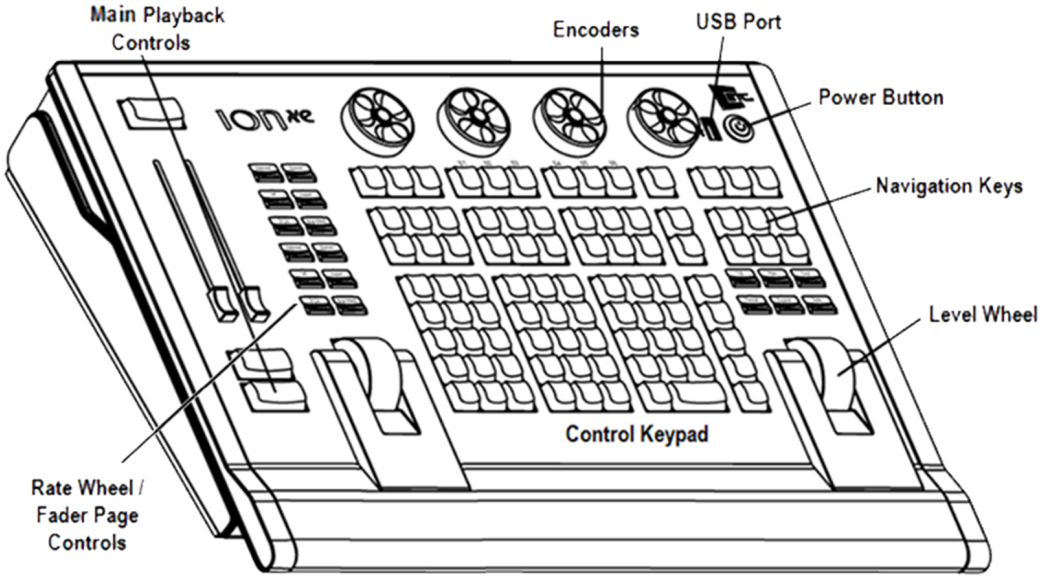


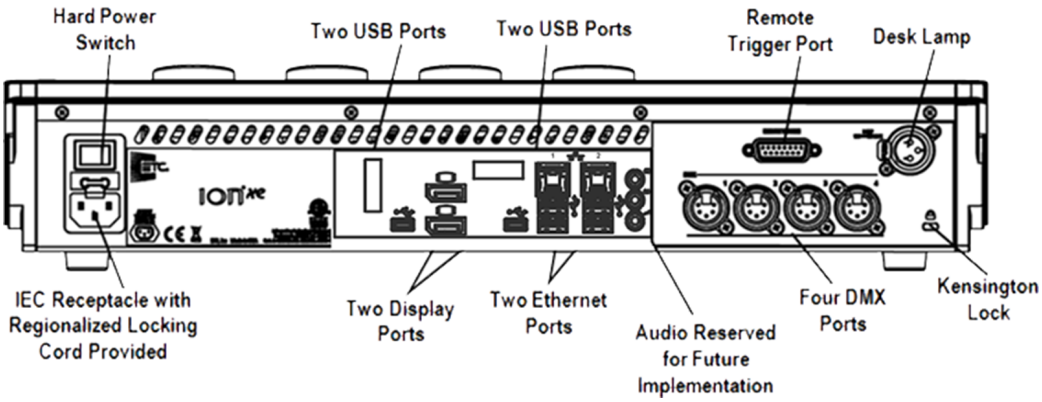
7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Ion Xe is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview





Power

Power Button

The soft power button on the front of the Ion Xe is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Fuse

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

External Monitors

Gio @ 5, Ion Xe, and Element 2 consoles support up to two external Display Port monitors compatible with Windows 7 or later.

CAUTION: ***Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.***

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

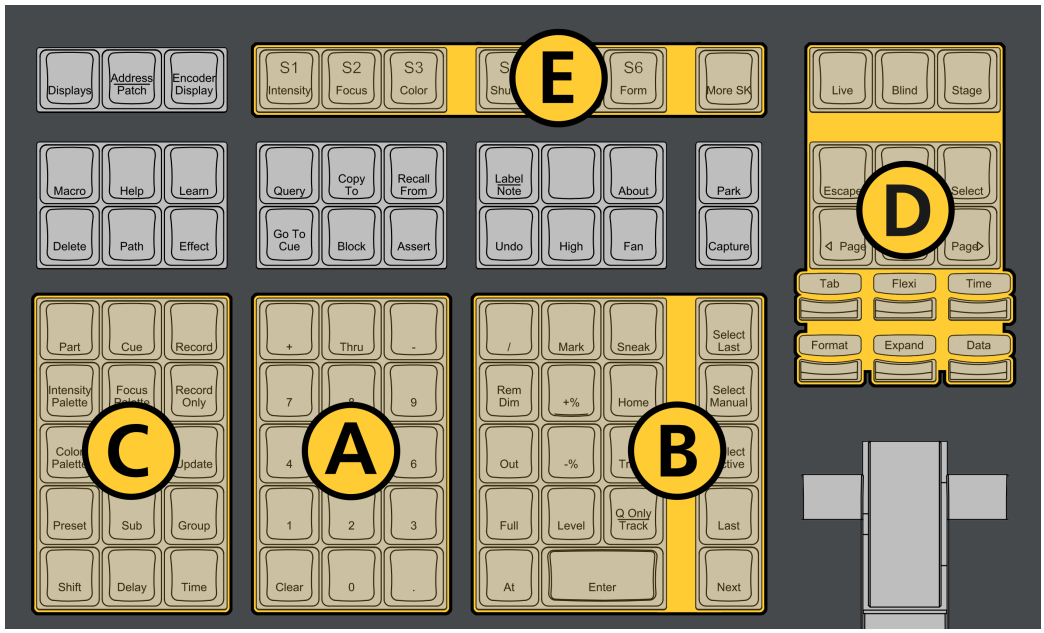
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to **Setup > Device >** *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Encoder Categories**	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via Setup > Device > *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using [Shift] & [Escape].

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the [Go] and [Stop/Back] functions.

Encoders

Encoders and an associated LCD for control of non-intensity parameters are provided at the top center of the console. The four encoders are pageable controls, which are populated on the LCD with the parameters used in your show.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

Rate Wheel

The rate wheel can be used to provide dynamic rate adjustments for multiple playbacks.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN*

(sACN) or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

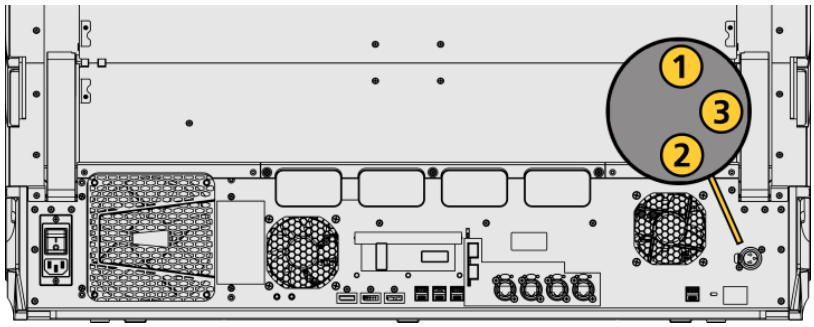
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

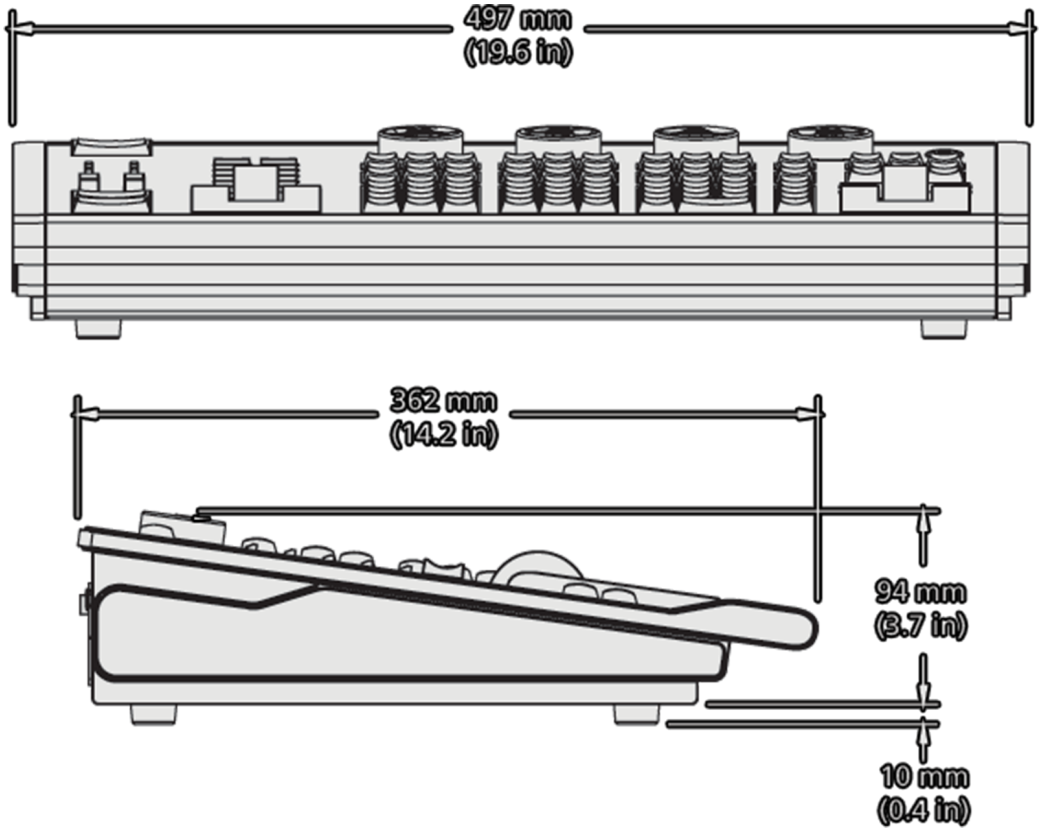
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under Setup > Device > *Brightness Settings and Presets*. The {Desk Lamp} slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down [Displays] and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Ion Xe	295	11.61	774.7	30.5	589.28	23.2	20.5	45
Ion Xe in shipping container	876.3	34.5	692.2	27.3	257.2	10.1	27.2	60
Ion Xe in travel case	863.6	34	919.5	36.2	234.2	9.3	36.3	80

Ships With

- One three-button scroll mouse and mousepad.
- Alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two active Display Port to DVI adapters.
- One 18-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Ion Xe requires Eos software v2.6.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Ion Xe supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Ion Xe is available with 2,048 (minimum) or 12,288 (maximum) outputs.

Capacities

- **Output Parameters** - 24,576.
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000
- **Faders**
  - **Main Playback** - 1 dedicated main playback pair, with Go and Stop/Back.
  - **Virtual Faders** - 100 virtual pages of 10 faders each.
  - **Playbacks** - 200 configurable cue playbacks, with Go and Stop/Back.
  - **Submasters** - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- **Power Consumption** - approximately 2 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant

- RoHS compliant
- WEEE

Ion Xe 20

Ion Xe 20 is a compact console that includes programming and playback controls. In addition to the backlit keyboard and full-featured software that are a part of other Eos Family consoles, Ion Xe 20 also has twenty non-motorized faders and dedicated displays to easily run control manually.

- *Setup Guide* - get started with Ion Xe 20.
- *Physical Overview* - Ion Xe 20 hardware layout.
- *Features, Specifications, and Requirements* - Ion Xe 20 capabilities.

Setup Guide

Prepare your Ion Xe 20 for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Ion Xe 20.*

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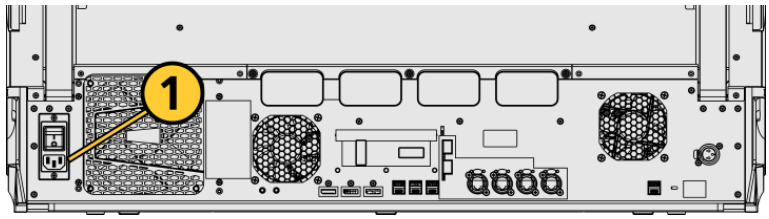
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Ion Xe 20. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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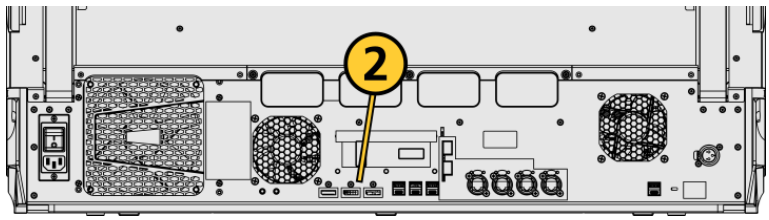
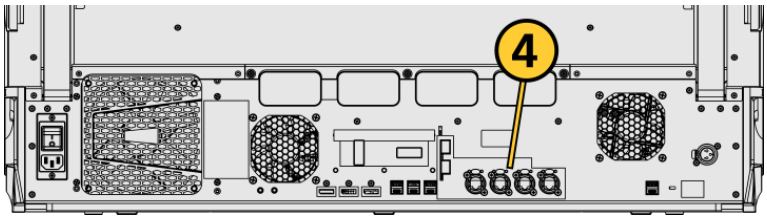
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

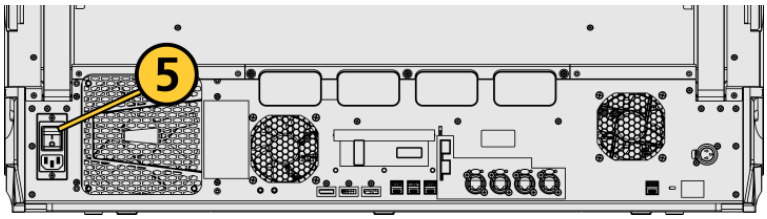


3. Connect any USB devices, such as an external mouse or the included keyboard.

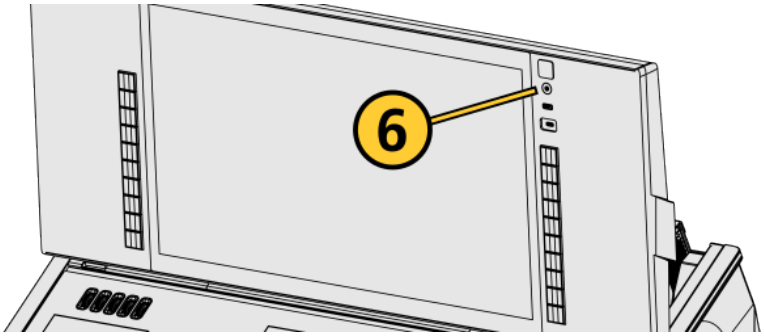
4. Connect any network cabling to the appropriate Ethernet port.



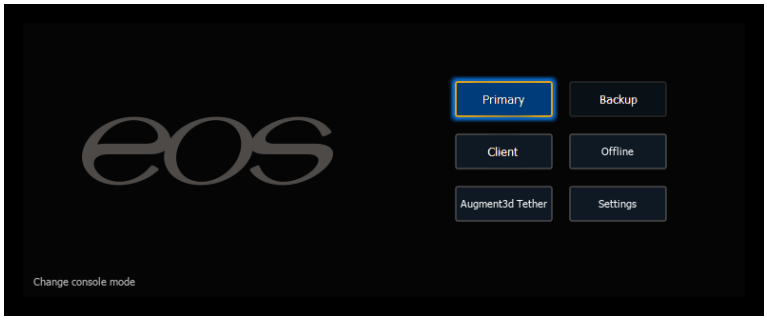
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Ion Xe 20.

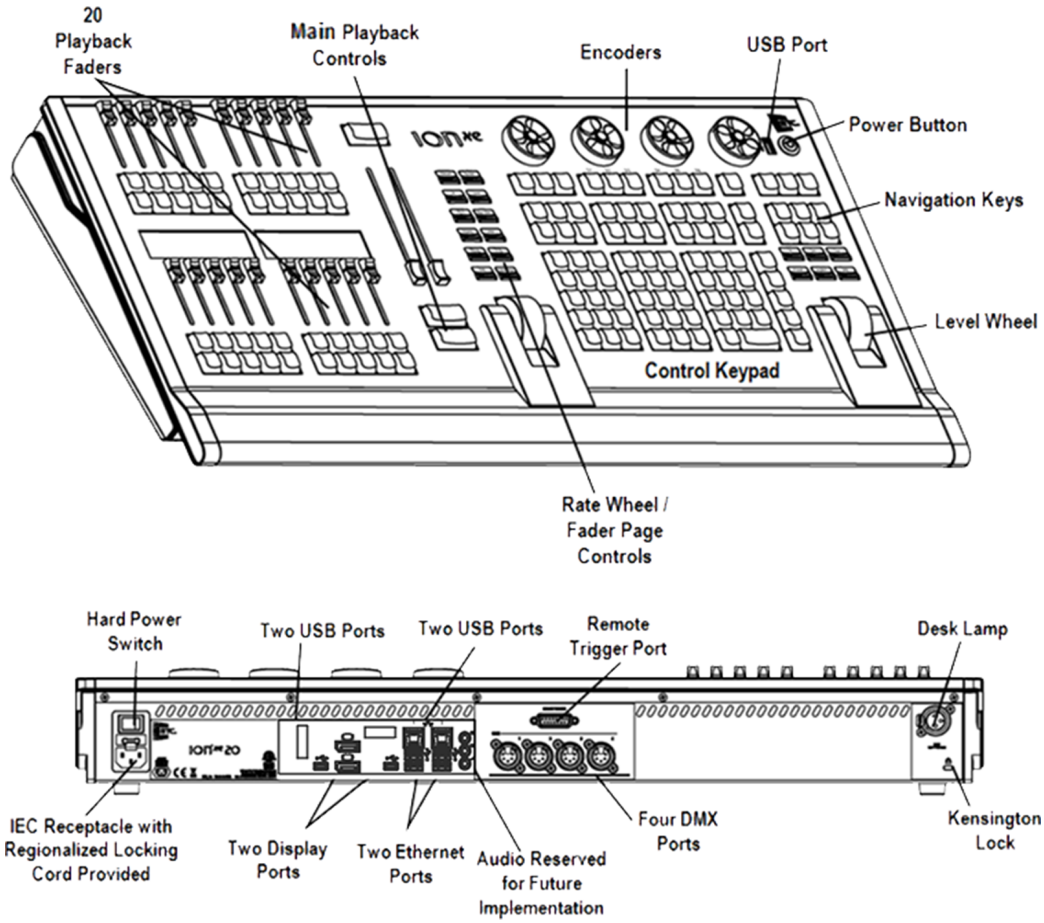


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Ion Xe 20 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



Power

Power Button

The soft power button on the front of the Ion Xe 20 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

External Monitors

CAUTION: *Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.*

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

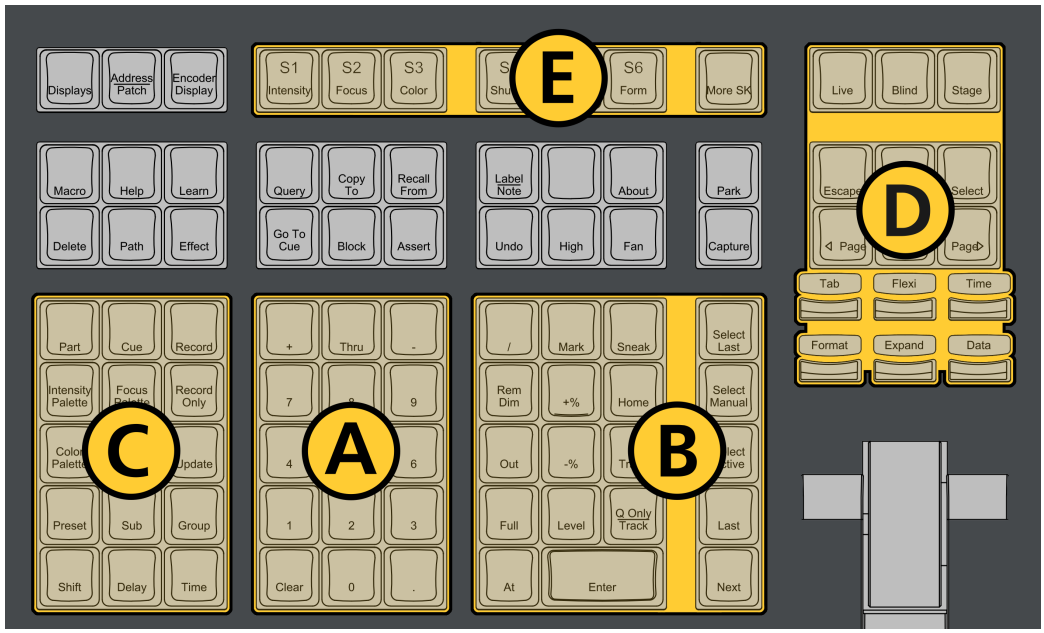
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to Setup > Device > *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the [Go] and [Stop/Back] functions.

Faders

In addition to the main playbacks, banks of configurable faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

The fader banks have dedicated LCD displays for local status of playback content.

Fader Selection Wheel

The fader selection wheel switches the fader banks between direct control of channels and submasters.

Fader Buttons

Ion Xe 20, Element 2, and Element Classic consoles lack dedicated load buttons for assigning a specified target to a specified fader, other than for the main playbacks. For all other faders, load is performed with a simultaneous press of the two bump buttons beneath the fader. See *Assigning Faders*.

Encoders

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

Rate Wheel

The rate wheel can be used to provide dynamic rate adjustments for multiple playbacks.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

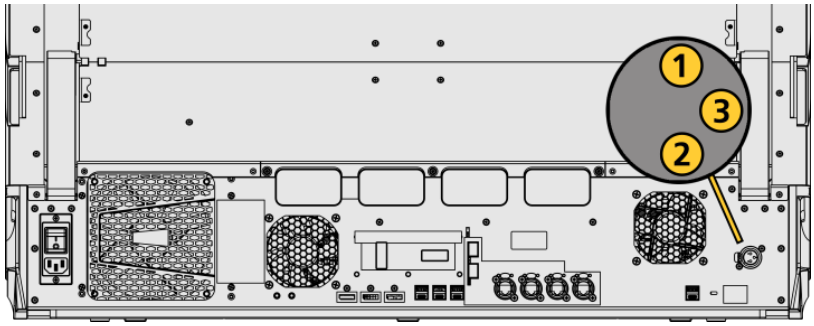
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

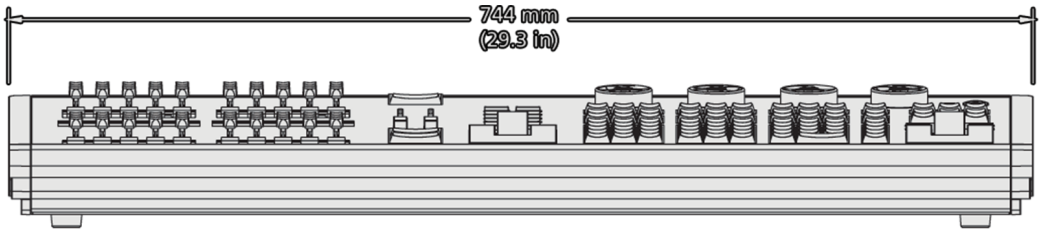
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

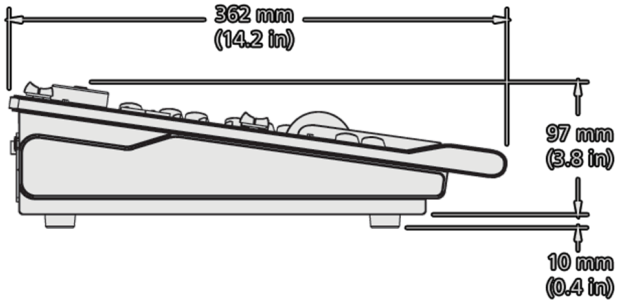
Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights





Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Ion Xe 20	107	4.2	744	29.3	362	14.2	7.35	16.6
Ion Xe 20 in shipping container	197	7.8	927	36.5	470	18.5	9.98	20.4
Ion Xe 20 in travel case	212	8.3	1146	45.1	494	19.5	18.94	41.8

Ships With

- One three-button scroll mouse and mousepad.
- Alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two active Display Port to DVI adapters.
- One 18-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Ion Xe 20 requires Eos software v2.6.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Ion Xe 20 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as Disconnected.

Available Outputs

The Ion Xe 20 is available with 2,048 (minimum) or 12,288 (maximum) outputs.

Capacities

- Output Parameters - 24,576.
- Channels - 32,768 (can be any number from 1 to 99,999).
- Cues - 10,000.
- Cue Lists - 999.
- Record Targets
  - Groups - 10,000.
  - Palettes - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 10,000.
  - Effects - 10,000.
  - Macros - 99,999.
  - Snapshots - 10,000.
  - Curves - 10,000.
  - Color Paths - 10,000
- Faders
  - Main Playback - 1 dedicated main playback pair, with Go and Stop/Back.
  - Faders - 20 faders with 40 configurable buttons.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 2 A at 120 V or 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Element 2

Designed for venues using primarily conventional lighting, the Element 2 control console provides the powerful features of the Eos system in an economical and simplified package.

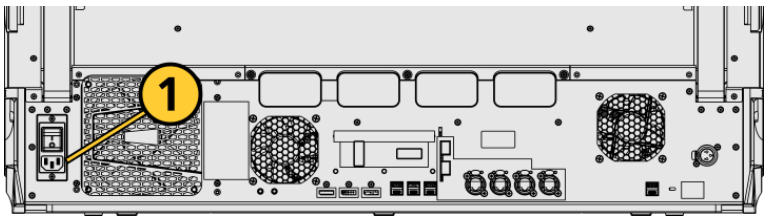
- *Setup Guide* - get started with Element 2.
- *Physical Overview* - Element 2 hardware layout.
- *Features, Specifications, and Requirements* - Element 2 capabilities.

Setup Guide

Prepare your Element 2 for use with the following setup steps.

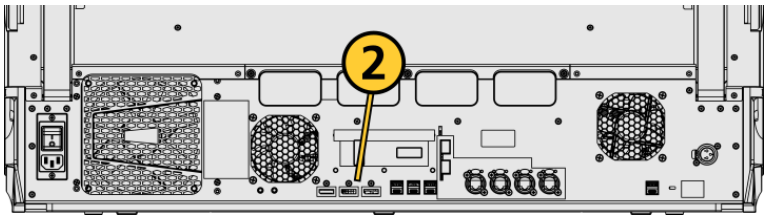
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Element 2.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Element 2. Connect the other end of the cord to wall power.



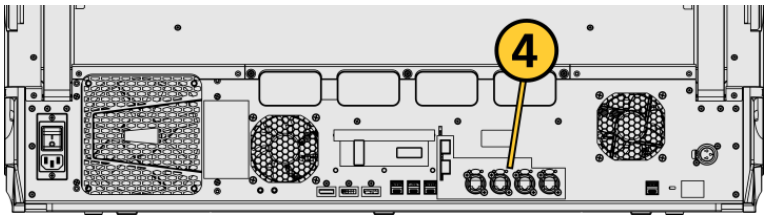
CAUTION: ***Power cord must be connected using an earth ground connection.***

2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

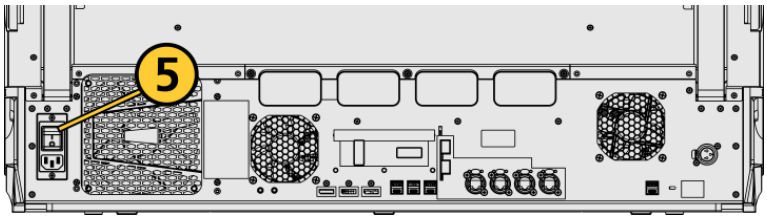


3. Connect any USB devices, such as an external mouse or the included keyboard.

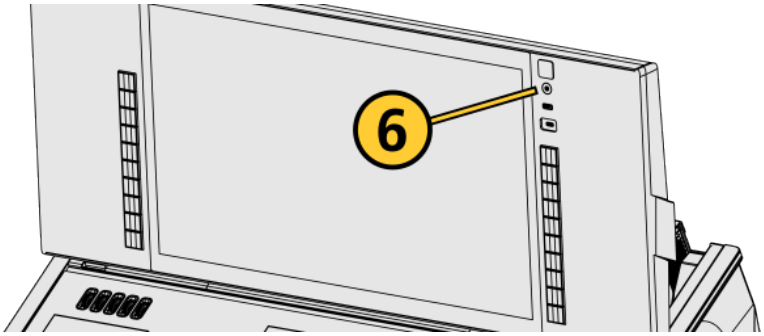
4. Connect any network cabling to the appropriate Ethernet port.



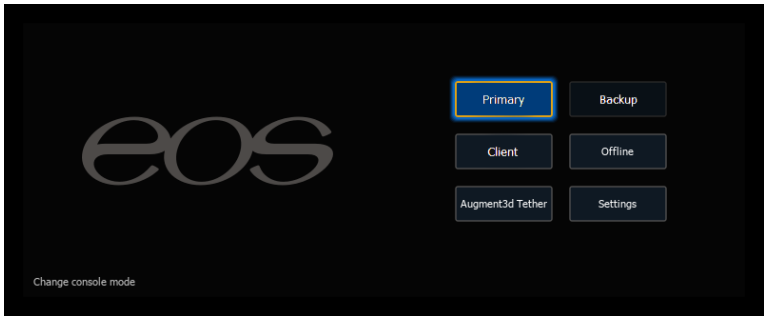
5. Activate the hard power switch above the IEC socket.



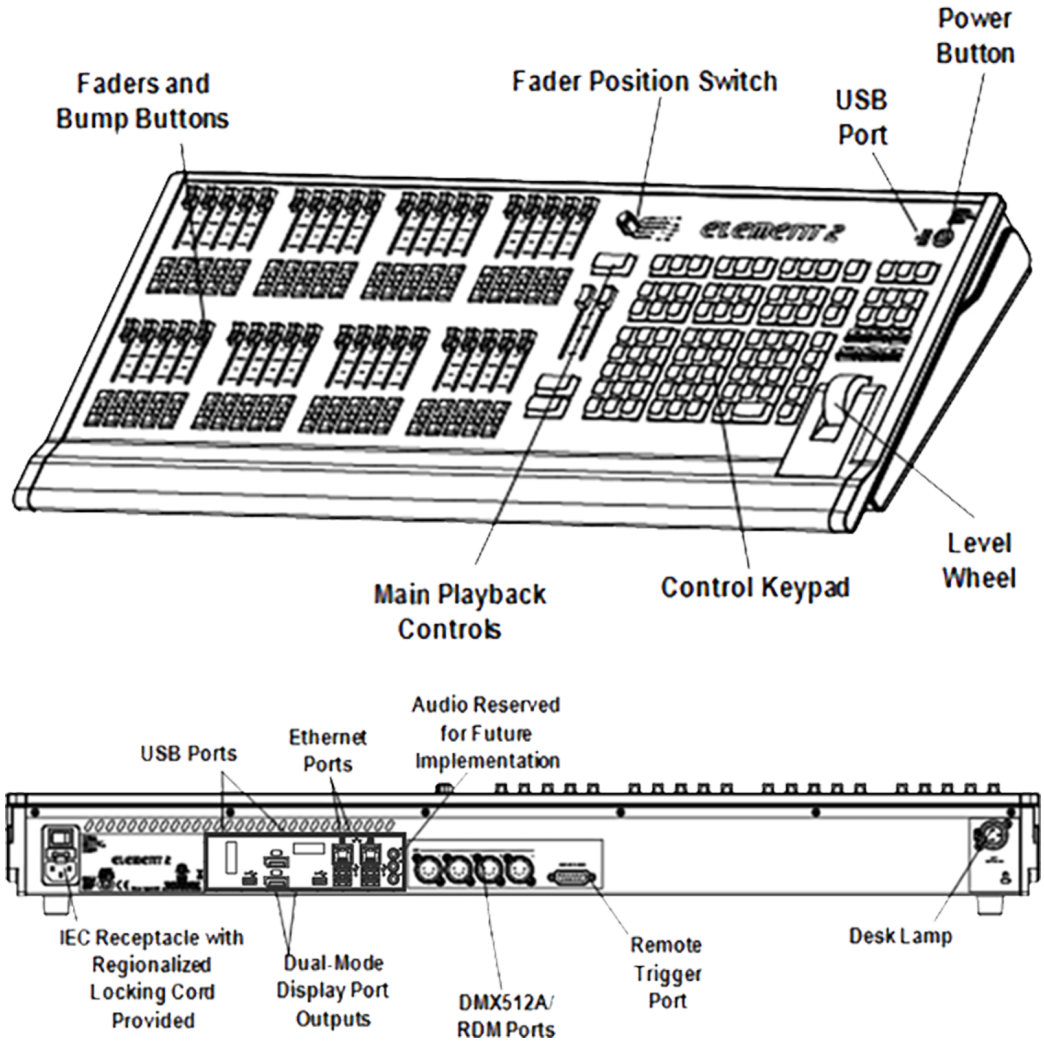
6. Activate the soft power button on the front or top of the Element 2.



7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Element 2 is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.



Power

Power Button

The soft power button on the front of the Element 2 is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Fuse

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

External Monitors

Gio @ 5, Ion Xe, and Element 2 consoles support up to two external Display Port monitors compatible with Windows 7 or later.

CAUTION: ***Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.***

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
  - DisplayPort v1.2. maximum resolution 3480x2160 (60Hz refresh rate). Video adapters may have their own ratings and limits.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

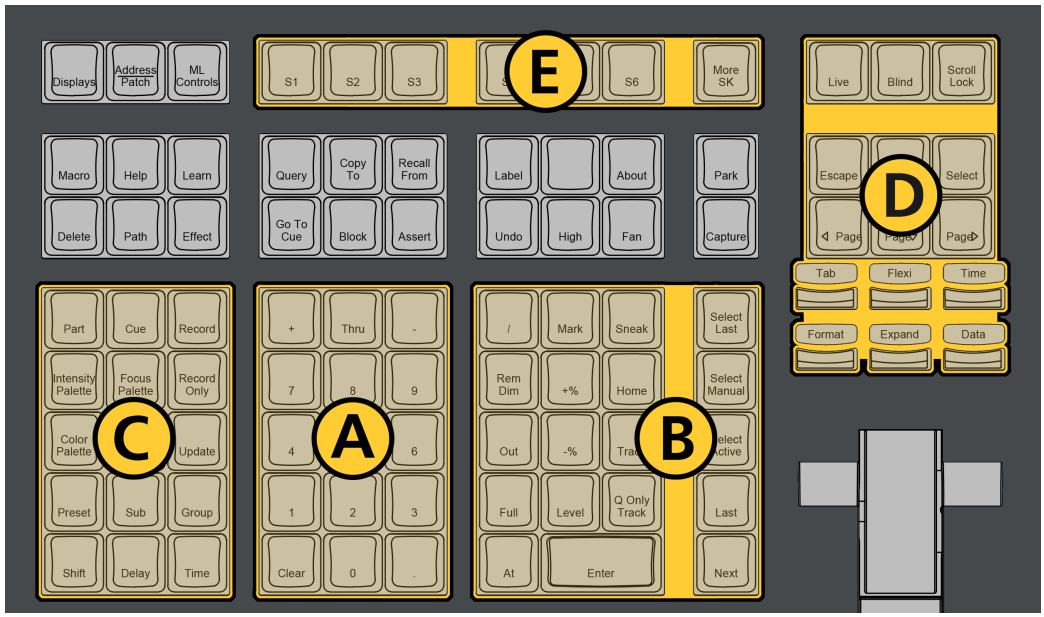
Monitor Specifications for DVI Devices

- Maximum digital resolution 2560x1600 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Maximum VGA resolution 2048x1536 (30Hz refresh rate) or 1920x1200 (60Hz refresh rate).
- Output to 4K resolution monitors may affect performance.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to **Setup > Device >** *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	**Keypad**	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	**Level Controls**	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	**Targets**	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	**Display and Navigation**	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	**Softkeys**	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Faders

In addition to the main playbacks, banks of configurable faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Selection Wheel

The fader selection wheel switches the fader banks between direct control of channels and submasters.

Fader Buttons

Ion Xe 20, Element 2, and Element Classic consoles lack dedicated load buttons for assigning a specified target to a specified fader, other than for the main playbacks. For all other faders, load is performed with a simultaneous press of the two bump buttons beneath the fader. See *Assigning Faders*.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

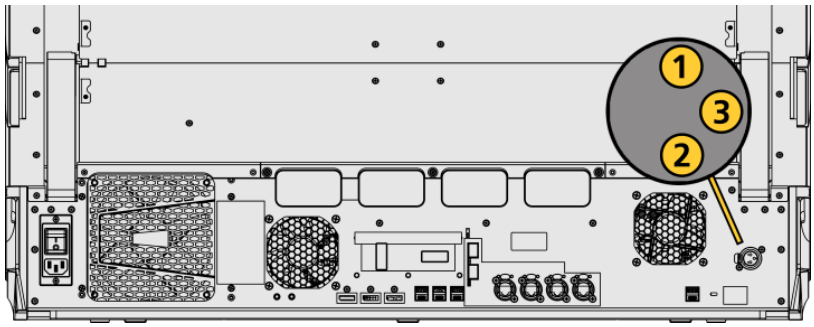
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

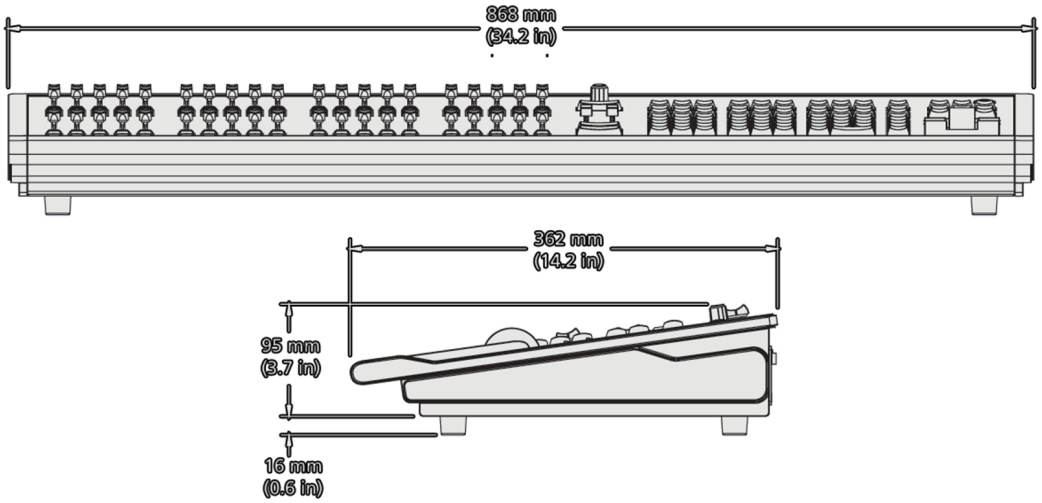
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Element 2	111	4.3	868	34.2	362	14.2	7.26	16.0
Element 2 in shipping container	241	9.5	1022	40.3	495	19.5	9.25	20.4
Element 2 in travel case	212	8.3	1146	45.1	494	19.5	18.94	41.8

Ships With

- One three-button scroll mouse and mousepad.
- Alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two active Display Port to DVI adapters.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Element 2 requires Eos software v2.7.0 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Element 2 supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Element 2 is available with 1,024 (minimum) or 6,144 (maximum) outputs.

Capacities

- **Output Parameters** - 1,024 (minimum) or 6,144 (maximum).
- **Cues** - 10,000.
- **Cue Lists** - 1.
- **Record Targets**
  - **Groups** - 1,000.
  - **Palettes** - 1,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 1,000.
  - **Effects** - 1,000.
  - **Macros** - 99,999.
  - **Snapshots** - 1,000.
  - **Curves** - 1,000.
  - **Color Paths** - 10,000
- **Faders**
  - **Main Playback** - 1 dedicated main playback pair, with Go and Stop/Back.
  - **Faders** - 40 faders with 80 configurable buttons.
  - **Virtual Faders** - 100 virtual pages of 10 faders each.
  - **Submasters** - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- **Power Consumption** - approximately 2 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Ion Classic

Legacy Hardware

The Ion Classic control console provides fully-integrated control of LED, conventional and moving lights in a compact, portable package.

- *Setup Guide* - get started with Ion Classic.
- *Physical Overview* - Ion Classic hardware layout.
- *Features, Specifications, and Requirements* - Ion Classic capabilities.

Setup Guide

Prepare your Ion Classic for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Ion Classic.*

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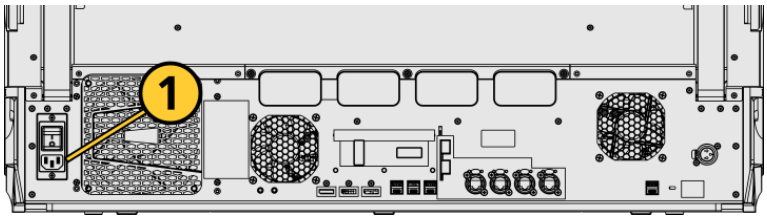
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Ion Classic. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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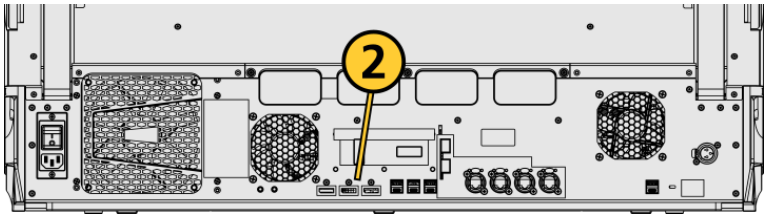
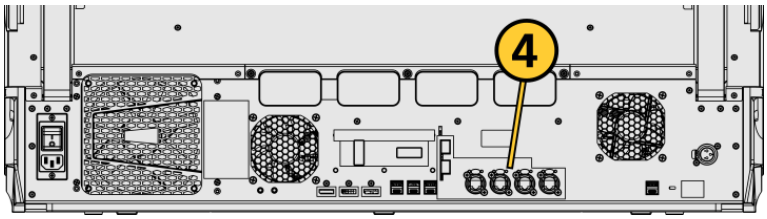
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

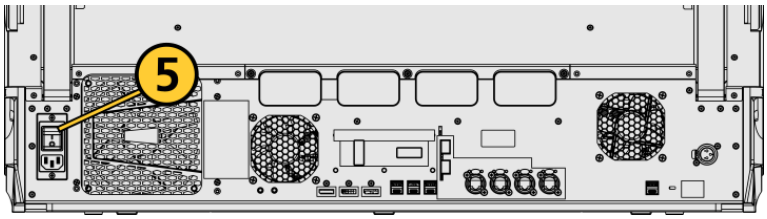


3. Connect any USB devices, such as an external mouse or the included keyboard.

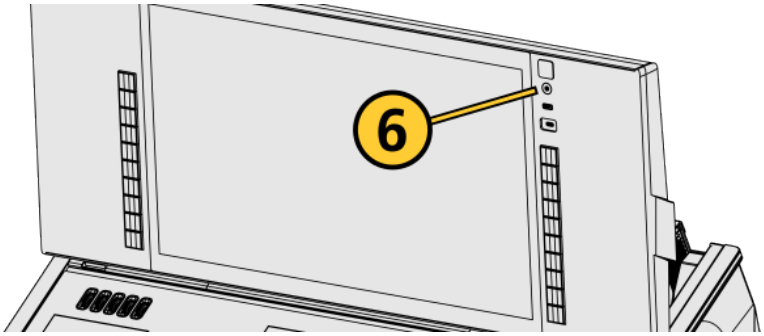
4. Connect any network cabling to the appropriate Ethernet port.



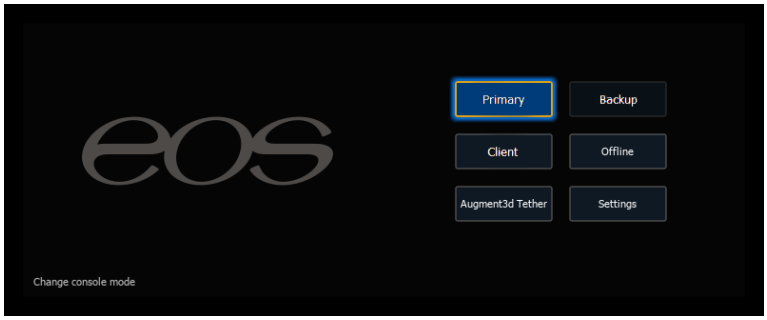
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Ion Classic.

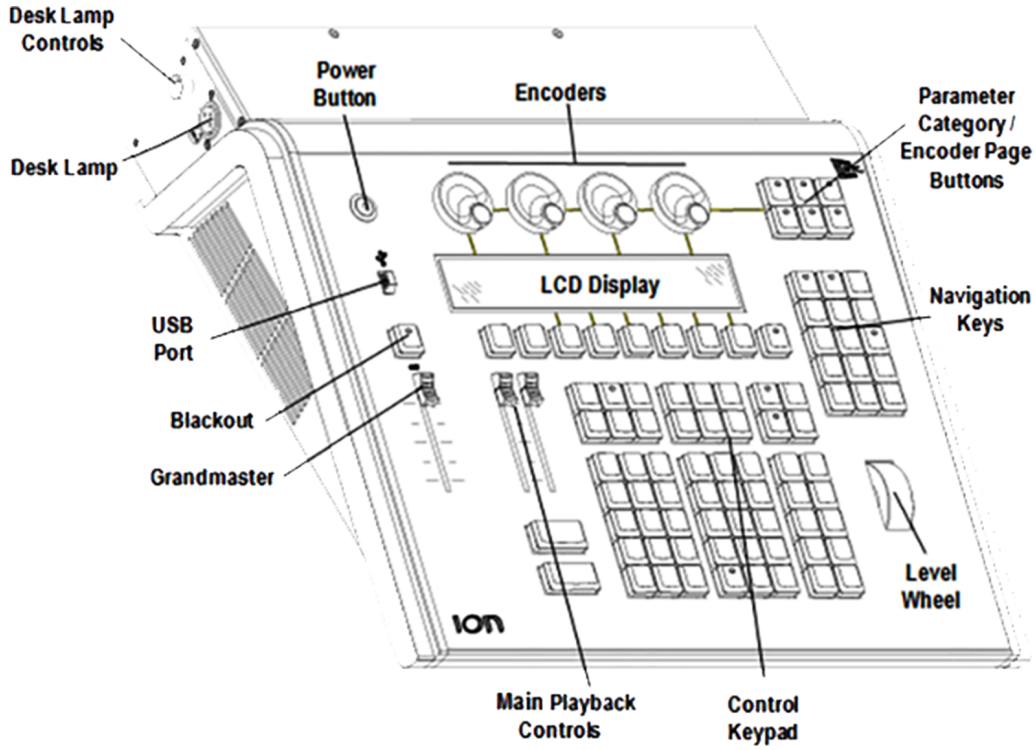


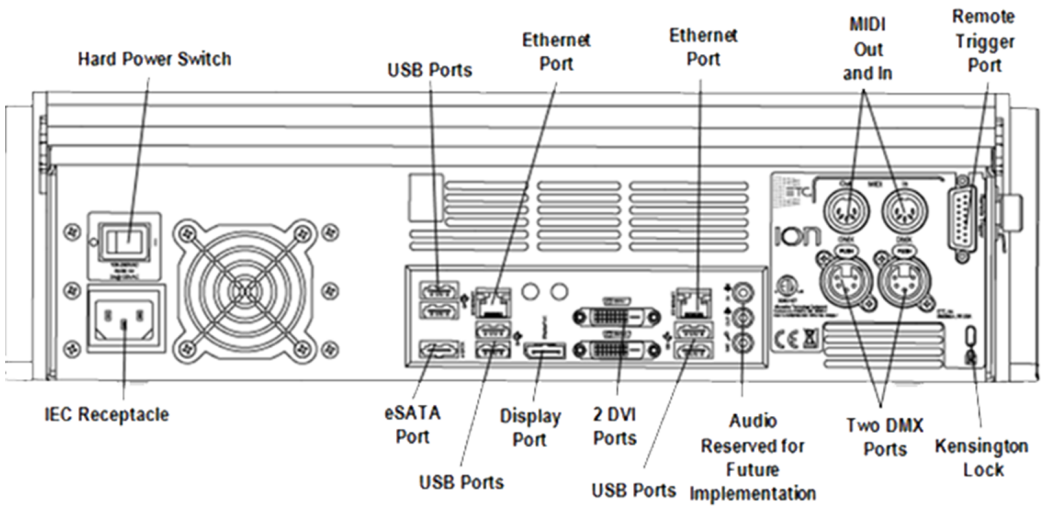
7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Ion Classic is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview





Power

Power Button

The soft power button on the front of the Ion Classic is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

External Monitors

CAUTION: *Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.*

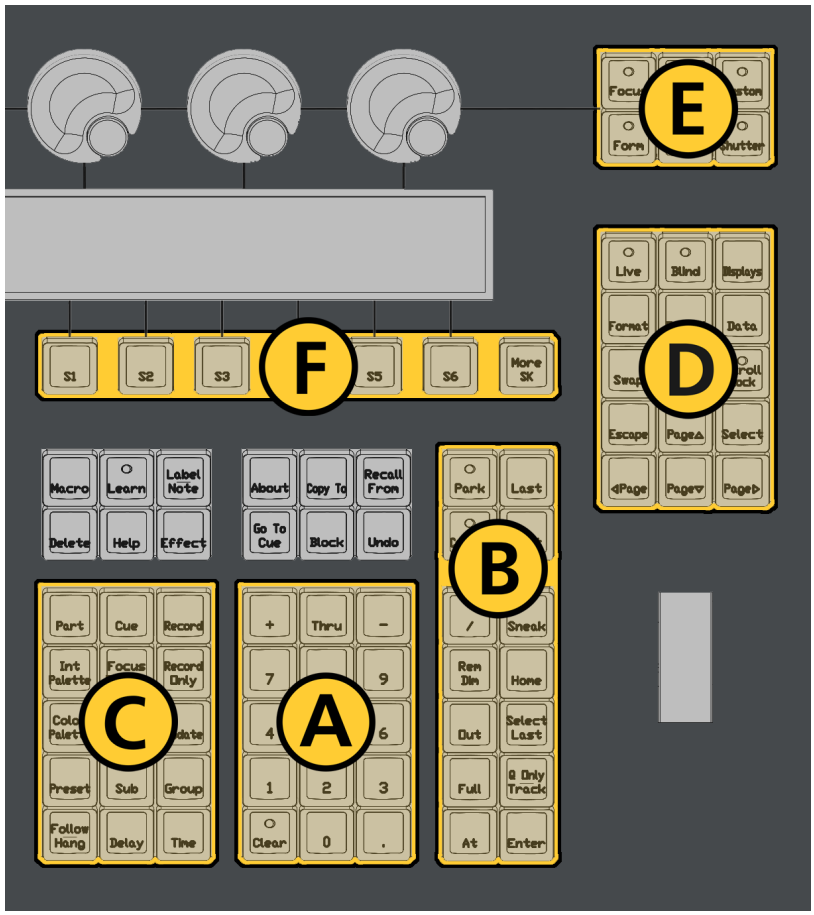
Windows 7 Ion Classic can support up to 2 monitors: either 2 DVI monitors, or 1 Display Port and 1 DVI.

Display Port can use an active adapter to VGA, DVI, or HDMI. DVI-I can be converted to VGA with a passive adapter.

Output to 4K resolution monitors may affect console performance. ETC recommends an external monitor resolution of 1024 or lower for use with Ion Classic consoles.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	Keypad	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	Level Controls	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	Targets	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	Display and Navigation	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	Encoder Categories	The encoder category buttons allow expanded control of a variety of fixture parameters, along with additional softkey options where applicable.
F	Softkeys	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via Setup > Device > *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using [Shift] & [Escape].

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the [Go] and [Stop/Back] functions.

Fader Buttons

Load buttons, located directly above each fader, are used when *Assigning Faders* to load a specified target to the associated fader, or to place special conditions on that fader.

Encoders

Encoders and an associated LCD for control of non-intensity parameters are provided at the top center of the console. The four encoders are pageable controls, which are populated on the LCD with the parameters used in your show.

LCD

This display accompanies the CIA as an additional user interface. This LCD offers you softkeys, encoder information, and an additional view of the command line. To adjust the brightness and contrast levels of the LCD, go to Setup > Device > *Brightness Settings and Presets* > Ion Display.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

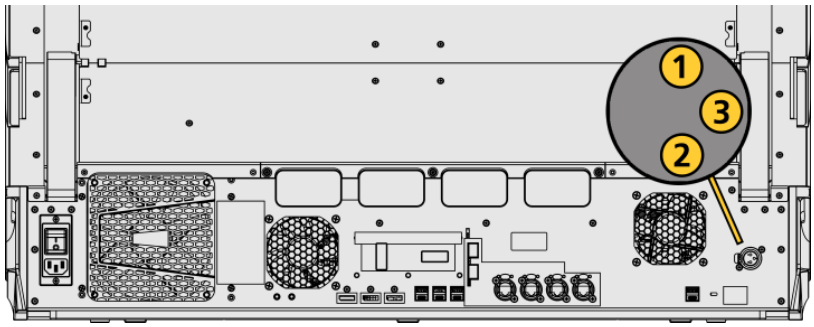
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

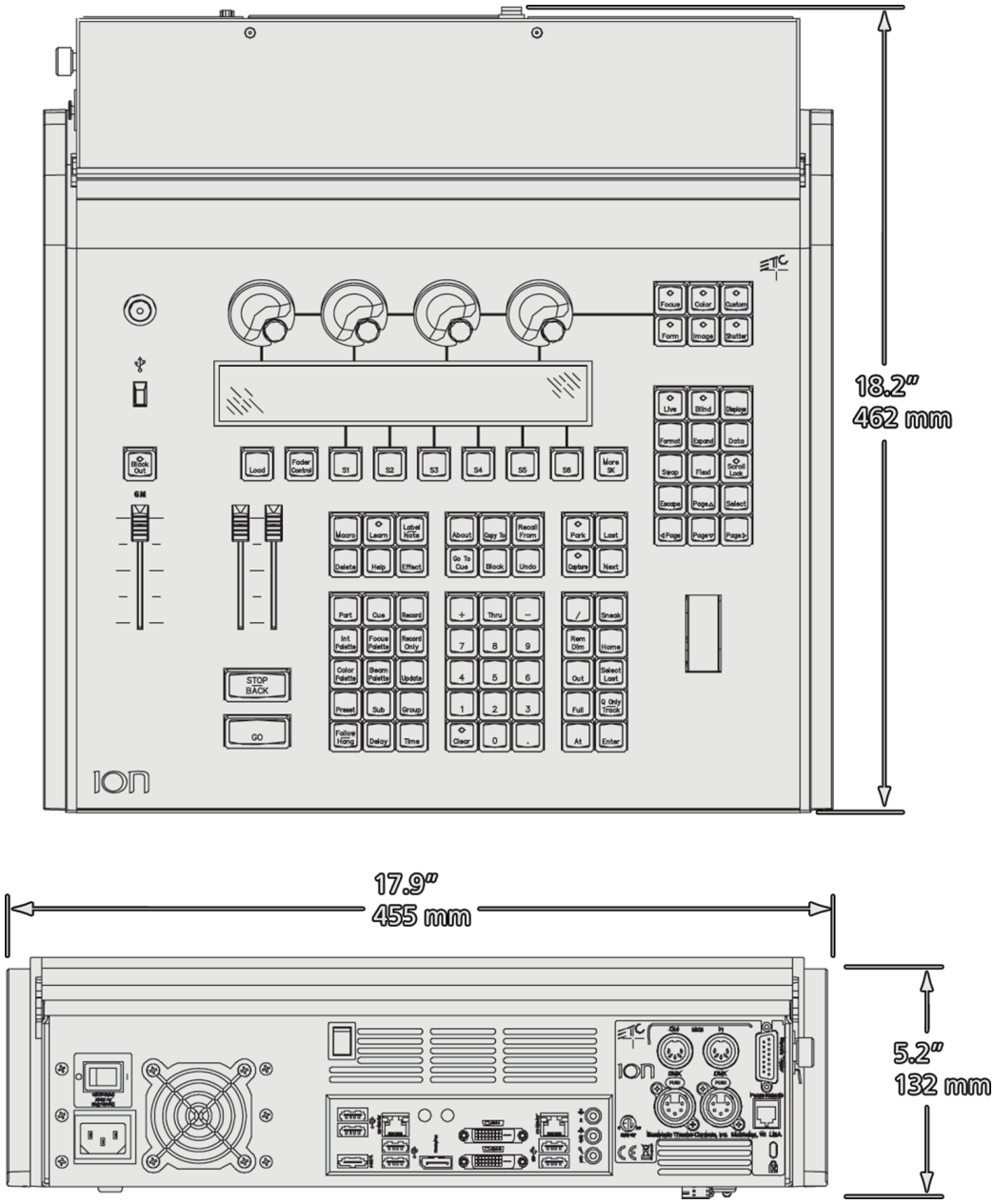
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Ion Classic	132	5.2	455	17.9	462	18.2	9.23	20.35

Ships With

- Dustcover.
- Mouse and mousepad.
- External alphanumeric keyboard.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Ion Classic requires Eos software v1.3.0 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Ion Classic supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Ion Classic is available with 1,024 (minimum) or 6,144 (maximum) outputs.

Capacities

- **Output Parameters** - 1,024 (minimum) or 6,144 (maximum).
- **Channels** - 16,000 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

- Faders
  - Main Playback - 1 dedicated main playback pair, with Go and Stop/Back.
  - Grandmaster - 1 configurable grandmaster, with Blackout and Blackout Enable.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Playbacks - 200 configurable cue playbacks, with Go and Stop/Back.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

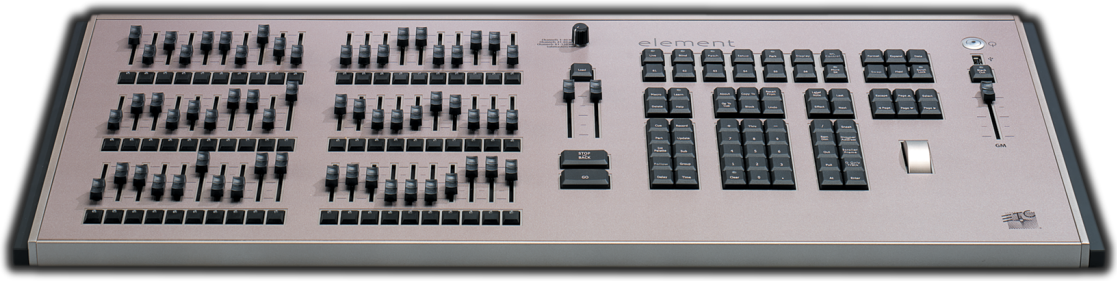
- Power Consumption - approximately 2 A at 120 V or 1 A at 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Element Classic

Legacy Hardware



Designed for venues using primarily conventional lighting, the Element Classic control console provides the powerful features of the Eos system in an economical and simplified package.

- *Setup Guide* - get started with Element Classic.
- *Physical Overview* - Element Classic hardware layout.
- *Features, Specifications, and Requirements* - Element Classic capabilities.

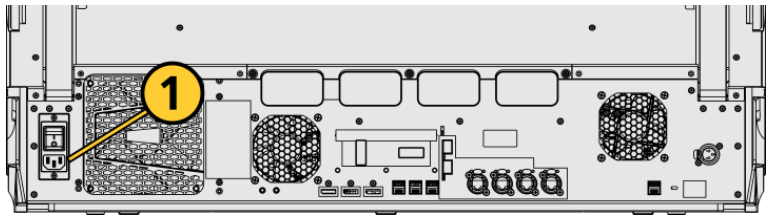
Setup Guide

Prepare your Element Classic for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Element Classic.*

---

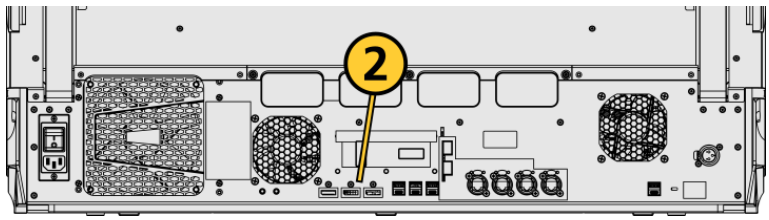
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Element Classic. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

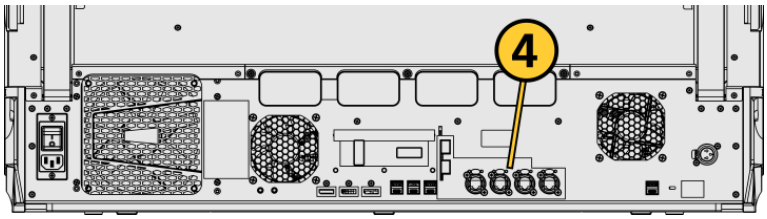
---

2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

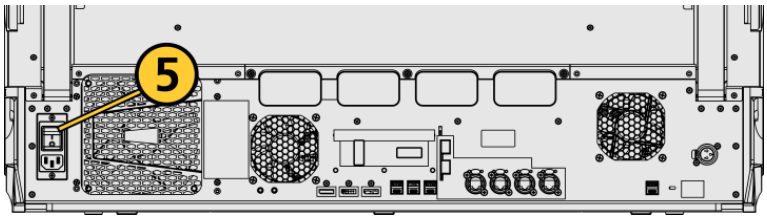


3. Connect any USB devices, such as an external mouse or the included keyboard.

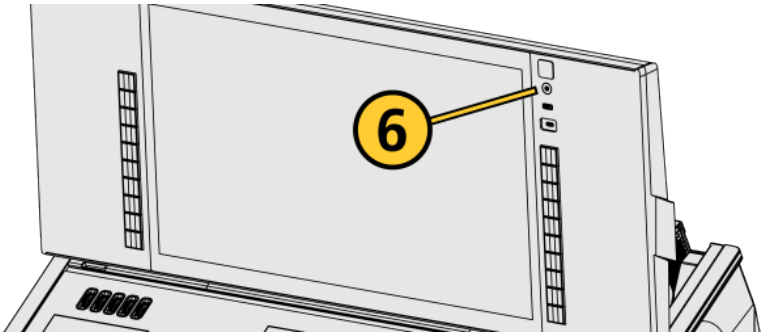
4. Connect any network cabling to the appropriate Ethernet port.



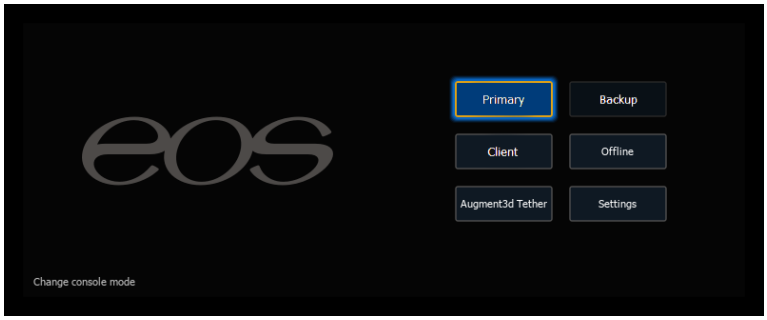
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Element Classic.

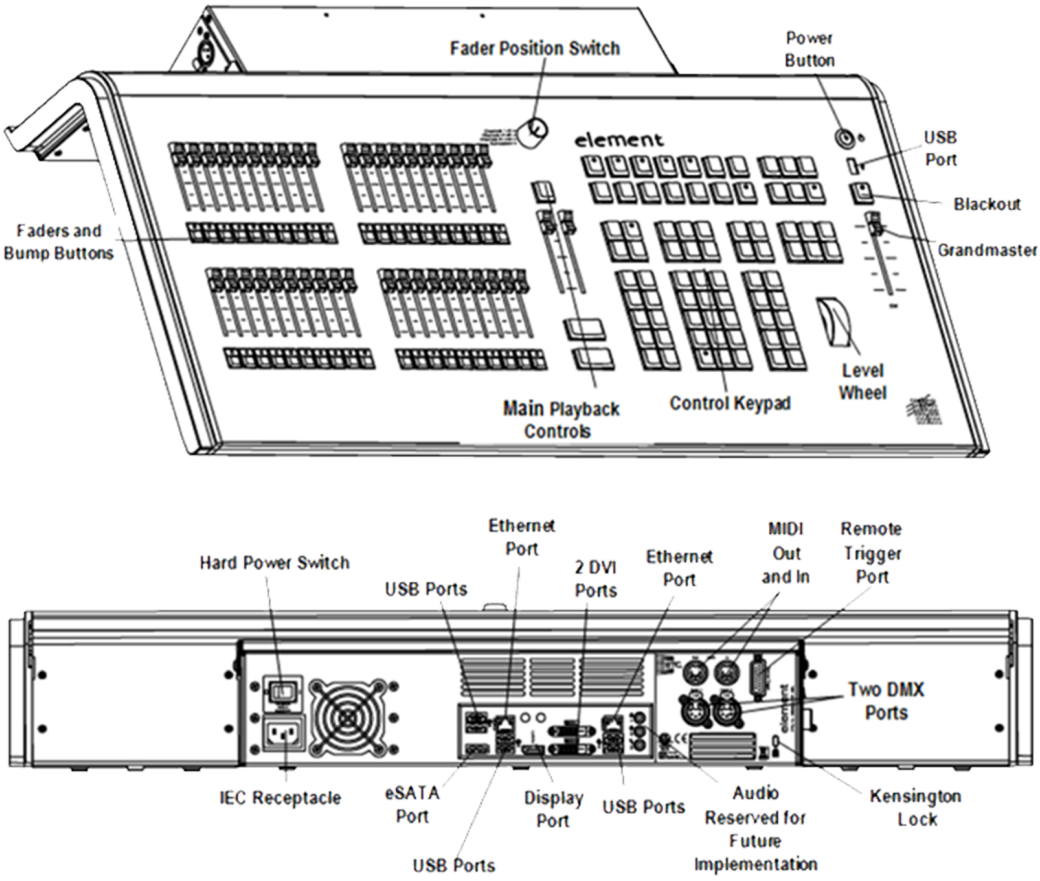


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Element Classic is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



Power

Power Button

The soft power button on the front of the Element Classic is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Battery

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

External Monitors

CAUTION: *Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.*

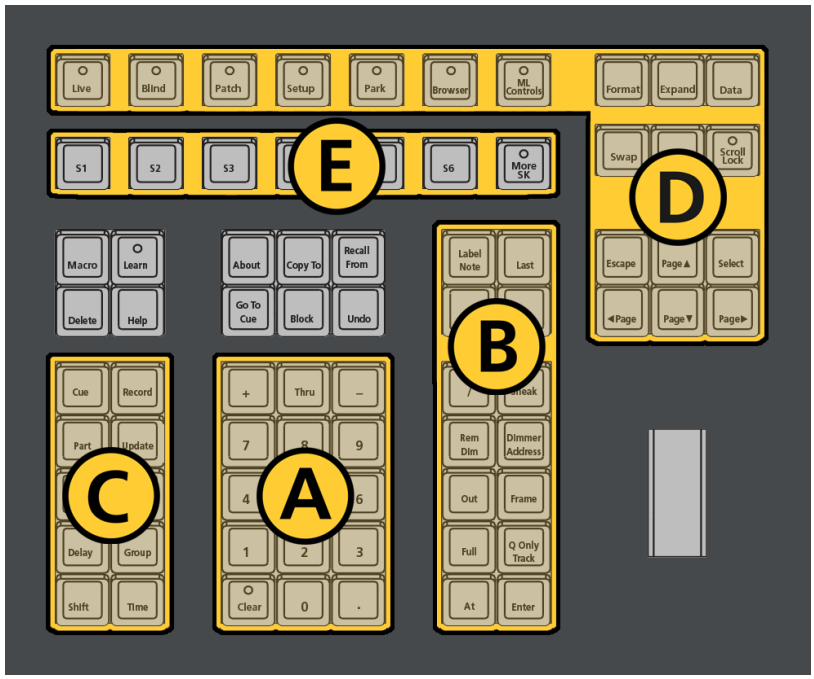
Windows 7 Element Classic can support up to 2 Display Port, DVI-I, or DVI-D monitors.

Display Port can use an active adapter to VGA, DVI, or HDMI. DVI-I can be converted to VGA with a passive adapter.

Output to 4K resolution monitors may affect console performance. ETC recommends an external monitor resolution of 1024 or lower for use with Element Classic consoles.

For monitor configuration, see *{Monitor Arrangement...}*.

Hardkeys



The backlit hardkeys provided on the face panel are divided into several sections based on their functionality.

A	Keypad	The numeric keypad allows you to type numbers for channel or target selection via the command line, along with modifier keys to alter your selection.
B	Level Controls	The level controls provide options for altering the intensity levels of channels, along with a number of other non-intensity parameters / targets.
C	Targets	The target controls provide options for altering a variety of record targets, as well as shortcuts to various Blind displays.
D	Display and Navigation	The display and navigation keys provide quick access to common displays, formatting, paging, and navigation within displays.
E	Softkeys	Softkeys allow physical control of context-based software options that change in response to the active display or command line syntax, including the onscreen softkey options, offering additional commands not available on hardkeys.

Additional Targets & Functions

Other hardkeys provide options for a variety of common console functions and shortcuts to various Blind displays.

Backlight

The hardkey backlight brightness level can be adjusted via **Setup > Device >** *Brightness Settings and Presets*. When your console has been idle for 10 minutes, the backlights will fade down by 10%. Any key press on the face panel keypad or an external keyboard, a move of the mouse, or an interaction with a touchscreen will return the keys to their set brightness level.

Additional Targets & Functions

You may lock the face panel, which prevents any actions from the command line or CIA, and locks any wings or USB connected peripherals.

Lock and unlock the face panel using **[Shift] & [Escape]**.

Main Playbacks

The main playback fader pair, located to the left of the control keypad, is a split cross-fader pair.

The button or buttons located directly above the playbacks load content to the playbacks. The two buttons below control the **[Go]** and **[Stop/Back]** functions.

Faders

In addition to the main playbacks, banks of configurable faders are provided. The faders may be configured as playbacks, submasters, grandmasters, timing masters, effects masters, targets, or target lists. One hundred virtual pages of 10 faders each are provided.

Fader Selection Wheel

The fader selection wheel switches the fader banks between direct control of channels and submasters.

Fader Buttons

Ion Xe 20, Element 2, and Element Classic consoles lack dedicated load buttons for assigning a specified target to a specified fader, other than for the main playbacks. For all other faders, load is performed with a simultaneous press of the two bump buttons beneath the fader. See *Assigning Faders*.

Level Wheel

The level wheel adjusts intensity up or down for any selected channels. With channels selected, roll the wheel up to increase intensity, or down to decrease it.

The level wheel can provide additional functions via *Eos Console Hardkey Shortcuts* when combined with various other console keys.

DMX Ports

In order to output control levels from your console, you can use the DMX ports on the back of the console and/or you may connect a gateway or node. If your device receives sACN or Art-Net directly, no gateway or node is required.

To output, connect one 5 pin XLR cable per port. The first port will default to outputting the first universe of DMX, addresses 1-512, the second port to the second universe, outputting addresses 513-1024, and so on.

See *Local Output* for information on reconfiguring the DMX ports.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

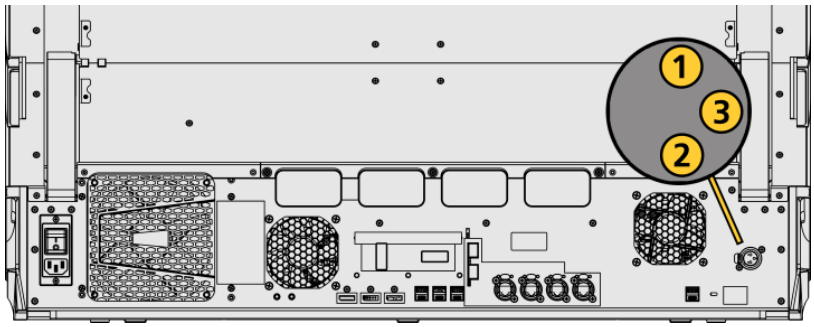
One USB port is provided on the front of the console to connect any USB storage device. Additional USB ports on the rear panel (and in the keyboard tray, when present) of the console connect peripherals such as an alphanumeric keyboard, pointing device, or touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Task Lights

Littlites®

Littlites can be connected to the back of your console.



One Littllite is included. Littlite XLR connectors use the following pinout:

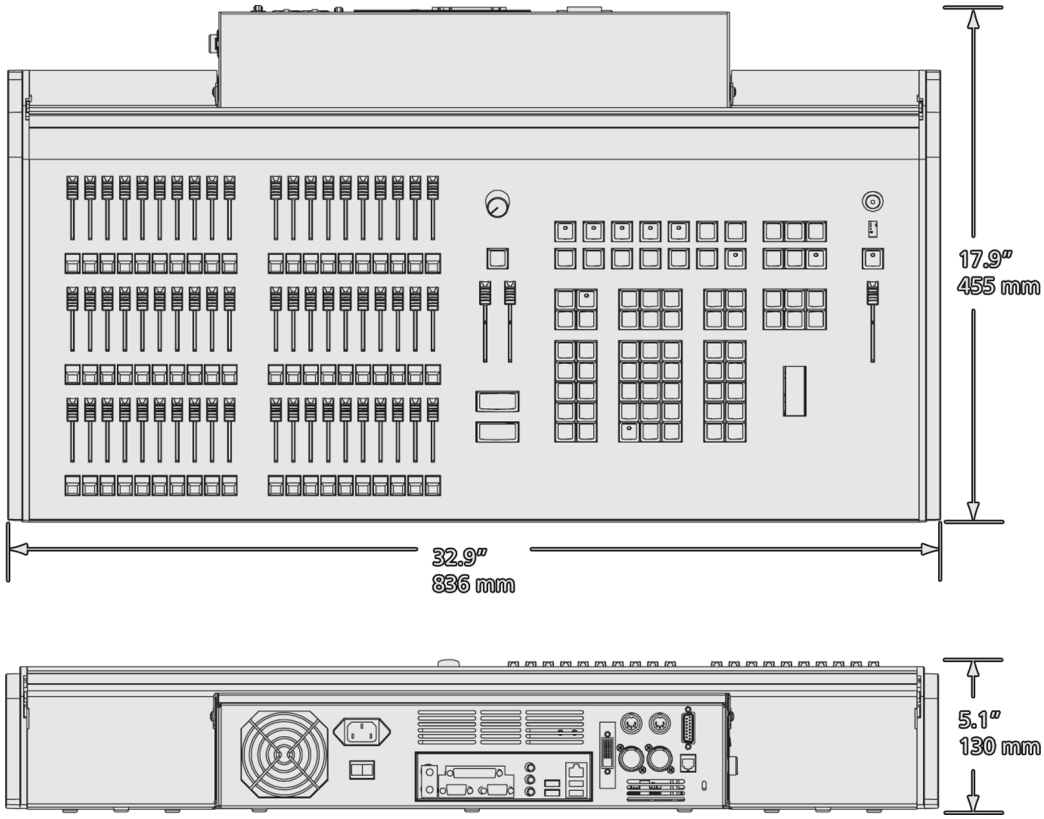
Pin	1	Chassis ground. Jumpered to ground lug.
Pin	2	0 VDC.
Pin	3	+12 VDC.

Dimming Task Lights

Task lights can be dimmed from within Eos, under **Setup > Device >** *Brightness Settings and Presets*. The **{Desk Lamp}** slider has a range of 0% (dimmest) to 100% (brightest). The default setting is 0%. The console will set the desk lamp to this setting on startup of the application.

Task lights can also be controlled by holding down **[Displays]** and rolling the level wheel.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Element Classic	130	5.1	836	32.9	455	17.9	13.6	30

Ships With

- Dust cover.
- Mouse and mousepad.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Element Classic requires Eos software v1.6.0 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Element Classic supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.

- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as Disconnected.

Available Outputs

The Element Classic is available with 1,024 outputs.

Capacities

- Channels - 250 or 500 (can be any number from 1 to 99,999).
- Cues - 10,000.
- Cue Lists - 1.
- Record Targets
  - Groups - 1,000.
  - Palettes - 1,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 1,000.
  - Effects - 1,000.
  - Macros - 99,999.
  - Snapshots - 1,000.
  - Curves - 1,000.
  - Color Paths - 10,000
- Faders
  - Main Playback - 1 dedicated main playback pair, with Go and Stop/Back.
  - Grandmaster - 1 configurable grandmaster, with Blackout and Blackout Enable.
  - Faders - 40 or 60 faders with bump buttons.
  - Virtual Faders - 100 virtual pages of 10 faders each.
  - Submasters - 999 configurable submasters, with Bump and Assert/ channel select.

Electrical and Thermal

- Power Consumption - approximately 2 A at 120 V or 1 A at 230/240 V.
- Ambient Room Temperature - 0°–35°C (32°–95°F).
- Ambient Humidity - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Family Rackmount Processors

This section provides overviews and setup information for Eos Family rackmount processors.

Eos Apex Processor

The Eos Apex Processor carries the same power as Apex consoles, in a 2U 19-inch rack mount unit. It includes the same one- and ten-gigabit Ethernet connections as Apex consoles, making it a great choice to drive a high-powered rig on its own, or serve as a backup to keep large systems running safely.

- *Setup Guide* - get started with Eos Apex Processor.
- *Physical Overview* - Eos Apex Processor hardware layout.
- *Features, Specifications, and Requirements* - Eos Apex Processor capabilities.

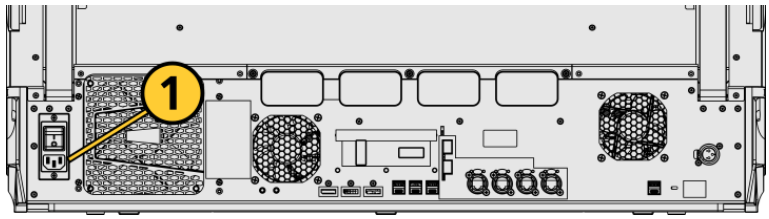
Setup Guide

Prepare your Eos Apex Processor for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Apex Processor.*

---

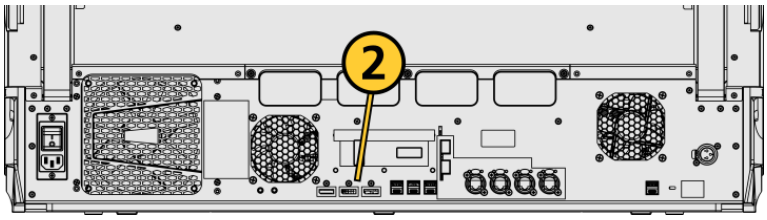
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Apex Processor. Connect the other end of the cord to wall power.



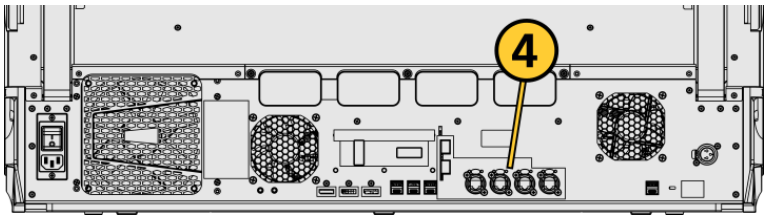
CAUTION: ***Power cord must be connected using an earth ground connection.***

---

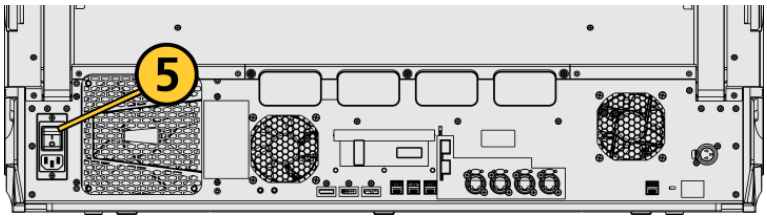
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



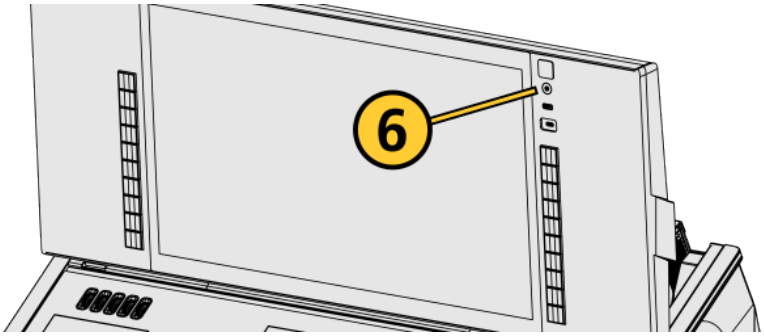
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



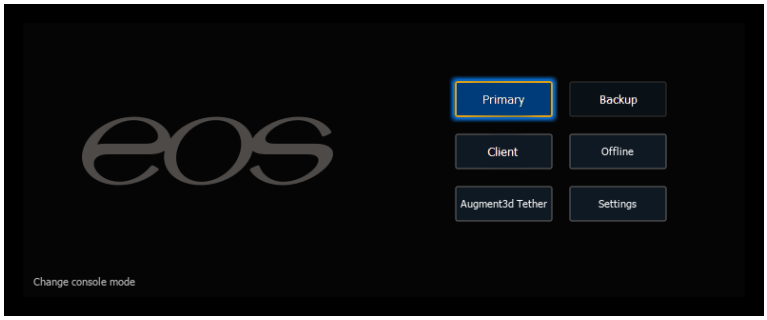
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Apex Processor.

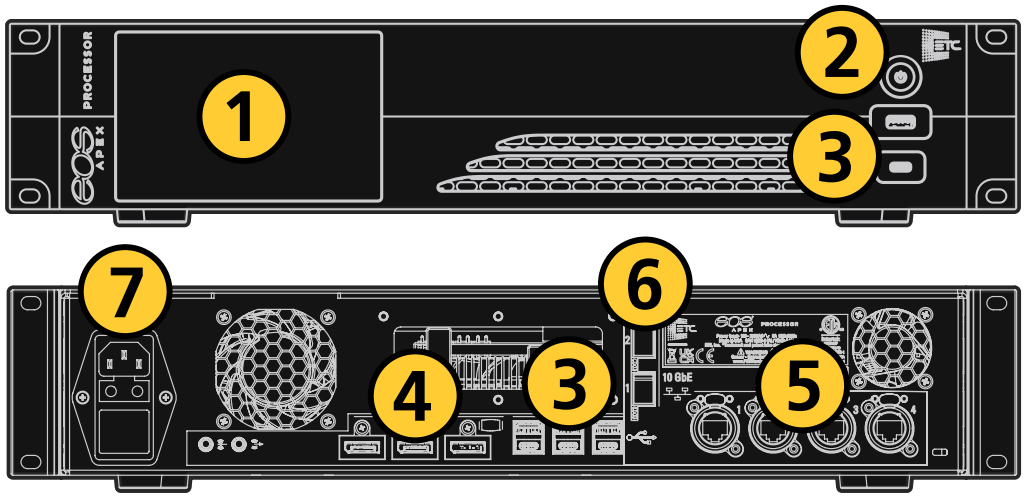


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Apex Processor is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Internal Touchscreen	5	Ethernet
2	Power Button	6	SFP+
3	USB-A and USB-C (Data)	7	Hard Power Switch
4	Display Port		IEC Socket

Power

Power Button

The soft power button on the front of the Eos Apex Processor is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Internal Touchscreens

The Eos Apex Processor is designed with a single internal touchscreen display, supporting haptic feedback or pressure-sensitive touch.

Touchscreen brightness can be controlled via **Setup > Device >** *Brightness Settings and Presets*.

External Monitors

For monitor configuration, see *{Monitor Arrangement...}*.

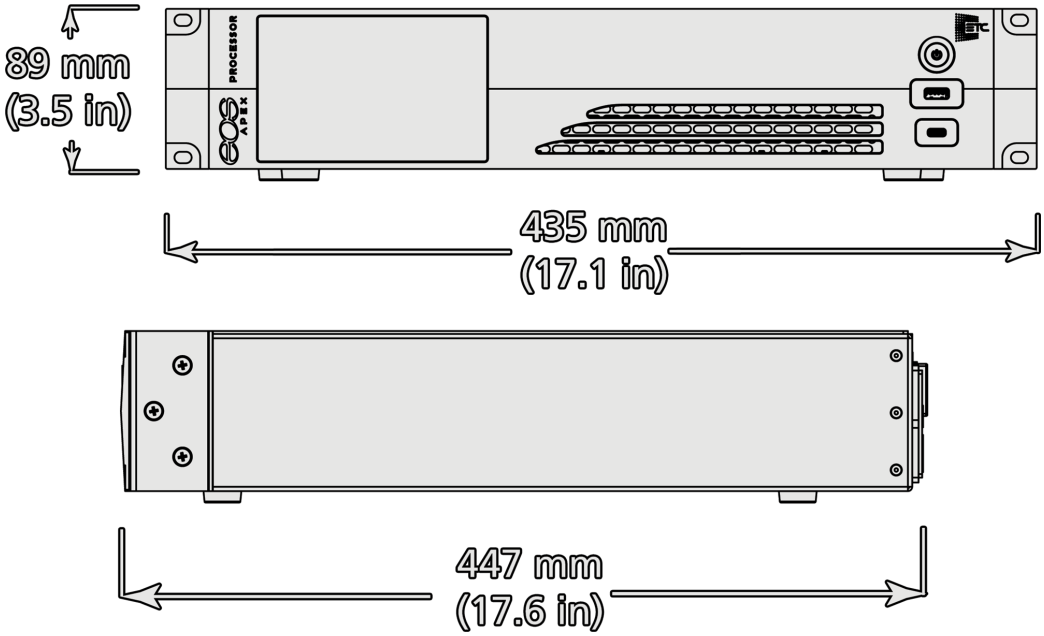
Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Apex Processor	89	3.5	435	17.1	447	17.6	9.2	20.2
Eos Apex Processor in shipping container	356	14.0	610	24.0	610	24.0	10.4	22.9

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.

- Two 19-inch rackmount ears and mounting hardware.
- Four rubberized feet (for desktop use).
- Augment3d AR target kit.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Apex Processor requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Apex Processor supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - **Backup Eos Expansion Processor (BEEP)** - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Apex Processor is available with 24,576 outputs.

Capacities

- **Output Parameters** - 24,576.
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

Electrical and Thermal

- **Power Consumption** - approximately 5 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Expansion Processor

The Eos Expansion Processor allows the distribution of entertainment control across the computing resources of multiple compatible Eos Family devices in a networked system, unlocking additional outputs for multi-console sessions.

- *Setup Guide* - get started with Eos Expansion Processor.
- *Physical Overview* - Eos Expansion Processor hardware layout.
- *Features, Specifications, and Requirements* - Eos Expansion Processor capabilities.

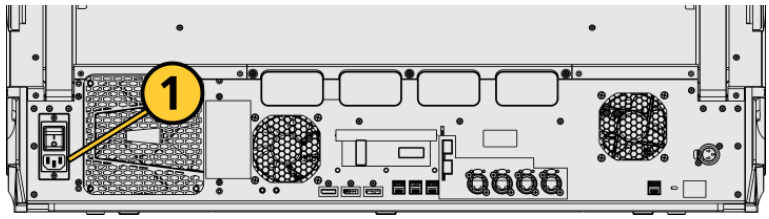
Setup Guide

Prepare your Eos Expansion Processor for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Expansion Processor.*

---

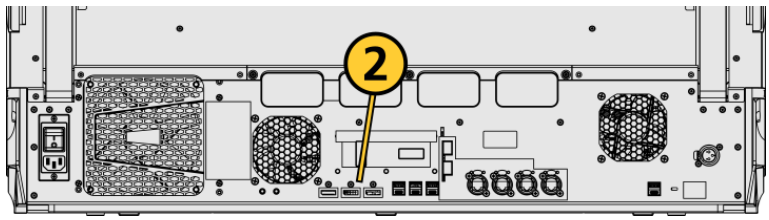
1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Expansion Processor. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

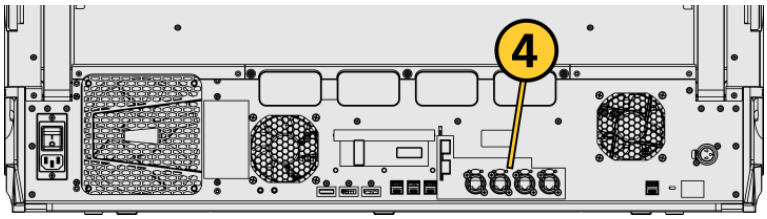
---

2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

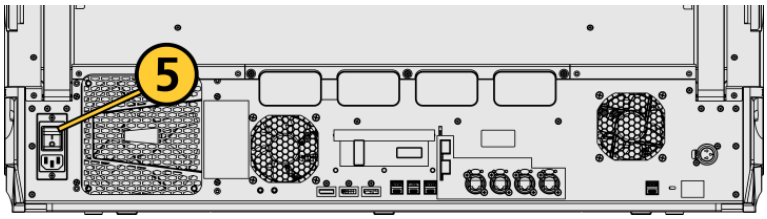


3. Connect any USB devices, such as an external mouse or the included keyboard.

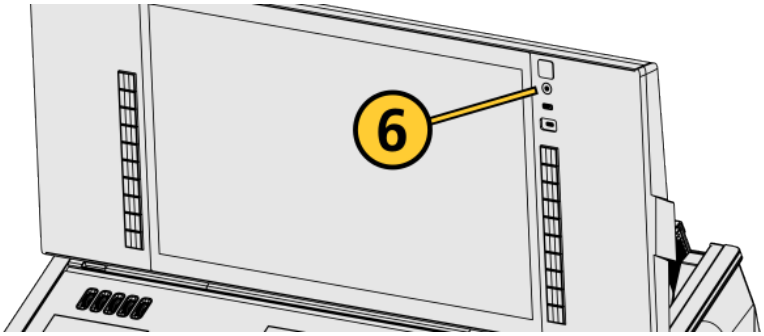
4. Connect any network cabling to the appropriate Ethernet port.



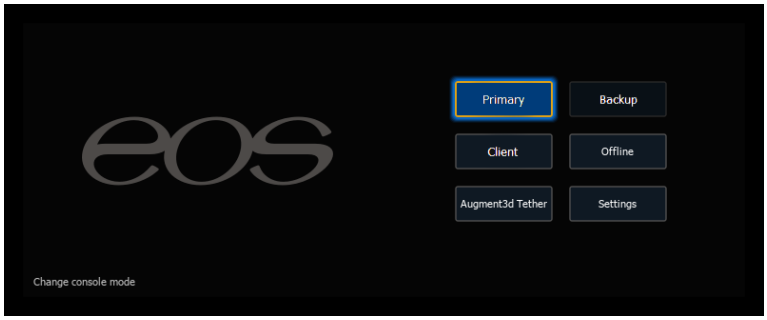
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Expansion Processor.

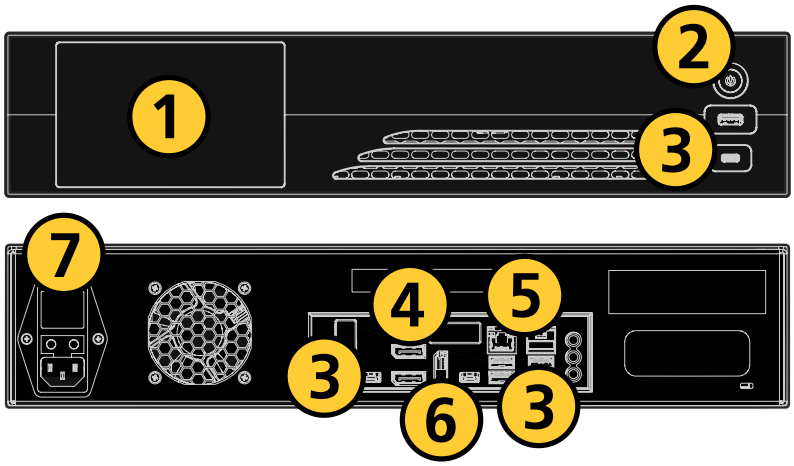


7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Expansion Processor is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview



1	Internal Touchscreen	5	Ethernet
2	Power Button	6	SFP+
3	USB-A and USB-C (Data)	7	Hard Power Switch
4	Display Port		IEC Socket

Power

Power Button

The soft power button on the front of the Eos Expansion Processor is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Internal Touchscreens

The Eos Expansion Processor is designed with a single internal touchscreen display, supporting haptic feedback or pressure-sensitive touch.

Touchscreen brightness can be controlled via **Setup > Device >** *Brightness Settings and Presets*.

External Monitors

For monitor configuration, see *{Monitor Arrangement...}*.

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

Dimensions and Weights

Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Expansion Processor	89	3.5	435	17.1	447	17.6	9.2	20.2
Eos Expansion Processor in shipping container	356	14.0	610	24.0	610	24.0	10.4	22.9

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Expansion Processor requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Expansion Processor supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.

- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - **Backup Eos Expansion Processor (BEEP)** - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The Eos Expansion Processor is available with 12,288 outputs.

Capacities

- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

Electrical and Thermal

- **Power Consumption** - approximately 5 A at 120 V or 230/240 V
- **Ambient Room Temperature** - 0°–35°C (32°–95°F)
- **Ambient Humidity** - up to 90% non-condensing

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Ion Xe RPU

The Ion Xe Remote Processor Unit (RPU) is a 2U 19-inch rack-mount controller that can serve as a backup for your Ion Xe or Ion Xe 20 lighting control system, or it can function as a stand-alone lighting playback controller. The front panel of the Ion Xe RPU features twenty user-programmable buttons and LED indicators that show mode and status.

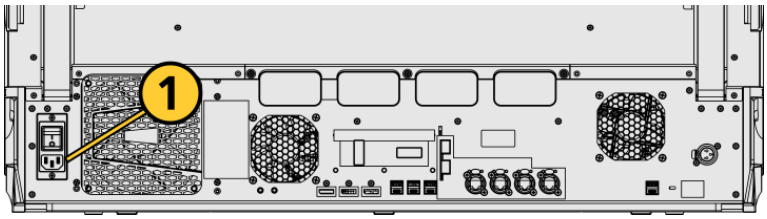
- *Setup Guide* - get started with Ion Xe RPU.
- *Physical Overview* - Ion Xe RPU hardware layout.
- *Features, Specifications, and Requirements* - Ion Xe RPU capabilities.

Setup Guide

Prepare your Ion Xe RPU for use with the following setup steps.

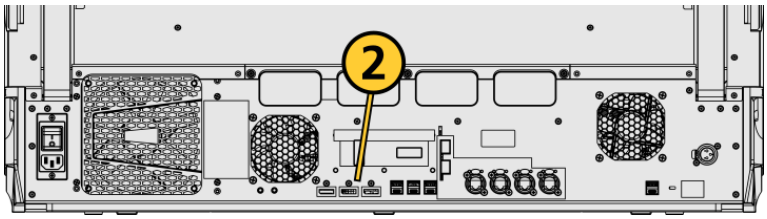
Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Ion Xe RPU.*

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Ion Xe RPU. Connect the other end of the cord to wall power.

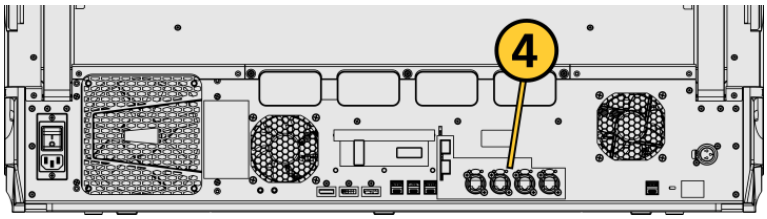


CAUTION: ***Power cord must be connected using an earth ground connection.***

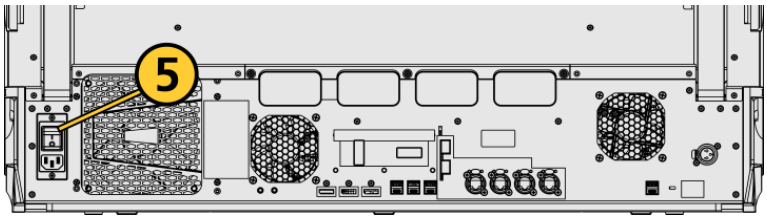
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



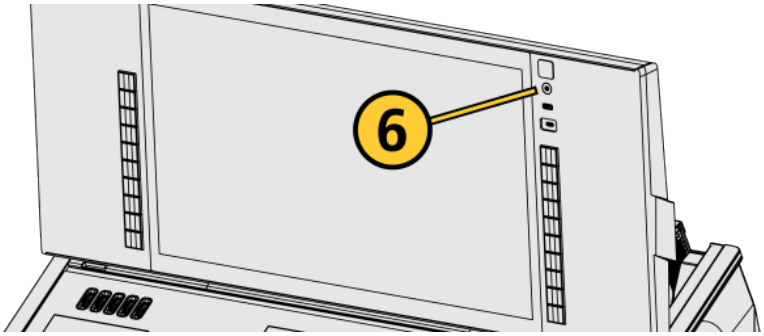
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



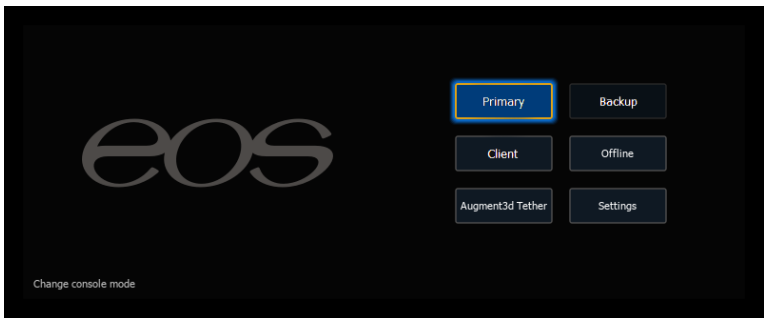
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Ion Xe RPU.



7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Ion Xe RPU is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Power

Power Button

The soft power button on the front of the Ion Xe RPU is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

External Monitors

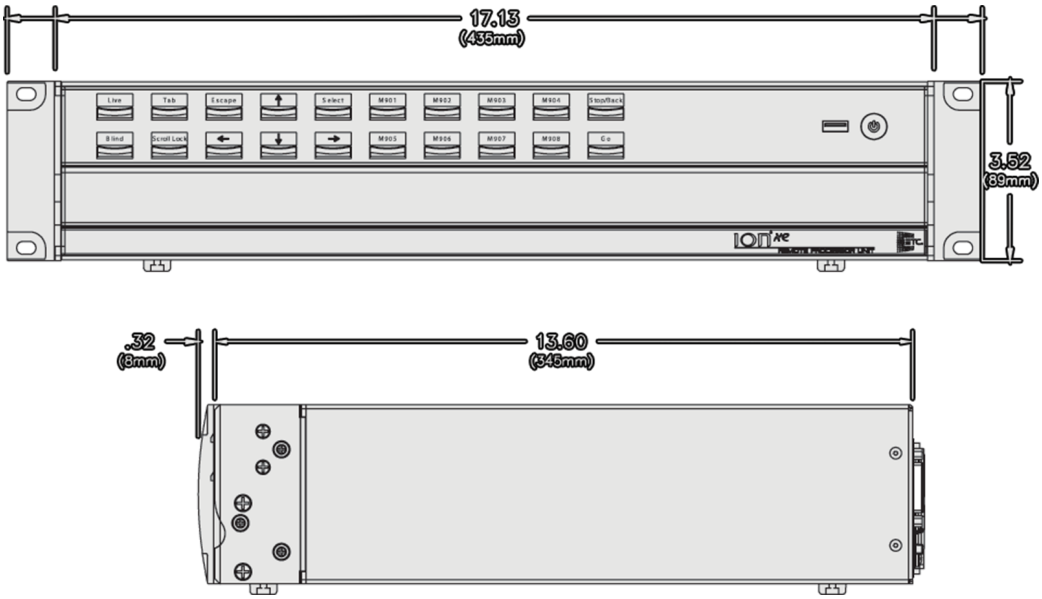
For monitor configuration, see *{Monitor Arrangement...}*.

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Ion Xe RPU	447	17.6	864	34.0	648	25.5	44	97
Ion Xe RPU in shipping container	318	12.5	966	48.0	794	31.3	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- Two active Display Port to DVI adapters.
- Two 19-inch rackmount ears and mounting hardware.
- Four rubberized feed (for desktop use).
- Augment3d AR target kit.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Ion Xe RPU requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Ion Xe RPU supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - Backup Eos Expansion Processor (BEEP) - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as Disconnected.

Available Outputs

The Ion Xe RPU is available with 24,576 outputs.

Capacities

- Output Parameters - 24,576.
- Channels - 32,768 (can be any number from 1 to 99,999).
- Cues - 10,000.
- Cue Lists - 999.
- Record Targets
  - Groups - 10,000.
  - Palettes - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 10,000.
  - Effects - 10,000.
  - Macros - 99,999.
  - Snapshots - 10,000.
  - Curves - 10,000.
  - Color Paths - 10,000

Electrical and Thermal

- Power Consumption - approximately 2 A at 120 V or 230/240 V
- Ambient Room Temperature - 0°–35°C (32°–95°F)
- Ambient Humidity - up to 90% non-condensing

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Eos Remote Interface

The Eos Remote Interface provides the same access to your system as a console - without the added cost of output control. Perfectly at home on a tech table or in an equipment rack, the Remote Interface supports up to three 4K multi-touch monitors and connects to your Eos Family lighting controller through Ethernet.

- *Setup Guide* - get started with Eos Remote Interface.
- *Physical Overview* - Eos Remote Interface hardware layout.
- *Features, Specifications, and Requirements* - Eos Remote Interface capabilities.

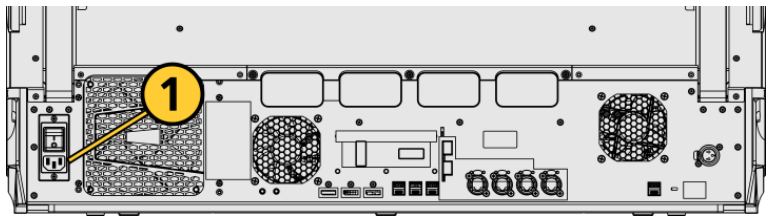
Setup Guide

Prepare your Eos Remote Interface for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your Eos Remote Interface.*

---

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the Eos Remote Interface. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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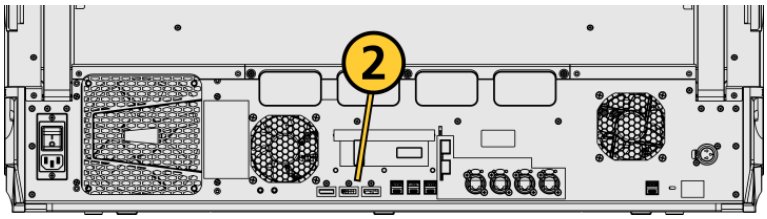
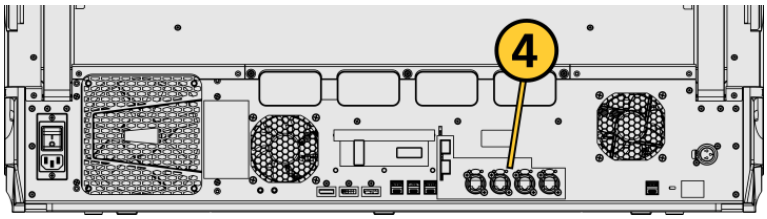
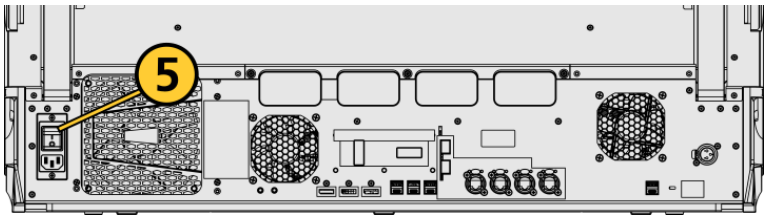
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.



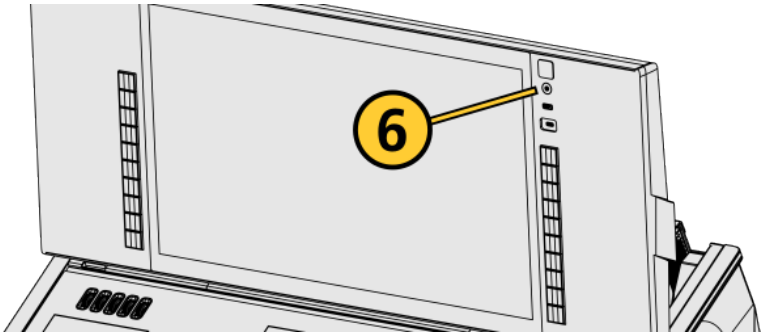
3. Connect any USB devices, such as an external mouse or the included keyboard.
4. Connect any network cabling to the appropriate Ethernet port.



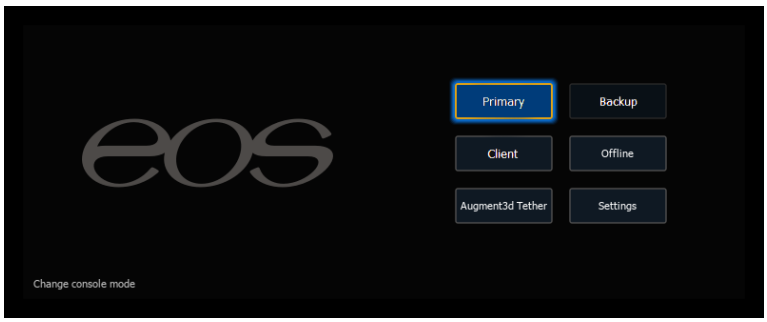
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the Eos Remote Interface.



7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your Eos Remote Interface is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Power

Power Button

The soft power button on the front of the Eos Remote Interface is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

Hard Power Switch

A separate hard power switch, located on the rear panel above or below the power cord socket, supplies or disconnects power from the console's internal components.

WARNING: Before servicing your console, you must switch off the power on the rear panel and disconnect the power cord completely.

Internal Touchscreens

The Eos Remote Interface is designed with a single internal touchscreen display, supporting haptic feedback or pressure-sensitive touch.

Touchscreen brightness can be controlled via Setup > Device > *Brightness Settings and Presets*.

External Monitors

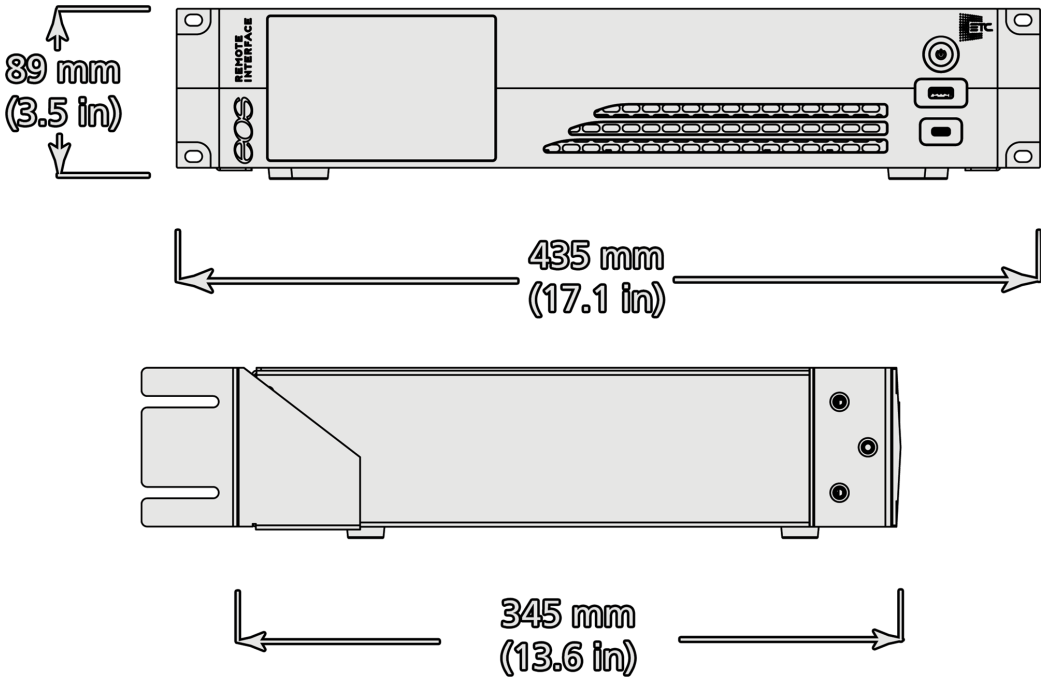
For monitor configuration, see *{Monitor Arrangement...}*.

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
Eos Remote Interface	89	3.5	435	17.1	345	13.6	TBD	TBD
Eos Remote Interface in shipping container	343	13.5	604	23.8	343	13.5	TBD	TBD

Ships With

- One three-button scroll mouse and mousepad.
- Cherry tenkeyless backlit alpha-numeric keyboard.
- Locking regionalized IEC power cord.
- One 24-inch LED gooseneck Littlite.
- Augment3d AR target kit.
- Dust cover.

Features, Specifications, and Requirements

Minimum Eos Software Version

The Eos Remote Interface requires Eos software v3.1.1 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The Eos Remote Interface supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - Backup Eos Expansion Processor (BEEP) - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as Disconnected.

Capacities

- Channels - 32,768 (can be any number from 1 to 99,999).
- Cues - 10,000.
- Cue Lists - 999.
- Record Targets
  - Groups - 10,000.
  - Palettes - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - Presets - 10,000.
  - Effects - 10,000.
  - Macros - 99,999.
  - Snapshots - 10,000.
  - Curves - 10,000.
  - Color Paths - 10,000

Electrical and Thermal

- Power Consumption - approximately 1 A at 120 V or 230/240 V
- Ambient Room Temperature - 0°–35°C (32°–95°F)
- Ambient Humidity - up to 90% non-condensing

Regulatory and Compliance

- CE compliant
- cETLus listed
- UKCA marked
- FCC compliant
- RoHS compliant
- WEEE

Other Eos Family Products

This section provides overviews and setup information for other Eos Family devices and accessories.

ETC Puck

The ETC Puck lighting controller is a full-featured mini-computer with an embedded ETCnomad lighting control USB dongle capable of running Eos and Element applications in Primary, Backup, Client and Offline environments.

- *Setup Guide* - get started with ETC Puck.
- *Physical Overview* - ETC Puck hardware layout.
- *Features, Specifications, and Requirements* - ETC Puck capabilities.

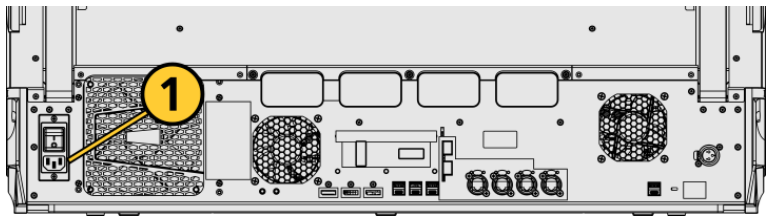
Setup Guide

Prepare your ETC Puck for use with the following setup steps.

Note: *The ports and port layouts pictured in this section are for general identification and orientation. See the Physical Overview below for details specific to your ETC Puck.*

---

1. Insert the included power cord, locking it into the IEC socket under the hard power switch on the back of the ETC Puck. Connect the other end of the cord to wall power.



CAUTION: ***Power cord must be connected using an earth ground connection.***

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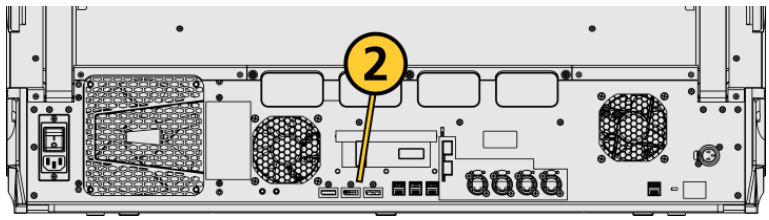
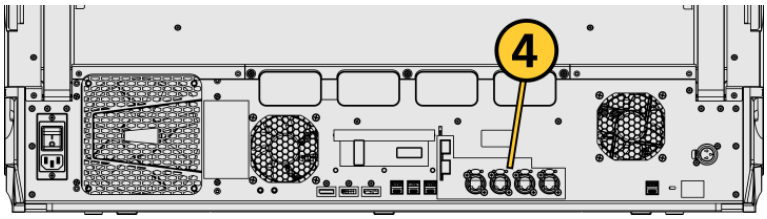
2. Connect any external monitors to the appropriate device ports, as well as their own power sources.

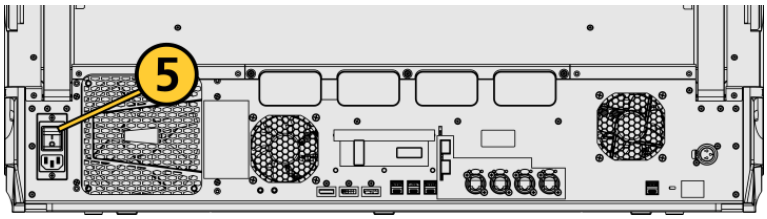


3. Connect any USB devices, such as an external mouse or the included keyboard.

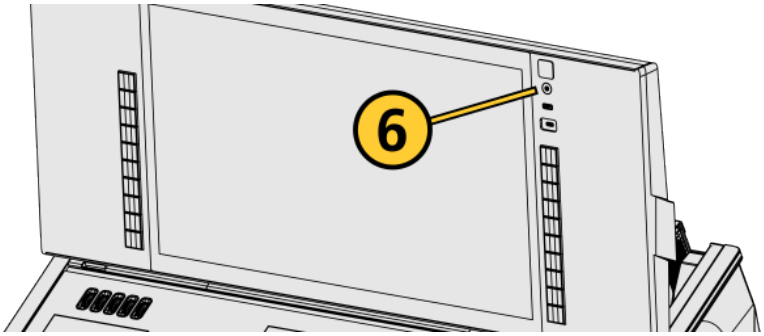
4. Connect any network cabling to the appropriate Ethernet port.



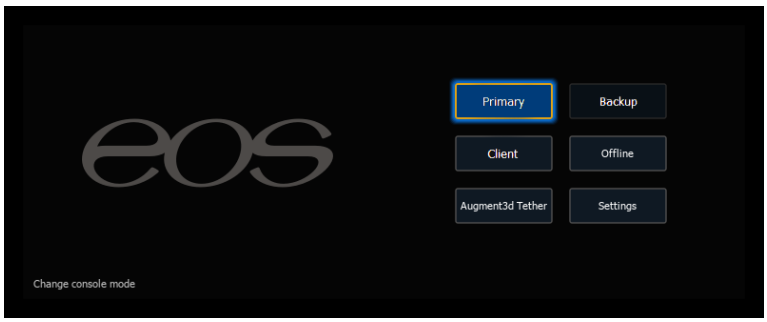
5. Activate the hard power switch above the IEC socket.



6. Activate the soft power button on the front or top of the ETC Puck.



7. Choose one of the *Supported Eos Device Roles* to log into the Eos application.



Once your ETC Puck is up and running, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Physical Overview

Power

Power Button

The soft power button on the top left of the ETC Puck is used to power it up or down.

You can also power down your device using *Browser* > {Power Off Device}.

CAUTION: ***It is recommended that you safely power down before physically disconnecting power from the device.***

External Monitors

CAUTION: ***Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.***

Monitor Specifications for Display Port Devices

- Display resolutions from 1920x1080 to 3480x2160 (4K) are supported.
- Each display may be utilized in landscape or portrait mode.
- Multi-touch display support requires:
  - Data connection via USB-A or USB-C cable per multi-touch monitor.
  - Windows Human Interface Device (HID) compliant touch displays, utilizing Windows standard driver.
  - Displays must process five or more points of simultaneous touch.
- Display Data Channel / Control Interface (DDC/CI) is supported for control of external monitor brightness.

External monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port can be dimmed from Eos via to Setup > Device > *Brightness Settings and Presets*.

For monitor configuration, see *{Monitor Arrangement...}*.

Ethernet Ports

Ethernet ports can be used to connect your device to *Network Switches*, gateways, and other network devices. Each port can be run as a separate Network Interface Card (NIC), and can be configured to directly output network-based lighting control protocols such as *Streaming ACN (sACN)* or *Art-Net*.

See *Patch > Protocols* and Setup > Device > *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

USB Ports

Data Ports

USB A and C ports are provided on the front and rear of your device, and in the keyboard tray, when present. USB ports can be used to connect peripherals such as storage devices, alphanumeric keyboards, pointing devices, and touchscreen control for external monitors.

USB data ports cannot be used for charging devices.

Dimensions and Weights

Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
ETC Puck	28	1.1	118	4.6	110	4.3	0.91	2.0

Ships With

- VESA 100x100 mm mounting plate.
- Power supply and detachable plug cable (IEC-320-C5 to NEMA 5-15P).

Features, Specifications, and Requirements

Minimum Eos Software Version

The ETC Puck requires Eos software v3.2.8 or later.

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The ETC Puck supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The ETC Puck is available with 1,024 (minimum) or 6,144 (maximum) outputs.

Capacities

- **Output Parameters** - 1,024 (minimum) or 6,144 (maximum).
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

Electrical and Thermal

- **Power Consumption** - approximately 1.6 A at 120 V or 230/240 V.
- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant
- cULus listed
- FCC compliant
- RoHS compliant
- WEEE

ETCnomad

Full-featured Eos software is available for free download and installation on Windows and macOS to create or edit show files for any Eos Family controller. An ETCnomad key connected to the computer via USB allows Eos to directly control conventional and LED luminaires, moving lights, and media servers, and allows the computer to act as a backup for Eos Family controllers, or to join larger systems as a client.

- *Setup Guide* - get started with ETCnomad.
- *Physical Overview* - ETCnomad hardware layout.
- *Features, Specifications, and Requirements* - ETCnomad capabilities.

Setup Guide

Download the Eos v3.3.6 software and learn more at etcconnect.com/eos-software.

To learn more about Eos, Get Started with information about *Eos System Requirements and Setup*, *Eos Family Resources*, and *Using This Manual*.

Hardware Requirements

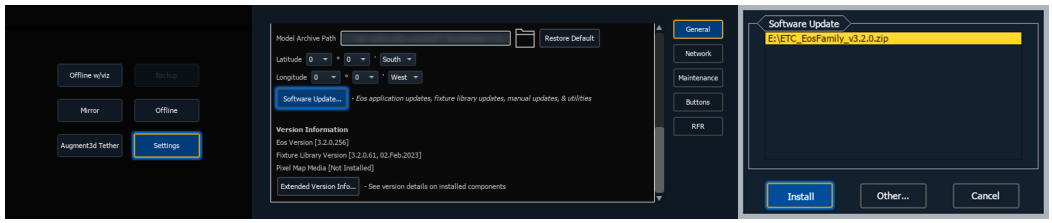
- Computer running Windows 7 (64-bit) or later, or macOS 13 (Ventura) or later
- Multicore processor with clock frequency higher than 2.0 GHz
- 3.5 GB free disk space or higher
- 2 GB RAM or higher
- Screen resolution of 1920x1080 or higher
- 64 MB video card or higher
- Direct X 11 or higher installed (Windows only)
- RJ-45 Ethernet network adapter (required to communicate with a lighting network and gateways for output)
- USB-A ports for connection of ETCnomad license key and output accessories

ETCnomad is also compatible with ETC Cobalt and Hog 4 PC software. Cobalt software is not compatible with macOS 15 (Catalina) and later.

Installation Instructions

If necessary, first download the Eos v3.3.6 software from the link above, transfer the zipped folder to a USB storage device, and insert it into the desired device.

1. On Eos Family hardware:
   a. Navigate to **Settings > General** in the ECU by exiting Eos via **Browser > Exit**, or by selecting **{Launching in...}** as the device boots.



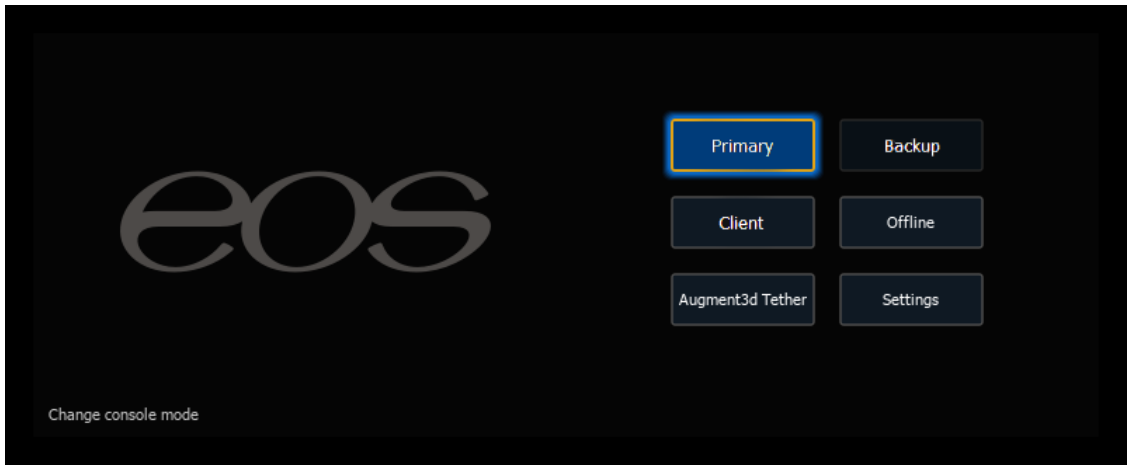
   b. Scroll to and select **{Software Update...}**. Any valid Eos installers detected will appear in a pop-up list.
   c. Select **{Install}** and follow the instructions to install Eos v3.3.6. Your device will automatically restart when the installation is complete.

2. On Windows or macOS:
   a. Double-click to unzip the zipped folder.
   b. Open the folder and double-click on the ETCnomad installer. The Windows installer is an EXE file; the macOS installer is a PKG.
   c. Follow the instructions to install Eos v3.3.6. You will be prompted to restart your computer to complete the installation.

CAUTION: ***In order for multiple Eos Family devices to connect (including consoles, processors, video interfaces, and Eos on Windows and macOS), all devices must be running the same software version, have the same fixture library version installed, and be set to the same language, or they will not connect.***

Getting Started

Once ETCnomad is installed and running, you may select one of the *Supported Eos Device Roles* from the menu to log into the application. Available roles will change depending on the detected ETCnomad USB key. Eos software can be run as an offline editor or in mirror mode when a dongle is not present.



To include the computer in *Multi-Console Sessions*, you must be connected to the same network as any other Eos Family devices, and follow all other *Eos Device Network Configuration* setup steps.

Lighting Control Output

Network outputs may be distributed via Ethernet protocols (sACN or Art-Net) directly to devices, or via compatible Ethernet distribution hardware, such as ETC Response DMX/RDM Gateways.

DMX output may be distributed using an ETC Gadget or Gadget 2 USB to DMX/RDM converter. Up to four Gadgets may be connected to a single computer.

Physical Overview

Dimensions and Weights

Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
ETCnomad Key	26	1.0	84	3.3	84	3.3	0.10	0.2

Ships With

- ETCnomad USB A key.
- USB drive with software and instructions.
- Tag with serial and ID numbers.
- Storage box.

Features, Specifications, and Requirements

Supported Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

The ETCnomad key supports the following *Eos Device Roles*:

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.

- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.
- *Offline w/viz* - allows output for visualizers only in Eos for Windows and macOS.

Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Available Outputs

The ETCnomad key is available with 1,024 (minimum) or 6,144 (maximum) outputs.

Capacities

- **Output Parameters** - 1,024 (minimum) or 6,144 (maximum).
- **Channels** - 32,768 (can be any number from 1 to 99,999).
- **Cues** - 10,000.
- **Cue Lists** - 999.
- **Record Targets**
  - **Groups** - 10,000.
  - **Palettes** - 10,000 x 4 (Intensity, Focus, Color, Beam).
  - **Presets** - 10,000.
  - **Effects** - 10,000.
  - **Macros** - 99,999.
  - **Snapshots** - 10,000.
  - **Curves** - 10,000.
  - **Color Paths** - 10,000

Target Key 10

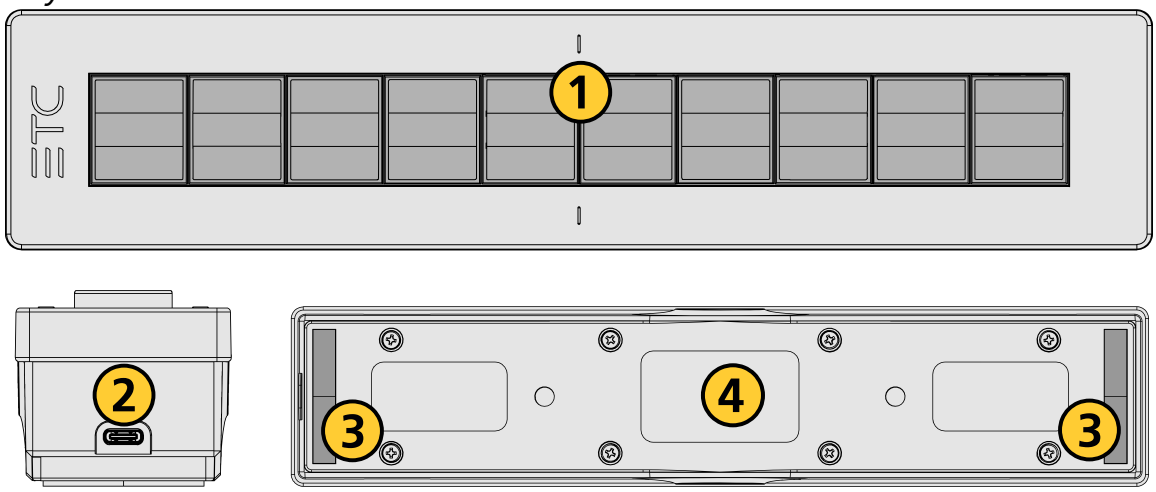
The Target Key 10 (TK 10) is an accessory bank of *Target Keys* for use with Eos Family devices. The USB-connected bank has ten buttons with displays, allowing fast, tactile input that changes as you program. TK 10 is available both as a portable device for connection to an Eos Family console or in a rackmount chassis for use with Eos Family rack processors.

- *Setup Guide* - get started with TK 10.
- *Physical Overview* - TK 10 hardware layout.
- *Features, Specifications, and Requirements* - TK 10 capabilities.

Setup Guide

Use a USB C cable to connect the TK 10 to an Eos Family console or rack processor. For information on configuring the button displays, see **System Basics >** *Direct Selects [Tab 4]* **>** *Target Keys*.

Physical Overview



1	Target Keys	2	USB C (Power and Data)	3	Rubber Feet	4	100 mm VESA Screw Pattern

Target Keys

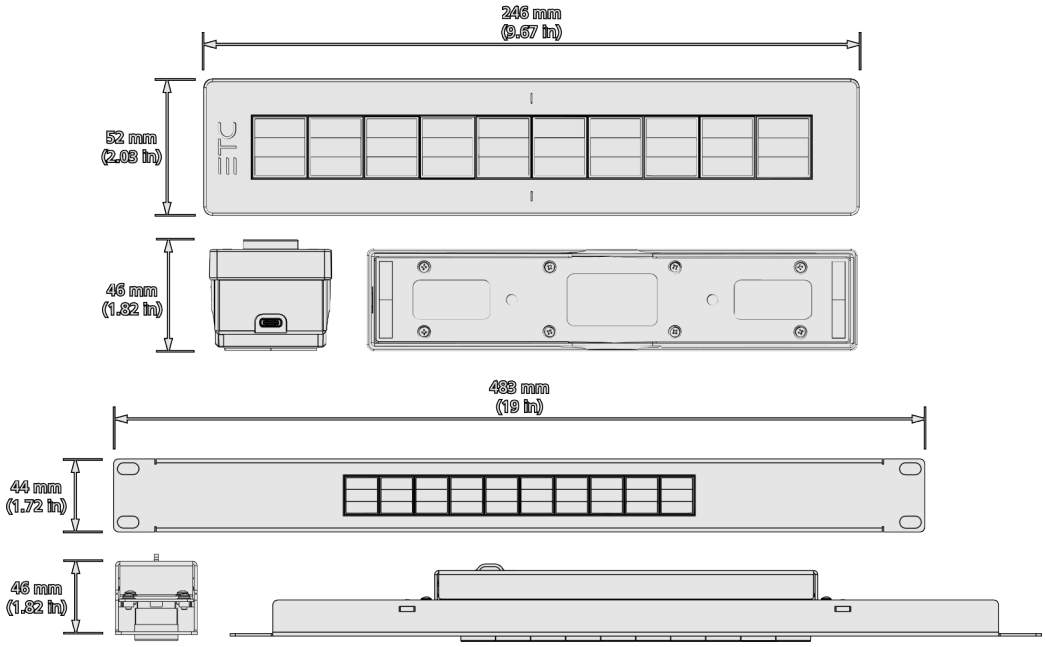
Apex consoles offer multiple banks of *Target Keys*, physical buttons with built-in high-resolution displays.

The TK 10 provides a single bank of 10 Apex target keys in a standalone accessory that can be used for programming and control with any Eos Family console or rackmount processor, including ETCnomad for Windows and macOS.

USB Ports

A USB C port is provided on the side of the TK 10 to connect to any Eos Family console, rackmount processor, or ETCnomad computer. Use any compatible USB cable to connect the TK 10, which is also powered via the connection.

Dimensions and Weights



Model	Height		Width		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
TK 10	52	2.03	246	9.67	46	1.82	0.66	1.45
TK 10-RM	44	1.72	483	19	46	1.82	0.54	1.20
TK 10 in shipping container	44	1.72	483	19	46	1.82	0.54	1.20
TK 10 in travel case								

Ships With

TK 10 Portable (**4450A1051**) ships with the following items:

- One 6-foot USB C cable.
- USB A to USB C adapter.

TK 10 Rackmount (**4450A1061**) ships with the following items:

- One 6-foot USB C cable.
- USB A to USB C adapter.
- 1U 19-inch rack chassis (installed).
- Mounting hardware.

The screw pattern allows the attachment of the TK 10 Portable to VESA-compatible mounts and brackets.

Accessories

TK 10 is compatible with a variety of accessories that can be 3D-printed and clipped onto the device.

Accessory files in STL format for 3D printers are available for download at etcconnect.com/eos.

Features, Specifications, and Requirements

Minimum Eos Software Version

The TK 10 requires Eos software v3.2.12 or later.

Electrical and Thermal

- **Ambient Room Temperature** - 0°–35°C (32°–95°F).
- **Ambient Humidity** - up to 90% non-condensing.

Regulatory and Compliance

- CE compliant

Chapter 2

Eos System Requirements and Setup

Eos Network Systems 172

Eos Networking Overview 174

Eos Network Requirements 214

Eos Device Network Configuration 234

Eos Network Systems

This chapter details Eos systems using network wiring and switches for the transmission of lighting data, and contains all of the information necessary to successfully set up a network for entertainment control.

Overview

Eos Networking Overview describes terms, technologies, and philosophies that are useful to understand when working with Eos and entertainment control networks. Most networking topics are not unique to entertainment control, and many additional resources are available online and elsewhere to learn more about these concepts.

- *Network Terms* - common networking terms and their definitions.
- *Entertainment Control Networks* - how and why entertainment control networks are designed.
- *Network Topology* - how a network is arranged and connected.
- *Network Switches* - the connective devices that create a network.
- *Network Protocols* - how communication and control data is passed through a network.
- *Network Wiring* - physical connection options in a network.
- *Wireless Networking* - how and why to add wireless capabilities to a network.
- *Network Show Control* - how to best connect external show control resources to a network.

Requirements

Eos Network Requirements details the hardware and software requirements for setting up Eos networks.

- *Advanced Managed Network Requirements* - requirements for larger or more complex networks using managed switches.
- *Basic Managed Network Requirements* - requirements for most Eos Family networks, including all permanently-installed networks.
- *Unmanaged Network Requirements* - requirements for small portable networks using unmanaged switches.

Networked Eos systems have specific hardware and software requirements which are detailed in this section. See the *Guide to ETC Network Requirements* for general requirements for ETC network systems.

CAUTION: ***These requirements are tested by ETC. Other network configurations may function, but are not supported. Requirements must be met specifically and explicitly for ETC to support a system. Equipment that is lacking information, from third-party manufacturers or otherwise, is considered to not meet requirements. If these requirements are not met, your system may not work as expected or desired, and ETC may not be able to resolve related issues until the system infrastructure is corrected.***

Setup

Eos Device Network Configuration explains how to set up an Eos device for use in a network system.

- *Network Configuration in the ECU* - settings in the *Eos Configuration Utility (ECU)* necessary or relevant for Eos network configuration.

- *Network Configuration in Eos* - settings in Eos *Setup* and *Patch* necessary or relevant for Eos network configuration.
- *Network Troubleshooting and Resources* - tips and tools to help identify and solve issues in a network.

Multi-Console Configuration explains how to set up multiple Eos devices for synchronized, interconnected use in a network.

- *Eos Device Roles* - different roles that Eos devices can perform in a multi-console session.
- *Multi-Console Session Capacities* - available ways to combine Eos devices and their resulting capabilities and outputs.
- *Multi-Console Sessions* - how to connect multiple Eos devices to start a session.
- *Multi-Console Configuration in the ECU* - settings in the *Eos Configuration Utility (ECU)* necessary or relevant for multi-console session configuration.
- *Multi-Console Configuration in Eos* - settings in Eos *Setup* and *Patch* necessary or relevant for multi-console session configuration.
- *Eos Expansion Processing* - features and hardware to distribute a lighting system's outputs across more than one Eos device in a multi-console session.
  - *Expansion Processing User Interface*
  - *Expansion Processing Session Capacities*
  - *Expansion Processing Configuration*
  - *Expansion Backups and Failover*

Eos Networking Overview

This section describes terms, technologies, and philosophies that are useful to understand when working with Eos and entertainment control networks. Most networking topics are not unique to entertainment control, and many additional resources are available online and elsewhere to learn more about these concepts.

- *Network Terms* - common networking terms and their definitions.
- *Entertainment Control Networks* - how and why entertainment control networks are designed.
- *Network Topology* - how a network is arranged and connected.
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- *Network Protocols* - how communication and control data is passed through a network.
- *Network Wiring* - physical connection options in a network.
- *Wireless Networking* - how and why to add wireless capabilities to a network.
- *Network Show Control* - how to best connect external show control resources to a network.

Network Terms

A **network** is a group of connected devices that can communicate with each other. These devices are referred to as **nodes**.

General

- **NIC** - Network Interface Controller, the hardware in devices that allow them to connect to a network as nodes.
- **Switch** - a device that connects nodes and can be configured to intelligently pass information and direct network traffic. See *Network Switches*.
- **Link** - the physical or logical connection between two nodes or segments. See *Network Topology*.
- **Segment** - a connection between two NICs that goes through at least one switch.
- **Hop** - a segment where data is passed from one device to another. See *Network Topology*.
- **LAN** - Local Area Network, any group of connected switches and nodes. See **Entertainment Control Networks >** *Network Isolation*.
- **VLAN** - Virtual Local Area Network, a digital subdivision of a physical LAN. See **Entertainment Control Networks >** *Network Isolation*.
- **WAN** - Wide Area Network, a group of LANs and their nodes, connected via routers.
- **Router** - a device, often wireless, that passes and filters information between separate LANs. See *Wireless Networking*.
- **Topology** - how the physical elements of a network are arranged and connected. See *Network Topology*.
- **Octet** - an eight-bit unit of data that is commonly used to represent part of a network address. See *Internet Protocol (IP)*.
- **Time Server** - a device that establishes the actual time and distributes that information to other nodes. See **Entertainment Control Networks >** *Time Servers*.
- **Wireless Access Point** - a device that provides a wireless connection point into a physical network. See *Wireless Networking*.
- **SSID** - Service Set Identifier, the name of a wireless network generated by an access point or router. See *Wireless Networking*.
- **Firewall** - a device or software that provides security monitoring and control of incoming and outgoing network traffic.

- **Gateway** - a device that translates from one protocol to another; in entertainment control networks, often from sACN to DMX. Not to be confused with *Default Gateway*.
- **Ping** - a utility used to test network connectivity between two nodes. Accessible in Eos software via *Eos Configuration Utility (ECU)* > *Settings > Network* > *Device*.

Data Units

- **Bit (b)** - the smallest unit of digital information for encoding and transmitting data. Literally a 1 or a 0.
- **Megabit (Mb)** - roughly one million bits.
- **Gigabit (Gb)** - roughly one billion bits.
- **Byte (B)** - eight bits.
- **Megabyte (MB)** - roughly one million bytes.
- **Gigabyte (GB)** - roughly one billion bytes.

Protocols

Network Protocols are sets of standards and rules for how to communicate, format, and process data in a network.

- **Unicast** - a protocol communication method where a single sender transmits data to a single receiver in a single IP network. See **Communication Methods >** *Unicast*.
- **Broadcast** - a protocol communication method where a single sender transmits data to every receiver in a network's subnet. See **Communication Methods >** *Broadcast*.
- **Multicast** - a protocol communication method where data from one or more senders is transmitted to one or more receivers that have requested to receive the data. See **Communication Methods >** *Multicast*.
- **IP** - governs how data is addressed and sent within and between networks. See *Internet Protocol (IP)*.
- **IP Address** - the unique virtual location of a device within an IP-based network.
- **Packet** - a unit of data for transmission in an IP network, often dividing a longer message into formatted pieces. See *Internet Protocol (IP)*.
- **Subnet** - logically subdivides an IP network, limiting which nodes can communicate with each other. See **Internet Protocol (IP) >***Subnet Mask*.
- **Default Gateway** - the IP address of a network device where data is sent if it cannot be delivered to its intended destination. See **Internet Protocol (IP) >** *Default Gateway*.
- **DHCP** - a method to automatically assign addresses to devices in a network. See **Internet Protocol (IP) >** *Dynamic Host Configuration Protocol (DHCP)*.
- **MAC Address** - a unique identifier manufacturer-assigned to any wired or wireless device that can connect to a network. See **Communication Protocols >** *Ethernet*.
- **Ethernet** - a collection of standardized technologies that govern network structure and data transmission. See **Communication Protocols >** *Ethernet*.
- **Frame** - a unit of data dividing a longer message into formatted pieces for transmission between MAC addresses. See **Communication Protocols >** *Ethernet*.
- **TCP** - ensures reliable communication of data between devices in a network. See **Communication Protocols >** *Transmission Control Protocol (TCP)*.
- **UDP** - allows rapid, connectionless communication of data between devices in a network. See **Communication Protocols >** *User Datagram Protocol (UDP)*.
- **ACN** - Architecture for Control Networks, a set of protocols allowing multiple entertainment control systems to operate on the same network. See **Control Protocols >** *Streaming ACN (sACN)*.
- **sACN** - continuously streams lighting levels over a network. See **Control Protocols >** *Streaming ACN (sACN)*.
- **IGMP** - allows communication between multicast transmitters and receivers. See *Internet Group Management Protocol (IGMP)*.

- NTP - synchronizes node clocks in a network to the same global time. See Communication Protocols > *Network Time Protocol (NTP)*.
- RSTP - prevents network loops by managing redundant connections between switches. See Communication Protocols > *Rapid Spanning Tree Protocol (RSTP)*.
- RDM - Remote Device Management, a protocol that allows remote device reporting and configuration via DMX wiring without a network.

Entertainment Control Networks

Networks designed for entertainment control are purpose-built to get real-time data between devices quickly, efficiently, and reliably with the lowest latency possible.

Overview

Entertainment control networks are designed to be risk-averse to avoid downtime, as well as scalable so that new equipment can be easily integrated without reconfiguration. They are also designed to use very little bandwidth under typical conditions, keeping the network open so that it can be flooded with data for immediate real-time control.

As a result, the unique configurations and priorities of entertainment control networks differ from those of standard computer networks. It is likely not a problem if you send an email and it takes a few minutes to arrive, but even a short delay when changing lighting levels can be undesirably obvious to an audience.

Eos communication in *Multi-Console Sessions* is built on multicast data distribution, and both *Streaming ACN (sACN)* and v4 of *Art-Net* use multicast to transmit address levels. Configuring a control network to manage the efficient distribution of multicast traffic reduces unnecessary data transmission and ensures that data only reaches the appropriate destinations. See *Why Multicast*. Networks improperly configured for multicast may not be able to transmit multicast data. In an unconfigured system, multicast is treated as broadcast data. See Network Protocols > *Multicast*.

Purpose-built devices, such as ETC Conductor or ETC SiteBox, can allow the safe use of Internet-connected features (such as routing, remote monitoring, and internet time) with entertainment control networks.

Digital Multiplex 512 (DMX)

ANSI/TIA E1.11

Digital Multiplex 512 (DMX512, or most commonly simply DMX) is a protocol developed and standardized for control of lighting and entertainment devices in traditional wired systems. The *Ethernet*-based network systems discussed in this section allow entertainment control networks to be scaled beyond 512 addresses over a single cable.

Universes

A single run of DMX can control up to 512 individual addresses, each of which can be set to a value between 0 and 255 (often expressed in Eos and other lighting controllers as a percentage). A single DMX universe can be said to contain 512 addresses, and any address numbers higher than 512 must be carried in a subsequent universe. Universes are typically how entertainment control networks organize their data addresses.s

Universes and addresses are sequentially numbered, typically represented in one of two ways.

- Port / Offset - the universe number and the address number, separated by a slash.
  - For example, 2/6 would be the sixth address in the second DMX universe.
- Absolute - just the address number, including all preceding universes.
  - 2/6 expressed as an absolute address would be 518 (the 512 addresses in universe 1 plus the 6 in universe 2).
  - Absolute addresses can be calculated with the formula ((universe number - 1) * 512) + any address offset.

Network-based protocols like *Streaming ACN (sACN)* and *Art-Net* maintain this numbering, while providing access to far more universes than would be practical in a DMX-based system.

DMX is still recommended for bridging the gap between network infrastructure and lighting equipment, as it can be daisy-chained to multiple lighting fixtures without increasing the *Network Width*.

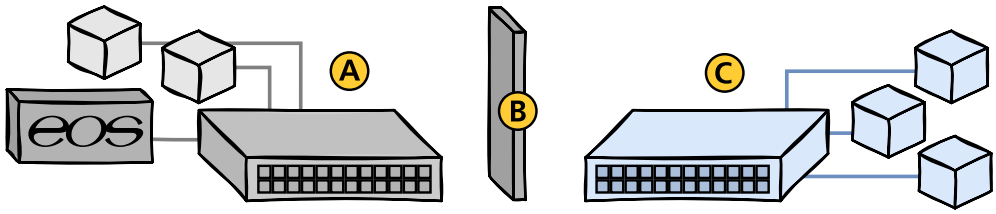
Network Isolation

General best practice is to isolate entertainment control networks from other networks, including the global Internet.

Physical LAN Isolation

A Local Area Network (LAN) is any group of connected switches and nodes.

ETC recommends keeping any entertainment control LANs entirely physically separated from other networks whenever possible or when security is a concern.



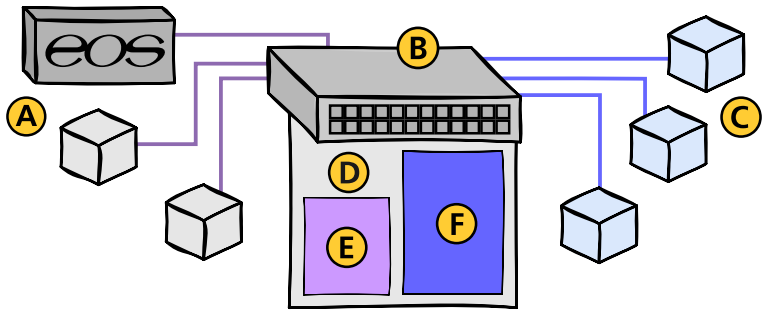
A	Entertainment control LAN	B	Physical separation	C	Building LAN

A complete network infrastructure can be dedicated to the lighting system where the network's sole purpose is connecting lighting devices. This has long been recommended by ETC and remains the best practice. It not only increases security, but also reduces coordination demands and simplifies system design, implementation, and troubleshooting.

Logical VLAN Isolation

When physical separation of your entertainment control system from other network infrastructure is impossible, logical isolation is an acceptable secondary option. A Virtual Local Area Network (VLAN) is a digital subdivision of a physical LAN.

Commonly used outside entertainment control for privacy and security, VLANs can be used to create a separate virtual network within an existing physical infrastructure, similar to partitioning a hard drive.



A	Entertainment control infrastructure	D	Logical isolation
B	VLAN switch	E	Entertainment control VLAN
C	Building infrastructure and firewall	F	All other VLANs

VLAN-enabled managed switches create an internal model of multiple virtually-separated LANs, each of which is given a VLAN ID. These IDs are then assigned to the ports being isolated into that virtual portion of the network. Network traffic is similarly tagged with an ID which the switches use to route the traffic to the correct virtual location. The data is untagged at the end and delivered to the appropriate ports within the VLAN.

VLANs are not intended for true separation of network traffic; a physically-separated LAN is still preferred. VLANs are still constrained by the overall bandwidth limitations of their physical network, just as partitioning a hard drive does not increase the amount of available space.

Eos only supports Layer 2 VLANs, where the network switch architecture handles the virtual network separation. Layer 3 VLAN interfaces, which allow the inspection and routing of packets into other networks, are not supported in entertainment control networks for the same reasons that *Routers* are not recommended.

The Internet

ETC does not recommend connecting entertainment control networks to the Internet.

- Devices accessing the Internet can consume significant bandwidth, which can introduce control latency.
- The network becomes open to security risks from bad actors.
- Viruses can pose a danger to network hardware and software, even the embedded operating systems used in most Eos devices.

Static and Dynamic Addressing

There are two ways to assign *Internet Protocol (IP)* addresses to devices in entertainment control networks.

- Static - manually choosing and assigning an IP address to each individual device in the network.
  - Offers predictability and a greater level of control over the addresses chosen.
  - Requires more human management, especially as a network grows and changes.

- Dynamic - using a *Dynamic Host Configuration Protocol (DHCP)* server to automatically assign addresses to network devices.
  - Saves time and effort, especially in larger or more complex networks.
  - Less consistent for troubleshooting, show control, and integration.

A combined approach can offer the best of both worlds. Once a device has been statically addressed, it will not request or take an IP address from a DHCP server. This is best applied to centralized control devices less likely to move or change, such as consoles and dimmer racks. Meanwhile, a DHCP server can remain active in the same network to dynamically address infrastructure and accessory devices, such as gateways and smartphone remotes.

Time Servers

A time server is a device that establishes the actual time and distributes that information to other nodes. Most time servers transmit this information via *Network Time Protocol (NTP)*.

Eos consoles are capable of acting as time servers, enabled in the *Eos Configuration Utility (ECU)* via Settings > Network > *Time Service (SNTP)*. Many ETC products, such as Paradigm Architectural Control, can also provide time services.

ETC recommends the use of time servers on all entertainment control networks in order to keep all nodes synchronized to the same consistent time.

Only one time server should be active at a time in a LAN to prevent time conflicts or changes.

Network Topology

Topology is how the physical elements of a network are arranged and connected. Entertainment control networks are arranged around one or more *Network Switches* in a variety of valid topologies.

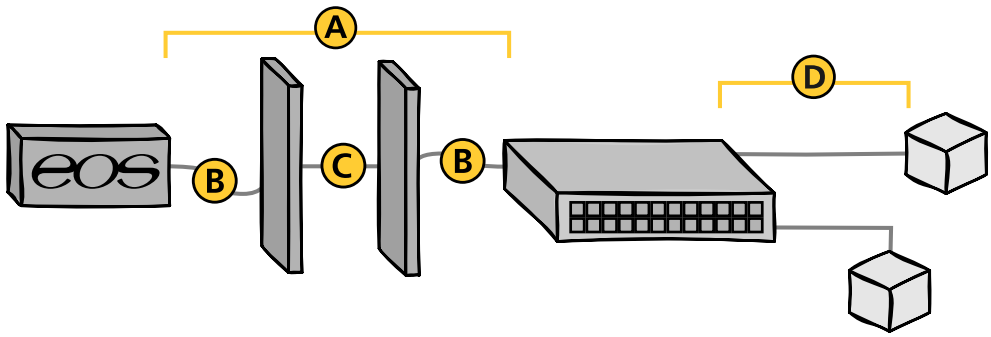
Network Width

Every time data passes through a switch, a small amount of latency is added. To maintain near real-time data transfer in an entertainment control network, the cumulative latency across all devices and components of a network is important.

- Link - the physical or logical connection between two nodes or segments. This includes any installed cable runs within walls or conduit, as well as the patch cables on both sides. The maximum lengths of the wire are determined by the cable type, which are rated for different distances (see *Network Wiring*). Exceeding these distances will cause a drop in signal strength, can cause erratic behavior in the network, or potentially prevent data reaching its destination entirely.
- Segment - a connection between two NICs that goes through at least one switch.
- Hop - a segment where data is passed from one device to another. This could be a console to a switch, a switch to a device, or a switch to a switch. A hop count (how many nodes data passes through between source and destination) that is acceptable for near-real-time control is limited by a network's topology, as well as the node hardware involved.
- Network Width - the highest number of segments or hops between nodes in a network. Acceptable network width is also limited based on network topology and hardware, and excessive network width can introduce latency or prevent communication entirely.

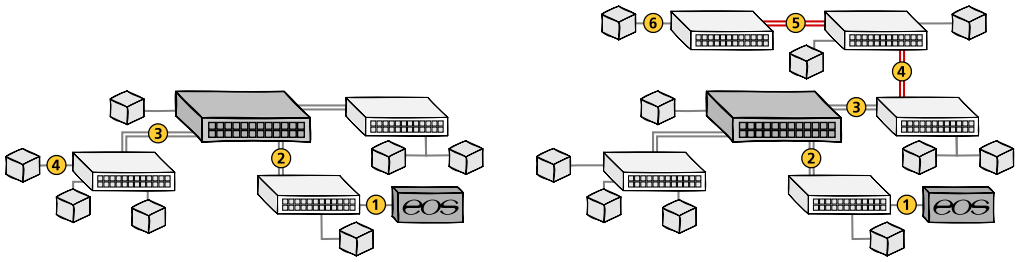
The network width describes the maximum number of switches data can pass through between any two nodes, and connection lengths between switches must not exceed the requirements of the cable being used.

The following segment connects an Eos device to the nodes on the right:

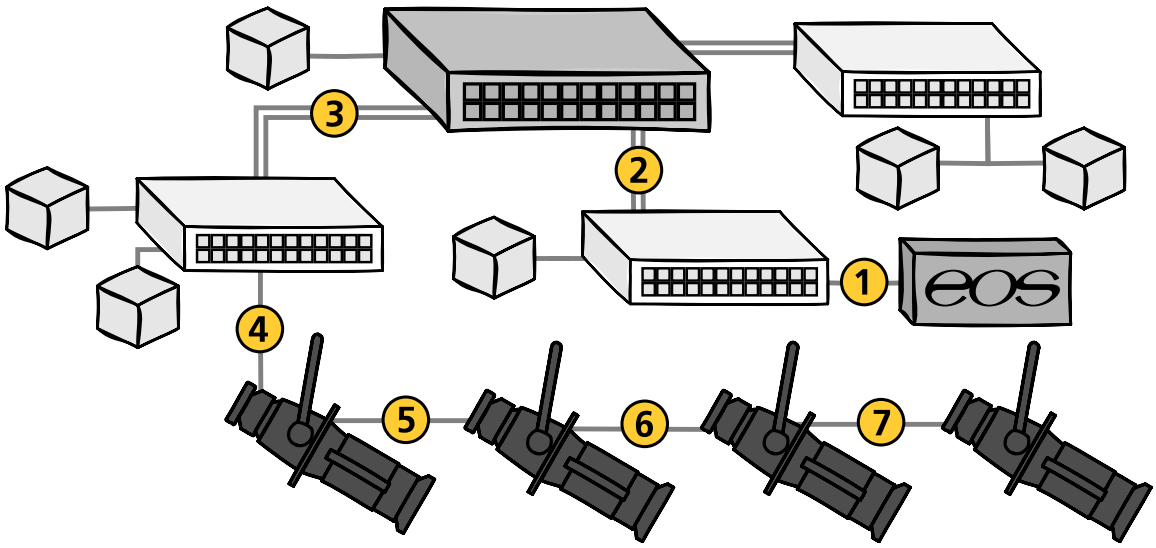


A	A link	B	Patch cables	C	Wire in the wall	D	One hop

Any additions or alterations to a network can affect the hop count and network width, especially when connecting additional switches. Plugging a switch into the backstage left port may seem like an easy way to add extra ports to your system, but can easily lead to unintended impacts on the entire network.



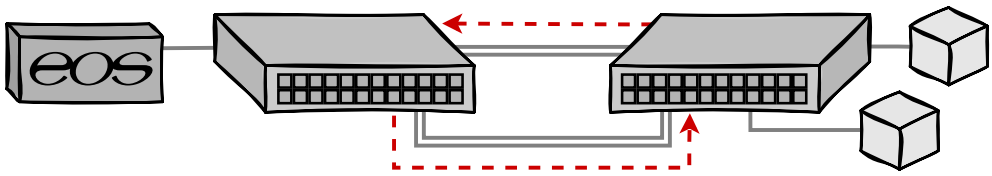
Many fixtures now offer direct wired network connectivity via onboard RJ45 ports. Since these fixtures have internal switches, they count as nodes and contribute to the node and hop limit for the network. This is especially important to consider when daisy-chaining fixtures together; running each fixture directly back to separate switch ports is preferred.



Since DMX is not subject to the same hop limitations, it is often recommended as a "last mile" protocol to connect fixtures to network infrastructure via a DMX gateway.

Network Loops

With any topology, care should be taken to avoid network loops, where cabling creates multiple paths to a switch. In this scenario, the data forwarded out of the switch reenters the switch through the loop and is duplicated and redistributed indefinitely. Eventually, the increase in traffic can impact other communication in the network, or, in extreme cases, cause a broadcast storm which disables the network entirely.

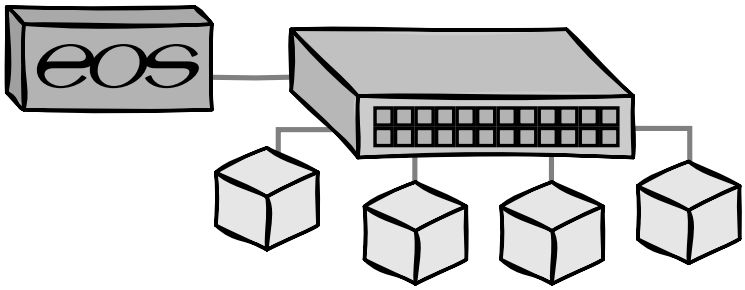


Loops most commonly occur when more than one connection to a switch is established. In a single-switch network this is typically because the switch has been connected to itself, one port to another.

Multi-switch networks, particularly when changed or reconfigured, have a higher potential for loops, which typically occur when two switches are connected by more than one cable run. If enabled within the network, *Rapid Spanning Tree Protocol (RSTP)* can help manage switch connections.

Single-Switch Network Topologies

In a single-switch topology, all nodes in the network are connected through a single network switch.



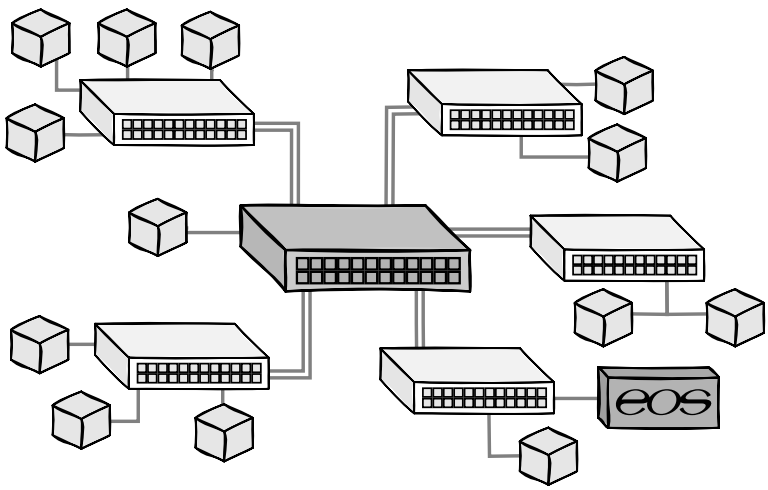
This topology is generally used to arrange small, simple networks. Permanent small networks should follow *Basic Managed Network Requirements*, while portable small networks may follow *Unmanaged Network Requirements*.

Multi-Switch Network

Larger, more complicated networks will generally make use of one or more topologies that utilize multiple network switches. See *Basic Managed Network Requirements* and *Advanced Managed Network Requirements*.

Star Topology

Star topology consists of nodes connected to multiple edge switches, each of which is connected to a central core switch. Nodes can also be connected to the core switch directly.



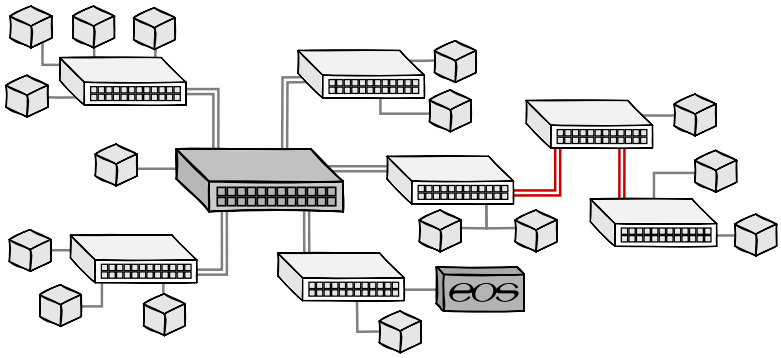
Devices are connected by either of the following wiring segments:

- **End device segment** - a home run from a node to a switch.
- **Trunk segment** - a home run from an edge switch to a core switch.

In some *Advanced Managed Networks*, the core switch can be a group of connected switches specially configured to behave as a single device.

Star topology design minimizes the overall network width and number of hops necessary to get from one point in the network to another. It also minimizes the impact of wiring or equipment failures, as a node, switch, or wiring segment issue will only affect a small portion of the network and be easier to troubleshoot. As the core switch is critical to the operation of the network, many switches offer redundant core capabilities which can mitigate the risk of failure.

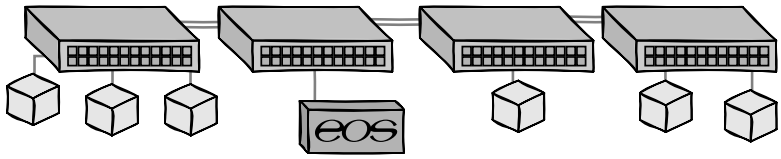
Caution should be taken to avoid branches or spurs, decentralized offshoots created when a switch is connected to an edge switch. This can often occur when a new switch is added to an existing network. Branches increase the network width and hop count between nodes and can have detrimental effects on the network.



ETC recommends star topology with no loops and the minimum number of branches as the ideal topology for entertainment control networks; other topologies may function but are generally more complex to configure and maintain.

Linear Topology

In a linear topology, multiple switches are connected sequentially.

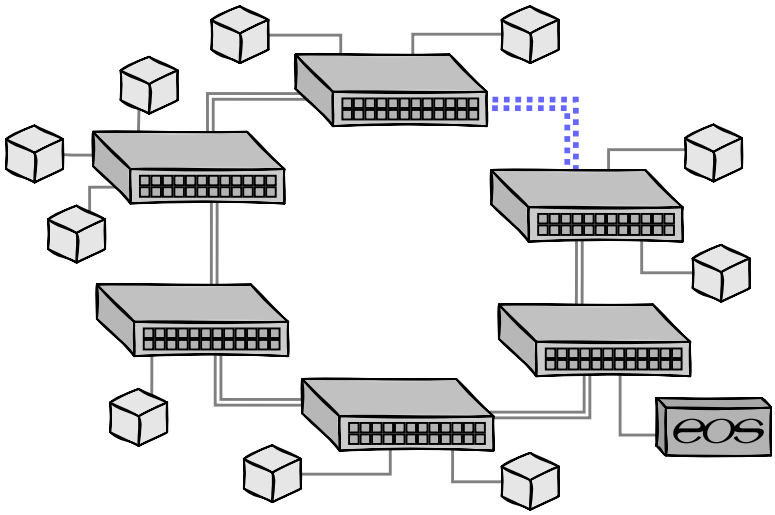


Hop count and network width must be carefully observed. In the pictured example, there are 3 or 3 hops between Eos and any of the connected nodes, which would increase to 5 hops if Eos was connected to the first or last switch in line.

Ring Topology

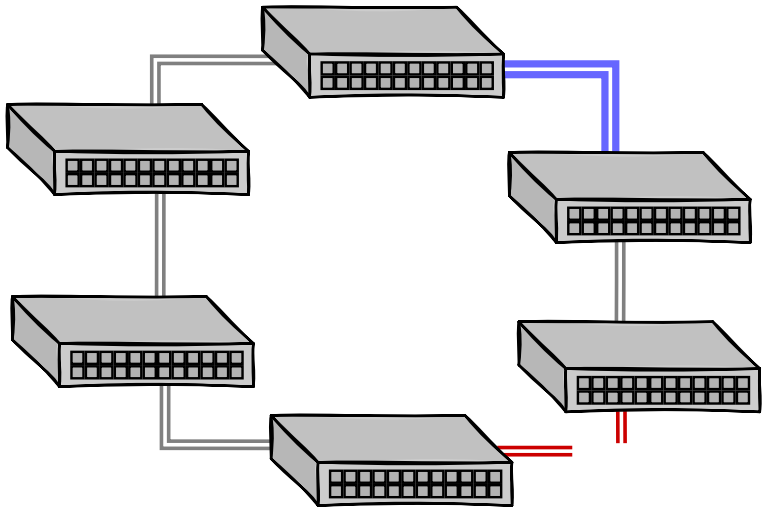
CAUTION: ***ETC does not recommend ring topology for entertainment control networks for most systems. Any network utilizing ring topology is subject to Advanced Managed Network Requirements.***

Ring topology is an advanced arrangement that intentionally introduces a network loop between switches. One switch is specially configured to close one of the network segments at a time. This switch also evaluates the flow of traffic around the network, checking the health of the ring using the Ethernet Ring Protection Switching (ERPS) protocol.



The two switches connected by the closed segment communicate the long way around through the normal segments; in terms of network traffic, acting as a linear topology.

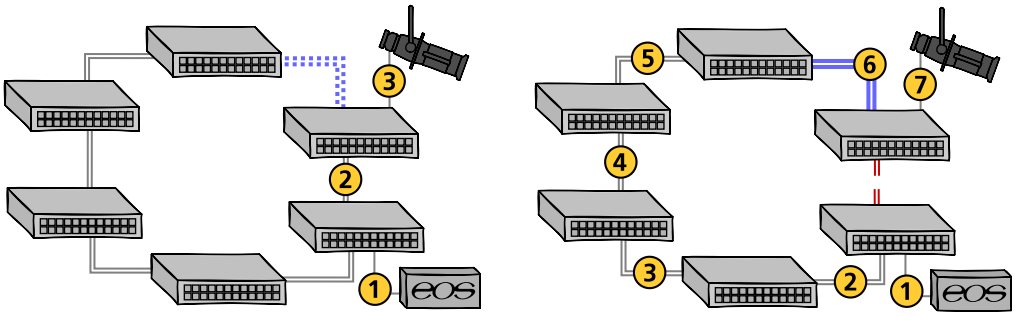
If the ERPS switch detects a disconnect in transmission across a normal segment between switches, it will open the closed segment to maintain the flow of data within the network.



Despite its self-healing properties, ETC does not recommend ring topology for entertainment control networks. As well as being difficult to configure and troubleshoot, miswiring the system or misconfiguring the ERPS switch could induce a network loop, introducing latency or taking the network down entirely.

Compared with star topology, ring topology can also adversely increase the overall network width, with a high number of hops between the switches connected by the closed segment. Even when correctly configured, it can be easy to increase the hops between a sender and receiver, which could have adverse playback effects during a live event.

Imagine a scenario where an Eos console is connected to one of six switches in a ring topology, controlling a fixture connected through the adjacent switch, totaling 3 hops to pass data from console to fixture.



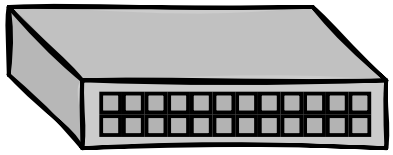
If these two switches are disconnected and the closed segment heals the network, console instructions must now pass through all other switches in the network to reach the fixture, increasing the hop count to 7.

If ring topology must be used, ETC recommends testing failover scenarios frequently, and during event-like conditions, to ensure that network communication remains possible. Any network using ring topology is subject to *Advanced Managed Network Requirements*. ERPS protocol tends to conflict with *Rapid Spanning Tree Protocol (RSTP)* when both are present in a ring network.

Network Switches

A network switch is a device that connects nodes and can be configured to intelligently pass information and direct network traffic.

Overview



Switches are what make *Internet Protocol (IP)* networks possible, acting as intermediary devices that connect nodes to each other and intelligently manage the flow of data by forwarding received packets to their intended destinations.

Note: *While the term is often used interchangeably, a network hub is a distinct type of device that lacks the intelligent data management of a network switch, simply broadcasting received data on all ports to any connected devices. Network hubs are not acceptable for modern entertainment control networks.*

Switches have a varying number of network ports, allowing multiple nodes to be plugged in at once. These ports may have different connectivity speeds and capabilities. Not all ports on a switch may be able to be used interchangeably.

As with all hardware, switches and connected *Network Wiring* can wear out over time. Switches and attached cabling should be evaluated for replacement every decade, or sooner if elements of the network are commonly moved or reconfigured.

Managed switches are typically more reliable than unmanaged switches, but also more expensive. Install switches are a type of managed switch designed to be the core of larger or more complex systems, and are often recommended for entertainment control networks.

Switches with more features and robustness may be more expensive, but provide the value of a reliable network for no-fail lighting traffic transmission. When selecting network equipment, including wiring and switches, balancing avoiding unplanned downtime (including potentially during a live event) with cost will vary by use-case.

Switch Management

Network switches generally fall into one of two categories, managed or unmanaged.

Switches in a network should all be similarly managed or unmanaged: any switches added to a managed system must also be managed, and unmanaged switches should not be used in a managed network. Mixing the two types could cause data to be passed indiscriminately, which can affect the network's real-time performance.

CAUTION: ***While managed switches are always preferred with ETC lighting control systems, a managed switch that is not properly configured can be more detrimental to system operation than an unmanaged switch.***

Managed

For the purposes of this document, a managed switch is defined as a switch that allows the user to configure individual settings for features (such as IGMP, VLAN, Spanning Tree, and so on). It is recommended that you use managed switches for ETC lighting networks as they can be configured based on the requirements outlined in *Eos Network Requirements*.

Managed switches offer advanced features generally required for the efficient transmission of *Multicast* data, particularly *Internet Group Management Protocol (IGMP)*. Networks requiring *Logical VLAN Isolation* must use a managed switch with VLAN capabilities.

Switches sold by ETC are managed switches preconfigured based on the system into which they are being installed. Managed switches should otherwise be configured by qualified individuals during the wiring and setup of the network. As a misconfigured switch can affect every aspect of network traffic and communication, ETC does not recommend altering switch configurations in the field once a network is up and running unless the network is being altered or the usage of the network is shifting from its original design.

Unmanaged

For the purposes of this document, an unmanaged switch is defined as a switch with no interface from which to configure settings for advanced features.

Unmanaged switches require no configuration and offer very basic features, forwarding frames to specific ports and maintaining multicast and MAC address lists.

Unmanaged switches should only be used in smaller-scale temporary networks utilizing a limited quantity of networked devices, such as a festival or film shoot where all networked devices are connected to the same network switch and no third-party integration is required. Even then a managed switch is still preferred.

Some consumer switches branded as unmanaged will have managed features enabled that may not be directly exposed to the user. Consult the documentation of any switch candidates thoroughly to determine whether it is appropriate for use in your system.

Switch Bandwidth

As switches are responsible for the communication between many or all of the devices in a network, they should be robust enough to handle more traffic than necessary. Switch throughput affects how quickly a switch can parse data, and should be evaluated for the needs of the network in which the switch will be utilized. This is important for switches on the edges of a *Star Topology*, but can become even more crucial for core switches at the center of a network.

Switch bandwidth in Eos network systems must be no less than 60% of the capacity of the total possible bandwidth of all ports. To calculate switch bandwidth:

1. Add the bandwidths of all individual ports (for example, a switch with 24x 1 Gbps ports and 4x 10 Gbps ports would add up to 64 Gbps).
2. Multiply by 2 for two-way traffic (64 Gbps x 2 = 128 Gbps). This speed represents a full-bandwidth switch.
3. Multiply by 0.6 for the acceptable maximum saturation bandwidth (60% of 128 Gbps = 76.8 Gbps).
4. Ensure the switch's documented Gbps bandwidth is higher than the calculated bandwidth needed.

Many switches document bandwidth in Packets Per Second (PPS) or Millions of Packets Per Second (MPPS). To convert from these units:

1. Multiply MPPS by 1,000,000 for PPS (for example, 156.25 MPPS x 1,000,000 = 156,250,000 PPS).
2. Multiply PPS by the packet size in bytes for the transfer rate in bytes per second (156,250,000 PPS x 64 byte packet = 10,000,000,000 bps).
    a. Typical packet size is 64 bytes, but may differ between switches. Consult your switch documentation for the appropriate packet size.
3. Divide the transfer rate by the number of bytes in a gigabit, 125,000,000, for the bandwidth in Gbps (10,000,000,000 bps / 125,000,000 = 80 Gbps).

Latency

Latency refers to the delays in network communication introduced by the various components of a network. Everything, from the switches to endpoint devices to the *Network Wiring*, contributes some amount of latency. In a larger network, it is often necessary to calculate total latency in order to ensure the transmission speeds necessary for real-time entertainment control.

Latency in switches is closely related to their bandwidth capacity and how much of that throughput is being used at any given time. Ensuring network traffic does not exceed the calculated bandwidth of a switch and its ports will help minimize latency in a system.

Switch Features

Many managed and unmanaged switches include various hardware and software network configuration and management features. Not all of these features are recommended for entertainment control networks; see *Eos Network Requirements* for switch configuration specifics.

Power Over Ethernet (PoE)

Many network switches, both managed and unmanaged, have the ability to power small connected devices via a feature called Power over Ethernet (PoE). PoE sends voltage directly to a node over the data wiring, providing power along with network connectivity and eliminating the need for a separate node power supply.

Smaller, portable switches that offer PoE generally have a limited number of ports that can be used to power devices, while rackmount install switches generally offer PoE on all ports.

PoE ports have power limits that vary between switch models. Consult any third-party documentation to determine these limits, as well as the power requirements of any devices powered via PoE, to ensure that the port can handle the devices connected to it. Usage of PoE should be also factored in when estimating the total power consumption of the switch to ensure the switch is able to handle all ports in use at full capacity.

Additional power output can also lead to increased fan volume from the switch, which may be undesirable in noise-sensitive areas. Smaller, convection-cooled switches may work better in these spaces.

Quality of Service (QoS)

Quality of Service (QoS) allows switches to monitor network traffic and prioritize transmission of certain types of data over others. Incoming packets are sorted into classes and organized into a queue to be sent out in a specific order.

QoS should be disabled in Eos networks.

Flow Control

Flow control allows switches to manage traffic by temporarily stopping the transmission of data when a speed mismatch exists between two nodes, or during periods of network congestion.

Flow control should be disabled in Eos networks.

Broadcast Storm Protection

Broadcast storm protection allows switches to cease forwarding traffic in the event of too much broadcast data on the network. Switches can misidentify *Multicast* traffic as broadcast, potentially resulting in some or all entertainment control data being blocked by the switch.

Broadcast storm protection should be disabled in Eos networks.

Energy Efficient Ethernet

Energy-efficient Ethernet allows switches to reduce power consumption to some or all ports during periods of low network activity. Even small port delays can affect the overall latency and real-time operation of an entertainment control network. Some network protocols and features are incompatible with ports in a low-power state, interpreting the energy-efficient mode as a disconnection which may not automatically reconnect when the port power is restored.

Energy-efficient ethernet should be disabled in Eos networks.

Network Protocols

Protocols are sets of standards and rules for how to communicate, format, and process data in a network.

Many protocols are officially standardized, meaning their rules are ratified by a professional organization or committee.

Specific standards are noted when relevant. Standards organizations include:

- Institute of Electric and Electronics Engineers (IEEE)
- American National Standards Institute (ANSI)
- Telecommunications Industry Association (TIA)
- Entertainment Services and Technology Association (ESTA)
- Internet Engineering Task Force (IETF)

For more information, please visit the linked websites.

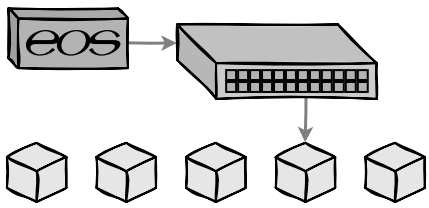
Communication Methods

Protocols send data in networks via three common methods: unicast, broadcast, and multicast.

Note: *Anycast, a fourth method, is not currently supported by any ETC network devices.*

Unicast

Unicast is a protocol communication method where a single sender transmits data to a single receiver in a single IP network.

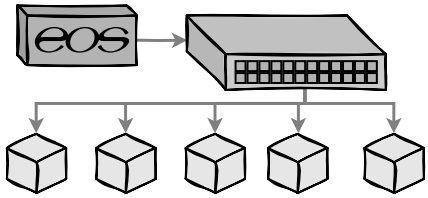


Unicast is like emailing a colleague, where you write a message and send it to their email address. Similarly, the unicast sender addresses the data to a specific IP address.

While unicast messages can be sent to multiple receivers, each message is sent separately, with individualized packets addressed to each device. This would be like you writing the same email individually for multiple colleagues and sending them all separately. This can make unicast a resource-intensive method of network communication for the sender.

Broadcast

Broadcast is a protocol communication method where a single sender transmits data to every receiver in a network's subnet. The receivers must then process the data and determine whether or not it applies to them.



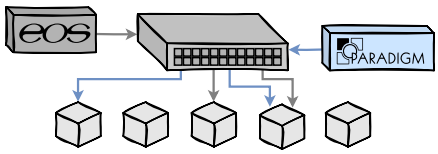
Broadcast is like emailing an entire department. You send one email that everyone in the department receives, who must then individually decide whether they can ignore the email, or if they need to take action on the received information.

While broadcast is easy on the sender, its lack of sophistication can make it resource-intensive for the rest of the network, especially receivers. If you spent all day reading and sorting through mass email communications not specifically applicable to you, you might not get much work done. Similarly, the required action from a broadcast message can reduce resources needed to keep devices running. This is sometimes referred to as a broadcast storm.

Broadcast is an IPv4-only protocol (see *Internet Protocol (IP)* > *Versions*) and is sent between devices with the same *Subnet Mask*.

Multicast

Multicast is a protocol communication method where data from one or more senders is transmitted to one or more receivers that have requested to receive the data. More specifically, one or more sending devices transmits data to a switch, which forwards the data to a specific virtual IP address, known as the multicast address. Any receiving device that is interested can subscribe to that address to receive any data sent there.



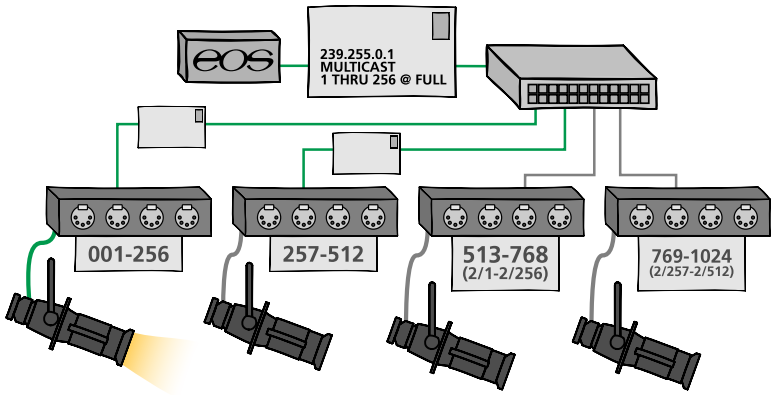
Multicast is like giving up on emails and deciding to post information to an internal blog or website. Some colleagues join you, writing posts of their own. Anyone interested can choose to subscribe to one or more of the authors and their updates, ignoring anything not applicable to them. Anyone not interested can ignore the entire site altogether. This makes multicast a happy middle ground between unicast and broadcast.

The IP address range from 224.0.0.0 through 239.255.255.255 are reserved by the IEEE for multicast addresses, and cannot be used when assigning IP addresses to nodes. A subset from 239.255.0.1 (universe 1) through 239.255.249.255 (universe 63,999) are reserved specifically for use with sACN universe data. See *Internet Protocol (IP)* and *Streaming ACN (sACN)*.

Why Multicast

Multicast is the backbone of real-time entertainment control. While unicast is easier for receivers, the amount of work it requires of senders makes it an impractical choice for low-latency systems. While broadcast is easier for senders, the amount of extraneous information being sent to and processed by each receiver similarly clutters a network. Multicast allows for selective involvement of the relevant devices for each universe, reducing the redundancy of data on the network to its lowest possible level.

In a multicast system, when sACN data is sent about a universe, it is actually being sent to the reserved multicast IP address of that universe. For example, Eos data for fixtures in universe 1 would be sent to 239.255.0.1. The packets contain information indicating that this is multicast data for any device interested in universe 1. The switch then duplicates the packets and distributes them to any devices subscribed to universe 1.



For example, imagine a 2-universe system divided equally between four DMX gateways. Eos sets addresses 1 through 256 in universe 1 to full, which sends data packets to the multicast address for universe 1, 239.255.0.1. The switch consults its internal list of the group of devices subscribed to that universe and duplicates the Eos data to send to all devices in the group; in this case, the first two gateways. Since all the affected addresses are assigned to the first gateway, it acts on the command and sends the DMX commands to turn on those addresses. The second gateway discards the packets.

The group of devices sending or receiving information about a particular universe is referred to as a multicast group, which are managed by *Internet Group Management Protocol (IGMP)*-enabled switches. Both a controller providing information about a universe or a subscriber asking about a universe can trigger the creation of a multicast group for that data.

Eos communication in *Multi-Console Sessions* is built on multicast data distribution, and both *Streaming ACN (sACN)* and v4 of *Art-Net* use multicast to transmit address levels. Configuring a control network to manage the efficient distribution of multicast traffic reduces unnecessary data transmission and ensures that data only reaches the appropriate destinations. Networks improperly configured for multicast may not be able to transmit multicast data. In an unconfigured system, multicast is treated as broadcast data.

Communication Protocols

These protocols are designed for general network communication, and are widely used outside of entertainment control systems.

The communication protocols *Internet Protocol (IP)* and *Internet Group Management Protocol (IGMP)* are discussed separately.

Ethernet

IEEE 802.3

Ethernet is a collection of standardized technologies that govern network structure and data transmission. Ethernet can also be thought of as the connection between the physical devices in a network.

Ethernet divides information into frames, a unit of data dividing a longer message into formatted pieces for transmission between MAC addresses. Frames contain source and destination information, and provide error detection and data retransmission. In a network utilizing the Internet Protocol (IP) via Ethernet, the data transported by Ethernet frames is typically IP packets.

Ethernet is often used as a catch-all term for various networking hardware, including category cable, other *Network Wiring*, and RJ45 connectors.

Media Access Control (MAC) Address

A Media Access Control (MAC) address is a unique identifier manufacturer-assigned to any wired or wireless device that can connect to a network. Ethernet frames use MAC addressing to send and receive data.

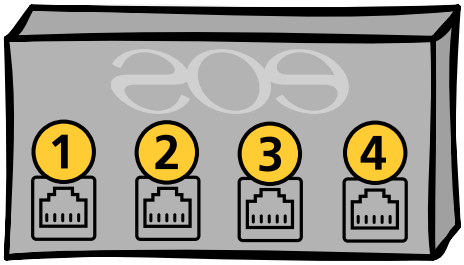
MAC addresses are composed of six hexadecimal octets (e.g. 00:C0:16:3E:DC:FC) that can be subdivided into two components:

- Organization ID - the first three octets of the address (e.g. 00:C0:16), denoting the manufacturer or vendor. Organization IDs are standardized and maintained by the Institute of Electric and Electronics Engineers (IEEE).
- Device ID - the last three octets of the address (e.g. 3E:DC:FC), assigned by the manufacturer or vendor to denote specific hardware or products.

MAC addresses can be written in upper or lowercase, with the octets separated by colons, periods, hyphens, or not at all. These are all ways to write the same address:

00:c0:16:da:bb:dc	00.C0.16.DA.BB.DC	00-c0-16-da-bb-dc	00C016DABBDC

While *IP Addresses* can be reused, a MAC address is a generally permanent identifier of a physical wired or wireless network port and cannot be altered in the field. Each Network Interface Controller (NIC) in a multi-NIC device will have its own MAC address.



NIC	MAC Address	NIC	MAC Address
1	00:C0:16:FE:ED:1F	3	00:C0:16:B1:77:F6
2	00:C0:16:6B:81:DA	4	00:C0:16:67:AF:BB

In Eos Family devices with built-in NICs, the MAC address for each NIC is labeled *Physical Address* and can be viewed in the *Eos Configuration Utility (ECU)* under **Settings > Network > Device**.

Transmission Control Protocol (TCP)

IETF RFC 761

Transmission Control Protocol (TCP) ensures reliable communication of data between devices in a network.

TCP prioritizes accuracy over delivery speed, establishing a connection with any potential receivers before transferring data. TCP sequences data to ensure it arrives in the correct order, checking for errors, and both guaranteeing and confirming delivery of the data. TCP also detects problems, rearranging or retransmitting data if necessary.

TCP is part of the Internet protocol suite, often referred to as TCP/IP, the framework of rules and protocols used for the Internet and similar networks.

Eos uses TCP in many ways, including as the preferred way to send and receive *Open Sound Control (OSC)* messages, aRFR and iRFR remote connections, and *Augment3d* tethering and file transfers.

User Datagram Protocol (UDP)

IETF RFC 768

User Datagram Protocol (UDP) allows rapid, connectionless communication of data between devices in a network.

UDP prioritizes speed and ease over reliability, and does not need or establish connections to any potential receivers before transferring data. UDP cannot arrange or sequence data, so the order packets arrive cannot be enforced. UDP cannot retrieve or retransmit lost data, and delivery is not guaranteed. UDP offers minimal error-checking which may not be enough to prevent all data issues.

UDP is also part of the Internet protocol suite.

Eos uses UDP in many ways, including as an alternative way to send and receive *Open Sound Control (OSC)* messages, *Streaming ACN (sACN)* and *Art-Net* control data, and serial *String Commands*.

Network Time Protocol (NTP)

IETF RFC 5905

Network Time Protocol (NTP) synchronizes node clocks in a network to the same global time. NTP is extremely accurate, analyzing multiple time sources using a variety of mathematical and statistical methods to avoid sync issues and latency, maintaining time within a few milliseconds of UTC.

NTP is generally the protocol used by *Time Servers*.

Simple Network Time Protocol (SNTP)

Simple Network Time Protocol (SNTP) is an implementation of NTP that requires fewer resources but is less accurate. SNTP is only recommended for use when time accuracy and reliability is less important, or if synced network devices are incompatible with NTP. SNTP can only receive time from NTP servers and cannot send time to other devices in a network.

Rapid Spanning Tree Protocol (RSTP)

IEEE 802.1w

Rapid Spanning Tree Protocol (RSTP) prevents network loops by managing redundant connections between switches. This protocol is offered as a feature in many managed *Network Switches*, determining the most optimal path to forward network traffic and rapidly adapting to changes in *Network Topology* to maintain the flow of data.

Ethernet Ring Protection Switching (ERPS) Protocol

ITUT-G.8032

Ethernet Ring Protection Switching (ERPS) protocol is designed to prevent loops specifically in *Ring Topology* networks. One of the managed *Network Switches* closes a segment of the ring and monitors the flow of traffic. In the event of a disconnect, the closed segment will open, healing the network and maintaining the flow of data.

The mortal enemy of Rapid Spanning Tree Protocol.

Internet Protocol (IP)

Internet Protocol (IP) governs how data is addressed and sent within and between networks.

Eos settings related to these concepts can generally be accessed on Eos devices via **Setup > Device >** *Network* (see *Network Configuration in Eos*) or **ECU >** *Settings > Network* (see *Network Configuration in the ECU*).

Overview

IP defines virtual addressing and delivery methods for devices in a network, using a specific structure to route data from source to destination by subdividing it into packets, a unit of data for transmission in an IP network, often dividing a longer message into formatted pieces. Packets are comprised of two components:

- **Header** - identifies the source and destination IP addresses of the packet, along with any additional necessary metadata (i.e. the envelope a letter is sent in).
- **Payload** - the data being transported (i.e. the letter itself).

In an IP network utilizing Ethernet, IP packet data is typically transported inside Ethernet frames.

IP can be understood as a "best effort" delivery mechanism where establishing a connection with receiving devices is not required. While this makes IP flexible and fast, it can often be unreliable, as packets can be delivered out of order, and delivery is not confirmed at the destination. Therefore, IP is often combined with *Transmission Control Protocol (TCP)*, which ensures reliable communication at the expense of speed. As part of the Internet protocol suite, the two are often referred to in conjunction as TCP/IP.

Versions

There are two IP versions currently in use:

- **IPv4** - uses 32-bit addressing (e.g. 10.101.98.101), providing up to 4,294,967,296 potential addresses in a network.
- **IPv6** - uses 128-bit addressing (e.g. 2001:0DB8:0000:0042:0000:8A2E:0370:7334), providing up to 340,282,366,920,938,463,463,374,607,431,768,211,456 (3.4e38) potential addresses in a network.

IPv4 is preferred for entertainment control networks, as it is more easily read and understood by humans than IPv6, and many protocols are not IPv6-compatible. Unless otherwise noted, any IP information for entertainment control refers to IPv4-based networks and conventions.

IP Addresses

An IP address can be thought of as the unique virtual location of a device within an IP-based network. While a *Media Access Control (MAC) Address* is a generally permanent identifier of a physical or wireless network port that cannot be altered in the field, IP addresses are not permanently tied to specific devices and can be reused. For example, imagine a scenario in which you are sending *Open Sound Control (OSC)* messages to a device's IP address, and that device fails. You can assign the same IP address to the replacement device, avoiding any reconfiguration to the sending system and retaining communication.

Each device in a network should be given a unique IP address. If running multiple devices of the same type, you must alter the default static IP addresses to ensure proper functionality. Two devices in a network sharing the same address will create a conflict that can kick one or both devices off the network, as well as locking up switch ports or the entire switch.

Address Structure

An IP address is structured as four 8-bit numbers between 0 and 255, known as octets, separated by periods; for example, 10.101.98.101.

Each octet denotes a different aspect of the device's virtual location in the network, moving in order from general to specific.

IP Address Component	Postal Address Component
10	Wisconsin
101	Middleton
98	Pleasant View Rd
101	3031

If the IP address as a whole is a postal address, the octets can be thought of as a region, a city within that region, a street within that city, and a building on that street.

The four octets are divided into the network ID and the node ID.

- Network ID - between one and three of the octets, depending on the subnet mask, identifying which part of the network the device communicates in. Also called the network prefix.
- Node ID - the remaining one to three octets, specific to the device itself. Also called the host ID.

For devices to communicate in the same subnet, they must have matching network IDs. The remaining octets can be used to assign unique addresses to each device.

Address Ranges

IP addresses ending in 0 or 255 are often reserved as the network and broadcast addresses for a particular network range, and should not be used for individual devices.

The IP address range from 224.0.0.0 through 239.255.255.255 are reserved by the IEEE for multicast addresses, and cannot be used when assigning IP addresses to nodes. A subset from 239.255.0.1 (universe 1) through 239.255.249.255 (universe 63,999) are reserved specifically for use with sACN universe data.

Subnet Mask

A subnet logically subdivides an IP network, limiting which nodes can communicate with each other. A subnet mask identifies which subnet an IP-addressed device belongs in.

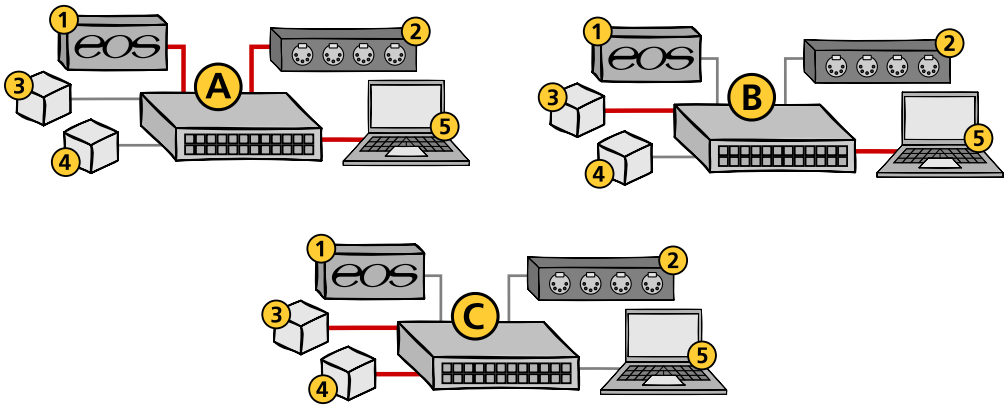
Default subnet masks can be divided into three classes, based on the number of nodes that could communicate in that subnet (i.e. that portion of the network).

- Class A - 255.0.0.0. One octet of a device's IP address must match. Three octets are available, providing up to 16,777,216 (256 x 256 x 256) unique node IDs.
- Class B - 255.255.0.0. Two octets of a device's IP address must match. Two octets are available, providing up to 65,536 (256 x 256) unique node IDs.
- Class C - 255.255.255.0. Three octets of a device's IP address must match. One octet is available, providing up to 256 unique node IDs.

ETC devices typically default to the Class B subnet mask of 255.255.0.0. This means the network ID for devices in this subnet is the first two octets, which must match in order for them to communicate. ETC devices typically default to a network ID of 10.101, leaving two octets available for unique node IDs.

Associated IP address and subnet ranges can be expressed together as the IP range that subnet devices must be addressed in, and the number of bits of the address that must match, separated by a forward slash. For example, the ETC default address range (10.101) and subnet (255.255.0.0) could also be written as 10.101.0.0/16, indicating the first 16 bits (two octets) of the address must be 10.101. This notation is part of the Classless Inter-Domain Routing (CIDR) standard (*IETF RFC 4632*).

It is generally best to keep all devices in an entertainment control network in the same subnet. Devices in different subnets can only communicate via *Routers*, which are not recommended in entertainment control networks.



LAN	Subnet Mask	Network ID	CIDR	Device	IP (In Subnet)	Device	IP (External)
A	255.0.0.0	151	151.0.0.0/8	3	151.101.40.50	1	10.101.191.211
				4	151.101.40.60	2	10.101.50.101
						5	192.168.16.17
B	255.255.0.0	10.101	10.101.0.0/16	1	10.101.98.101	3	10.10.40.50
				2	10.101.69.14	5	192.168.10.101
				4	10.101.40.60		
C	255.255.255.0	192.168.129	192.168.129.0/24	1	192.168.129.101	3	192.168.40.50
				2	192.168.129.74	4	192.168.40.60
				5	192.168.129.38		

Default Eos IP Addresses

All Eos Family consoles ship with the following default IP addresses configured for each network port.

Device	NIC 1	NIC 2	NIC 3	NIC 4	SFP 1	SFP 2
Apex 5	10.101.191.101	192.168.191.101	172.16.191.101	10.0.191.101	10.201.191.101	172.31.191.10
Apex 10	10.101.192.101	192.168.192.101	172.16.192.101	10.0.192.101	10.201.192.101	172.31.192.10
Apex 20	10.101.190.101	192.168.190.101	172.16.190.101	10.0.190.101	10.201.193.101	173.31.193.10
Apex Processor	10.101.193.101	192.168.193.101	172.16.193.101	10.0.193.101	10.201.193.101	172.31.193.101
Apex FP	10.101.194.101	192.168.194.101	172.16.194.101	10.0.194.101	10.201.194.101	172.31.194.101
Expansion Processor	10.101.195.101	192.168.195.101				

Device	NIC 1	NIC 2
Eos Ti	10.101.92.101	192.168.92.101
Gio	10.101.91.101	192.168.91.101
Gio @ 5	10.101.98.101	192.168.98.101
Ion Xe	10.101.100.20	192.168.100.20
Ion Xe 20	10.101.100.30	192.168.100.30
Ion Xe RPU	10.101.96.201	192.168.96.201
Element 2	10.101.99.101	192.168.99.101
ETC Puck	10.101.185.101	192.168.185.101
RPU3	10.101.93.101	192.168.93.101
RVI3	10.101.86.101	192.168.86.101
Ion Classic	10.101.100.101	
Ion RPU	10.101.96.101	
Element Classic	10.101.97.101	
Eos Classic	10.101.90.101	
Eos Classic RPU	10.101.95.101	
RVI	10.101.85.101	

Default Gateway

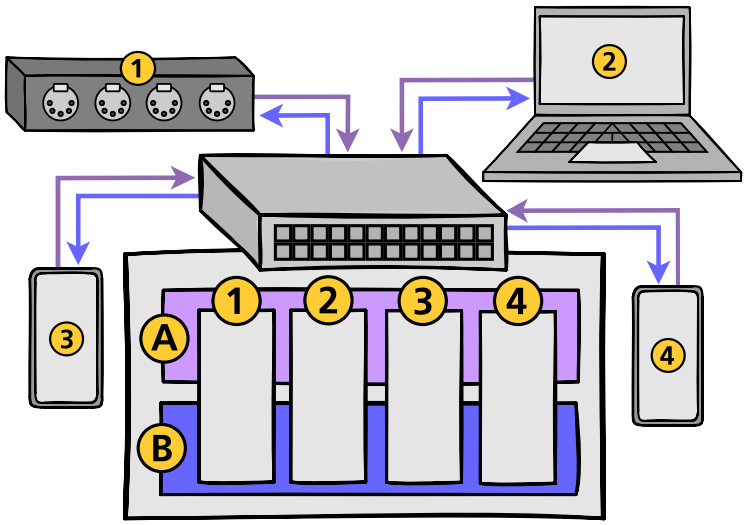
The default gateway is the IP address of a network device where data is sent if it cannot be delivered to its intended destination. This data is typically directed to *Routers* to be passed into other networks, although this is generally not recommended for entertainment control networks.

It is generally best to assign all devices in an entertainment control network the same default gateway. In ETC devices, this is typically 10.101.1.1.

Dynamic Host Configuration Protocol (DHCP)

Dynamic Host Configuration Protocol (DHCP) a method to automatically assign addresses to devices in a network. It is often referred to as a service, and a device providing a DHCP service for a network is often referred to as a DHCP server.

A DHCP server exists to distribute available IP addresses to devices joining a network, storing a table of which addresses have been assigned to which MAC addresses. DHCP provides a mechanism for devices to join a network without individual configuration, and can be useful in any scenario where manually addressing every node would be impractical, such as in larger networks.



	Device 1	Device 2	Device 3	Device 4
A	00:C0:D8:1D:6D:B2	67:F0:BC:0F:19:4F	AC:B6:D9:B9:AA:5E	25:FD:3C:E5:0F:7E
B	10.101.50.101	192.168.12.42	192.168.4.51	192.168.4.61

While any device can be addressed via DHCP, you should decide which devices in your network are permanent and less likely to be regularly joining and leaving the network. It is generally best practice to statically address installed devices like consoles and architectural systems, letting DHCP handle movable devices like gateways and remotes.

The configurable amount of time a device can have a DHCP-assigned address before needing to request a new one and reconnect is called the DHCP lease. In ETC devices, the DHCP lease is locked to 99 years.

CAUTION: ***Only one device at a time should act as a DHCP server for a network or portion of a network. Multiple overlapping DHCP services active in the same network can lead to IP address conflicts, which prevent communication with the affected devices.***

Eos consoles are among many devices capable of acting as a DHCP server. DHCP is configured in the *Eos Configuration Utility (ECU)* under Settings > Network > *DHCP Service*.

Internet Group Management Protocol (IGMP)

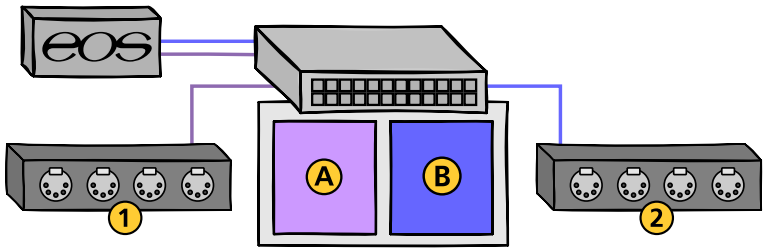
Internet Group Management Protocol (IGMP) allows communication between multicast transmitters and receivers.

Eos communication in *Multi-Console Sessions* is built on multicast data distribution, and both *Streaming ACN (sACN)* and v4 of *Art-Net* use multicast to transmit address levels. Configuring a control network to manage the efficient distribution of multicast traffic reduces unnecessary data transmission and ensures that data only reaches the appropriate destinations. See *Why Multicast*. Networks improperly configured for multicast may not be able to transmit multicast data. In an unconfigured system, multicast is treated as broadcast data.

Overview

IGMP software on a managed switch must be present for *Multicast* transmission within a network. All IGMP versions and settings must match across switches in an entertainment control network.

When devices want to send or receive data to or from a universe, they send multicast packets. IGMP-enabled managed switches dynamically respond to requests for information about universes by creating IGMP groups for each one. Each group contains a list of all devices receiving information about that universe. When new data is sent to a universe, the switch distributes the information to all devices in the multicast group for that universe.



	IGMP Group	Sender	Receiver
A	Universe 1	Eos	1
B	Universe 2	Eos	2

For example, Eos is sending information to two DMX gateways via a switch. Gateway 1 is assigned to universe 1, and generating a multicast packet requesting universe 1 data which prompts the switch to create IGMP group A, containing gateway 1 as a subscriber of universe 1 information. Gateway 2 is assigned to universe 2, which similarly prompts its addition to

newly-created IGMP group B. When Eos sends information to universe 1, the switch routes the universe 1 data to gateway 1. When Eos sends information to universe 2, the switch similarly uses group B to direct the data to gateway 2.

In larger non-entertainment control networks, IGMP is usually handled by a router. IGMP is generally not generated or handled by unmanaged switches or network hubs.

IGMP Groups

Network switches can manage varying numbers of total IGMP groups. The number of groups needed in a system is based on the quantity of devices, universes, and connections in the network.

A unique IGMP group is required for the following:

- Each Eos Family and ETCnomad device.
- Each sACN and Art-Net4 universe.
- Each DMX or show control gateway.
- Each Concert connection.

IGMP Querier

An IGMP querier is a device that sends query messages to discover which devices belong to which multicast groups. This is a crucial role that facilitates accurate and updated multicast membership information throughout the network. Unless other equipment has been specified, ETC recommends using a managed network switch as the IGMP querier in entertainment control networks.

There can be only one active IGMP querier on a network. Multiple backup queriers may be configured and elected to take over in the event the active querier stops working.

The querier sends out two different messages:

- General Membership Query - sent to all devices to identify which devices on the network are subscribed to which multicast groups. The destination IP address is 224.0.0.1 in IGMP v1 and v2, and 224.0.0.22 in IGMP v3.
- Group Specific Membership Query - sent to specific multicast groups to identify if that group has any devices on the network. The destination IP address is the multicast address for the group.

In IGMP version 3, the querier may also make changes to group memberships when it receives a relevant join or leave message from a host.

IGMP Host

An IGMP host is any receiving device that wishes to be part of a multicast group for a particular universe.

Hosts send out two different messages:

- Membership Reports - sent to inform the network switch that the host wishes to join a multicast group. These reports can be sent in response to a query or as an unsolicited request. The destination IP address is the multicast address the host wishes to subscribe to; for example, multicast address 239.255.0.1 for sACN universe 1.
- Leave Group - sent when the host wishes to leave a multicast group, including a list of the sources (or groups) the host wants to unsubscribe from. The destination IP address is 224.0.0.2 in IGMP v2 and v3.

In IGMP version 1, there is no process to leave a group; the host simply does not reply to the group specific membership query. The querier times out after not seeing a response and the multicast address is removed from the IGMP group.

Configuring IGMP

IGMP querier messages can be configured via the querier interval and robustness values.

- Querier Interval - the amount of time between separate general membership query transmissions.
- Querier Robustness - the quantity of general membership query packets sent with each transmission.

Packet Forwarding

IGMP packet forwarding takes multicast packets that are not being forwarded to specific destinations (i.e. no device has subscribed to the group), and will *Broadcast* them to all devices. Certain devices have been observed to not fully comply with IGMP registration, or do not send modern IGMP registration requests. If packet forwarding is disabled, these devices will not join IGMP groups, and will not receive packets (though ping and other tools may indicate them as online).

In systems where large amounts of multicast data is being generated but not subscribed to (like a fully patched system with no gateways online), the network may become inundated with broadcast traffic. This is a rare scenario, and should not be considered in a typical system design.

Net3 Show Control and I/O Gateways, CEM+ processors, and other legacy ETC devices do not send registration requests, and require IGMP packet forwarding to be enabled at the port or switch level.

Control Protocols

These protocols are generally designed specifically for control in entertainment control systems.

Architecture for Control Networks (ACN)

ANSI/TIA E1.17

Architecture for Control Networks (ACN) is a standardized set of network protocols that allows multiple entertainment control systems to operate within a single *Internet Protocol (IP)* network without conflicts. The protocol is modular in nature to assist with the development of extension protocols within the same infrastructure.

Streaming ACN (sACN)

ANSI/TIA E1.31

Streaming ACN (sACN) continuously streams lighting levels over a network. It is one of the most commonly-used protocols in network-based lighting control, and was developed as an extension of the ACN suite to allow the transmission of *Digital Multiplex 512 (DMX)* data within IP networks.

sACN constantly sends data over the network with continuous packet updates. As this would be an overwhelming amount of information for *Unicast* transmitters or *Broadcast* receivers, sACN relies on *Multicast* to efficiently distribute packets via *User Datagram Protocol (UDP)*.

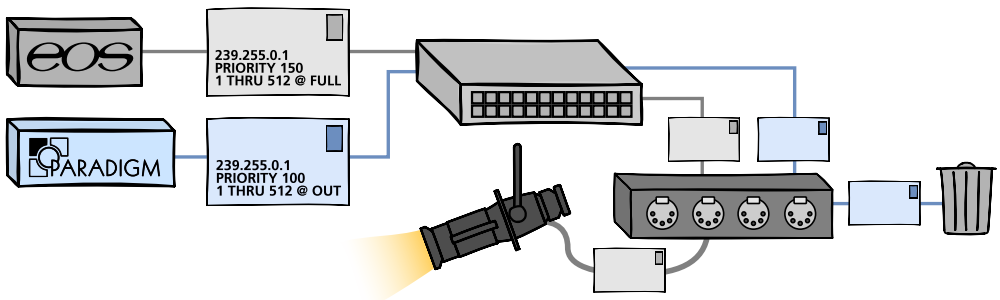
ACN and sACN both communicate using TCP/UDP port 5568.

Priority

All sACN packets contain a priority level value between 0 (lowest priority) and 200 (highest priority), defaulting in Eos to 100.

When a network has more than one source of sACN for the same universe, being sent to the same multicast address, (for example, an Eos console and a Paradigm architectural system), conflicts can arise if two sources attempt to control the same addresses. Assigning a priority to the data being sent can ensure that one source supersedes any others.

sACN priority overrides the highest-takes-precedence logic typically used in entertainment control systems (see **Important Concepts** > *HTP vs. LTP*). sACN levels sent at a higher priority will supersede levels from another source, even if the levels themselves are lower. For example, if Eos sends a 100% intensity command at 150 priority and Paradigm sends an 0% intensity command at 100 priority, the lower-priority packet is discarded, and Eos will set the lights to full.



When multiple sources of equal priorities attempt to control the same address, the receiving gateway decides how to handle the packets. ETC gateways will allow the highest level value to take precedence as normal.

All Eos devices and most other sACN-compatible hardware and software allow for two ways for packets to communicate sACN priority.

- **Per-Universe** - a priority level for an entire control universe (512 addresses, see *Universes*) is sent in the packet header. Also referred to as per-port or per-source priority.
- **Per-Address** - a priority level is sent with each address packet. Not supported by all devices. Also referred to as per-channel or slot-by-slot priority. See **Patch > Protocols > *sACN***.

Art-Net

Art-Net is a royalty-free communications protocol that transmits both DMX and RDM data within *Ethernet* networks via *User Datagram Protocol (UDP)*. It can be used on the same network as sACN without conflicts.

Better suited to rapid development than ratified standards like sACN, there have been several major versions of the Art-Net protocol.

- **Art-Net I** - broadcast communication. Theoretical maximum of 40 universes.
- **Art-Net II** - broadcast and unicast communication. Theoretical maximum of 256 universes.
- **Art-Net 3** - primarily unicast communication. Theoretical maximum of 32,768 universes.
- **Art-Net 4** - sACN for live control data, Art-Net for device discovery and management.

More information is available at the official Art-Net website, art-net.org.uk. Art-Net™ Designed by and Copyright Artistic Licence.

ETCNet2

ETCNet2 (or simply Net2) is an ETC proprietary protocol that used EDMX to transmit lighting level information within IP-based networks. EDMX transmits DMX levels over a TCP/IP network using only absolute addressing only, with no knowledge of universes. A single multicast data stream allowed control of up to 32,768 addresses.

Net2 packets also contain priority level values between 20 (lowest priority) and 1 (highest priority), defaulting to 10. Prioritization is otherwise handled the same way as in sACN.

Replaced by ETC Net3, Net2 is no longer in active development, but is still used in networks containing legacy Net2 gateways and hardware. Eos software v3.2.0 and later does not support Net2.

ETC Net3

ETC Net3 is an ACN-compatible protocol developed to replace Net2. Net3 uses sACN for live control data, and allows network configuration and discovery via multiple protocols, including RDM, *Dynamic Host Configuration Protocol (DHCP)*, and *Network Time Protocol (NTP)*.

Streaming Video

Many entertainment control networks are configured to transmit video streams.

Eos can receive and display the following formats of streaming network video.

Secure Reliable Transport (SRT)

Secure Reliable Transport (SRT) is a UDP-based, open-source protocol for transporting video over networks.

Real-Time Streaming Protocol (RTSP)

IETF RFC 7826

Real-Time Streaming Protocol (RTSP) is a protocol for streaming audio, video, and interactive content over networks.

Network Wiring

Officially named category cable, network wiring is often colloquially referred to as "*Ethernet* cables." Different types of category cable have varying capacities and uses in entertainment control networks.

Overview

Nodes in entertainment control networks are typically connected via unshielded twisted pair (UTP) or shielded twisted pair (STP) copper wiring terminated with RJ45 connectors. This type of wiring is common and cross-compatible with most standard networking equipment. Shielding reduces electrical interference, which can be helpful if running network cables alongside power or other infrastructure cabling.

Category cable types have segment limits detailed in the table below.

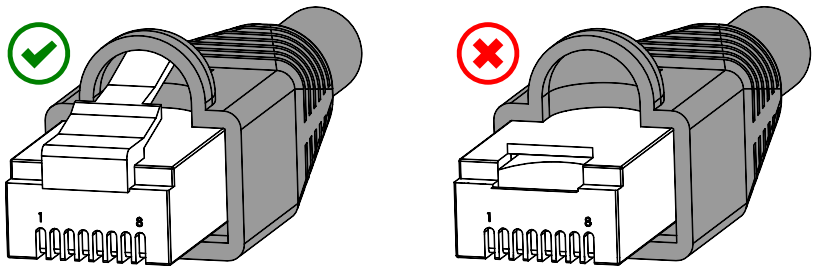
Fiber

Fiber-based wiring offers many advantages over category cable, especially in terms of its increased distance rating and the speed at which it passes data. However, since switch and other node throughput still affect network speed, fiber does not necessarily make a system faster.

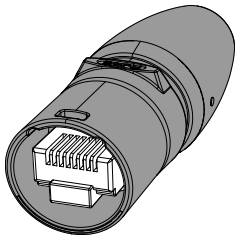
Fiber can also be used to differentiate connections in a *Star Topology* network; for example, using fiber for trunk segments between core and edge switches, with traditional category cables from edge switches to all nodes.

Connectors

Standard RJ45 category cable connectors are common and cross-compatible with most standard networking equipment. However, they can be fragile, especially in networks where devices are frequently moved and cables unplugged.



RJ45 connectors must be fully seated for reliable communication. If the plastic tab that holds the connector in place breaks, the cable must either be re-terminated with a new connector, or disposed of and replaced.



Ethercon is a rugged connector designed for the entertainment industry, combining a tabless RJ45 connector with an XLR housing that locks when inserted.

A crossover cable is a legacy option to connect two nodes directly, without the need for a switch. Crossover cables are not recommended for use in entertainment control networks.

DMX Over Cat 5

DMX over Cat 5 is an implementation of the non-network *Digital Multiplex 512 (DMX)* protocol that allows it to use category cable. This is distinct from *Streaming ACN (sACN)*, which digitizes DMX data for transmission in an *Internet Protocol (IP)* network.

DMX to Cat 5 adapters convert between 5-pin XLR and 8-pin RJ45 connectors. They cannot transmit sACN, nor do they allow DMX devices to be plugged into a network switch. A DMX gateway must be used to translate between network infrastructure and DMX devices.

Cable Latency

For the purposes of entertainment networking, a delay of 500 ns (0.5 µs) per 100 m (328 ft) segment is sufficient to include when calculating latency for all cable types.

Detailed cable latency can be determined with the Nominal Velocity of Propagation (NVP), a proportion of the relative speed of light in a vacuum, generally represented by "c." This value is typically represented as a percentage of c; for example, NVP values of all structured wiring cables will be between 0.6c–0.9c.

Cable Type	Max Band-width	Max Distance for Max Data Rate	Speed Low	Delay per 100 m	Speed High	Delay per 100 m
Cat 5e	TBD	100 m (1 Gbps)	177,000,000 m/s (0.59c)	565 ns	234,000,000 m/s (0.78c)	427 ns
Cat 6	TBD	55 m (10 Gbps) 100 m (1 Gbps)	185,000,000 m/s (0.62c)	541 ns	240,000,000 m/s (0.80c)	417 ns
Cat 6e	TBD	TBD	TBD	TBD	TBD	TBD
Cat 6a	TBD	100 m (10 Gbps)	190,000,000 m/s (0.63c)	526 ns	245,000,000 m/s (0.82c)	408 ns
Cat 7	TBD	TBD	TBD	TBD	TBD	TBD
Cat 8	2000 MHz	30 m (25–40 Gbps)	200,000,000 m/s (0.67c)	500 ns	250,000,000 m/s (0.83c)	400 ns
OM3 Multi-Mode Fiber	2000 MHz/km	300 m (10 Gbps) 100 m (40 Gbps)	200,000,000 m/s (0.67c)	500 ns	210,000,000 m/s (0.70c)	476 ns
OM4 Multi-Mode Fiber	4700 MHz/km	550 m (10 Gbps) 150 m (100 Gbps)	200,000,000 m/s (0.67c)	500 ns	210,000,000 m/s (0.70c)	476 ns
Single-Mode Fiber	Terahertz+ range	10s–1000s of km (100+ Gbps)	200,000,000 m/s (0.67c)	500 ns	210,000,000 m/s (0.70c)	476 ns

NVP values will typically be found on cable spec sheets. You can use a known NVP to determine the length of a cable, or use a known length of cable to test the NVP with cable testing equipment. This helps determine the length of a wire run, for example, in a wall. Cable length and latency limitations are crucial to ensuring reliable communication over a network.

Wireless Networking

Wi-Fi is a standard collection of protocols (*IEEE 802.11*) that allow for the wireless transmission of network data using radio waves between wireless devices and the wired hardware in a network. Wireless networking devices like access points and routers use Wi-Fi to allow wireless communication with the wired portions of a network.

Overview

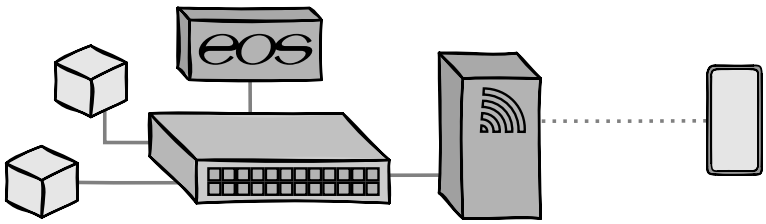
It is generally best to connect nodes in entertainment control networks directly using the appropriate *Network Wiring*. Certain applications, such as the use of smartphone remotes and other portable devices, may require wireless connection capability added to the network.

When wireless capabilities must be added to an entertainment control network, wireless connectivity should only be used for portable control or programming interfaces and remotes, and should not be used for devices running Eos Family software or other permanently-installed lighting equipment.

Some streaming multicast and broadcast data protocols, including *Streaming ACN (sACN)*, can create performance issues on wireless infrastructure. Some ETC wireless applications need to establish both unicast and multicast connections with hardwired ETC devices.

Access Points

A wireless access point (or WAP) is a device that provides a wireless connection point into a physical network. They operate similarly to *Network Switches*, but with a wired segment replaced by a Wi-Fi connection.



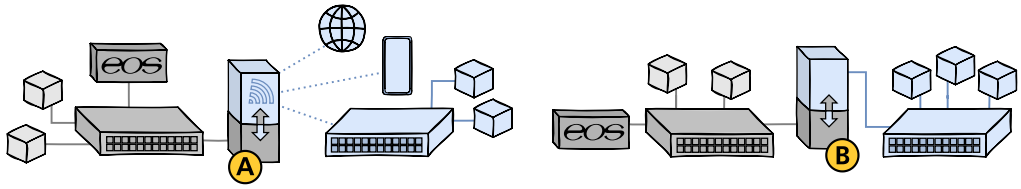
ETC recommends access points when wireless must be added to an entertainment control system, as they do not filter data or allow connections to other networks, simply allowing wireless devices to connect to and communicate as if they were in a wired LAN. When using a WAP, connected wireless devices should be addressed as if they were physically connected to the entertainment control network.

Access points can be obtained in both consumer-grade and professional or commercial varieties. Professional access points typically offer greater signal strength that can reach a wider physical area and connect to more wireless devices at a time.

Routers

A router is a device, often wireless, that passes and filters information between separate LANs. They are typically used to connect LANs to WANs to provide multiple local devices access to the global Internet, but can also be used to connect a LAN to one or more adjacent LANs.

Routers are not recommended for use with Eos and other entertainment control devices, as the connection of two or more networks undermines the *Physical LAN Isolation* recommended for entertainment control networks. Additionally, their data inspection and filtering functions can add latency and interfere with *Multicast* communication.



A	Wireless router	B	Wired router

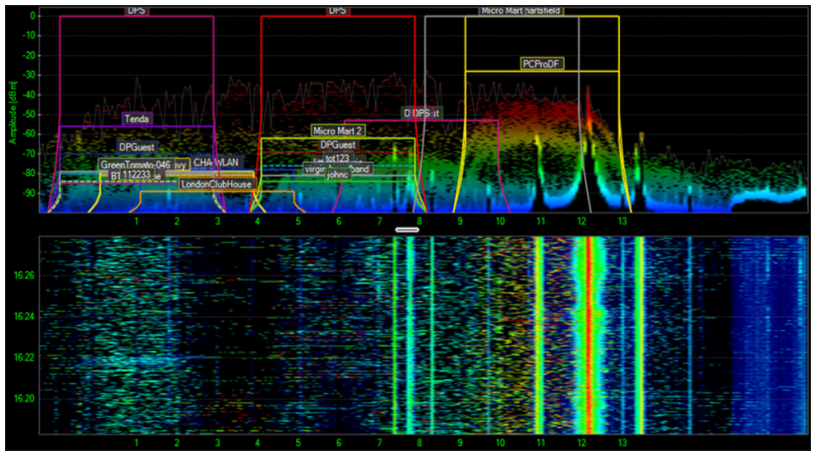
Routers inspect incoming data packets for *IP Addresses* and forward the information to destinations in other networks. They use an internal routing table, a list of the most efficient paths between various network destinations, to ensure the data is delivered as reliably and quickly as possible. They may also filter or block certain types of traffic from passing between networks. Many routers can act as a *Dynamic Host Configuration Protocol (DHCP)* server. All of these settings and features must be correctly configured in order to not interfere with the functionality of wireless remotes and accessories.

Although commercially-available routers exist, they are generally consumer-grade, designed for home or small business use.

Best Practices

ETC recommends prioritizing security by locking the wireless network with a secure password. Consider using wireless network encryption, hiding the SSID so that it must be manually entered for devices to connect, and powring off access points or wireless routers when not actively in use. As wireless networks lack any physical security, ETC encourages an additional *Media Access Control (MAC) Address* filtering security layer for wireless devices accessing the entertainment control network.

Before installing wireless networking equipment, it may be beneficial to conduct a wireless deployment survey.



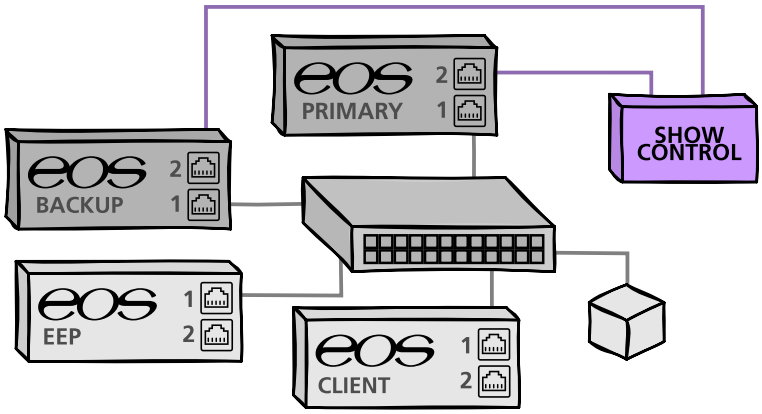
These surveys obtain an overview of the different wireless traffic, channels, and frequency bands already in use in a space, and ensure that any newly-added wireless connections will operate and communicate with as little interference as possible.

Network Show Control

As discussed in *Network Isolation*, entertainment control networks should be physically separated from all other network infrastructure whenever possible. A variety of topologies should be considered when using network-based *Show Control*, as it may be separated from the rest of the Eos system.

Basic Network Show Control

In *Basic Managed Networks* and the majority of Eos systems, the Eos *Host* processes all show control information and distributes it to the rest of the entertainment control network. As a result, any source of network show control must be connected directly to the *Primary* and optional *Backup* via a secondary network port (NIC).



For example, the Primary and Backup are connected to the entertainment control network switch via NIC 1. As a result, the show control source should be connected to both via their secondary NICs.

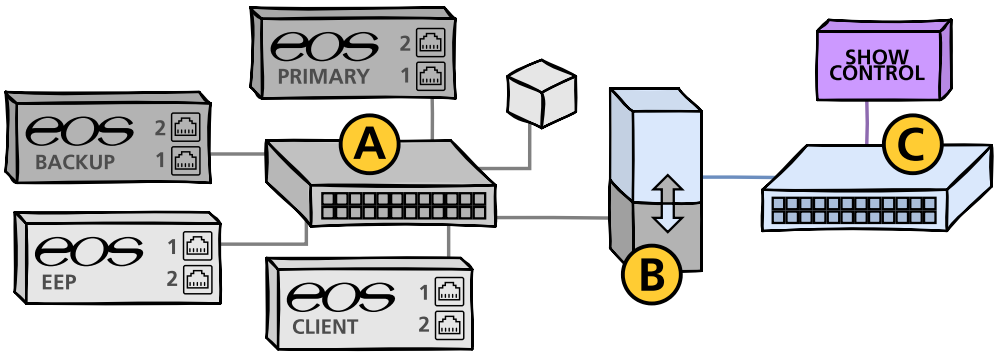
IP Addresses for the secondary ports must be in a separate subnet from the entertainment control network. For maximum redundancy, show control sent to a specific IP address should target the addresses of the secondary ports of both the Primary and the Backup.

ETC Show Control Gateways

ETC Response Show Control Gateways can be connected directly to the entertainment control LAN, as they locally process all show control data for network transmission.

Advanced Network Show Control

Advanced Managed Networks may use show control on a physically separate LAN via a routed connection to the entertainment control network.



A	Entertainment control network	B	Routed connection	C	Show control network

The connection must be routed to maintain separation; when two LANs are directly connected, they become a single network. The routing device must be configured to filter only relevant show control traffic into the entertainment control network.

Eos Network Requirements

This section details the hardware and software requirements for setting up Eos networks.

CAUTION: ***These requirements are tested by ETC. Other network configurations may function, but are not supported. Requirements must be met specifically and explicitly for ETC to support a system. Equipment that is lacking information, from third-party manufacturers or otherwise, is considered to not meet requirements. If these requirements are not met, your system may not work as expected or desired, and ETC may not be able to resolve related issues until the system infrastructure is corrected.***

Specific standards are noted when relevant. Standards organizations include:

- Institute of Electric and Electronics Engineers (IEEE)
- American National Standards Institute (ANSI)
- Telecommunications Industry Association (TIA)
- Entertainment Services and Technology Association (ESTA)
- Internet Engineering Task Force (IETF)

For more information, please visit the linked websites.

Managed networks are required for all installed Eos network systems and recommended for all temporary Eos network systems. Select ETC hardware is designed to be portable and may be entering and exiting the network frequently.

Your system will have its own network requirements to ensure expected operation that depend on the scale and complexity of your Eos and entertainment control network. Use the criteria below to determine the appropriate requirements for your system.

Advanced Managed Networks

Advanced managed networks are larger or more complex networks using managed switches, specifically utilizing any of the following:

- Greater than 25 Eos Family devices in any *Multi-Console Sessions*.
- Greater than 75k outputs (150 universes) of sACN and Art-Net cumulatively.
- Greater than 100 network endpoint devices (gateways, dimmer racks, fixtures, etc.)
- *Eos Expansion Processing*.
- VLANs.
- Advanced show control, with input via gateways into the entertainment control LAN, via dedicated NIC input on console devices, or routed into the entertainment control LAN from an external network.

If any of the above criteria apply to your system, it should be configured according to the *Advanced Managed Network Requirements*.

Basic Managed Networks

Basic managed networks are most Eos Family networks, including all permanently-installed networks, specifically utilizing any of the following:

- 5–25 Eos Family devices in any *Multi-Console Sessions*.
- 12k–75k outputs (24–150 universes) of sACN and Art-Net cumulatively.
- 11–100 network endpoint devices (gateways, dimmer racks, fixtures, etc.)
- Basic show control, with input via gateways into the entertainment control LAN, or via dedicated NIC input on console devices. No routed show control.

If any of the above criteria apply to your system, it should be configured according to the *Basic Managed Network Requirements*.

Unmanaged Networks

Unmanaged networks are smaller or portable systems, either using unmanaged switches or not using switches at all, specifically utilizing any of the following:

- 1–5 Eos Family devices in any *Multi-Console Sessions*.
- Fewer than 12k outputs (24 universes) of sACN and Art-Net cumulatively.
- 1–5 network endpoint devices (gateways, dimmer racks, fixtures, etc.)

If any of the above criteria apply to your system, it should be configured according to the *Unmanaged Network Requirements*.

Advanced Managed Network Requirements

Advanced managed networks are required for systems utilizing:

Advanced managed networks are larger or more complex networks using managed switches, specifically utilizing any of the following:

- Greater than 25 Eos Family devices in any *Multi-Console Sessions*.
- Greater than 75k outputs (150 universes) of sACN and Art-Net cumulatively.
- Greater than 100 network endpoint devices (gateways, dimmer racks, fixtures, etc.)
- *Eos Expansion Processing*.
- VLANs.
- Advanced show control, with input via gateways into the entertainment control LAN, via dedicated NIC input on console devices, or routed into the entertainment control LAN from an external network.

Networked Eos systems have specific hardware and software requirements which are detailed in this section. See the *Guide to ETC Network Requirements* for general requirements for ETC network systems.

CAUTION: ***These requirements are tested by ETC. Other network configurations may function, but are not supported. Requirements must be met specifically and explicitly for ETC to support a system. Equipment that is lacking information, from third-party manufacturers or otherwise, is considered to not meet requirements. If these requirements are not met, your system may not work as expected or desired, and ETC may not be able to resolve related issues until the system infrastructure is corrected.***

Physical Infrastructure

Cabling and Communication

Hardwired infrastructure is required for all ETC hardware, which primarily utilizes RJ-45 connectors.

All cables must be marked on the cable jacket as meeting or exceeding the listed standards.

- All cabling used for 1 Gbps connections must meet or exceed:
  - 1000-Base-T communication standards (*IEEE-802.3ab*)
  - Category 5e cable standards (*ANSI/TIA 568.2-D*)
- All cabling used for 10 Gbps connections must meet or exceed:
  - 10G-Base-T communication standards (*IEEE-802.3an*)
  - Category 6a cable standards (*ANSI/TIA 568-C.2*)

SFP-connected cable and fiber requirements are determined by the installed transceiver. The following supported transceivers can be installed in Eos Family hardware.

Description	Connector Type	Supported Speeds	Product Code	Supplier Part Number
Intel Ethernet SFP+ SR Optical Module, Dual Rate 1000BASE-SX 1GbE and 10GBASE-SR 10GbE	SR	1 Gb 10 Gb	E10GSFPSR	FTLX8571D3BCV-IT AFBR-703SDZ-IN2 FTLX8571D3BCVIT1 FTLX8574D3BCV-IT AFBR-709DMZ-IN2 AFBR-709DMZ-IN3
			E10GSFPSRG1P5	FTLX8571D3BCV-13 FTLX8571D3BCVI31 FTLX8574D3BCV-I3 FTLX8574D3BCV-I5
			E10GSFPSRG2P5	AFBR-709DMZ-IN7 AFBR-710DMZ-IN2
Intel Ethernet SFP+ Twinaxial Cables, 10GbE/1GbE Direct Attach passive Copper cable	RJ45	10 Gb	XDACBL1M	PSF1PXA1MBLLN NDCCDA-I201
			XDACBL3M	PSF1PXA3MBLLN NDCCDA-I202
			XDACBL5M	PSF1PXD5MBLLN NDCCDD-I202 603830005
Intel Ethernet SFP+ LR Optical Module, Dual Rate 1000BASE-SX 1GbE and 10GBASE-SR 10GbE	LR	1 Gb 10 Gb	E10GSFPLR	FTLX1471D3BCV-I3 FTLX1471D3BCVI31
Intel Ethernet SFP+ Optics - SRX (Extended Temp), Single Rate 10GBASE-SR 10GbE	SR Extended Temp	10 Gb	E10GSFPSRX	FTLX8574D3BNL-IT

The following connections (including installed, portable, and patch cables) must meet or exceed the listed communication standards.

- All switch ports connecting to Eos Family and ETCnomad devices must communicate with 1000-Base-T or higher standards. 10G-Base-T is preferred.
- All switch ports connecting to other switches must communicate with 10G-Base-T or higher standards.
- Switch ports connected to the Primary and Backup in systems utilizing *Eos Expansion Processing* for outputs above 75k must communicate with 10G-Base-T or higher standards.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must communicate with 100-Base-T or higher standards.

Many endpoint devices are not gigabit capable. Your cable and switch should be capable of carrying appropriate data speeds, generally 100-Base-T or 1000-Base-T. Consult the documentation for any network devices to determine the necessary speeds.

For the purposes of entertainment networking, a delay of 500 ns (0.5 µs) per 100 m (328 ft) segment is sufficient to include when calculating latency for all cable types. For more information, see Eos Network Overview > Network Wiring > *Cable Latency*.

It is recommended that all network ports be capable of providing *Power Over Ethernet (PoE)* with the ability to enable and disable on a port-by-port basis. ETC hardware implements 802.3af/at unless otherwise specified.

Topologies

See Eos Network Overview > *Network Topology* for general information about network topologies.

Single-switch networks must meet the following requirements.

- The network switch must comply with all other network requirements.

Multi-switch networks must meet the following requirements.

- Star-topologies only, with no loops, and minimized branches.
- A network supporting Eos Family sessions shall not exceed 6 hops along the furthest path in the network.

Advanced managed networks must meet the following requirements.

- Ring networks require exceedingly specific configurations to prevent collisions and duplicated data, and minimize latency. Severe disruptions can be caused if a ring network is misconfigured - either during normal operation or during a failure. As such, ETC recommends hub-and-spoke topologies unless specific network requirements push the design to a ring topology.

Switches

Port Bandwidth

- All switch ports connecting to Eos Family and ETCnomad devices must support connections of at least 1 Gbps.
- All switch ports connecting to other switches must support connections of at least 10 Gbps.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must support both gigabit and megabit connections, as many endpoint devices are not gigabit capable.
- All network ports must auto-negotiate 10/100/1000 Mbps speeds. The ability to set static speed on a port-by-port basis is preferred. Select hardware provided by ETC operates at lower speeds of 10/100.
- Throttling (static or dynamic) of network bandwidth is not permitted.
- Switch ports connected to the primary and backup in systems utilizing *Eos Expansion Processing* for outputs above 75k must communicate with 10G-Base-T or higher standards.

Switch Bandwidth

Full-bandwidth switches are recommended for all systems, particularly larger systems that are approaching the limits of a basic managed Eos network.

- Switch bandwidth must be no less than 60% of the capacity of the total possible bandwidth of all ports.

To calculate switch bandwidth, see Eos Network Overview > Network Switches > *Switch Bandwidth*.

Switch Latency

- Switch latency shall not exceed 15 microseconds (µs).
- Full network latency, which includes all downstream switches, shall not exceed 2 milliseconds (ms).

Switch Configuration

Switch configuration issues can be as detrimental to a network as poor cabling, too much traffic, and so on. Smaller systems may be able to minimize these problems with an unmanaged network; see *Unmanaged Network Requirements*.

Follow these requirements when configuring network switch ports:

- Hardwired lighting ports shall be statically assigned to output untagged data from the relevant VLAN (Virtual Local Area Network).
- If Network Access Control (NAC) is required, ETC equipment is compatible with MAC Authentication Bypass.
- Usage of MAC Authentication Bypass or any limitations on the quantity of active MAC addresses for any port should be coordinated prior to installation.
- No login mechanism (e.g. 802.1x) should be required for a connected device to gain access upon connection.
- To facilitate quick troubleshooting, including swapping of ETC hardware without IT intervention, enforcing security by limiting physical access to the assigned lighting network ports is preferred.

Internet Group Management Protocol (IGMP)

Internet Group Management Protocol (IGMP) must be supported and enabled on all switches in the system.

CAUTION: ***Adding switches to a system that are unmanaged or have misconfigured IGMP settings can cause issues with multicast traffic and violates network requirements. IGMP settings must match across all switches. ETC recommends using switches of the same brand, model, and firmware version throughout your system.***

- All switches and connected devices in a system must use the same IGMP version.
  - Mixing versions is not supported. While IGMP v3 is backwards-compatible, v2 is not compatible with v3. Eos uses IGMP v2.
- IGMP snooping must be enabled on all switches.
- IGMP querier must be enabled on all switches, and all settings must match.
  - Querier must support devices utilizing IGMP v1, v2, and v3.
  - Robustness must be set to 2.
  - Interval must be set to 30.
- All switches must offer a minimum of 500 IGMP groups.
- IGMP packet forwarding must be enabled on all switches.
- The network shall support simultaneous IGMP join requests per device.

Rapid Spanning Tree Protocol (RSTP)

- *Rapid Spanning Tree Protocol (RSTP)* settings must be enabled on all switches.

Other Switch Features

The following features and their settings are exceedingly specific to individual network configurations and can cause severe disruptions in entertainment control networks if misconfigured. As such, ETC does not have any recommended settings for these features and does not offer support for systems where they are utilized.

- All routing settings must be disabled.
- All *Quality of Service (QoS)* settings must be disabled.
- All *Flow Control* settings must be disabled.
- All *Broadcast Storm Protection* settings must be disabled.
- All *Energy Efficient Ethernet* settings must be disabled.

External and Wireless Connections

Other Devices and the Internet

ETC lighting systems have traditionally used isolated networks with dedicated network hardware and cabling that are physically separate from corporate intranets and the outside world. This is the required network arrangement for advanced and basic managed networks and remains the best practice for all networks regardless of size and complexity.

- Facility intranet(s) and the ETC entertainment control network shall be separated physically (preferred) or logically (VLAN).
- The greater internet shall not be routed to or from the ETC entertainment control network.

VLANs

When physical isolation of the entertainment control network is not practical, isolated Virtual Local Area Networks (VLANs) may be used for lighting traffic. VLANs provide network security by creating logically separate Layer 2 networks defined on shared network equipment. ETC does not support Layer 3 VLANs. VLANs are intended for privacy and security, and do not increase network bandwidth.

- Devices on the lighting VLAN should only be reachable by other devices on this network. Network traffic will not be routable to the organization's network or beyond.
- The lighting VLAN must be kept isolated from all other VLANs in the same physical network.
- VLAN bandwidth for multi-console sessions must be at least 100 Mbps.
  - Bandwidth required for sACN and Art-Net4 depends on multiple system factors and is highly variable. As a general rule, ETC recommends 1 Mbps of bandwidth for every 10 universes of lighting traffic.
- All Traffic Shaping settings must be disabled.

Consider the following best practices when using a shared network.

- If the site requires UDP string integration (third-party control integration), targeted permissions may be required allowing routed ICMP and UDP sent to/from one or more specific lighting controllers.

CAUTION: ***Provide a static bandwidth allocation to the lighting network. Do not apply traffic shaping to the lighting VLAN. Dynamic bandwidth allocation can result in lighting communication sequencing or timing failures.***

- Jumbo frames shall be permitted.

- Apply *Rapid Spanning Tree Protocol (RSTP)* to help avoid incidental loops that can cause loss of communication and control.
- Unless otherwise stipulated, all lighting device and programming ports should be configured with RSTP Edge Port Enabled to allow data forwarding as rapidly as possible upon port connection.

Show Control

Network-based show control must meet the following requirements:

- ETC Show Control Gateways may be connected directly to the entertainment control network.
- Other show control sources must be connected to Eos *Host* devices directly via secondary network ports (NICs).
  - *IP Addresses* for the secondary ports must be in a separate subnet from the entertainment control network, and may be assigned statically or using DHCP.
  - Show control sent to a specific IP address should target the addresses of the secondary ports of both Host devices.
- *Control Protocols* show control must be connected individually to each Eos device that requires it.
- A separate show control network may be used via a routed connection to the entertainment control network.
  - Routed connections to other show control systems should be filtered to only allow relevant traffic into the entertainment control network.
- Show-critical communication between third-party systems and Eos Family devices must use a *Transmission Control Protocol (TCP)* connection.

Wireless

- Wireless networking is only permitted for use with approved and supported ETC software applications.

Wireless networking is only permitted for use with approved and supported ETC software applications.

Use of *Wireless Networking* hardware is subject to the following requirements:

- Wireless connections to the entertainment control network are only to be used for Wi-Fi remotes.
- Wireless connections between Eos devices are not supported.

Wireless *Access Points* are preferred in entertainment control networks. *Routers* are not recommended due to their relative complexity to configure and higher potential of delaying or blocking real-time lighting data.

Protocols and Services

The following protocols and services must be supported.

Internet Protocol

Use of *Internet Protocol (IP)* is subject to the following requirements:

- ETC prefers that all ETC devices use static IP addresses in a single IPv4 subnet (/16 preferred).
  - ETC default IPv4 scheme is 10.101.0.0/16.
- Limitations on the quantity of active MAC addresses per network port is to be coordinated prior to an ETC technician's arrival.

- All IP addresses shall be private. No public IP address is required as the ETC lighting network shall not be on the internet. For more information about private IP ranges, see *Address Ranges*.

IPv6 addressing is not currently implemented in ETC hardware.

sACN and Art-Net

Use of *Streaming ACN (sACN)* and *Art-Net* is subject to the following requirements:

- *Multicast* shall not be restricted, filtered, or blocked.
- Multicast address ranges used by ETC are part of industry accepted standards and protocols and are non-negotiable. They cannot be modified.
  - A list of multicast address ranges used by ETC is available upon request.
- Anycast communication is not supported by ETC product.
- Jumbo frames shall be allowed/permitted.

Network Time Protocols

Use of *Network Time Protocol (NTP)* and *Simple Network Time Protocol (SNTP)* is subject to general networking requirements.

Basic Managed Network Requirements

Basic managed network requirements are valid for any Eos network system which will be permanently installed, or those utilizing any of the following:

Basic managed networks are most Eos Family networks, including all permanently-installed networks, specifically utilizing any of the following:

- 5–25 Eos Family devices in any *Multi-Console Sessions*.
- 12k–75k outputs (24–150 universes) of sACN and Art-Net cumulatively.
- 11–100 network endpoint devices (gateways, dimmer racks, fixtures, etc.)
- Basic show control, with input via gateways into the entertainment control LAN, or via dedicated NIC input on console devices. No routed show control.

Networked Eos systems have specific hardware and software requirements which are detailed in this section. See the *Guide to ETC Network Requirements* for general requirements for ETC network systems.

CAUTION: ***These requirements are tested by ETC. Other network configurations may function, but are not supported. Requirements must be met specifically and explicitly for ETC to support a system. Equipment that is lacking information, from third-party manufacturers or otherwise, is considered to not meet requirements. If these requirements are not met, your system may not work as expected or desired, and ETC may not be able to resolve related issues until the system infrastructure is corrected.***

Physical Infrastructure

Cabling and Communication

Hardwired infrastructure is required for all ETC hardware, which primarily utilizes RJ-45 connectors.

All cables must be marked on the cable jacket as meeting or exceeding the listed standards.

- All cabling used for 1 Gbps connections must meet or exceed:
  - 1000-Base-T communication standards (*IEEE-802.3ab*)
  - Category 5e cable standards (*ANSI/TIA 568.2-D*)
- All cabling used for 10 Gbps connections must meet or exceed:
  - 10G-Base-T communication standards (*IEEE-802.3an*)
  - Category 6a cable standards (*ANSI/TIA 568-C.2*)

SFP-connected cable and fiber requirements are determined by the installed transceiver. The following supported transceivers can be installed in Eos Family hardware.

Description	Connector Type	Supported Speeds	Product Code	Supplier Part Number
Intel Ethernet SFP+ SR Optical Module, Dual Rate 1000BASE-SX 1GbE and 10GBASE-SR 10GbE	SR	1 Gb 10 Gb	E10GSFPSR	FTLX8571D3BCV-IT AFBR-703SDZ-IN2 FTLX8571D3BCVIT1 FTLX8574D3BCV-IT AFBR-709DMZ-IN2 AFBR-709DMZ-IN3
			E10GSFPSRG1P5	FTLX8571D3BCV-13 FTLX8571D3BCVI31 FTLX8574D3BCV-I3 FTLX8574D3BCV-I5
			E10GSFPSRG2P5	AFBR-709DMZ-IN7 AFBR-710DMZ-IN2
Intel Ethernet SFP+ Twinaxial Cables, 10GbE/1GbE Direct Attach passive Copper cable	RJ45	10 Gb	XDACBL1M	PSF1PXA1MBLLN NDCCDA-I201
			XDACBL3M	PSF1PXA3MBLLN NDCCDA-I202
			XDACBL5M	PSF1PXD5MBLLN NDCCDD-I202 603830005
Intel Ethernet SFP+ LR Optical Module, Dual Rate 1000BASE-SX 1GbE and 10GBASE-SR 10GbE	LR	1 Gb 10 Gb	E10GSFPLR	FTLX1471D3BCV-I3 FTLX1471D3BCVI31
Intel Ethernet SFP+ Optics - SRX (Extended Temp), Single Rate 10GBASE-SR 10GbE	SR Extended Temp	10 Gb	E10GSFPSRX	FTLX8574D3BNL-IT

The following connections (including installed, portable, and patch cables) must meet or exceed the listed communication standards.

- All switch ports connecting to Eos Family and ETCnomad devices must communicate with 1000-Base-T or higher standards. 10G-Base-T is preferred.
- All switch ports connecting to other switches must communicate with 10G-Base-T or higher standards.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must communicate with 100-Base-T or higher standards.

Many endpoint devices are not gigabit capable. Your cable and switch should be capable of carrying appropriate data speeds, generally 100-Base-T or 1000-Base-T. Consult the documentation for any network devices to determine the necessary speeds.

For the purposes of entertainment networking, a delay of 500 ns (0.5 µs) per 100 m (328 ft) segment is sufficient to include when calculating latency for all cable types. For more information, see **Eos Network Overview > Network Wiring >** *Cable Latency*.

It is recommended that all network ports be capable of providing *Power Over Ethernet (PoE)* with the ability to enable and disable on a port-by-port basis. ETC hardware implements 802.3af/at unless otherwise specified.

Topologies

See **Eos Network Overview >** *Network Topology* for general information about network topologies.

Single-switch networks must meet the following requirements.

- The network switch must comply with all other network requirements.

Multi-switch networks must meet the following requirements.

- Star-topologies only, with no loops, and minimized branches.
- A network supporting Eos Family sessions shall not exceed 6 hops along the furthest path in the network.

Switches

Port Bandwidth

- All switch ports connecting to Eos Family and ETCnomad devices must support connections of at least 1 Gbps.
- All switch ports connecting to other switches must support connections of at least 1 Gbps.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must support both gigabit and megabit connections, as many endpoint devices are not gigabit capable.
- All network ports must auto-negotiate 10/100/1000 Mbps speeds. The ability to set static speed on a port-by-port basis is preferred. Select hardware provided by ETC operates at lower speeds of 10/100.
- Throttling (static or dynamic) of network bandwidth is not permitted.

Switch Bandwidth

Full-bandwidth switches are recommended for all systems, particularly larger systems that are approaching the limits of a basic managed Eos network.

- Switch bandwidth must be no less than 60% of the capacity of the total possible bandwidth of all ports.

To calculate switch bandwidth, see **Eos Network Overview > Network Switches >** *Switch Bandwidth*.

Switch Latency

- Switch latency shall not exceed 125 microseconds (µs).
- Full network latency, which includes all downstream switches, shall not exceed 22 milliseconds (ms).

Switch Configuration

Switch configuration issues can be as detrimental to a network as poor cabling, too much traffic, and so on. Smaller systems may be able to minimize these problems with an unmanaged network; see *Unmanaged Network Requirements*.

Internet Group Management Protocol (IGMP)

Internet Group Management Protocol (IGMP) must be supported and enabled on all switches in the system.

CAUTION: ***Adding switches to a system that are unmanaged or have misconfigured IGMP settings can cause issues with multicast traffic and violates network requirements. IGMP settings must match across all switches. ETC recommends using switches of the same brand, model, and firmware version throughout your system.***

- All switches and connected devices in a system must use the same IGMP version.
  - Mixing versions is not supported. While IGMP v3 is backwards-compatible, v2 is not compatible with v3. Eos uses IGMP v2.
- IGMP snooping must be enabled on all switches.
- IGMP querier must be enabled on all switches, and all settings must match.
  - Querier must support devices utilizing IGMP v1, v2, and v3.
  - Robustness must be set to 2.
  - Interval must be set to 30.
- All switches must offer a minimum of 150 IGMP groups. ETC recommends 300 groups or more.
- IGMP packet forwarding must be enabled on all switches.
- The network shall support simultaneous IGMP join requests per device.

Rapid Spanning Tree Protocol (RSTP)

- *Rapid Spanning Tree Protocol (RSTP)* settings must be enabled on all switches.

Other Switch Features

The following features and their settings are exceedingly specific to individual network configurations and can cause severe disruptions in entertainment control networks if misconfigured. As such, ETC does not have any recommended settings for these features and does not offer support for systems where they are utilized.

- All routing settings must be disabled.
- All *Quality of Service (QoS)* settings must be disabled.
- All *Flow Control* settings must be disabled.
- All *Broadcast Storm Protection* settings must be disabled.
- All *Energy Efficient Ethernet* settings must be disabled.

External and Wireless Connections

Other Devices and the Internet

ETC lighting systems have traditionally used isolated networks with dedicated network hardware and cabling that are physically separate from corporate intranets and the outside world. This is the required network arrangement for advanced and basic managed networks and remains the best practice for all networks regardless of size and complexity.

Systems where network infrastructure must be shared must follow *Advanced Managed Network Requirements*.

- Facility intranet(s) and the ETC entertainment control network shall be separated physically (preferred) or logically (VLAN).
- The greater internet shall not be routed to or from the ETC entertainment control network.

Show Control

Network-based show control must meet the following requirements:

- ETC Show Control Gateways may be connected directly to the entertainment control network.
- Other show control sources must be connected to Eos *Host* devices directly via secondary network ports (NICs).
  - *IP Addresses* for the secondary ports must be in a separate subnet from the entertainment control network, and may be assigned statically or using DHCP.
  - Show control sent to a specific IP address should target the addresses of the secondary ports of both Host devices.
- *Control Protocols* show control must be connected individually to each Eos device that requires it.

Wireless

- Wireless networking is only permitted for use with approved and supported ETC software applications.

Wireless networking is only permitted for use with approved and supported ETC software applications.

Use of *Wireless Networking* hardware is subject to the following requirements:

- Wireless connections to the entertainment control network are only to be used for Wi-Fi remotes.
- Wireless connections between Eos devices are not supported.

Wireless *Access Points* are preferred in entertainment control networks. *Routers* are not recommended due to their relative complexity to configure and higher potential of delaying or blocking real-time lighting data.

Protocols and Services

The following protocols and services must be supported.

Internet Protocol

Use of *Internet Protocol (IP)* is subject to the following requirements:

- ETC prefers that all ETC devices use static IP addresses in a single IPv4 subnet (/16 preferred).
  - ETC default IPv4 scheme is 10.101.0.0/16.
- Limitations on the quantity of active MAC addresses per network port is to be coordinated prior to an ETC technician's arrival.
- All IP addresses shall be private. No public IP address is required as the ETC lighting network shall not be on the internet. For more information about private IP ranges, see *Address Ranges*.

IPv6 addressing is not currently implemented in ETC hardware.

sACN and Art-Net

Use of *Streaming ACN (sACN)* and *Art-Net* is subject to the following requirements:

- *Multicast* shall not be restricted, filtered, or blocked.
- Multicast address ranges used by ETC are part of industry accepted standards and protocols and are non-negotiable. They cannot be modified.
  - A list of multicast address ranges used by ETC is available upon request.

- Anycast communication is not supported by ETC product.
- Jumbo frames shall be allowed/permitted.

Network Time Protocols

Use of *Network Time Protocol (NTP)* and *Simple Network Time Protocol (SNTP)* is subject to general networking requirements.

Unmanaged Network Requirements

Managed networks are always recommended, but unmanaged networks can be used in small, portable systems utilizing:

Unmanaged networks are smaller or portable systems, either using unmanaged switches or not using switches at all, specifically utilizing any of the following:

- 1–5 Eos Family devices in any *Multi-Console Sessions*.
- Fewer than 12k outputs (24 universes) of sACN and Art-Net cumulatively.
- 1–5 network endpoint devices (gateways, dimmer racks, fixtures, etc.)

Networked Eos systems have specific hardware and software requirements which are detailed in this section. See the *Guide to ETC Network Requirements* for general requirements for ETC network systems.

CAUTION: ***These requirements are tested by ETC. Other network configurations may function, but are not supported. Requirements must be met specifically and explicitly for ETC to support a system. Equipment that is lacking information, from third-party manufacturers or otherwise, is considered to not meet requirements. If these requirements are not met, your system may not work as expected or desired, and ETC may not be able to resolve related issues until the system infrastructure is corrected.***

Physical Infrastructure

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Hardwired infrastructure is required for all ETC hardware, which primarily utilizes RJ-45 connectors.

All cables must be marked on the cable jacket as meeting or exceeding the listed standards.

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SFP-connected cable and fiber requirements are determined by the installed transceiver. The following supported transceivers can be installed in Eos Family hardware.

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			E10GSFPSRG1P5	FTLX8571D3BCV-13 FTLX8571D3BCVI31 FTLX8574D3BCV-I3 FTLX8574D3BCV-I5
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The following connections (including installed, portable, and patch cables) must meet or exceed the listed communication standards.

- All switch ports connecting to Eos Family and ETCnomad devices must communicate with 1000-Base-T or higher standards. 10G-Base-T is preferred.
- All switch ports connecting to other switches must communicate with 10G-Base-T or higher standards.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must communicate with 100-Base-T or higher standards.

Many endpoint devices are not gigabit capable. Your cable and switch should be capable of carrying appropriate data speeds, generally 100-Base-T or 1000-Base-T. Consult the documentation for any network devices to determine the necessary speeds.

For the purposes of entertainment networking, a delay of 500 ns (0.5 µs) per 100 m (328 ft) segment is sufficient to include when calculating latency for all cable types. For more information, see **Eos Network Overview > Network Wiring >** *Cable Latency*.

It is recommended that all network ports be capable of providing *Power Over Ethernet (PoE)* with the ability to enable and disable on a port-by-port basis. ETC hardware implements 802.3af/at unless otherwise specified.

Topologies

See Eos Network Overview > *Network Topology* for general information about network topologies.

Single-switch networks must meet the following requirements.

- The network switch must comply with all other network requirements.

Switches

Port Bandwidth

- All switch ports connecting to Eos Family and ETCnomad devices must support connections of at least 1 Gbps.
- All switch ports connecting to other switches must support connections of at least 1 Gbps.
- All switch ports connecting to network endpoint devices (gateways, dimmer racks, fixtures, etc.) must support both gigabit and megabit connections, as many endpoint devices are not gigabit capable.
- All network ports must auto-negotiate 10/100/1000 Mbps speeds. The ability to set static speed on a port-by-port basis is preferred. Select hardware provided by ETC operates at lower speeds of 10/100.
- Throttling (static or dynamic) of network bandwidth is not permitted.

Switch Bandwidth

- Switch bandwidth must be no less than 60% of the capacity of the total possible bandwidth of all ports.

To calculate switch bandwidth, see Eos Network Overview > Network Switches > *Switch Bandwidth*.

Switch Latency

- Switch latency shall not exceed 125 microseconds (µs).
- Full network latency, which includes all downstream switches, shall not exceed 22 milliseconds (ms).

External and Wireless Connections

Other Devices and the Internet

ETC lighting systems have traditionally used isolated networks with dedicated network hardware and cabling that are physically separate from corporate intranets and the outside world. This is the required network arrangement for advanced and basic managed networks and remains the best practice for all networks regardless of size and complexity.

- Facility intranet(s) and the ETC entertainment control network shall be separated physically (preferred) or logically (VLAN).
- The greater internet shall not be routed to or from the ETC entertainment control network.

Show Control

Network-based show control must meet the following requirements:

- ETC Show Control Gateways may be connected directly to the entertainment control network.
- Other show control sources must be connected to Eos *Host* devices directly via secondary network ports (NICs).
  - *IP Addresses* for the secondary ports must be in a separate subnet from the entertainment control network, and may be assigned statically or using DHCP.
  - Show control sent to a specific IP address should target the addresses of the secondary ports of both Host devices.
- *Control Protocols* show control must be connected individually to each Eos device that requires it.

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Wireless networking is only permitted for use with approved and supported ETC software applications.

Use of *Wireless Networking* hardware is subject to the following requirements:

- Wireless connections to the entertainment control network are only to be used for Wi-Fi remotes.
- Wireless connections between Eos devices are not supported.

Wireless *Access Points* are preferred in entertainment control networks. *Routers* are not recommended due to their relative complexity to configure and higher potential of delaying or blocking real-time lighting data.

Protocols and Services

The following protocols and services must be supported.

Internet Protocol

Use of *Internet Protocol (IP)* is subject to the following requirements:

- ETC prefers that all ETC devices use static IP addresses in a single IPv4 subnet (/16 preferred).
  - ETC default IPv4 scheme is 10.101.0.0/16.
- Limitations on the quantity of active MAC addresses per network port is to be coordinated prior to an ETC technician's arrival.
- All IP addresses shall be private. No public IP address is required as the ETC lighting network shall not be on the internet. For more information about private IP ranges, see *Address Ranges*.

IPv6 addressing is not currently implemented in ETC hardware.

sACN and Art-Net

Use of *Streaming ACN (sACN)* and *Art-Net* is subject to the following requirements:

- *Multicast* shall not be restricted, filtered, or blocked.
- Multicast address ranges used by ETC are part of industry accepted standards and protocols and are non-negotiable. They cannot be modified.
  - A list of multicast address ranges used by ETC is available upon request.
- Anycast communication is not supported by ETC product.
- Jumbo frames shall be allowed/permitted.

Network Time Protocols

Use of *Network Time Protocol (NTP)* and *Simple Network Time Protocol (SNTP)* is subject to general networking requirements.

Eos Device Network Configuration

Network Interface Configuration

This section explains how to set up an Eos device for use in a network system.

- *Network Configuration in the ECU* - settings in the *Eos Configuration Utility (ECU)* necessary or relevant for Eos network configuration.
- *Network Configuration in Eos* - settings in Eos *Setup* and *Patch* necessary or relevant for Eos network configuration.
- *Network Troubleshooting and Resources* - tips and tools to help identify and solve issues in a network.

Multi-Console Configuration

This section explains how to set up multiple Eos devices for synchronized, interconnected use in a network.

- *Eos Device Roles* - different roles that Eos devices can perform in a multi-console session.
- *Multi-Console Session Capacities* - available ways to combine Eos devices and their resulting capabilities and outputs.
- *Multi-Console Sessions* - how to connect multiple Eos devices to start a session.
- *Multi-Console Configuration in the ECU* - settings in the *Eos Configuration Utility (ECU)* necessary or relevant for multi-console session configuration.
- *Multi-Console Configuration in Eos* - settings in Eos *Setup* and *Patch* necessary or relevant for multi-console session configuration.
- *Eos Expansion Processing* - features and hardware to distribute a lighting system's outputs across more than one Eos device in a multi-console session.
  - *Expansion Processing User Interface*
  - *Expansion Processing Session Capacities*
  - *Expansion Processing Configuration*
  - *Expansion Backups and Failover*

Network Configuration in the ECU

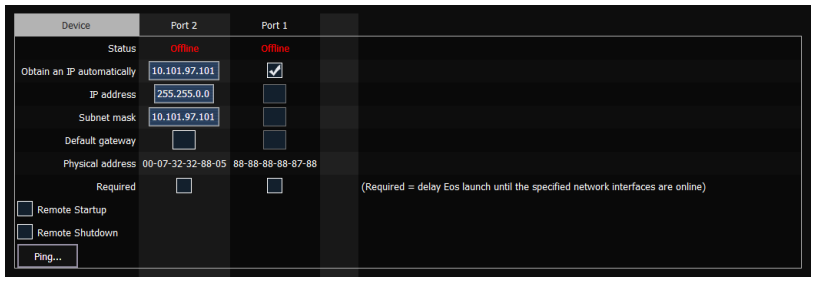
The following settings in the *Eos Configuration Utility (ECU)* (ECU) are typically used when first setting up and configuring an Eos network, and can also be useful for troubleshooting network issues. You can exit the Eos application to access the ECU using *Browser* > Exit.

Network settings changes in the ECU do not require a device restart. Most of these settings are also available in Setup > Device > *Network*; see *Network Configuration in Eos*.

ECU Settings > Network

For general information about this section of the ECU, see *Settings > Network*. For general information about networking terms, see *Eos Networking Overview*.

Network > Device



- *Obtain IP Automatically* - each Eos device must have a unique IP address in the same range as the rest of the network. If a static IP is not assigned, this setting allows a device to receive an IP address and subnet mask from a DHCP server on the network.
- *IP Address* - each Eos device must have a unique IP address in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Subnet Mask* - each Eos device must have a subnet mask in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Physical Address* - indicates the *Media Access Control (MAC) Address* of the NIC, a unique identifier that is separate from the IP address and subnet mask.
- *Network Interface Delay (Required)* - enable this setting to force devices to wait for their network connection to fully initialize before launching Eos.
- *{Ping}* - this utility can be used to test whether there is network communication between Eos and other network devices.

Network > DHCP Service

When enabled, the *DHCP Service* assigns IP addresses to devices on the network. To prevent conflicts, there should only be one DHCP service active in a network.

For more information, see **Eos Network Overview > Internet Protocol (IP) >** *Dynamic Host Configuration Protocol (DHCP)*.

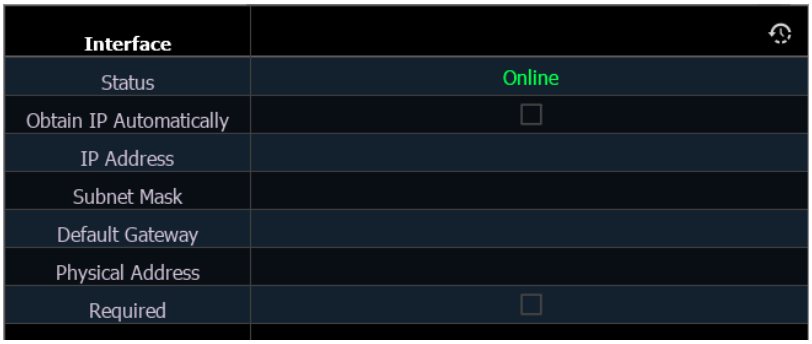
Network Configuration in Eos

The following settings in Eos *Setup* and *Patch* are typically used when first setting up and configuring an Eos network.

Network settings changes in **Setup** require a device restart. Most of these settings are also available in **ECU >** *Settings > Network*; see *Network Configuration in the ECU*.

Setup > Device > Network

To access Setup, select **[Displays]**, then **{Setup}**, or navigate to **Setup** via the browser. Apex and Element Classic console users can also use the dedicated **[System]** and **[Setup]** hardkeys.



- *Obtain IP Automatically* - each Eos device must have a unique IP address in the same range as the rest of the network. If a static IP is not assigned, this setting allows a device to receive an IP address and subnet mask from a DHCP server on the network.
- *IP Address* - each Eos device must have a unique IP address in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Subnet Mask* - each Eos device must have a subnet mask in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Network Interface Delay (Required)* - enable this setting to force devices to wait for their network connection to fully initialize before launching Eos.

- *Output Protocols* - enable or disable the sACN and Art-Net protocols for communication with the devices in your system.

CAUTION: ***Protocols must also be enabled in Patch > Protocols.***

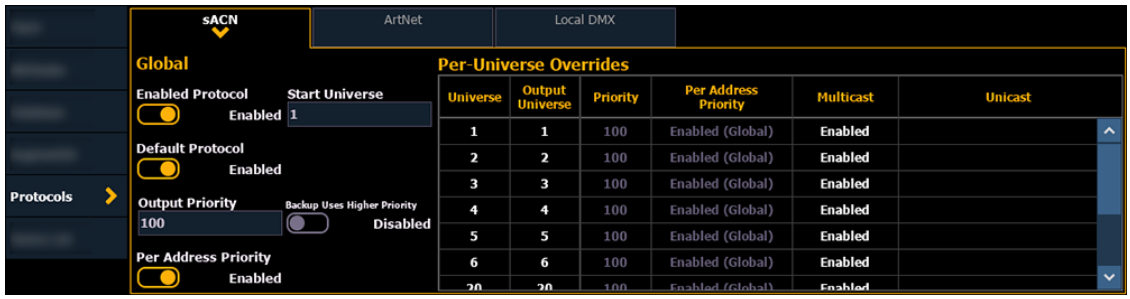
Patch > Protocols

To access *Patch*, use any of the following shortcuts:

- **[Tab] [1] [2]**
- **[Displays] {Patch}**
- **[Address/Patch] [Address/Patch]**

Ion Classic users can use **{Address} {Address}**. Element Classic users can use **[Patch]**.

sACN



- *Enabled Protocol* - enable or disable the sACN protocol for communication with the devices in your system.

CAUTION: ***Protocols must also be enabled in Setup > Device > Network.***

- *Backup Uses Higher Priority* - enable this setting to allow the backup to take over at one priority level higher than the primary if the primary goes offline. For more information, see Eos Network Overview > Network Protocols > Control Protocols > sACN > *Network Protocols*.

Network Troubleshooting and Resources

Most networking topics are not unique to entertainment control, and many additional resources are available online and elsewhere to learn more about these concepts.

Troubleshooting

In-depth information about various networking hardware and software is available via the ETC Knowledge Management System (KMS). Maintained by ETC's excellent Technical Services team, the KMS provides a wealth of explanatory and troubleshooting resources for current and legacy ETC, High End, and RAYN products.

- For Eos Family information, see support.etcconnect.com/ETC/Consoles/Eos_Family.
- For general networking information, see support.etcconnect.com/ETC/Networking.
- For frequently asked questions, see support.etcconnect.com/ETC/FAQ.

The KMS should be the primary resource used for troubleshooting ETC equipment and products.

sACN Output Viewer

In Eos v2.7.0 and later, the *sACN Output Viewer [Tab 37]* is available on [Tab] [3][7], allowing you to check the current live outputs on a universe by universe basis.

Ping

{Ping} is available in the *Eos Configuration Utility (ECU)* under Settings > Network, and can be used to test whether there is network communication between Eos and other network devices. Ping can also be run on a computer via the Windows® Command Prompt and macOS® Terminal utilities.

Ping only establishes that there is a valid network connection between two devices. Other network issues may cause communication problems that ping cannot diagnose.

System Design

Validation, certification, the recommendations in this document.

Software

The following software may be useful when troubleshooting networking issues or configuring network devices.

- Concert - an ETC utility included on Eos consoles or available for download, providing remote monitoring and configuration of network hardware. See etcconnect.com/concert.
- sACNview - a free, open-source, third-party utility for monitoring and testing sACN sources and addresses. See sacnview.org.
- Wireshark - a free third-party utility for capturing raw packet data to analyze various network protocols. See wireshark.org.

Systems with certain legacy products may need to use older software.

- Gateway Configuration Editor (GCE) - a legacy ETC utility included on Eos consoles or available for download, providing remote monitoring and configuration of Net3 and Net2 networks and hardware.
- Network Configuration Editor (NCE) - a legacy ETC utility included on Eos consoles or available for download, providing remote monitoring and configuration of Net2 networks and hardware.

Other Resources

Online

- wikipedia.org - the greatest resource on the internet, yeah I donate, you should too.
- computer-networking.info - access to *Computer Networking : Principles, Protocols, and Practice*, an open-source ebook detailing basic networking principles and protocols.

Multi-Console Configuration

This section explains how to set up multiple Eos devices for synchronized, interconnected use in a network.

- *Eos Device Roles* - different roles that Eos devices can perform in a multi-console session.
- *Multi-Console Session Capacities* - available ways to combine Eos devices and their resulting capabilities and outputs.
- *Multi-Console Sessions* - how to connect multiple Eos devices to start a session.
- *Multi-Console Configuration in the ECU* - settings in the *Eos Configuration Utility (ECU)* necessary or relevant for multi-console session configuration.
- *Multi-Console Configuration in Eos* - settings in Eos *Setup* and *Patch* necessary or relevant for multi-console session configuration.
- *Eos Expansion Processing* - features and hardware to distribute a lighting system's outputs across more than one Eos device in a multi-console session.
  - *Expansion Processing User Interface*
  - *Expansion Processing Session Capacities*
  - *Expansion Processing Configuration*
  - *Expansion Backups and Failover*

See *Multi-Console Programming* for information specific to working in a multi-console system.

Overview

Multiple Eos Family devices can be connected over a network to work together when *Multi-Console Sessions*. Devices in a session share and can edit the same show file.

Each device in a session runs in one of the *Eos Device Roles*, providing each device in a session with specific roles; for example, a Backup that can take over for the Primary if it goes offline, or a Client that allows you to remotely monitor and control your show away from the Primary.

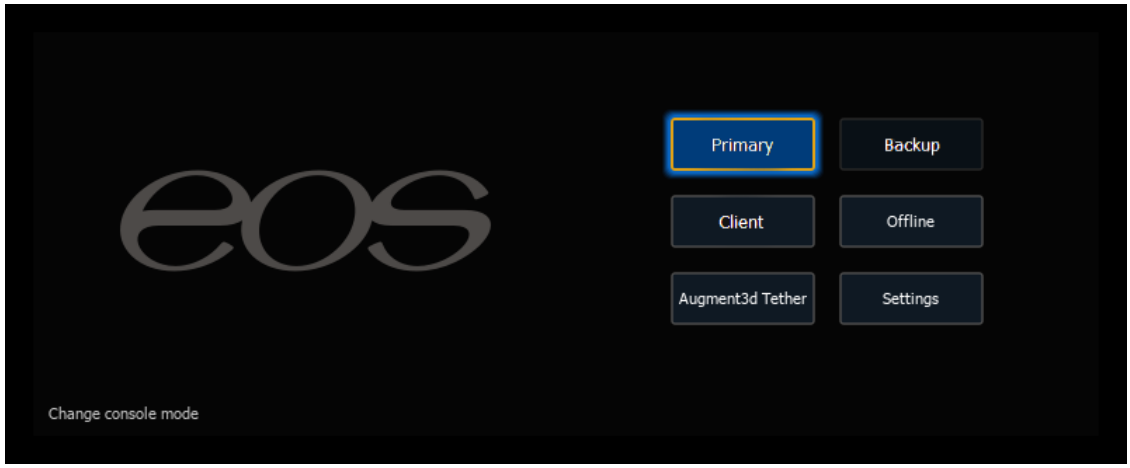
Any multi-console system must first adhere to all relevant *Eos Network Requirements* and be set up according to *Eos Device Network Configuration* standards. A variety of additional settings can then be used to enable and configure multi-console connectivity.

- *Multi-Console Configuration in the ECU* details the settings for multi-console sessions available in the *Eos Configuration Utility (ECU)*.
- *Multi-Console Configuration in Eos* details the settings for multi-console sessions available in Eos *Setup*.

Multi-console functionality is also used to save across the whole network, providing synchronized backup of your show file. All Eos Family and ETCnomad devices in the session will receive all show data updates and stage levels. If the Primary goes offline, the Backup will be capable of taking control of the system without a loss of show data or live output.

Eos Device Roles

Eos Family device roles determine the device's behavior and abilities, primarily in *Multi-Console Sessions*. Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.



Some roles are not available on all devices; see the respective overviews in *Eos Family Product Overview and Setup* for details on which roles a device supports.

Host

All Eos sessions, regardless of how many devices they include, require one Host device to run the session and operate the system. The Host is whichever device is currently in control of the system; it is not a selectable mode from the ECU Welcome Screen.

In a single-device session, the Host and the Primary are one and the same. In a multi-console session, the Host will typically be the Primary. If connection to the Primary is lost and a Backup is assigned to take control of the system, the Backup becomes the Host.

Primary

A single Eos Family device should generally be run as a Primary. Eos devices boot into Primary by default.

In a multi-console session, the Primary is the device that Backup and Client consoles synchronize with, making it the source of all information for other devices in the session as well as the device that will be backed up.

Backup

A Backup is capable of taking control of the system if the connection to the Primary fails. You may input data and run your show from a Backup. There can only be one Backup in an Eos session and you must specify which Primary it is backing up.

Backup requires a Primary device be online to synchronize. Once this is done, the Backup downloads all show data for use in the event that it needs to take control of the lighting system. Consoles in this mode will not have control of the lighting system unless the connection to the Primary is lost. If the Primary fails, the Backup will offer to take control of the system or troubleshoot the problem. You can set the Backup to automatically take control. While the Primary remains in control, the Backup will behave as a Client would.

Client

Client devices can act as remote controllers or video stations for a system, but cannot output to or control the lighting equipment.

Client data is sent and received over the network, and Clients will synchronize with a designated Primary.

User ID determines some interaction between the Client and other devices. If the Client and the Primary console have the same user ID, they will act as one. If they have different user IDs, they will have separate command lines.

By default, Client and Backup devices do not output from their DMX ports. Local DMX output can be enabled via *Setup > Device* > *Local Output* > *{Output In Client Mode}*.

Expansion Processor (EEP)

Expansion Processor devices enable the use of *Eos Expansion Processing* in multi-console sessions, which allows Eos to distribute output processing between multiple hardware devices. Each Expansion Processor is assigned one or more universes of addresses to output, up to their individual output count.

A device logged in as an Expansion Processor may perform one of two roles:

- **Eos Expansion Processor (EEP)** - contributes to the overall session capacity and outputs assigned universes of addresses to the system.
- **Backup Eos Expansion Processor (BEEP)** - assigned directly to a specific EEP to take over output of that device's universes if it goes offline.

The Expansion Processor login role should not be confused with the *Eos Expansion Processor*, a dedicated rackmount expansion processing device that can only act as an EEP or a BEEP.

The *Eos Expansion Processor*, dedicated expansion processing devices, and devices logged in as an *Expansion Processor (EEP)* have a minimal configuration and health user interface instead of the full Eos display, with a default screen and four sub-menus which can be accessed with the menu button in the top left. Connected monitors will display the same user interface, which can be interacted with via internal and external touchscreens. See *Expansion Processing User Interface*.

Offline

Primarily intended for show file editing, Offline devices cannot output to or communicate with the rest of a network. Any changes to show data from an Offline device can only be saved locally, and will not affect other Eos devices or the entertainment control network.

ETCnomad on Windows and macOS Only

Augment3d Tether

Available for *Running Augment3d* on a connected ETCnomad computer with or without a dongle.

Offline w/viz

Available when running unlicensed ETCnomad software without a dongle. This role is only intended to be used with visualizer software, and does not output entertainment control data.

Multi-Console Session Capacities

A session is a networked system of one or more Eos devices, consisting of a Host (the Primary and optional Backup) that a varying number of optional client devices connect to and synchronize with. The Host devices determine how many address outputs are initially available and which other devices can be added to the session. In supported sessions, you may increase the available outputs of your system using *Eos Expansion Processing*.

Device Outputs and Licenses

Eos devices are purchased with a license to communicate with a set number of data addresses, referred to as outputs. Some devices have two output license options, base and unlocked. Overall system output counts are determined in the following ways, based on the type of session:

- Single console sessions - the output of the Primary.
- Multi-console sessions - the lower of the Primary and Backup device outputs. Client device output counts do not contribute.
- Expansion processing sessions - the lower of the Primary and Backup device outputs. Client device output counts do not contribute. Expansion processors stack their outputs until the session capacity or the EEP-BEEP limit has been reached, whichever comes first.
- Multiple sessions on the same network - each session is treated as its own instance, subject to the output count rules above.

Devices can each contribute a maximum of 24,576 output addresses to a session, even if their individual output count is higher. A maximum of 99,999 channels may be patched per session. A range of *Allowed Outputs* for your Eos console can be configured in the *Eos Configuration Utility (ECU)* under Settings > Network > *Device*.

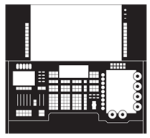
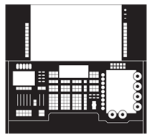
For more information on specific Eos Family devices, see the individual overviews in *Eos Family Product Overview and Setup*, which are also linked underneath individual devices below.

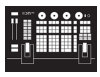
Session Capacities

Session capacities are based on the Host devices managing the session. If two different classes of hardware are used in a Primary-Backup relationship, the session capacities are limited to the class of the lower device.

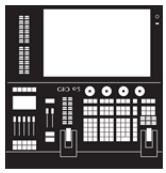
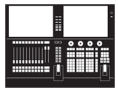
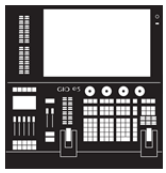
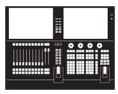
Use the tables below to determine the capacities for any potential sessions. Keep hardware-specific limitations in mind, especially the total number of supported addresses or universes, and the maximum number of Expansion Processor and Client devices supported by the session.

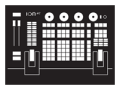
Apex Session Capacities

Primary Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Backup Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Contribution	24,576 addresses (48 universes).					
Expansion Processors	Sessions utilizing *Eos Expansion Processing* are subject to *Expansion Processing Session Capacities*.					

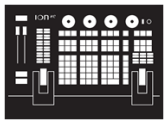
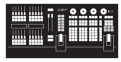
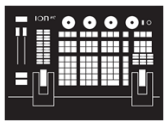
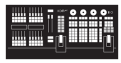
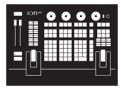
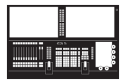
<table>
<tr><td rowspan="4">Clients</td><td rowspan="4">Up to 15 per session.</td><td rowspan="2"></td><td> </td><td> </td><td></td><td></td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>RVI
RVI3</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>All Hardware</td><td>Windows 7 and Windows 10 Hardware</td><td>All Hardware</td></tr>
<tr><td rowspan="2"></td><td> </td><td>  </td><td> </td><td> </td></tr>
<tr><td>Ion Classic
Ion RPU Classic</td><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td>Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td></td><td>Windows 7 Hardware</td><td>All Hardware</td><td>All Hardware</td><td>All Hardware</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="5">24,576 addresses (48 universes).</td></tr>
<tr><td>Devices Supported</td><td colspan="5">Up to 17 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="5">Basic Managed Network Requirements are recommended. Eos Network Requirements may vary based on the scale and complexity of the system.</td></tr>
</table>

Gio @5, Gio, Eos Ti, and Eos RPU3 Session Capacities

Primary Host	1 per session.				
		Gio @5 (All Hardware)	*Gio* (All Hardware)	*Eos Ti* (All Hardware)	Eos RPU3 (All Hardware)
Backup Host	1 per session.				
		Gio @5 (All Hardware)	*Gio* (All Hardware)	*Eos Ti* (All Hardware)	Eos RPU3 (All Hardware)
Contribution	4,096, 16,384, or 24,576 addresses (8, 32, or 48 universes) depending on device licenses.				
Expansion Processors	Sessions utilizing *Eos Expansion Processing* are subject to *Expansion Processing Session Capacities*.				

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 10 per session.</td><td> </td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>RVI
RVI3</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>All Hardware</td><td>Windows 7 and Windows 10 Hardware</td><td>All Hardware</td></tr>
<tr><td> </td><td>  </td><td> </td><td> </td></tr>
<tr><td>Ion Classic
Ion RPU Classic</td><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td>Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>Windows 7 Hardware</td><td>All Hardware</td><td>All Hardware</td><td>All Hardware</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="4">4,096, 16,384, or 24,576 addresses (8, 32, or 48 universes) depending on device licenses.</td></tr>
<tr><td>Devices Supported</td><td colspan="4">Up to 12 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="4">Basic Managed Network Requirements are recommended. Eos Network Requirements may vary based on the scale and complexity of the system.</td></tr>
</table>

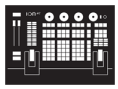
Ion Xe Session Capacities

<table>
<tr><td rowspan="2">Primary Host</td><td rowspan="2">1 per session.</td><td>  </td><td>  </td><td> </td><td rowspan="2"></td></tr>
<tr><td>Ion Xe
(All Hardware)</td><td>Ion Xe 20
(All Hardware)</td><td>Ion Xe RPU
(All Hardware)</td></tr>
<tr><td rowspan="2">Backup Host</td><td rowspan="2">1 per session.</td><td>  </td><td>  </td><td> </td><td rowspan="2"></td></tr>
<tr><td>Ion Xe
(All Hardware)</td><td>Ion Xe 20
(All Hardware)</td><td>Ion Xe RPU
(All Hardware)</td></tr>
<tr><td>Contribution</td><td colspan="5">2,048 or 12,288 addresses (4 or 24 universes) depending on device licenses.</td></tr>
<tr><td>Expansion Processors</td><td colspan="5">Sessions utilizing Eos Expansion Processing are subject to Expansion Processing Session Capacities.</td></tr>
<tr><td rowspan="6">Clients</td><td rowspan="6">Up to 10 per session.</td><td> </td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>RVI
RVI3</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>All Hardware</td><td>Windows 7 and Windows 10 Hardware</td><td>All Hardware</td></tr>
<tr><td> </td><td>  </td><td>  </td><td> </td></tr>
<tr><td>Ion Classic
Ion RPU Classic</td><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td>Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>Windows 7 Hardware</td><td>All Hardware</td><td>All Hardware</td><td>All Hardware</td></tr>
</table>

Maximum Session Capacity	2,048 or 12,288 addresses (4 or 24 universes) depending on device licenses.	
Devices Supported	Up to 12 Eos Family devices per session.	
Network Requirements	*Basic Managed Network Requirements* are recommended. *Eos Network Requirements* may vary based on the scale and complexity of the system.	

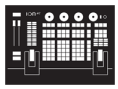
ETCnomad, ETC Puck, Ion Classic, and Ion RPU Classic Session Capacities

Primary Host	1 per session.				
		ETCnomad (Windows and macOS)	ETC Puck (All Hardware)	*Ion Classic* (Windows 7 Hardware)	Ion RPU Classic (Windows 7 Hardware)
Backup Host	1 per session.				
		ETCnomad (Windows and macOS)	ETC Puck (All Hardware)	*Ion Classic* (Windows 7 Hardware)	Ion RPU Classic (Windows 7 Hardware)
Contribution	1,024 or 6,144 addresses (2 or 12 universes) depending on device licenses.				
Expansion Processors	*Eos Expansion Processing* is not supported with Ion Classic, Puck, or ETCnomad Primary or Backup Hosts.				

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 5 per session.</td><td> </td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>RVI
RVI3</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>All Hardware</td><td>Windows 7 and Windows 10 Hardware</td><td>All Hardware</td></tr>
<tr><td> </td><td>  </td><td> </td><td> </td></tr>
<tr><td>Ion Classic
Ion RPU Classic</td><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td>Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>Windows 7 Hardware</td><td>All Hardware</td><td>All Hardware</td><td>All Hardware</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="4">1,024 or 6,144 addresses (2 or 12 universes) depending on device licenses.</td></tr>
<tr><td>Devices Supported</td><td colspan="4">Up to 7 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="4">Basic Managed Network Requirements are recommended. Eos Network Requirements may vary based on the scale and complexity of the system.</td></tr>
</table>

Element and Element Mode Session Capacities

Primary Host	1 per session.	ETCnomad (Windows and macOS)	ETC Puck (All Hardware)	*Element 2* (All Hardware)	Element Classic (Windows 7 Hardware)
Backup Host	1 per session.	ETCnomad (Windows and macOS)	ETC Puck (All Hardware)	*Element 2* (All Hardware)	Element Classic (Windows 7 Hardware)
Contribution	1,024 or 6,144 addresses (2 or 12 universes) depending on device licenses.				
Expansion Processors	*Eos Expansion Processing* is not supported with Primary or Backup Hosts that are Element devices or devices booted into Element mode.				

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 5 per session.</td><td> </td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>RVI
RVI3</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>All Hardware</td><td>Windows 7 and Windows 10 Hardware</td><td>All Hardware</td></tr>
<tr><td> </td><td>  </td><td> </td><td> </td></tr>
<tr><td>Ion Classic
Ion RPU Classic</td><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td>Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>Windows 7 Hardware</td><td>All Hardware</td><td>All Hardware</td><td>All Hardware</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="4">1,024 or 6,144 addresses (2 or 12 universes) depending on device licenses.</td></tr>
<tr><td>Devices Supported</td><td colspan="4">Up to 7 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="4">Basic Managed Network Requirements are recommended. Eos Network Requirements may vary based on the scale and complexity of the system.</td></tr>
</table>

Multi-Console Sessions

A session is a networked system of one or more Eos devices, consisting of a Host (the Primary and optional Backup) that a varying number of optional client devices connect to and synchronize with. The Host devices determine how many address outputs are initially available and which other devices can be added to the session. In supported sessions, you may increase the available outputs of your system using *Eos Expansion Processing*.

Multi-Console Session Capacities are organized around the hardware class of the Eos devices included in the session. Refer to the linked hardware class tables to determine the capacities for any potential sessions.

ETC recommends that all networks utilizing multi-console sessions also use *Time Servers*, to keep the various Eos devices in the system synchronized to a single consistent time.

Starting a Multi-Console Session

Before starting a multi-console session, you must have an active *Primary* device. Eos logs into this role by default on boot. You may then connect any additional Eos devices.

Eos Device Roles can be chosen from the *ECU Welcome Screen*, which can be accessed on device startup or by exiting the Eos application to the shell via **Browser > Exit**.

Synchronized Backup

During normal operation, the Primary controls the entertainment control system and sends updates to any detected Backup and Client devices to keep the following information synchronized:

- Playback
- Record operations
- Manual data
- Show file and data

To assign a Backup to a Primary:

1. Exit the Eos environment (**Browser > Exit Eos**) on the console you wish to act as the Backup. This will send you to the ECU welcome screen.
2. Touch or click on the **{Backup}** button in the welcome screen. The console will launch the Eos software as a Backup. Eos will try to connect to a Primary console. The CIA will say "Waiting for Host. One moment please…".
3. If the Backup doesn't connect after a few moments, press the **{Troubleshoot}** button in the CIA. This will open the network configuration screen in the CIA.
   a. If this is the first time that a Backup is connecting to this Host, you will need to press **{Troubleshoot}** and select the Host.
4. Select a Primary console from the list on the right. If none are available in the list, a Primary console is not connected to the network.
5. Press **{Change Host}**. The Backup Eos will synchronize with the new Host.

You will see the console's current status above the softkeys display.

When Host control moves between the Primary and Backup device, any Clients in the system will automatically connect to the current Host. Clients will also display a message, but the message will be dismissed after a short period of time. The device status above the CIA icons will also change.

A Backup may take up to 5 seconds to determine that connection with the Host has been lost. This timing can be adjusted based on network type selected in the ECU. See *ECU Settings > Network*. BEEPs use the same timing thresholds to determine disconnects.

The **Network > Configure** screen will show that your Backup is now acting as the Primary and is controlling the system.

Connection Issues

If the Primary loses its connection to the network, an assigned Backup can automatically take control of the system if **Setup > System > Session >** *Backup Auto Take Control* has been enabled. Whenever Host control changes between the Primary and the Backup, there will be a dialog window that will be displayed that must be dismissed by the user.

Primaries do not automatically retake control of the system if they comes back online, but will wait until it is re-designated as the Host and the Backup is reassigned to it. You can force the Backup to release control back to the Primary by going to **Browser > Network > Configuration** and pressing **{Release Control}**. You can also force the Primary to take control from a Backup by going to **Browser > Network > Configuration** and pressing **{Take Control}**.

Multi-Console Configuration in the ECU

The following settings in the *Eos Configuration Utility (ECU)* (ECU) are often used when setting up an Eos multi-console system. You can exit the Eos application to access the ECU using *Browser* > **Exit**.

Network settings changes in the ECU do not require a device restart. Most of these settings are also available in **Setup > Device >** *Network*; see *Multi-Console Configuration in Eos*.

ECU Settings > General

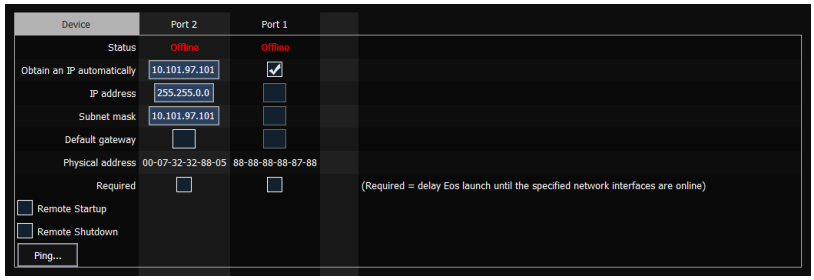
For general information about this section of the ECU, see *Settings > General*.

- *Device Name* - to easily identify a specific Eos device on the network, you can change the device name to be representative of the device (for example, "Booth Primary" or "Rack Backup"). This setting is also available in **Setup > Device >** *Config*; see *Multi-Console Configuration in Eos*.
- *Language* - all devices in a multi-console Eos session must be set to the same language.
- *Keyboard* - all devices in a multi-console Eos session must be set to the same keyboard.
- *Open in "Shell" E.C.U.* - enable this setting to force a device to power up on the *ECU Welcome Screen* rather than booting into primary mode.
- *Automatically Update Software* - enable this setting on non-primary devices in your session to allow them to receive automatic updates when the primary is updated.
  - In Eos v3.3.0 and later, enabling this setting can synchronize software, fixture library, and language versions between devices in a session. If there are any conflicts between versions, the device will download necessary files and settings from the primary, restart, and join the session.
- *{Software Update}* - all devices in a multi-console Eos session must be running the same version of software and fixture library.

ECU Settings > Network

For general information about this section of the ECU, see *Settings > Network*. For more information about networking terms, see *Eos Networking Overview*.

Network > Device



- *Obtain IP Automatically* - each Eos device in a multi-console session must have a unique IP address in the same range as the rest of the network. If a static IP is not assigned, this setting allows a device to receive an IP address and subnet mask from a DHCP server on the network.
- *IP Address* - each Eos device in a multi-console session must have a unique IP address in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Subnet Mask* - each Eos device in a multi-console session must have a subnet mask in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Physical Address* - indicates the *Media Access Control (MAC) Address* of the NIC, a unique identifier that is separate from the IP address and subnet mask.
- *Network Interface Delay (Required)* - enable this setting to force devices to wait for their network connection to fully initialize before launching Eos.
- *Remote Startup and Shutdown* - enable these settings on any non-primary devices that you want the primary to be able to remotely power on and off.
- *{Ping}* - this utility can be used to test whether there is network communication between Eos and other network devices.

Network > Interface Protocols

- *MultiConsole* - this setting must be enabled on all devices in a multi-console Eos session.
- *Network Type* - this setting affects how long the backup will wait before taking over for the primary.
- *File Transfer* - this setting affects the speed that show files are transferred between devices in a multi-console Eos session.

Network > DHCP Service

When enabled, the *DHCP Service* assigns IP addresses to devices on the network. To prevent conflicts, there should only be one DHCP service active in a network. In a multi-console Eos session, ETC recommends enabling DHCP service only on the primary.

For more information, see Eos Network Overview > Internet Protocol (IP) > *Dynamic Host Configuration Protocol (DHCP)*.

Network > Time Service (SNTP)

When enabled, the *Time Service (SNTP)* synchronizes the time between all devices on the network. To prevent conflicts, there should only be one time service active in a network. In a multi-console Eos session, ETC recommends enabling time service only on the primary.

Multi-Console Configuration in Eos

The following settings in Eos *Setup* and *Patch* are often used when setting up an Eos multi-console system.

Network settings changes in **Setup** require a device restart. Most of these settings are also available in **ECU >** *Settings > Network*; see *Multi-Console Configuration in the ECU*.

Setup

To access Setup, select **[Displays]**, then **{Setup}**, or navigate to **Setup** via the browser. Apex and Element Classic console users can also use the dedicated **[System]** and **[Setup]** hardkeys.

Setup > System > Session

- *Backup Auto Take Control* - enable this setting to allow the backup to take control automatically if the primary goes offline.

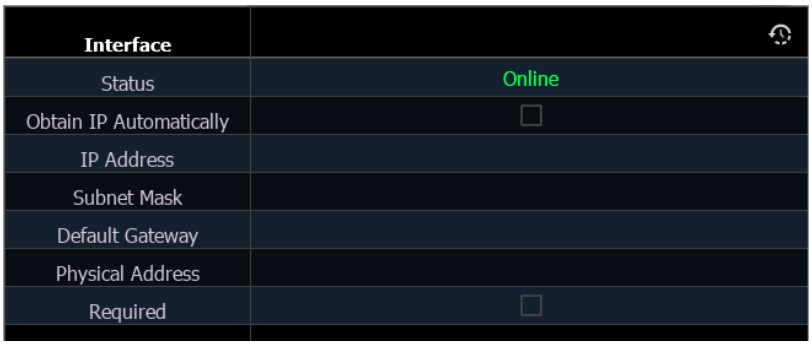
Setup > System > Users

Users allows you to assign a *User ID*. To quickly change the user ID, you may also select the user ID displayed above the CIA. A pop-up window will open with the available user ID options.

Setup > System > Partitions

Partitions can be used to restrict a specific user's access to certain channels when multiple programmers are working in a session. This can help avoid overlapping control of channels by multiple programmers at once. See *Using Partitions*.

Setup > Device > Network



- *Obtain IP Automatically* - each Eos device in a multi-console session must have a unique IP address in the same range as the rest of the network. If a static IP is not assigned, this setting allows a device to receive an IP address and subnet mask from a DHCP server on the network.
- *IP Address* - each Eos device in a multi-console session must have a unique IP address in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Subnet Mask* - each Eos device in a multi-console session must have a subnet mask in the same range as the rest of the network. If a device is not set to obtain an IP automatically, this setting allows you to assign one manually.
- *Network Interface Delay (Required)* - enable this setting to force devices to wait for their network connection to fully initialize before launching Eos.

- *Remote Startup and Shutdown* - enable these settings on any non-primary devices that you want the primary to be able to remotely power on and off.

Setup > Device > Local Output

- *{Output In Client Mode}* - by default, non-primary devices in a multi-console Eos session will not send data from their DMX ports. Enable this setting to allow local output of DMX.

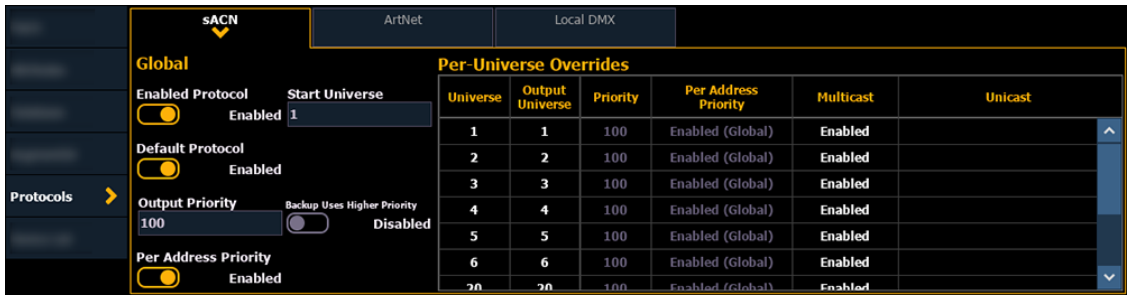
Patch

To access *Patch*, use any of the following shortcuts:

- [Tab] [1] [2]
- [Displays] {Patch}
- [Address/Patch] [Address/Patch]

Ion Classic users can use {Address} {Address}. Element Classic users can use [Patch].

Patch > Protocols > sACN



- *Backup Uses Higher Priority* - enable this setting to allow the backup to take over at one priority level higher than the primary if the primary goes offline. For more information, see Eos Network Overview > Network Control Protocols > sACN > *Priority*.

Eos Expansion Processing

This section covers Eos Expansion Processing (EEP), which allows you to synchronously distribute entertainment control across the computing resources of multiple compatible Eos Family devices in a networked system, and contains the following topics:

- *Expansion Processing User Interface*
- *Expansion Processing Session Capacities*
- *Expansion Processing Configuration*
- *Expansion Backups and Failover*

Systems utilizing expansion processing are subject to the *Eos Network Requirements*.

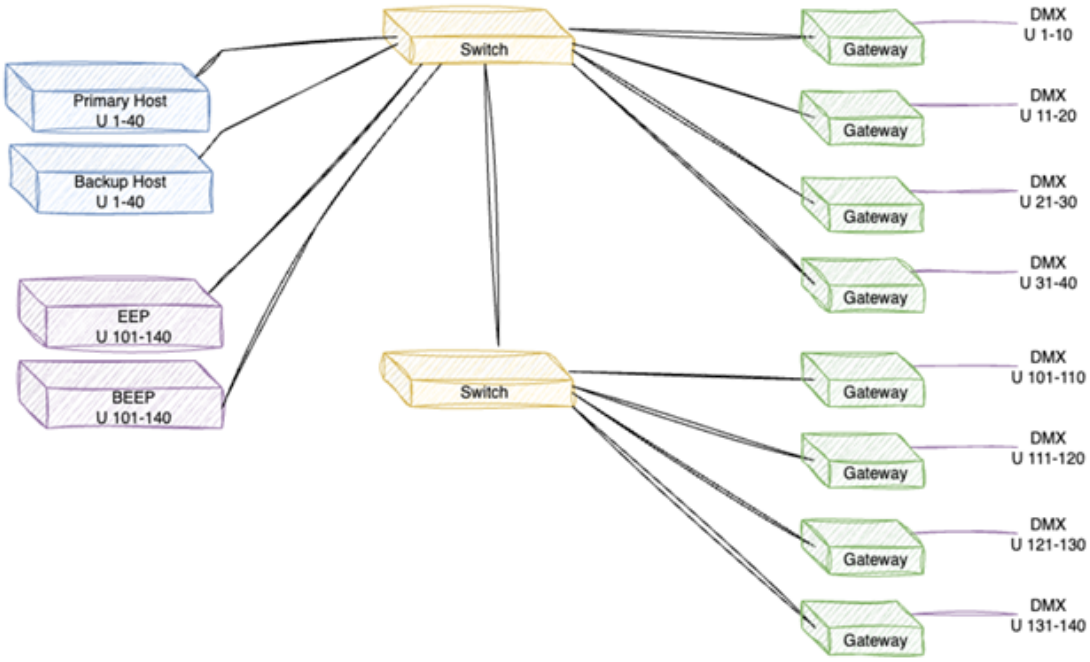
Expansion Processing Background

Eos Family sessions have always relied on a single device for all tasks related to the management and operation of *Entertainment Control Networks*. These tasks can be generally broken into three different software layers.

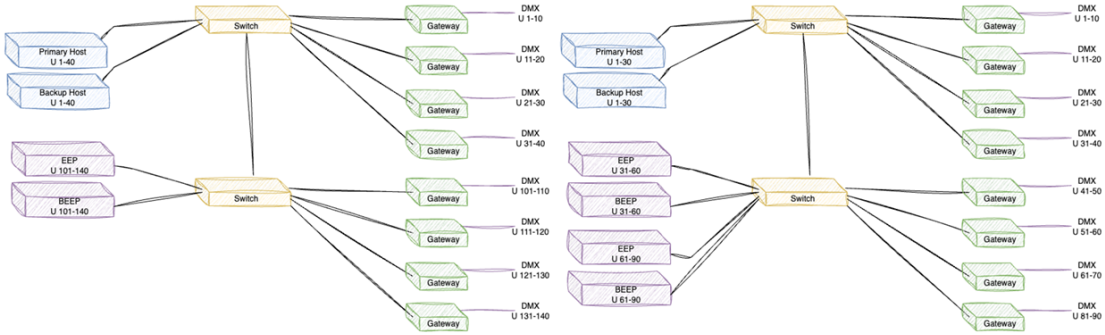
- Fade engine - generates the information streamed to the system, responding to instantaneous changes and outputting data packets for DMX, sACN, Art-Net, and other control protocols.
- Interface - handles displays and user input, keeping onscreen colors, objects, and summaries updated in response to system changes via keys, touch input, and external sources.
- Session management - keeps all devices in a session synchronized, communicating changes in the fade engine and interface, and validating reception and processing of commands.

While only the *Host* generates output packets, these layers are run by every device in a session in as close to real-time as possible, each refreshing every 22 milliseconds under ideal conditions. A single computer can only handle so many real-time operations. Expansion processing allows Eos to distribute the computational requirements of the fade engine across multiple discrete pieces of hardware.

Eos expansion processing uses a deterministic output design, in which devices are responsible for fade engine processing and output packet generation for any universes assigned to them. In a session utilizing expansion processing, all devices contribute to the total output of the rig. Each universe may only live in a single device, so the device is fully responsible for all fade engine processing and output of that universe to the network.



In this basic expansion processing session, universes 1-40 have been assigned to the Primary-Backup pair, and universes 101-140 have been assigned to an EEP-BEEP pair. Each device processes its assigned universes locally, generating output packets to send over the network.



The session is on the left is similar but with a variation in the *Network Topology*. The session on the right is more complicated, using two processors with tracking backups.

A well-architected network will ensure that all Eos devices in the session stay in sync, and data makes its way to the relevant output devices.

Session Roles

Devices in a multi-console session may take on one of many *Eos Device Roles* in order to use expansion processing.

- *Host* - previously "Master," the Host is whichever of these devices is currently leading the session:
  - *Primary*- the device designated to operate the session.
  - *Backup* - the device logged in to track the Primary and take over in event of failure.
- *Client* - any device logged in as a full-time participant of the session, with no ability to become a Host.

- *Expansion Processor (EEP)* - a device logged into Expansion Processing mode for processing and outputting additional universes of data.
  - **Backup Eos Expansion Processor (BEEP)** - a device logged into Expansion Processing mode, assigned to track an EEP and take over in the event of failure.
- *Offline* - any device that has been logged into Offline mode, which may be on a network, but is not connected to a session and is not outputting.
- *Offline w/viz* - allows output for visualizers only in Eos for Windows and macOS.

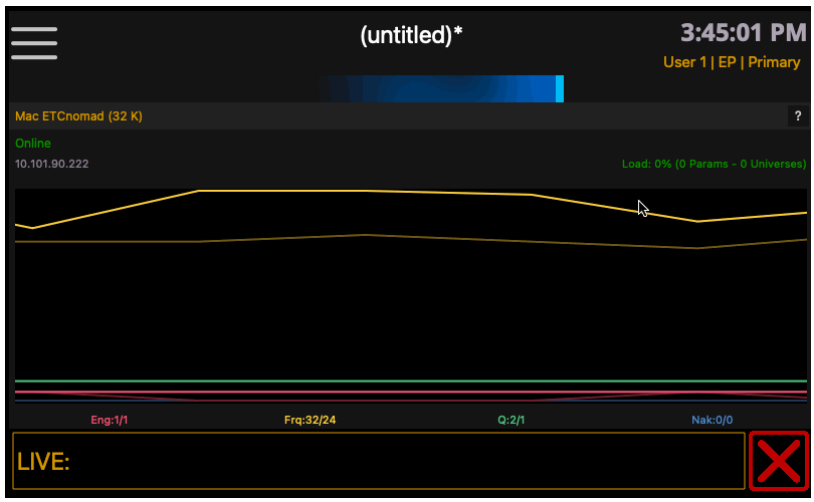
Any device that was logged in but is no longer able to communicate with a session will appear as **Disconnected**.

Expansion Processing User Interface

The *Eos Expansion Processor*, dedicated expansion processing devices, and devices logged in as an *Expansion Processor (EEP)* have a minimal configuration and health user interface instead of the full Eos display, with a default screen and four sub-menus which can be accessed with the menu button in the top left. Connected monitors will display the same user interface, which can be interacted with via internal and external touchscreens.

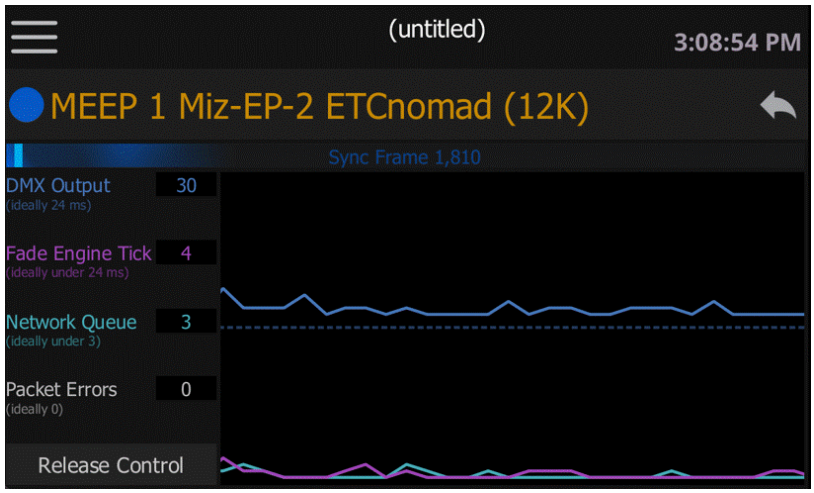
About Device

This is the default Expansion Processing display, providing important information about the health and connectivity of your device and session.



Performance Graph

The **Performance Graph** display shows additional device health information about the device.



The live graph shows an ongoing 30-second window of the following health metrics:

- **DMX Output** - elapsed time since the last DMX output packet was sent in milliseconds (ms). Values above 24 for extended periods may result in dropped packets.
- **Fade Engine Tick** - elapsed time between fade engine ticks (refreshes) in milliseconds (ms).
- **Network Queue** - the number of queued commands from the multi-console *Host* waiting to be executed.
- **Packet Errors** - the number of packets received with ACN NAK errors. Higher values may indicate network issues.

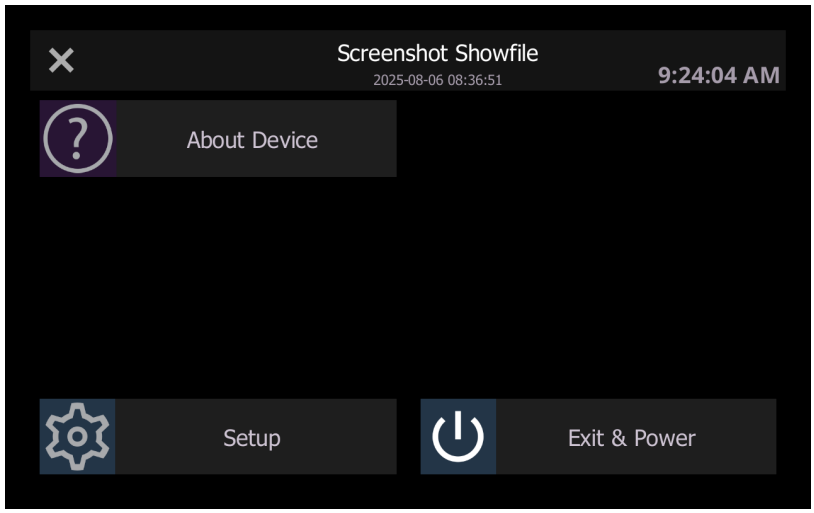
The solid line indicates the peak observed value for a metric. The darker line indicates the average of all observed values.

Use the graph and arrow buttons in the top right of the simple health display to toggle back and forth between the default and performance views.

Menu

The button in the top left opens the menu, which provides access to the **{Setup}** and **{Exit and Power}** options.

Use **{About Device}** to return to the default display.

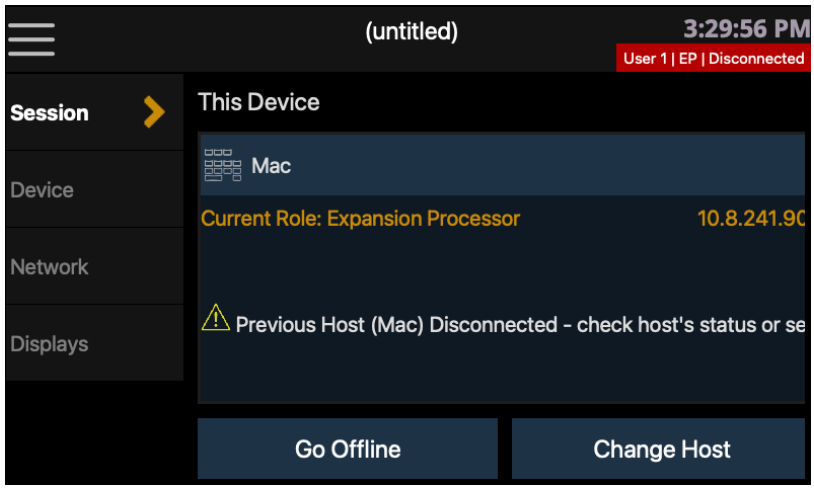


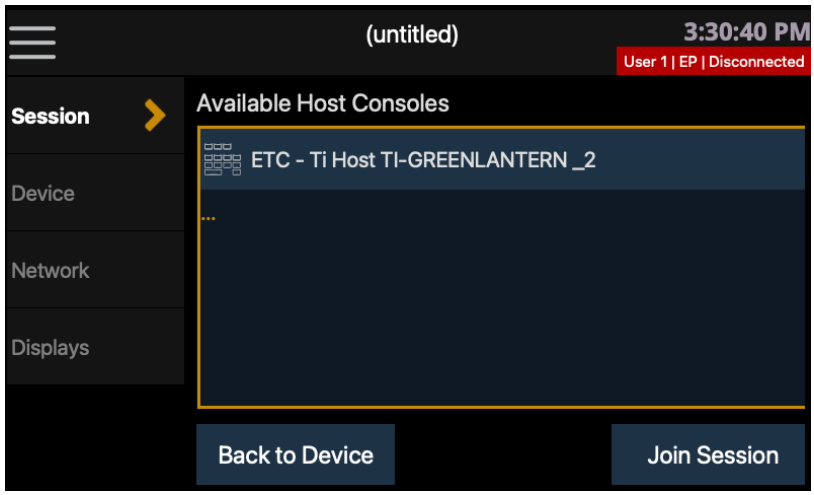
{Setup}

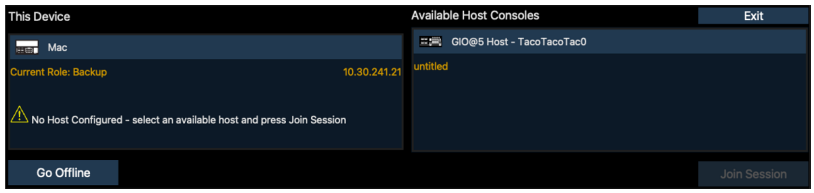
The **{Setup}** menu provides access to the **{Session}**, **{Device}**, **{Network}** and **{Displays}** sections.

{Session}

The **{Session}** section of the **{Setup}** menu allows you to manage your session.

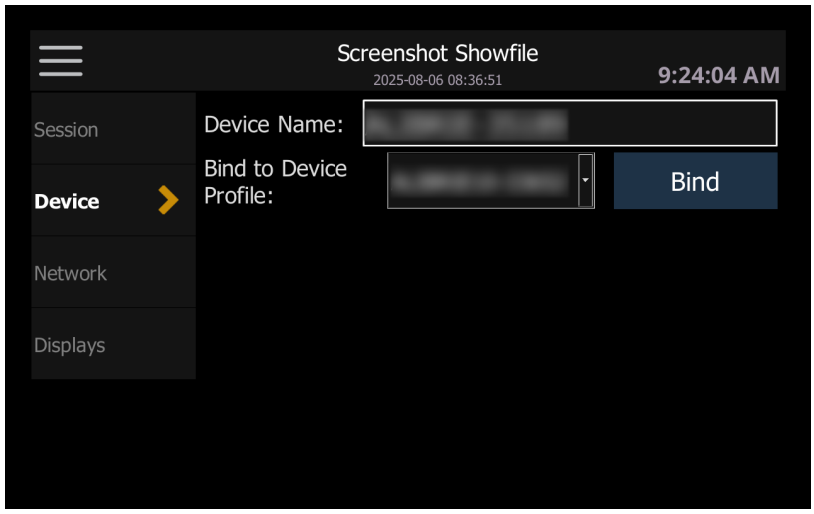






{Device}

The **{Device}** section of the **{Setup}** menu provides access to settings for this Expansion Processing device.

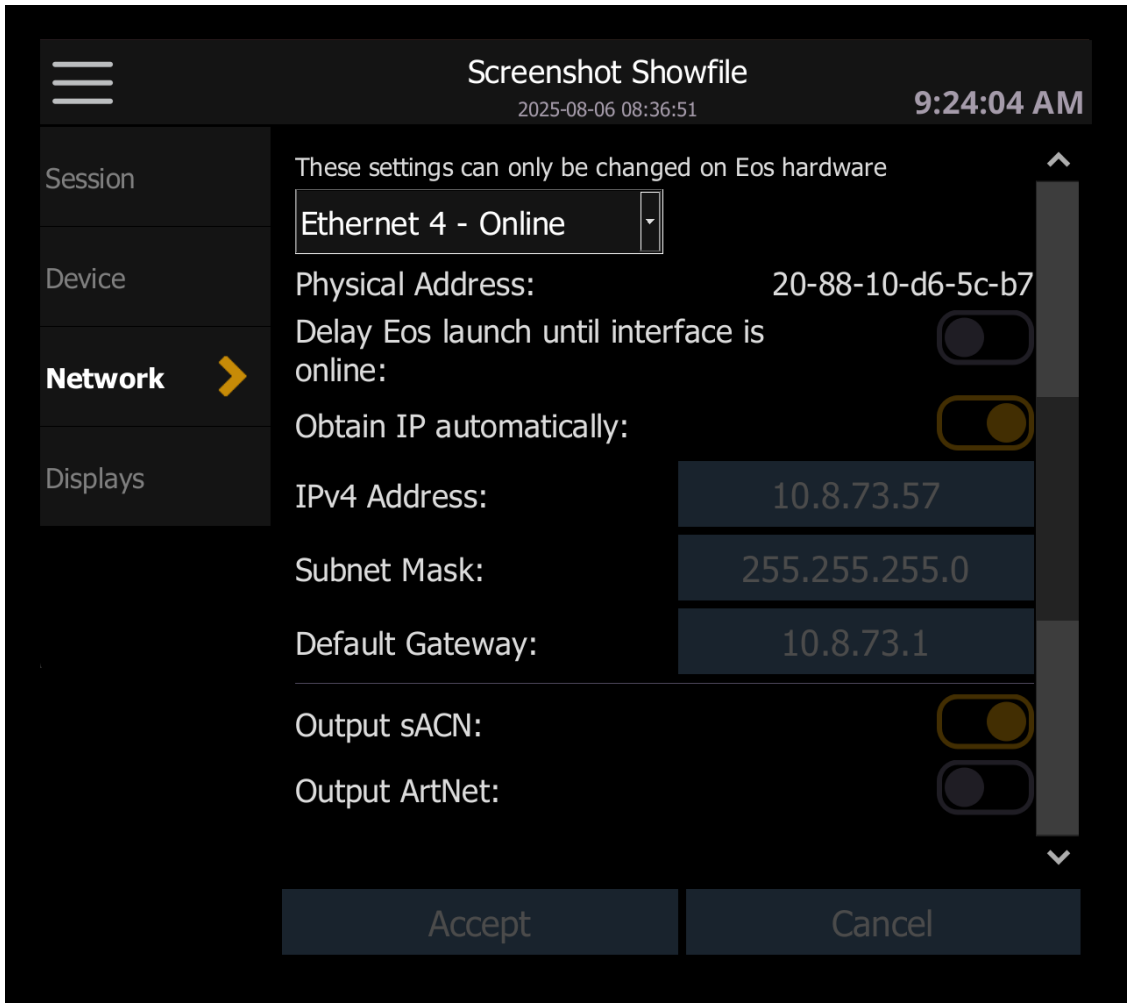


The following options are available:

- **Device Name** - the name of this Expansion Processing device.
- **Bind to Device Profile** - tie this device to an existing profile in **Setup > System > *Processors***. Select a profile from the dropdown menu and use the **{Bind}** button to confirm.

{Network}

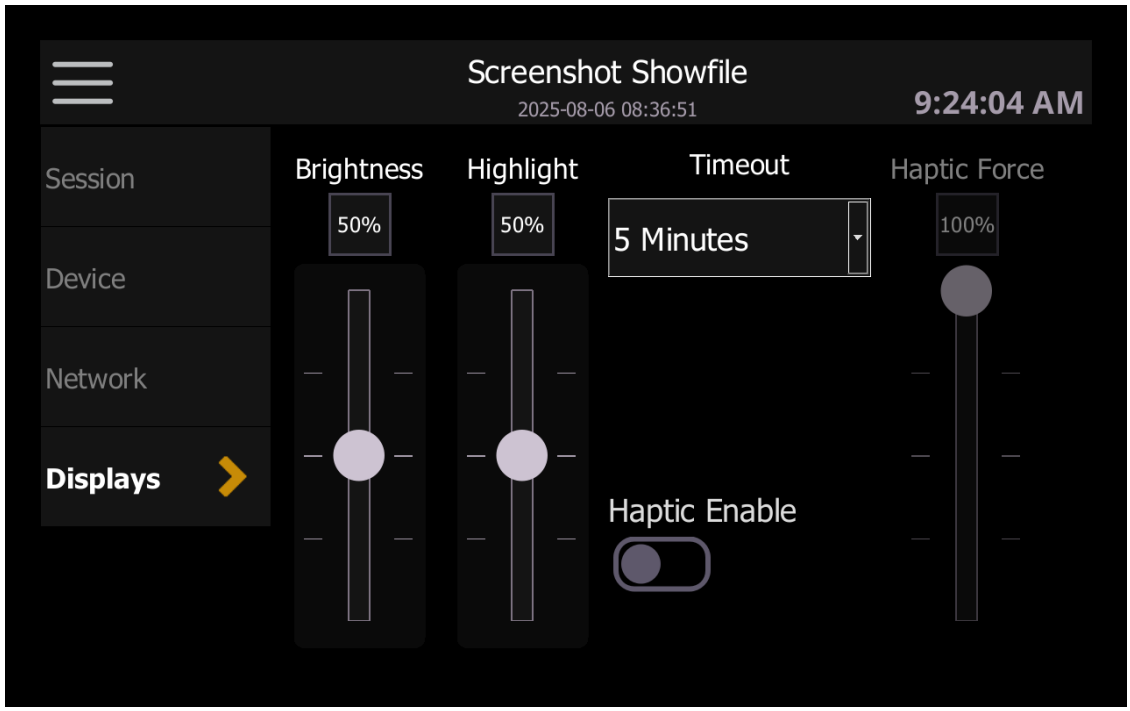
The **{Network}** section of the **{Setup}** menu provides access to network and connectivity settings.



Use **{Accept}** to apply any settings edits, or **{Cancel}** to discard changes and exit.

{Displays}

The **{Displays}** section of the **{Setup}** menu provides access to brightness settings. On the *Eos Apex Processor* and *Eos Expansion Processor*, these settings apply to the internal touchscreen.

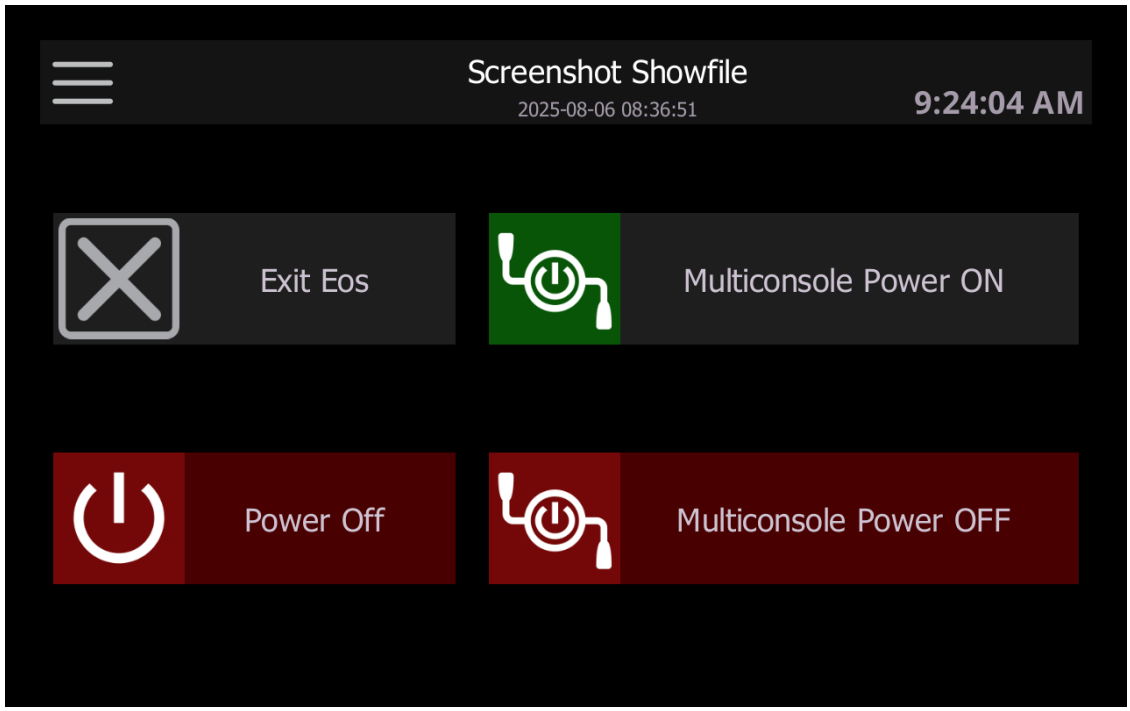


The following options are available:

- **Brightness** - this slider adjusts the brightness of the display. Defaults to 50%.
- **Highlight** - this slider adjusts the highlight level. Defaults to 50%.
- **Timeout** - controls how long the screen waits before sleeping. Choose from the options from the dropdown menu. Defaults to 5 minutes.
- **{Haptic Enable}** - enables or disables haptic feedback on touchscreen displays (if supported). Disabled by default.
- **Haptic Force** - if haptics are enabled, this slider adjusts the power of the feedback. Defaults to 100%.

{Exit and Power}

The **{Exit and Power}** menu provides access to options for shutting down the Expansion Processing device, along with other devices in the session.



The following options are available:

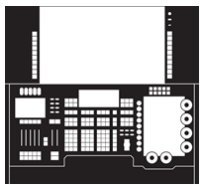
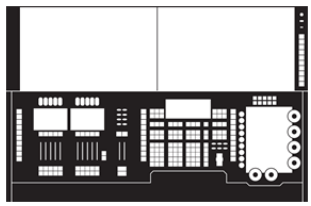
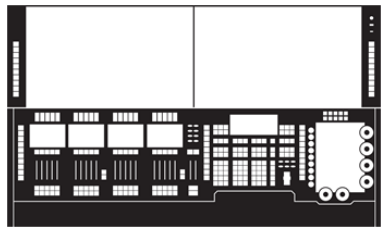
- **{Exit Eos}** - exits the Eos application.
- **{Power Off}** - powers down the device.
- **{Multiconsole Power ON}** - powers on all devices in the multi-console session.
- **{Multiconsole Power OFF}** - powers off all devices in the multi-console session.

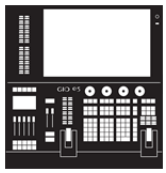
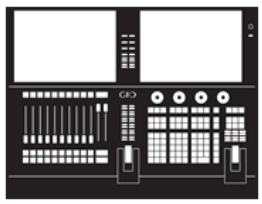
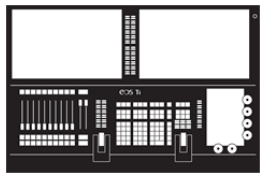
Expansion Processing Session Capacities

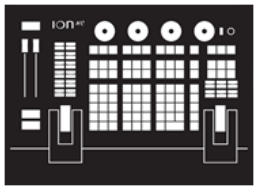
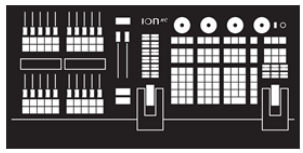
Use the tables below to determine the capacities for any potential sessions. Keep hardware-specific limitations in mind, especially the total number of supported addresses or universes, and the maximum number of Expansion Processor and Client devices supported by the session.

Qualified Host Devices

The following Eos Family devices can host Expansion Processing sessions:

		
Eos Apex 5	*Eos Apex 10*	*Eos Apex 20*
Eos Apex FP	*Eos Apex Processor*	*Eos Expansion Processor*

			
Gio @5 (Display Port)	*Gio* (Display Port and DVI)	*Eos Ti* (Display Port and DVI)	Eos RPU3 (Display Port)

		
Ion Xe	*Ion Xe 20*	*Ion Xe RPU*

The maximum session capacity, number of Clients and Expansion Processors supported, and types of Client devices supported are all determined by the Host devices. It is best practice to use the same output capacity and class of hardware for both the Primary and Backup device.

The output capacity added to an Expansion Processing session will be the lower of the Primary and Backup outputs. If multiple classes of hardware are used in a Primary-Backup relationship, the session capacities shall be limited to that of the lesser-class device.

The following devices **cannot** host Eos Expansion Processing sessions:

ETCnomad (Eos Mode) (Windows and macOS)	ETC Puck (Eos Mode)	*Ion Classic*	Ion RPU Classic

ETCnomad (Element Mode) (Windows and macOS)	ETC Puck (Element Mode)	*Element 2*	Element Classic

Qualified Expansion Processor Devices

The following devices are the ONLY devices that can boot into Expansion Processing mode:

Eos Expansion Processor	*Ion Xe RPU*
+12,288 addresses (24 universes)	+2,048 addresses (4 universes) +12,288 addresses (24 universes)
Eos RPU3	*Eos Apex Processor*
+4,096 addresses (8 universes) +16,384 addresses (32 universes) (DVI) +24,576 addresses (48 universes)	+24,576 addresses (48 universes)

To back up an Expansion Processor, use another device that can boot into Expansion Processing mode. It is recommended to use the same output capacity and class of hardware as the paired Expansion Processor. Just like the Primary-Backup relationship, the output capacity added to the session will be the lesser between the main EEP and the backup EEP (BEEP). If multiple classes of hardware are used in a EEP-BEEP relationship, the session capacities shall be limited to that of the lesser-class device.

Session Capacities

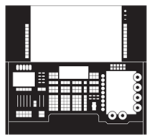
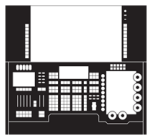
When expansion processing is enabled in a session, the Primary-Backup Host pair will contribute their license (based on the rules of backups) to the session. Each additional EEP-BEEP pair will add their license (based on the rules of backups) to the session, up to the maximum devices or session capacity.

A device shall never contribute more than 24k to an expansion processing session capacity, regardless of its base license.

Ion Xe Class-hosted sessions have a maximum capacity of 24k. For example, If an Ion Xe 12k gets an Apex Processor 24k as an EEP, that processor will only contribute 12k to the session.

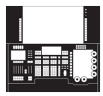
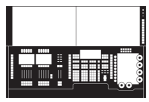
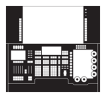
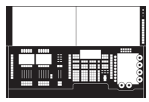
Apex Expansion Processing Session Capacities

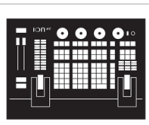
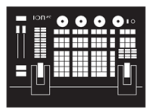
{Exceed 75k Output} Enabled

Primary Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Backup Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Contribution	+24,576 addresses (48 universes).					
Expansion Processors	Up to 15 EEPs and 15 BEEPs per session (30 total).					
			Eos Expansion Processor		*Eos Apex Processor*	
			+12,288 addresses (24 universes)		+24,576 addresses (48 universes)	

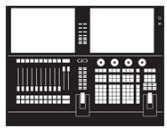
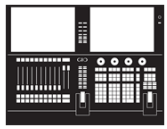
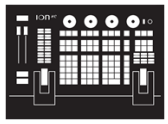
Clients	Up to 15 per session.					
			ETCnomad (Windows and macOS)	ETC Puck	*Eos Remote Interface*	*Eos Apex FP* *Eos Apex 5* *Eos Apex 10* *Eos Apex 20* *Eos Apex Processor*
			Quad Core + 16GB Minimum RAM Passmark CPU Benchmark: Multithread Score 10000+ Geekbench: Multithread Score 5500+	Gen 4, 5, and 6 Hardware	Enhanced Hardware	
Maximum Session Capacity	153,600 addresses (300 universes).					
Devices Supported	Up to 47 Eos Family devices per session.					
Network Requirements	*Advanced Managed Network Requirements* must be met.					

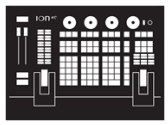
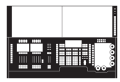
{Exceed 75k Output} Disabled

Primary Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Backup Host	1 per session.					
		Eos Apex FP	*Eos Apex 5*	*Eos Apex 10*	*Eos Apex 20*	*Eos Apex Processor*
Contribution	+24,576 addresses (48 universes).					

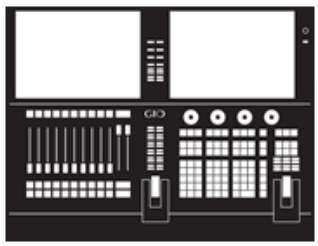
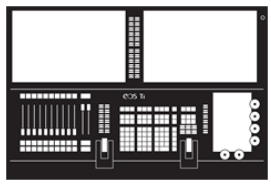
Expansion Processors	Up to 10 EEPs and 10 BEEPs per session (20 total).					
			Eos Expansion Processor	*Ion Xe RPU*	Eos RPU3 (Display Port Hardware)	*Eos Apex Processor*
			+12,288 addresses (24 universes)	+2,048 addresses (4 universes) +12,288 addresses (24 universes)	+4,096 addresses (8 universes) +24,576 addresses (48 universes)	+24,576 addresses (48 universes)
Clients	Up to 10 per session.					
				ETCnomad (Windows and macOS)	ETC Puck	*Eos Remote Interface*
				Quad Core + 16GB Minimum RAM Passmark CPU Benchmark: Multithread Score 10000+ Geekbench: Multithread Score 5500+	Gen 4, 5, and 6 Hardware	All Hardware
						
				Ion Xe *Ion Xe 20* *Ion Xe RPU*	*Eos Ti* *Gio* *Gio @5* Eos RPU3	*Eos Apex FP* *Eos Apex 5* *Eos Apex 10* *Eos Apex 20* *Eos Apex Processor*
				All Hardware	Display Port Hardware	
Maximum Session Capacity	76,800 addresses (150 universes).					
Devices Supported	Up to 32 Eos Family devices per session.					
Network Requirements	While *Advanced Managed Network Requirements* are recommended, *Basic Managed Network Requirements* may be acceptable.					

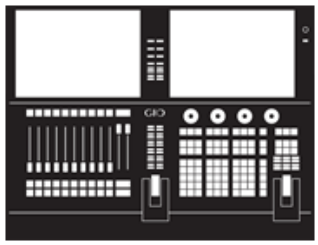
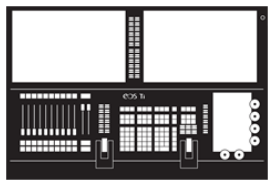
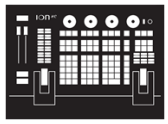
Gio @5, Gio, Eos Ti, and Eos RPU3 Display Port Expansion Processing Session Capacities

Primary Host	1 per session.				
		Gio @5 (Display Port Hardware)	*Gio* (Display Port Hardware)	*Eos Ti* (Display Port Hardware)	Eos RPU3 (Display Port Hardware)
Backup Host	1 per session.				
		Gio @5 (Display Port Hardware)	*Gio* (Display Port Hardware)	*Eos Ti* (Display Port Hardware)	Eos RPU3 (Display Port Hardware)
Contribution	4,096, 16,384, or 24,576 addresses (8, 32, or 48 universes) depending on device licenses.				
Expansion Processors	Up to 10 EEPs and 10 BEEPs per session (20 total).				
		Eos Expansion Processor	*Ion Xe RPU*	Eos RPU3 (Display Port Hardware)	*Eos Apex Processor*
		+12,288 addresses (24 universes)	+2,048 addresses (4 universes) +12,288 addresses (24 universes)	+4,096 addresses (8 universes) +24,576 addresses (48 universes)	+24,576 addresses (48 universes)

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 10 per session.</td><td rowspan="5"></td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>Gen 4, 5, and 6 Hardware</td><td>All Hardware</td></tr>
<tr><td>  </td><td> </td><td>  </td></tr>
<tr><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
Eos RPU3</td><td rowspan="2">Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>All Hardware</td><td>Display Port Hardware</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="5">76,800 addresses (150 universes).</td></tr>
<tr><td>Devices Supported</td><td colspan="5">Up to 32 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="5">While Advanced Managed Network Requirements are recommended, Basic Managed Network Requirements may be acceptable.</td></tr>
</table>

Gio and Eos Ti DVI Expansion Processing Session Capacities

<table>
<tr><td rowspan="2">Primary Host</td><td rowspan="2">1 per session.</td><td>  </td><td>  </td></tr>
<tr><td>Gio
(DVI Hardware)</td><td>Eos Ti
(DVI Hardware)</td></tr>
</table>

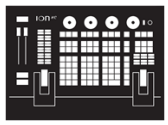
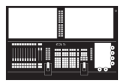
<table>
<tr><td rowspan="2">Backup Host</td><td rowspan="2">1 per session.</td><td>  </td><td>  </td></tr>
<tr><td>Gio
(DVI Hardware)</td><td>Eos Ti
(DVI Hardware)</td></tr>
<tr><td>Contribution</td><td colspan="4">4,096 or 16,384 addresses (8 or 32 universes) depending on device licenses.</td></tr>
<tr><td rowspan="2">Expansion Processors</td><td rowspan="2">Up to 5 EEPs and 5 BEEPs per session (10 total).</td><td> </td><td>  </td><td> </td><td> </td></tr>
<tr><td>Eos Expansion Processor

+12,288 addresses (24 universes)</td><td>Ion Xe RPU

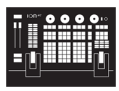
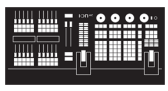
+2,048 addresses (4 universes)
+12,288 addresses (24 universes)</td><td>Eos RPU3 (Display Port Hardware)

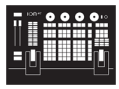
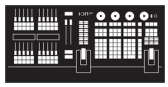
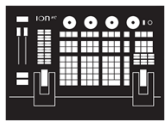
+4,096 addresses (8 universes)
+24,576 addresses (48 universes)</td><td>Eos Apex Processor

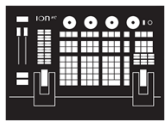
+24,576 addresses (48 universes)</td></tr>
</table>

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 10 per session.</td><td rowspan="5"></td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>Gen 4, 5, and 6 Hardware</td><td>All Hardware</td></tr>
<tr><td>  </td><td>  </td><td> </td></tr>
<tr><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
(All Hardware)</td><td rowspan="2">Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="5">24,576 addresses (48 universes).</td></tr>
<tr><td>Devices Supported</td><td colspan="5">Up to 22 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="5">Basic Managed Network Requirements or higher must be met.</td></tr>
</table>

Ion Xe-Expansion Processing Session Capacities

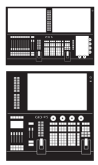
<table>
<tr><td rowspan="2">Primary Host</td><td rowspan="2">1 per session.</td><td>  </td><td>  </td><td> </td><td rowspan="2"></td></tr>
<tr><td>Ion Xe
(All Hardware)</td><td>Ion Xe 20
(All Hardware)</td><td>Ion Xe RPU
(All Hardware)</td></tr>
</table>

Backup Host	1 per session.				
		Ion Xe (All Hardware)	*Ion Xe 20* (All Hardware)	*Ion Xe RPU* (All Hardware)	
Contribution	2,048 or 12,288 addresses (4 or 24 universes) depending on device licenses.				
Expansion Processors	Up to 1 EEP and 1 BEEP per session (2 total).				
		Eos Expansion Processor	*Ion Xe RPU*	Eos RPU3 (Display Port Hardware)	*Eos Apex Processor*
		+12,288 addresses (24 universes)	+2,048 addresses (4 universes) +12,288 addresses (24 universes)	+4,096 addresses (8 universes) +12,288 addresses (24 universes) Units licensed above 12k will be limited to 12k.	+12,288 addresses (24 universes) Units licensed above 12k will be limited to 12k.

<table>
<tr><td rowspan="5">Clients</td><td rowspan="5">Up to 10 per session.</td><td rowspan="5"></td><td> </td><td> </td><td> </td></tr>
<tr><td>ETCnomad (Windows and macOS)</td><td>ETC Puck</td><td>Eos Remote Interface</td></tr>
<tr><td>Quad Core + 8GB Minimum RAM
Passmark CPU Benchmark: Multithread Score 5500+
Geekbench: Multithread Score 3000+</td><td>Gen 4, 5, and 6 Hardware</td><td>All Hardware</td></tr>
<tr><td>  </td><td> </td><td> </td></tr>
<tr><td>Ion Xe
Ion Xe 20
Ion Xe RPU</td><td>Eos Ti
Gio
Gio @5
(All Hardware)</td><td rowspan="2">Eos Apex FP
Eos Apex 5
Eos Apex 10
Eos Apex 20
Eos Apex Processor</td></tr>
<tr><td>All Hardware</td><td>Eos RPU3 (Display Port Hardware)</td></tr>
<tr><td>Maximum Session Capacity</td><td colspan="5">24,576 addresses (48 universes).</td></tr>
<tr><td>Devices Supported</td><td colspan="5">Up to 14 Eos Family devices per session.</td></tr>
<tr><td>Network Requirements</td><td colspan="5">Basic Managed Network Requirements or higher must be met.</td></tr>
</table>

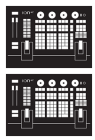
Expansion Processing Example Sessions

Host		Primary	Apex 10 (24k)
		Backup	Apex Processor (24k)
		Total Contribution	+24,576 addresses (48 universes)
Expansion Processor		EEP	Apex Processor (24k)
		BEEP	Apex Processor (24k)
		Total Contribution	+24,576 addresses (48 universes)
Session Capacity	48,128 addresses (94 universes)		

Host		Primary	Eos Ti (Display Port) (24k)
		Backup	Gio @5 (Display Port) (24k)
		Total Contribution	+24,576 addresses (48 universes)
Expansion Processor		EEP	Eos RPU3 (Display Port) (24k)
		BEEP	Eos RPU3 (Display Port) (24k)
		Total Contribution	+24,576 addresses (48 universes)
Expansion Processor		EEP	Eos RPU3 (Display Port) (24k)
		BEEP	None
		Total Contribution	+24,576 addresses (48 universes)
Session Capacity	72,704 addresses (142 universes)		

Host		Primary	Apex 10 (24k)
		Backup	Apex 10 (24k)
		Total Contribution	+24,576 addresses (48 universes)
Expansion Processor		EEP	Apex Processor (24k)
		BEEP	Apex Processor (24k)
		Total Contribution	+24k (48 universes)

Expansion Processor		EEP	Eos RPU3 (Display Port) (24k)
		BEEP	Eos RPU3 (Display Port) (24k)
		Total Contribution	+24,576 addresses (48 universes)
Expansion Processor		EEP	Apex Processor (24k)
		BEEP	Eos RPU3 (Display Port) (4k)
		Total Contribution	+4,096 addresses (8 universes)
Session Capacity	76,800 addresses (150 universes)		

Host		Primary	Ion Xe (2k)
		Backup	Ion Xe (12k)
		Total Contribution	+2,048 addresses (4 universes)
Expansion Processor		EEP	Ion Xe RPU (12k)
		BEEP	Ion Xe RPU (12k)
		Total Contribution	+12,288 addresses (24 universes)
Session Capacity	14,336 addresses (28 universes)		

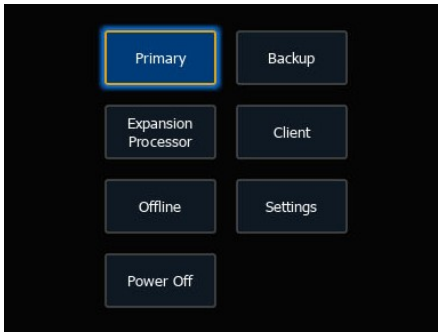
Expansion Processing Configuration

Expansion Processing configurations are stored in the show file in *Setup > System > Processors*. Upon show load, the Processor assignments will be loaded to system - and recognized devices will gain the universe assignments stored in the show file (Eos uses its own UUIDs to determine matching hardware).

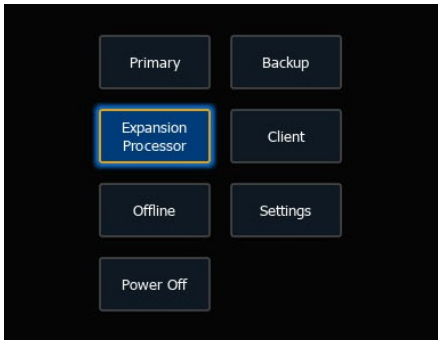
ETC recommends that all networks utilizing expansion processing also use *Time Servers*, to keep the various Eos devices in the system synchronized to a single consistent time.

Configure an Expansion Processing Session

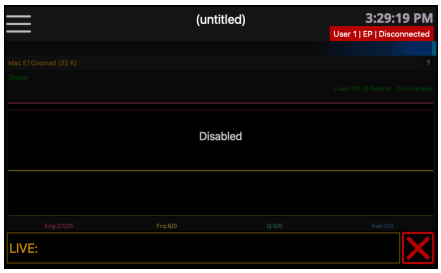
1. On your main console, log in as a Primary.



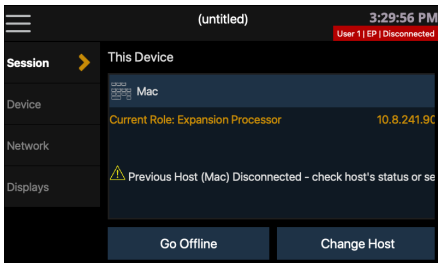
2. Log your intended EEP device in as an Expansion Processor.



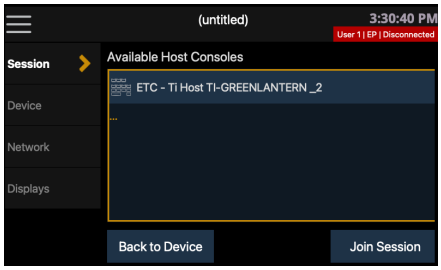
3. On the EEP, go into the Setup menu (hamburger in the top left), then into Session.



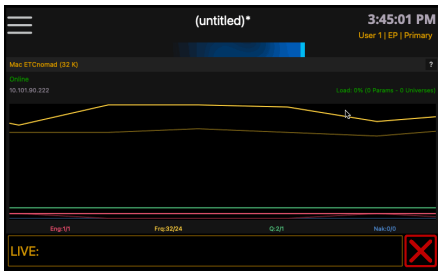
4. Touch on Change Host in the bottom left.



5. Select the Host, and touch Join Session in the bottom left.



6. The EEP is now in the session and available for use.

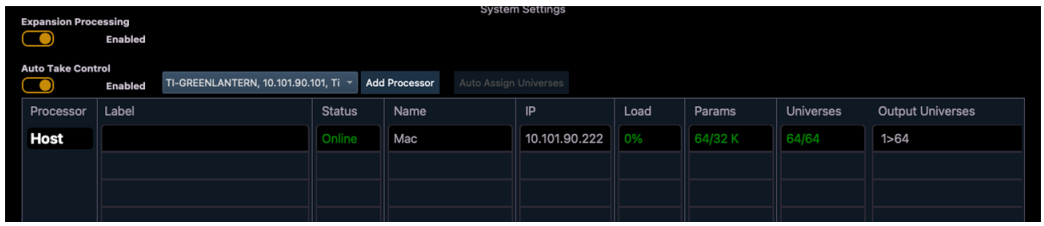


If the software version of the incoming Expansion Processor does not match the Host, the auto-update software settings on the local device will be respected (it is recommended that auto-update software be enabled). Dedicated hardware devices like the *Eos Expansion Processor* always update their software automatically.

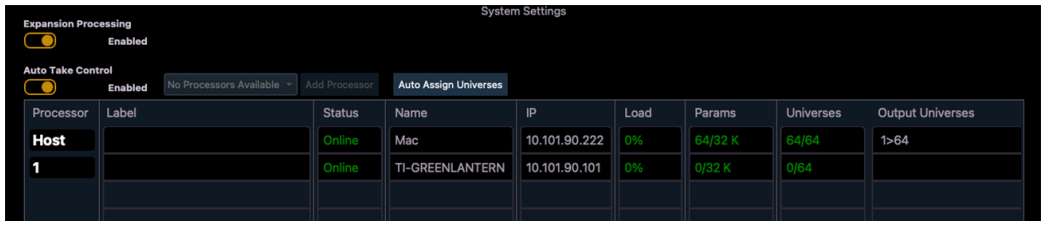
Adding Processors to a Show File

Once a device has joined a session as an Expansion Processor, it can be added and configured in *Setup*. You can also add them offline for configuration ahead of time, and bind EEP hardware to profiles once they are online.

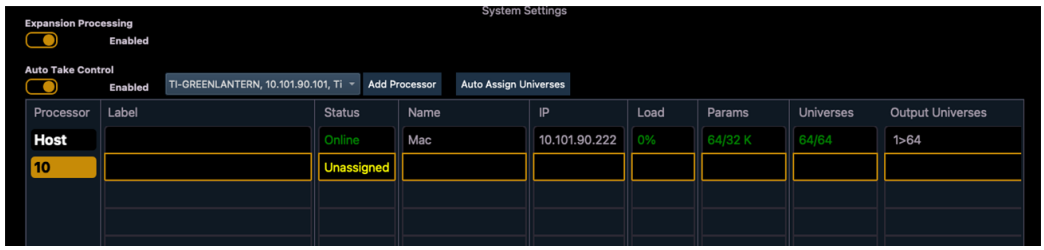
First, go to *Setup > System* **>** *Processors* and enable the Expansion Processing setting at the top. If you disable Expansion Processing, the system returns to classic output mode, where the Host will try to process and output all universes up to the license level of the Host. All universe assignments are remembered, so if Expansion Processing is re-enabled, the session will be restored.



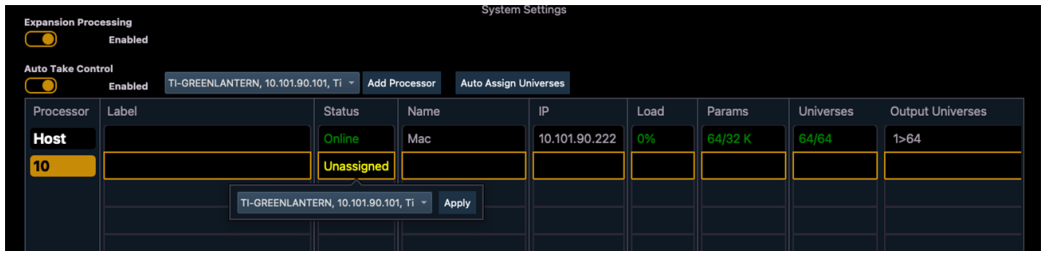
You can add processors by using the dropdown, or by adding them and then binding them to hardware. To use the dropdown, touch the menu, and select **Add Processor** next to the desired device. The lowest next available processor slot will be used.



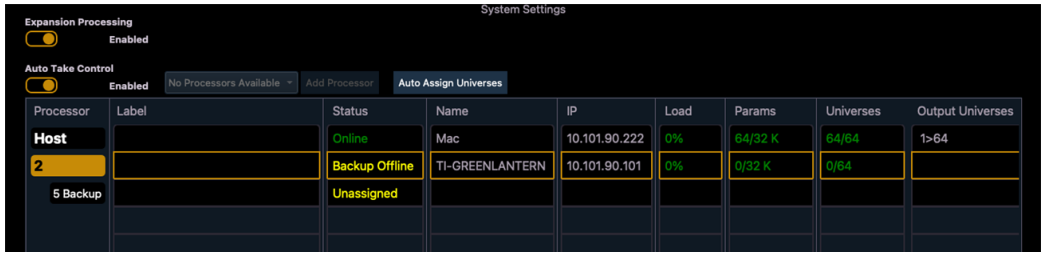
To add a processor profile to bind later, first type **{Processor} [10] [Enter]**.



Now, you can use other softkeys to configure it. When you are ready to bind the processor to real hardware, click on status and choose an available processor.



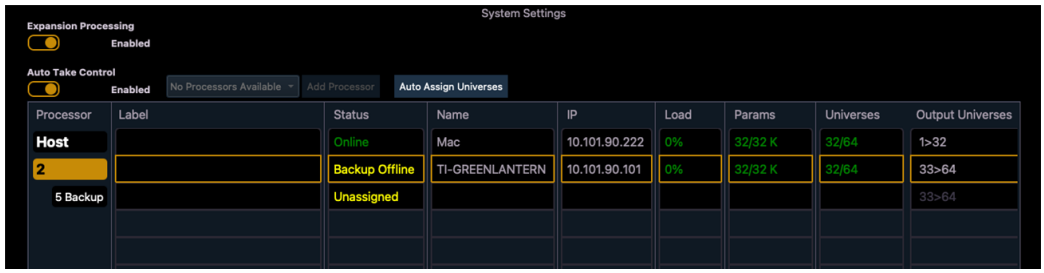
To assign a processor as a backup to another processor, type **{Processor} [2] {Backup Processor} [5] [Enter]**. Processor 5 shall now be the fully tracking backup of Processor 2.



To delete a processor from the show and unbind the hardware, type **[Delete] [5] [Enter] [Enter]**. To keep a processor profile and just unbind the hardware, select **Status > Unassigned > Apply**. **[Copy To]** and **{Move To}** are expected to function in this space as well.

Assigning Universes to Expansion Processors

To assign universes to the processor, use the softkey **{Output Universes}** or on a blank command line, start with a number. **{Processor 2} {Output Universes} [33] [Thru] [64] [Enter]** will assign those universes to be processed and output from EEP 2.



Smooth, unified control of a channel relies on using the same hardware to process all of a channel's parameters. Channel parameters include any parts added when *Creating Multipart and Compound Channels*.

Once created, a channel's parts can be addressed individually, including in separate universes. When using expansion processing with multipart channels patched this way, all universes used by the channel's parts must be assigned to the same Eos Expansion Processor.

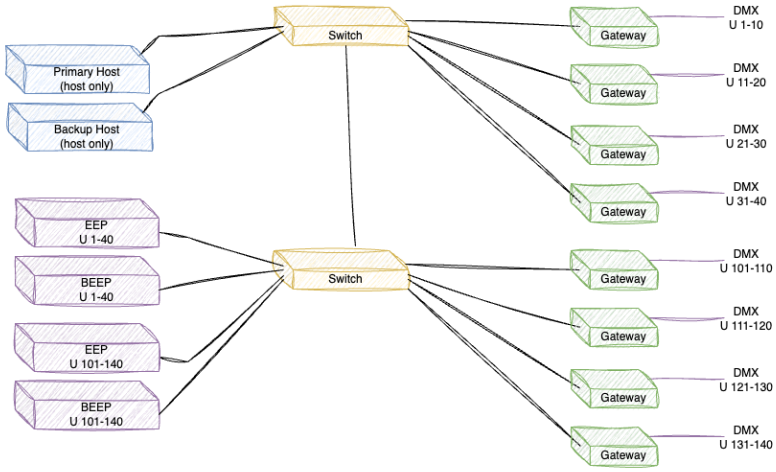
Overclocking EEPs

Devices booted as Expansion Processors can host up to double their license in universes. For example, an Ion XE RPU 12k (24k universes) can host and output 24k (48 universes) while booted into EEP mode. The addresses patched within those universes count against the session capacity, and the total number of addresses assigned to all devices cannot exceed the session capacity. The intention of "overclocking" an EEP has several uses:

- **Unifying like-type and like-purpose systems** - it will be recommended to group logical systems on the same processor, rather than spanning. For example, your front light likely does not want to span processors, in case of issues. Similarly, if you have scenic portals using pixel mapping, it would be recommended to group them together. This may inform your choice in hardware (instead of using an Ion Xe RPU 2k, you may opt for an Apex Processor 24k).
- **Unifying physically-separated systems** - for the same reasons above, but for processors that cover different sets on the same lot, different facades of the same building, etc.
- **Outputting partial universes** - ones who do not have all addresses patched in the session.
- **"Offloading" the Host** - even in a single-EEP system, you'll be able to move all fade engine activities from the Host to the EEP, with properly-sized devices.

Offloading Host Outputs

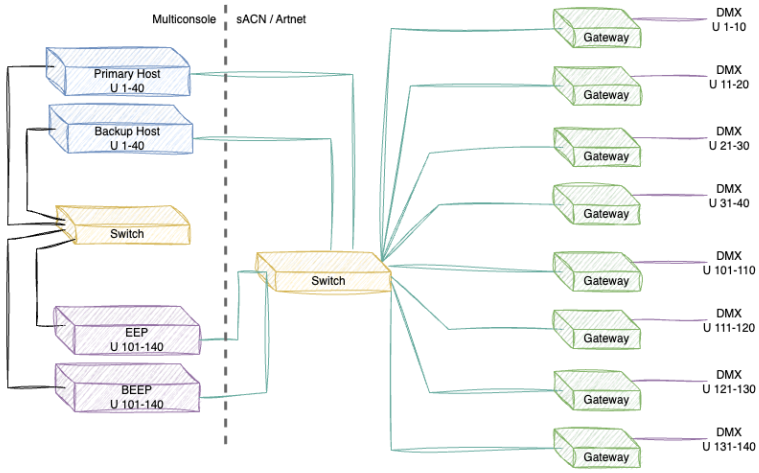
In sessions where the Host needs to focus on Interface tasks, all outputs can be moved to Expansion Processors. This configuration may be required for systems above a certain parameter count - check the Configuration section for up-to-date requirements.



In this layout, all Fade Engine tasks are handled by Expansion Processors, and the Host device will be more responsive with complex displays and input. The Host still retains session management tasks.

Separate LANs

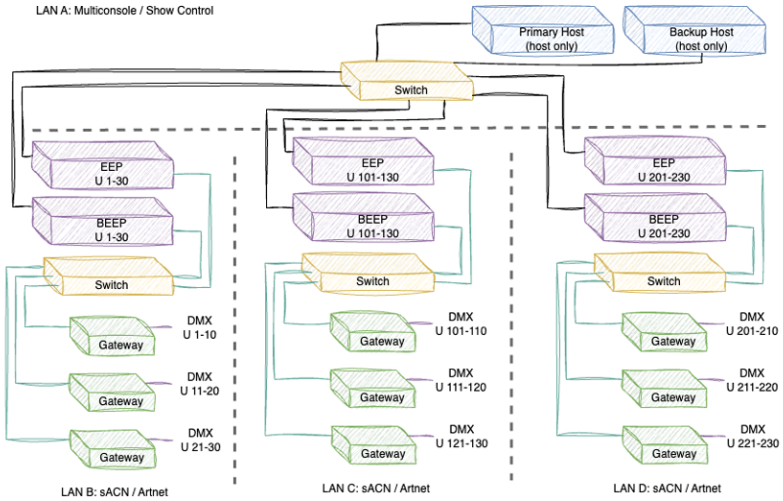
On systems where separating multi-console traffic and output traffic would be valuable, sessions can be designed to use separate LANs by using the multiple NICs on each device, similar to *Network Show Control*. All Eos and entertainment control networks are subject to *Eos Network Requirements*.



Using NIC 1 on each device, a LAN can be created, and Eos can be configured to only allow multi-console communication on that network. Using NIC 2 on each device, a second LAN can be created, and Eos can be configured to only allow output traffic (sACN, ArtNet). Show control gateways must be on the multi-console network.

In addition to scalability, a Deterministic Output scheme offers a predictable network landscape, where you always know which devices are generating which outputs. For large or complex systems, this allows for segregating portions of the output to LANs via multiple NICs. So on large-scale networks like studio sets or installations - you can manage a multi-console

LAN between all devices, and put LANs in each space to prevent the need to manage all universes in all spaces (like on a single managed network). All LANs must follow *Eos Network Requirements*.



Similar to the above example, secondary NICs can be used to create output LANs in large or complex environments. Remember that show control gateways and communication must be on the multi-console network.

Expansion Backups and Failover

Primary, *Backup*, and *Expansion Processor (EEP)* devices may each be assigned a Backup Eos Expansion Processor (BEEP) to take over their outputs if they go offline.

Host Backups

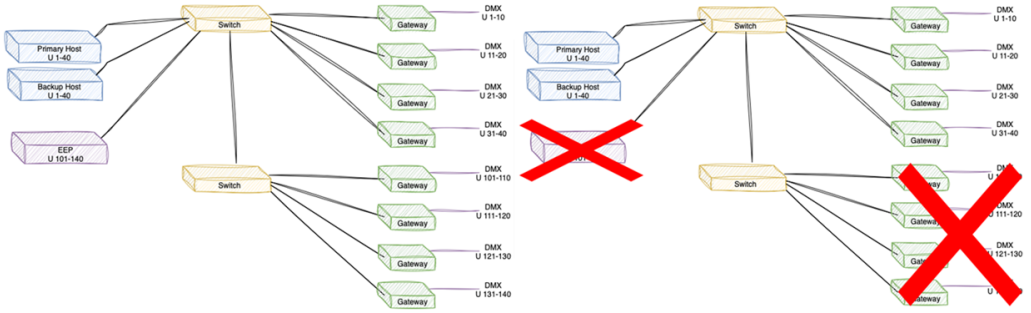
As has always been the case, it is recommended to run all sessions with a full-tracking Backup for the Primary Host console. In sessions utilizing Expansion Processing, the same rules for a Host Backup apply: the lesser of the two licenses will be used to determine the license contribution of the Primary-Backup pair. It is recommended to use the same device, hardware version, and output count in a Primary-Backup pair.

If the Primary fails, the Backup will assert control of the session (either automatically or manually, based on settings described below), and all responsibilities of the session will transfer to the Backup, including output ascribed to the Primary, synchronization with EEPs and Clients, and third-party integration like show control.

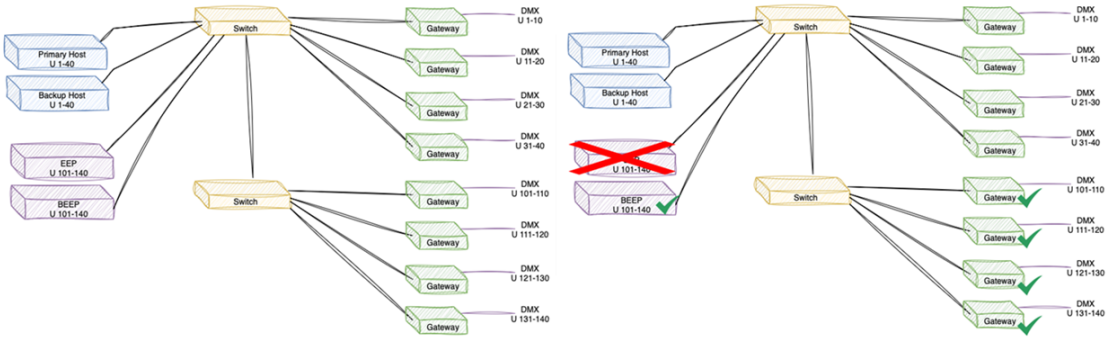
Expansion Backups

Because of the deterministic nature of Expansion Processing, if an output segment is critical, it must be backed up to ensure output during a failover.

If universes 101-140 are assigned to an EEP that goes offline, those universes will not be generated from anywhere else in the system unless they are reassigned in *Setup > System* > *Processors*.



Therefore, it is recommended to have full-tracking BEEPs for each session-critical device. Like Primary and Backup Hosts, an EEP-BEEP pair determines their license contribution to the session by using the lesser or the two licenses. It is recommended to use the same device, hardware version, and output count in an EEP-BEEP pair.



EEP Settings in Setup

There are several settings that determine how failovers are handled session-wide. These settings are in **Setup > System >** *Session*, and impact any failover - be it between the Primary and Backup Host, or between an EEP and BEEP pair.

Global Backup Settings

- **Auto Take Control** - when disabled (default), the affected pair will send a prompt to the session alerting to the outage, and allowing the user to manually force the Backup to take control for its paired device. When enabled, the Backup will automatically take control when it senses a failed connection with its paired device, and will prompt the session that it has taken control.
- **Use Higher Priority (sACN)** - when a Backup receives control (either manually or automatically), if this setting is disabled, the Backup device will output the sACN its paired device was outputting at the same sACN priority level. If this setting is enabled (default), upon taking control the Backup device will output the sACN of its paired device at one priority level higher. For example, if the failed device was outputting at sACN priority 70, the Backup would output at 71.

EEP Failure Settings

In the event both the Primary and Backup Hosts go offline, a **{Hold Last Look}** (HLL) setting can be enabled for Expansion Processors, as a way to help a session ride through a temporary loss of all Host devices.

- {Hold Last Look} - if this setting is disabled (default), when an Expansion Processor loses connection with all Hosts, it will recognize the disconnected state, stop output, and await a Host to rejoin the session. If this setting is enabled, the Expansion Processor will continue to output at its last known playback state, including dynamic elements like auto-called cues and effects.
- Hold Last Look Timeout - if HLL is enabled, this setting determines how long HLL behavior will be active. If the time expires and a Host has not rejoined the session, the Expansion Processor will recognize the disconnected state, stop output, and await a Host to rejoin the session.

Chapter 3

System Basics

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Important Concepts

Before using your console, you should read and familiarize yourself with the concepts defined below. These concepts are important for understanding both how your console functions, as well as how you will interact with your system.

Channel

A channel is a single numerical name that is used by your console to control a dimmer, a group of dimmers, a dimmer and a device, or a complete automated fixture.

Fixtures

A fixture is defined as a group of related addresses that together control a device. Most LED and automated fixtures contain multiple parameters that allow you to independently control functions like pan, tilt, scroll, color, and so on.

Eos family consoles treat fixtures and channels as one and the same, assigning each fixture a single channel number. Individual parameters are then associated with that channel as additional lines of channel information.

When you select a channel number, all of the controllable properties or parameters of that channel are available through the keypad, level wheel, encoders, or Moving Light (ML) Controls (**[Tab] [5]**).

Note: *Multicell Fixtures, which are made up of multiple channels and addresses, are handled differently. See Patching Multicell Fixtures.*

Address

Addresses are numerical identifiers set on the actual dimmers, multi-parameter fixtures, or other devices you want to control. To connect addresses to channels, you will need to use the *Patch* function. Patched Eos addresses correspond to DMX addresses in your system. A conventional incandescent fixture's address should match its DMX address. Multi-parameter fixture addresses should match their starting DMX address, with each parameter taking up subsequent addresses.

Note: *You can patch more than one address to a single channel, but you cannot patch multiple channels to a single address.*

Syntax Structure

Most instructions can be entered into your console through the command line. The command line expects instructions to be entered in a specific structure, or syntax.

Generally speaking, the order of syntax can be described as:

1. What are you trying to affect? (Channel, group, etc)
2. What do you want it to do? (Change intensity, focus, pan/tilt, etc)
3. What value do you want? (Intensity at full, Iris at 50, etc)

Naturally other commands will be used in the course of programming your show, but most other functions are modifiers of these three basic steps: modifying the channels you are working with, determining what parameters of those channels you are impacting, and what value you want them to assume. When working with *Record Targets*, the syntax is similar.

Not all actions must be entered from the command line, although many will result in a command line instruction. Other actions bypass the command line entirely.

Enter

Since the command line can receive multiple edits and instructions at once, it is necessary to let your console know when you have completed your instruction in the command line. This is done with the **[Enter]** key.

There are some commands which are self-terminating, and therefore do not require **[Enter]** to be pressed. Some (but not all) of these commands are:

- Out
- +%
- -%
- Level
- Actions from the direct selects

Parameters and Parameter Categories

Eos family consoles divide fixture parameters into four major **parameter categories**: Intensity, Focus, Color, and Beam.

These are the parameters in each category:

- **Intensity** - Intensity
- **Focus** - Pan and Tilt
- **Color** - All color parameters (such as color wheel, CMY, scrollers, and so on).
- **Beam** - Any parameter not covered in the other categories.

Throughout this manual, non-intensity parameters will be referred to as "NPs."

Record Targets

A record target is any data location that you can store data using a **[Record]** command. Examples of record targets are cues, palettes, and macros.

Throughout this manual, the word "target" is used to refer to any container of data.

Cues

A cue is a record target comprised of channels with associated parameter data, discrete (channel/parameter level) timing, cue timing, and cue attributes (such as preheat, follow or hang instructions).

Tracking vs. Cue Only

Eos family consoles are, by default, tracking consoles. This means two things. First, tracking relates to how cue lists are created. Once data is in a cue list, it will remain a part of that cue list, at its original setting, until a new instruction is provided or until it is removed from the cue list using filters or null commands.

Secondly, tracking relates to how changes to cue data are handled. Unless otherwise instructed by a Cue Only command, changes to a parameter in a cue will track forward through the cue list until a move instruction (or block command) is encountered.

It is possible to change the default setting of your console to "Cue Only" in *About Setup*. This prevents changes from tracking forward into subsequent cues, unless overridden with a track instruction. See *Track*.

Eos family consoles also have a **[Q Only / Track]** button that allows you to record or update a cue as an exception to the default setting. Therefore, if the console is set to Tracking, the button acts as Cue Only. If console is set to Cue Only, it behaves as a Track button.

Tracking Mode

When you create a new cue, any unchanged channel parameter data from the previous cue is tracked into the new specified cue. Any changes in this new cue will also track forward into subsequent cues until a move instruction or a block flag is encountered. In the following example, the shaded boxes contain tracked values and the white boxes contain move instructions.

Channel	Cue 1	Cue 2	Cue 3	Cue 4	Cue 5
1	0%	FL	FL	FL	0%
2	25%	25%	25%	25%	25%
3	0%	60%	50%	50%	50%
4	FL	FL	FL	FL	0%
5	30%	25%	50%	30%	65%

When in tracking mode, edits made to an existing cue will track forward through the cue list until a move instruction is encountered. Changes made to cue 3 will affect the cue list as shown below in bold.

Channel	Cue 1	Cue 2	Cue 3	Cue 4	Cue 5
1	0%	FL	50% →	50%	0%
2	25%	25%	75% →	75%	75%
3	0%	60%	75% →	75%	75%
4	FL	FL	80% →	80%	0%
5	30%	25%	65%	30%	65%

Cue Only Mode

The **[Q Only / Track]** key is an exception to this behavior. **[Q Only / Track]** combined with **[Record]** or **[Update]** modifies standard tracking behavior. When you record a cue in the middle of the cue list, using the **[Q Only]** button will prohibit new information from tracking into the subsequent cue, and will protect the previously tracking levels by adding a move instruction into the next cue for those levels. When you rerecord or update a cue, the modifications will not track forward. Using **[Record] <Cue> [3] [Q Only] [Enter]** would affect the cue list as shown below.

Channel	Cue 1	Cue 2	Cue 3	Cue 4	Cue 5
1	0%	FL	**50%**	FL	0%
2	25%	25%	**75%**	25%	25%
3	0%	60%	**75%**	50%	50%
4	FL	FL	**80%**	FL	0%
5	30%	25%	**65%**	30%	65%

Using Trace

{Trace} works just like Tracking mode, except it allows changes to be tracked backwards though the cue list, until it sees a move instruction. In the example below, the channel levels have been adjusted while cue 3 is live on stage. Using Trace will take those adjusted levels and update them into the cues as follows: channel 1's new level is recorded into cue 2, channel 2's level is recorded into cue 1, and channel 3's level is recorded into cue 3. This is because the move instruction for those channels are contained in those cues. In the case of channels 1 and 2, their new level will track into cue 3. Using **[Record] <Cue> [3] {Trace} [Enter]** would affect the cue list as shown below in **bold**.

Channel	Cue 1	Cue 2	Cue 3	Cue 4	Cue 5
1	0%	**50%**	← 50%	FL	0%
2	**75%**	75%	← 75%	75%	75%
3	0%	60%	**75%**	50%	50%
4	**80%**	80%	← 80%	FL	0%
5	30%	25%	**65%**	30%	65%

{Trace} {Trace} will force that channel's new value to go backward in the cue list.

For information on using **[Update]** and **{Trace}**, see *Update Using Trace*.

Move Instruction

A move instruction is any change to a parameter from its previous stored value, such as changes to a channel's intensity, pan or tilt, color mixing, etc.

Manual Data

Manual data is any value set for a channel via the command line in Live. Manual data will remain at its value until a move instruction is provided for it.

Move Fade

Move fade is a lighting control philosophy which determines how cues are played back on Eos family consoles. Element Classic consoles are inherently move-fade only.

In a move fade system, parameters do not change from their current setting until they are provided a move instruction in a cue or are given a new instruction manually.

Move fade systems allow for fade-within-fade behavior. Fade-within-fade means that you can start a long fade in one cue, and the following cues will not affect the long fade as long as none of the following cues contain move instructions for the channels in the long fade cue. A blocked value is considered a move instruction. Additionally, manual changes to channels will not be removed by pressing **[Go]** unless the incoming cue contains a move instruction for those channels.

For example, in cue 1, channel 1 has been given an intensity value of 50%. This value does not change until cue 20, where channel 1 is moved to 100%. Therefore, channel 1 has a tracked intensity value of 50% in cues 2-19. If the user applies a manual intensity value of 25% while sitting in cue 5 (for example), that channel will stay at 25% until Cue 20 is recalled - because 20 is the next cue in which channel 1 has a move instruction.

Cue List Ownership

Note: *Multiple cue lists are not available on Element 2 and Element Classic.*

Most Eos family consoles are capable of running multiple cue lists. Cue list ownership is determined by the cue from which a channel is currently receiving its value. In Live, a parameter is considered to be "owned" by a cue list when it is receiving its current value from that cue list.

When alternating between cue lists in sequential playback, an active cue list does not necessarily own a channel unless that list has provided the last move instruction for that channel. For example, assume a channel is owned by cue list 1 and is at a tracked value. If a cue from another cue list is executed and provides a move instruction for the channel in the new cue, the channel is now owned by the second cue list. It will not return to cue list 1 until that cue list provides a move instruction for the channel.

Assert may be used to override this default behavior, allowing a cue list's control over a channel to resume, even when the channel's data is tracked.

This rule is not followed when executing an out-of-sequence cue. An out-of-sequence cue is any cue that is recalled via **[Go To Cue]**, a Link instruction, or manually changing the pending cue. In general applications, the entire contents of the cue (both moves and tracks) will be asserted on an out-of-sequence cue.

Block vs. Assert

Note: *Assert is not available on Element 2 and Element Classic.*

Blocked channel data is an editing convention only, and it prohibits tracked instructions from modifying the associated data. Blocked data has no impact on playback; the channels will continue to play back as though they were tracks. Assert is used to force playback of a tracked/ blocked value.

Live and Blind

Live and Blind are modes in which to view and edit data in your show files. When you press the **[Live]** key, the screen will show you the live display. When you press **[Blind]**, you will see the blind display. In either case, you may alter how the data is displayed *Using [Format]*.

When in Live, the data displayed represents the data being sent from the console at that moment. In other words, the parameter data that is "live" on stage. When you edit data in live, those changes will become active and visible on stage as soon as the command line is terminated.

When in Blind, the data displayed represents data from the record target you choose to view (cues, presets, palettes, and so on). When you edit data in Blind, changes will not automatically appear on stage, since the data you are modifying is not live. This is true even if the record target you are modifying is active on stage. It is possible to play a cue in Live, then switch to Blind and edit that cue in blind without affecting levels on stage. Edits in Blind do not require a **[Record]** command to be stored. They are considered stored when the command line is terminated. Any display that is not the Live display is considered Blind, and the Blind LED will be illuminated. For example, if you open patch, the blue LED on **[Blind]** will be lit to show that you are in a Blind display.

HTP vs. LTP

HTP (Highest-Takes-Precedence) and LTP (Latest-Takes-Precedence) are terms used to define the output of a channel parameter that is receiving data from multiple sources. Cue lists can operate as HTP or LTP for intensity parameters only. Non-intensity parameters (NPs) are always LTP. Submasters can operate as HTP or LTP for intensity. The default is HTP. The default cue list setting for intensity is LTP.

HTP

HTP is only applicable to the intensity of a channel. HTP channels will output the level that is the highest of all inputs. HTP channels are also referred to as "pile-on", because as control inputs are added (for example - you may bring up cues and multiple submasters that all have the same channel recorded at various levels), the system calculates which input has the highest level for that channel and outputs that level for the channel. As control inputs are removed (you pull some of the submasters down to zero), the console will adjust the channel level, if required, to the highest remaining level.

LTP

LTP is applicable to any parameter of any channel. LTP output is based on the most recent move instruction issued to the channel parameter. Any new values sent to the channel will supersede any previous values, regardless of the level supplied.

Once an Eos console determines the LTP value for a channel, it can be overridden by any HTP input values that are higher than the LTP instruction. This can then be modified by manual control.

Powering Up and Down

Reference the *Eos Family Product Overview and Setup* chapter for hardware information specific to your Eos device.

Powering Up

1. Attach the appropriate power cable to the IEC connector on the rear of your device.
2. Press the I/O switch (I is “on”) next to the IEC connector on the rear of the console to turn power on. This will provide power to all internal electronics.
3. Press the power button located on the front of your device. The button LED will illuminate blue to indicate . The console will boot to the launch screen, then launch the Eos application. The system is now ready for use.

Use the *Open in "Shell" E.C.U.* setting to change this behavior. When enabled, the device will boot to the welcome screen without automatically launching the Eos application. When disabled, the console will boot into whichever of the *Eos Device Roles* it was last used in.

Powering Down

1. After *Saving Show Files*, select **{Power Off Device}** in the browser menu. A dialogue box opens asking you to confirm.
2. Confirm this command by pressing **{OK}** in the dialog box. The console will power down.

The console will display an improper shutdown message on the next power up if the console was not powered down from the browser menu or welcome screen.

Eos Family consoles use persistent storage systems. Therefore if you shut down your system without saving the show file, you will return to the same place in your show when you reboot.

Central Information Area (CIA)

The Central Information Area (CIA) is the lower portion of the screen. By default, the CIA consists of three primary areas: the command line, the parameter display, and the browser. Softkeys are also contained within the CIA.

Gio and *Gio @5* have a *Mini Encoder Display* as part of their CIA.

1	*Parameter Display*	2	*The Command Line*	3	*CIA Icons*	4	*Browser*

Parameter Display

This display shows the parameters available for patched channels. It is also where you can select which parameters to view in the Live and / or Blind displays, or select parameters for command line control. The parameter display will dynamically change depending on the

channel (fixture) selected and its applicable parameters. See *Using the Parameter Display*.

Parameter Category Button Labels

These labels correspond to the six parameter categories; Intensity, Focus, Color, and the three Beam categories (Form, Image, and Shutter).

Collapsing the Parameter Display

The parameter display can be collapsed when working with some displays that use the CIA, such as About and Query. A collapse/ expand arrow will display in the last column where this option is available.

When collapsed, only the **{All NPs}**, **{All Speed}**, and **{**Expand Arrow**}** buttons will be displayed.

The Command Line

This is the area where commands appear when entered. When in Live, this line is bordered in gold. The command line will display in blue when in Blind.

The command line requires a specific *Syntax Structure* for command input.

Press **[Clear]** to remove commands from a terminated command line. Use **[Shift] & [Clear]** to remove commands from a command line that is not terminated.

Command Line Prompt

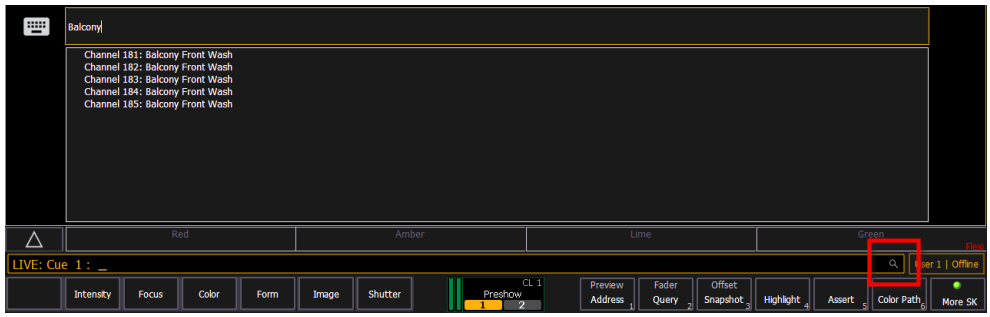
Note: *This feature is only available on Element 2 and Element Classic.*

Directly above the command line, you will see gold text that will prompt you for an action. The prompts will change between different displays and actions, and provide useful information to aid you in programming.

Command line prompts can be disabled in **Setup >** *Device > Displays*.

Command Line Search

Command line search allows you to search your recorded targets, effects, and channels. The search window will display the object, it's number, and any label you have given it.



Press the **Search** icon at the end of the command line or use **[Shift] & [About]** to open the command line search window.

CIA Icons

There are three icons located above the CIA.

Favorite CIA Display

You can select a favorite default display for the CIA that will show when **[Displays]** is pressed. The standard default display for the CIA is the Browser.

The favorite display will show a **gold star** icon at the top of the CIA by the arrow and lock icons. Displays that can be selected as a favorite, but are currently not, will show a **gray star** at the top of the CIA. Click on the **gray star** to make that display your favorite. That display will now be the new default display for the CIA. Displays that show up in the CIA but cannot be the default display will not show the star icon.

Collapse/ Expand the CIA

It is possible to collapse the CIA from view. To do this, you can click the **arrow** icon above the CIA. The CIA will collapse from view, exposing a larger viewing area of whatever display is visible above the CIA. The arrow will move to the bottom of the screen.

To expand the CIA into view again, click the **arrow** at the bottom of the screen. The CIA will reopen.

Lock the CIA

You can lock the CIA in place to prevent it from being collapsed or viewed.

To lock the CIA, click on the **lock** above the browser. The lock will "lock".

To unlock the CIA, click the sunken **lock** again.

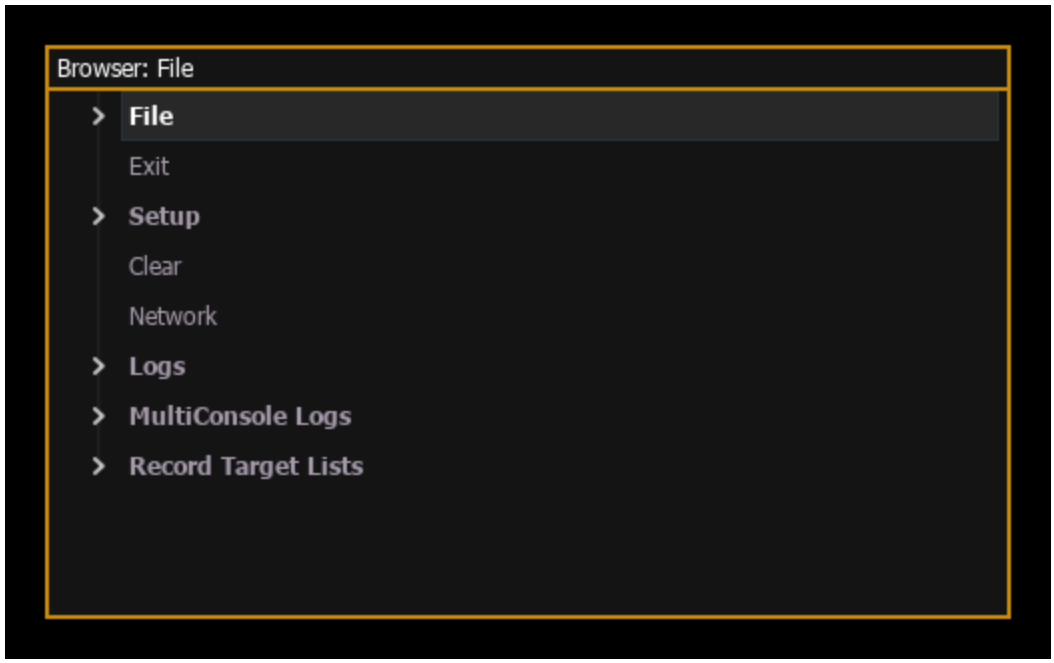
Note: *While locked, the CIA can still be collapsed or expanded by clicking the **arrow** icon. You can also use **[Displays] & [Page ▲]** to expand or **[Displays] & [Page ▼]** to collapse.*

Browser

The browser is the interface for numerous functions including saving and loading *Show Files*, opening displays, and many other functions. Press **[Displays] {Browser}** to open the browser.

Using the Browser

To use the browser, you must first draw focus to it by touching anywhere in the browser area of the CIA. When focus is on the browser, the window border highlights in gold. The paging keys will now control selection in the browser.



- Use the page arrow keys to move the selection bar up and down the list. You may also use the level wheel to scroll through the list.
- When the bar highlights the desired menu, press **[Page Right]** to open the menu.
- Continue pressing **[Page Right]** to open submenus.
- Scroll to the item you wish to open using **[Page Up]** or **[Page Down]**, or select the item by clicking or tapping. Press **[Enter]**, **[Select]**, or double-click to open.
- If you wish to close a submenu scroll to that item and press **[Page Left]**.
- Additional presses of **[Displays]** will minimize or restore the CIA.
- To draw focus to the browser at any time, press any area within it or press the **[Displays]** button.
- File folders display with a folder icon beside their name.
- Previous versions of a showfile will be displayed in dark gray text. To see previous versions of a showfile, you must click on the arrow to the left of the showfile name or use **[Page ▶]**.
- The **[Select]** key can be used to confirm a choice in the browser.

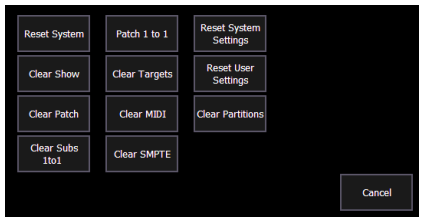
Browser Color Coding

The following color coding for selected items is used in the browser:

- **Save** - green.
- **Save As** - green.
- **Open** - red.
- **Merge** - yellow.
- **New** - red.
- **Clear** - red.

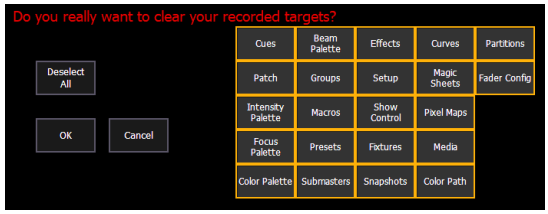
Clear Functions

You can access the various clear options from the browser by selecting **{Clear}** from the main browser menu. The clear functions window will open in the CIA.



From this menu you can select one of the available clear options by clicking on the desired button in the CIA. Eos will ask you for a confirmation before performing the selected clear. For {Clear Targets}, Eos will allow you to choose which record targets you want to clear.

CAUTION: ***Clear functions cannot be undone by using the Undo option.***



From the {Clear Targets} screen you can select which record targets you wish to clear. The buttons at the center of the CIA represent all of the record targets that you can choose to clear. By default all components are selected (gray) and will be cleared. To withhold any targets from being cleared, simply deselect them in the CIA by clicking the respective button. To deselect all of the targets, click the {Deselect All} button.

To reselect all targets, click the {Select All} button and all buttons will return to gray (selected). To stop the process, click the {Cancel} button.

When you have selected or deselected all of the record targets you require, click {OK}.

After clearing, the CIA will return to the browser. If you want to perform additional clear functions, you must select {Clear} from the browser again.

To exit the clear functions screen without clearing, press the [Displays] key at any time or select a clear button and then select {Cancel} from the confirmation screen.

Reset System vs Clear Show

Using {Reset System} will open a new show file and reset the Setup options to their defaults. Using {Clear Show} will only open a new show file.

Patch 1 to 1 vs Clear Patch

Using {Patch 1 to 1} will clear your patch and set it to a 1-to-1 patch. Using {Clear Patch} will only clear out the patch.

Softkeys

Some of the features and displays of your Eos family console are accessible from the softkeys, which are located under the Browser. Softkeys are indicated in documentation with **bold {braces}**.

The softkeys are context sensitive, therefore they repaint to display softkeys relevant to the display or command you are working with. The white labels on the bottom row indicate the

active softkeys. The gray labels in the top row indicate the second page of available softkeys, available by pressing the **[More SK]** button. For example, with a channel on the command line, pressing **[More SK] & [Intensity]** will post Make Manual on the command line.

On Element 2, Ion Classic, and Element Classic, these softkeys correspond to buttons **[S1]** - **[S6]** and **[More SK]** on the face panel.

Changing Softkey Pages

When there are more relative softkeys than the six available buttons, both gray and white softkey labels will be visible. The white labels on the bottom row of the label window indicate the active softkeys. The gray labels in the top row indicate the second page of softkeys.

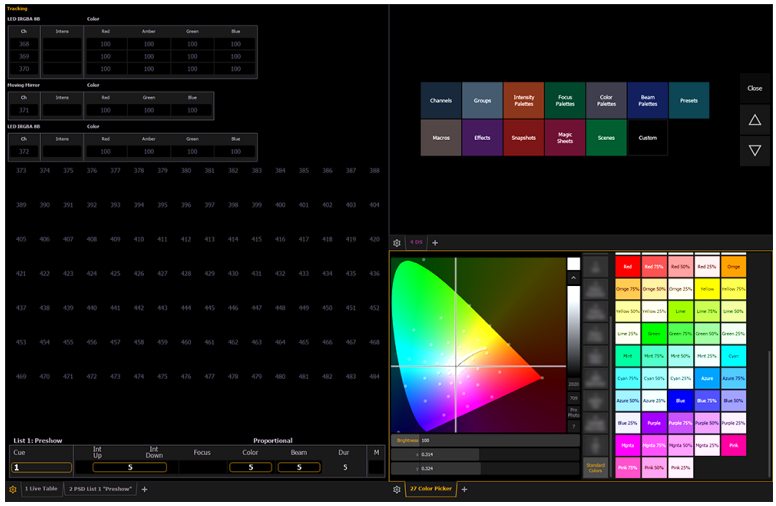
To access the second page of softkeys, press **[More SK]**. To access the previous softkeys, press **[More SK]** again.

Displays

There are several terms that are useful to know when discussing the displays on your console:

- **Monitor** - any physical display or touchscreen device connected to your console. The monitor number will display in the upper left corner of the screen.
- **Workspace** - offers independent display control on all of your connected monitors. Every monitor can have up to three workspaces.
- **Frame** - a subdivision of a workspace
- **Tab** - offers the ability to view multiple displays in one frame.
- **Displays** - are the individual views or tools available for use in programming your console. They are viewed in tabs.

Eos has the ability to have one of three different workspaces active on individual monitors, as well as to have up to 16 frames in use in any workspace. Each frame can hold multiple tabs. Each tab contains one display.



Workspaces

Workspaces offer independent display control on all of your connected monitors. Each workspace can be individually configured with any of the layout, display, and control options available in the *Workspace Layout Menu*.

Every monitor can have up to three workspaces, identified by the numbered workspace icons in the upper left corner of any monitor. Select an icon to open that workspace, or use **[Tab] & [Page Up]** and **[Tab] & [Page Down]** to cycle through workspaces on all monitors. A **{Workspace}** softkey is available by pressing **[Displays]**. Hold **{Workspace}** and type the number of a workspace to open.

Note: *From an alphanumeric keyboard, hold down either of the bracket buttons ([or]) and type in the number of the workspace you wish to view. For example, hold down [and press 2 to view workspace 2.*

Frames

Each workspace can have up to 16 frames in its layout. The number and arrangement of frames can be edited in the *Workspace Layout Menu*.

Tabs

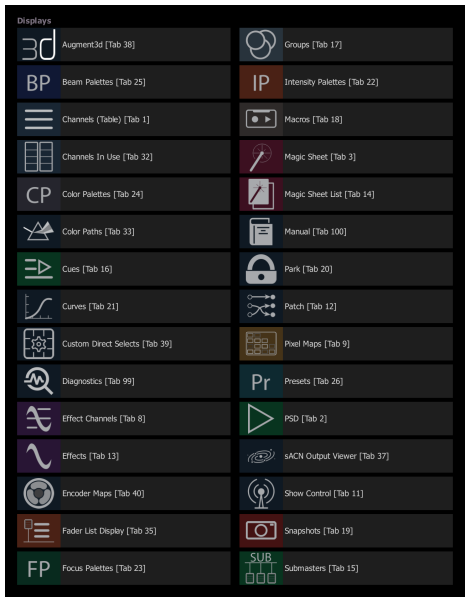
Any frame can have multiple tabs open. You can open or close tabs using the icons in the *Workspace Layout Menu*, or typing **[Tab]** & the tab number.

Pressing **[Shift] & [Tab]** once will clear all tabs on the selected monitor but tabs in locked frames will remain. Pressing **[Shift]** and tapping **[Tab]** twice will clear all tabs on all monitors but tabs in locked frames will remain. Tapping **[Tab]** a third time will clear all tabs on all monitors including those in locked frames.

Tabs can be reordered by dragging the tab to a new location.

Display Tabs

Display tabs are the various displays available on the console, such as the playback status display and the park display. The following displays can be selected, and they will open in a new tab in the selected frame:



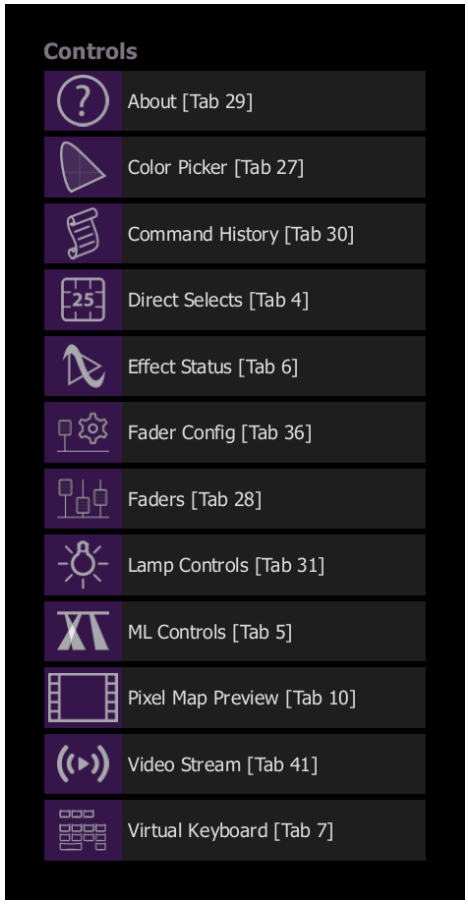
Multiple instances of the following displays can be open:

- *Channels Summary [Tab 1]*
- *Channels Table [Tab 1]*
- *Playback Status Display (PSD) [Tab 2]*

- *Magic Sheet [Tab 3]*
- *Effect Channels [Tab 8]*
- *Park [Tab 20]*

Control Tabs

Control tabs are the virtual control options, such as the color picker and the virtual keyboard. Select from the following list of virtual controls, and they will open in a new tab in the selected frame:



Single-clicking on a control tab will bring it to the front of the frame but will not move focus to that tab unless the tab's frame already has focus. Double-click to bring it to the front and grab focus.

Tab Numbers

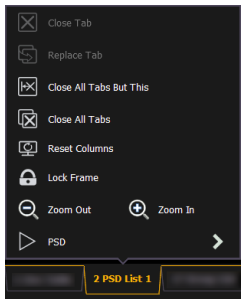
All tabs have fixed numbers under which they open. These numbers appear in the *Workspace Layout Menu* next to each icon. For multiple instances of the same display, the tab number will be followed with a decimal number. Additional tabs will start their numbering with .2. When you press **[Tab]**, active focus will move chronologically through all open tabs on active workspaces.

1. *Live and Blind [Tab 1]*
2. *Playback Status Display (PSD) [Tab 2]*
3. *Magic Sheet [Tab 3]*

4. *Direct Selects [Tab 4]*
5. *ML Controls [Tab 5]*
6. *Effect Status [Tab 6]*
7. *Virtual Keyboard [Tab 7]*
8. *Effect Channels [Tab 8]*
9. *Pixel Map [Tab 9]*
10. *Pixel Map Preview [Tab 10]*
11. *Show Control [Tab 11]*
12. *Patch [Tab 12]*
13. *Effects [Tab 13]*
14. *Magic Sheet List [Tab 14]*
15. *Submasters [Tab 15]*
16. *Cues [Tab 16]*
17. *Groups [Tab 17]*
18. *Macro Editor [Tab 18]*
19. *Snapshots [Tab 19]*
20. *Park [Tab 20]*
21. *Curves [Tab 21]*
22. *Intensity Palettes [Tab 22]*
23. *Focus Palettes [Tab 23]*
24. *Color Palettes [Tab 24]*
25. *Beam Palettes [Tab 25]*
26. *Presets [Tab 26]*
27. *Color Picker [Tab 27]*
28. *Faders [Tab 28]*
29. *[About] [Tab 29]*
30. *Command History [Tab 30]*
31. *Lamp Controls [Tab 31]*
32. *Channels In Use [Tab 32]*
33. *Color Path [Tab 33]*
35. *Fader List [Tab 35]*
36. *Fader Configuration [Tab 36]*
37. *sACN Output Viewer [Tab 37]*
38. *Augment3d [Tab 38]*
39. *Custom Direct Selects [Tab 39]*
40. *Encoder Maps [Tab 40]*
41. *Video Stream [Tab 41]*
99. *Diagnostics [Tab 99]*
100. *Manual [Tab 100]*

Tab Tools

Every frame has a gear icon in the lower left corner of the frame at the start of the tab bar. Selecting this icon will open the tab tools menu, which provides options for opening and closing tabs in that frame. Tab tools can also be opened by double-selecting or context-selecting a tab in focus.



The following options are available:

- Close Tab - closes the selected tab.
- Replace Tab - allows you to close the current tab and choose from the Home Screen which display to replace it with. Pressing escape will return you to the previously selected tab.
- Close All Tabs But This - closes all of the tabs except the selected one.
- Close All Tabs - closes all of the tabs including the selected one.
- Reset Columns - resets all of the column widths in the selected tab to Eos defaults. This option will only be available for displays with columns.
- Lock Frame - prevents any additional tabs from being opened in the selected frame, unless intentionally added with the display picker.
- Open New Tabs In This Frame - specifies that any new tabs opened will automatically open in the specified frame. Only one frame can have this option selected at a time.
- Zoom Out / Zoom In - zooms the selected tab.

Not all options are available for every tab.

Tab Configuration Menu

Many displays have a configuration menu that can be accessed from the bottom of the tab tools menu, containing additional options specific to that display's features.

- *Live and Blind Tab Configuration*
- *Channels In Use Tab Configuration*
- *Playback Status Display Tab Configuration*
- *Direct Selects Tab Configuration*
- *Color Picker Tab Configuration*
- *Faders Tab Configuration*
- *Cue List Index Tab Configuration*
- *Magic Sheet Tab Configuration*
- *Augment3d Tab Configuration*
- *Pixel Map Tab Configuration*
- *Pixel Map Preview Tab Configuration*

Display Control and Navigation

Displays can be opened and closed in different ways, depending on the display. Many displays are accessible from the browser, while other displays are accessible from the softkeys. Blind displays or lists of record targets can be quickly accessed by double pressing the record target button; for example, [Cue] [Cue] opens the Cue List Index.

Live and Blind [Tab 1] and the *Playback Status Display (PSD) [Tab 2]* are always open and cannot be closed. Multiple instances of these tabs can be opened.

Every display has an assigned tab number. Tab numbering is useful for navigating to views. See *Tab Numbers* for a list of displays and their tab numbers.

Opening Displays

From the Home Screen

The *Workspace Layout Menu* shows all of the available displays for quick selection. Click on the **{+}** button by the tabs to access the home screen.

From the Browser

Open and navigate the *Browser*. You can open record target lists, such as the preset list or cue list index, by navigating to **Browser > Record Target Lists**.

To the browser, simply press **[Displays]**.

Using Hardkeys

You can open list views of any record target by double-pressing the key for the desired record target . For example, **[Cue] [Cue]** opens the cue list index.

Using Softkeys

To open any displays accessible from the softkeys, press **[Displays]**. The softkeys will repaint to display:

- Effect Status
- Color Picker
- Patch
- Setup
- Browser
- Magic Sheet
- Workspace
- Command History
- Curves
- Pixel Maps
- Show Control
- Mirror

Single press any of these softkeys to open the associated display.

Closing Displays

To close any tab display, select the display by using the **[Tab]** key or other means of navigation. When the desired display is active, press **[Escape]** to close it.

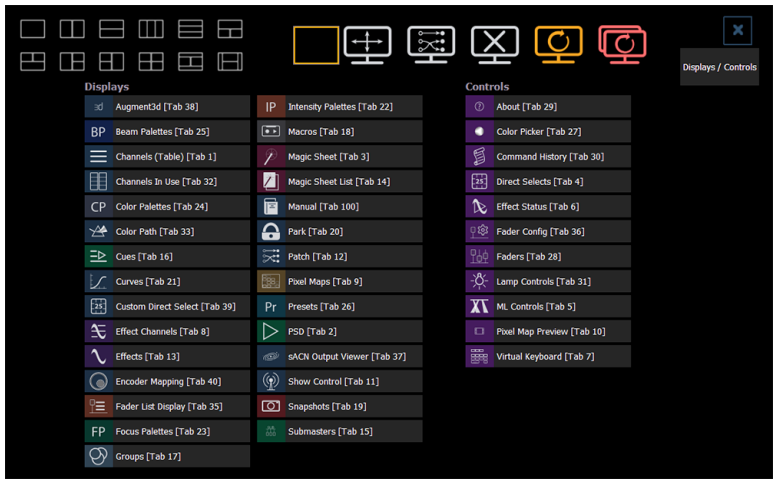
To close a display in the CIA, press the **[Displays]** key and the browser will reappear.

To close all displays except for the Live and Blind display and the playback status display (Tabs 1 and 2), press **[Shift] & [Tab]**.

You can also close tabs by using the *Tab Tools*.

Workspace Layout Menu

Upon start up or creation of a new show file, any connected monitor that is not already displaying *Live and Blind [Tab 1]* or the *Playback Status Display (PSD) [Tab 2]* will show the workspace layout menu. This screen will also display when a new tab is opened.



This screen consists of four general areas, each offering different display-related options.

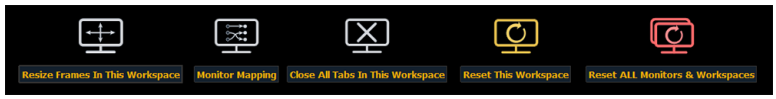
Display and Control Icons

Selecting a display or control icon will open in one or more new *Tabs*.

Layout Options

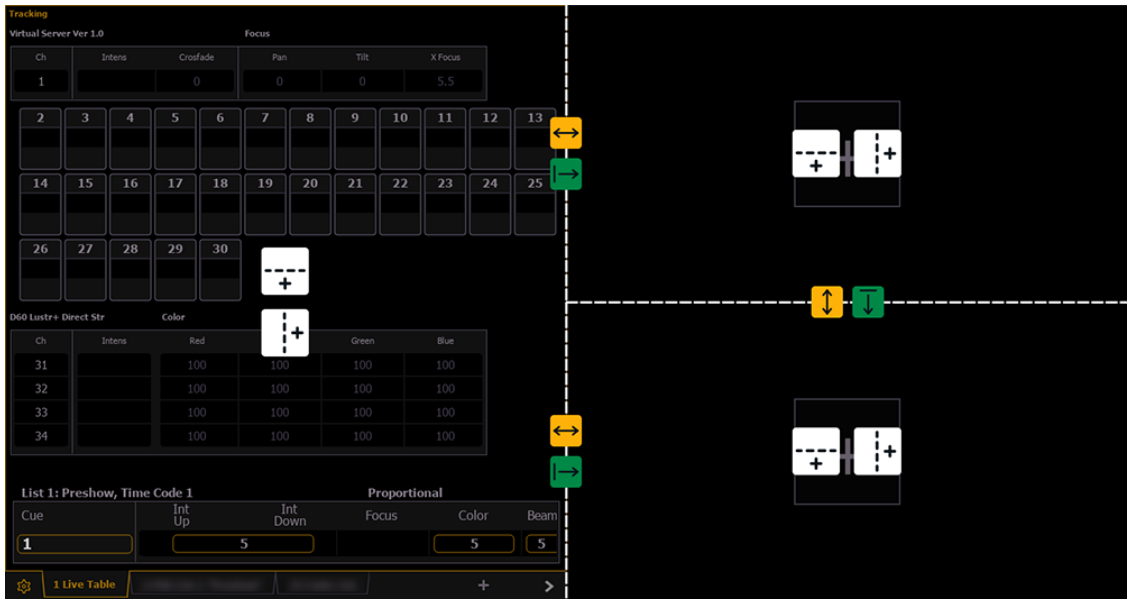
These tools offer you greater flexibility in the number of tabs you can view in any given workspace. A workspace can have up to 16 frames. Selecting a layout icon will assign the frame layout identified in the icon. Once a layout is assigned, you can select which displays and controls will be in which frames.

This screen also offers options for opening and closing tabs as well as resizing and resetting monitors.



Resize Frames In This Workspace

Allows you to freely resize and edit the frames in any of the workspaces on the monitor. Select this option to activate the frame configuration grid.



The grid includes the following tools:

Adds a horizontal split, dividing the associated frame horizontally into upper and lower rows.

Inserts a vertical split, dividing the associated frame vertically into left and right columns.

Drag left or right to freely adjust the width of the associated frames. Double-press to reset to the default horizontal size.

Drag up or down to freely adjust the height of the associated frames. Double-press to reset to the default vertical size.

Eliminates a split by closing the frame to the right and merging its contents into the frame to the left.

Eliminates a split by closing the frame below and merging its contents into the frame above.

Frames of the same size can be freely merged without altering the rest of the grid. Smaller frames can be merged with larger frames, but this may alter adjacent splits. A larger frame will absorb any smaller frames it is merged towards.

The grid is limited to a maximum of three splits in either direction, for up to 16 total frames per monitor or workspace.

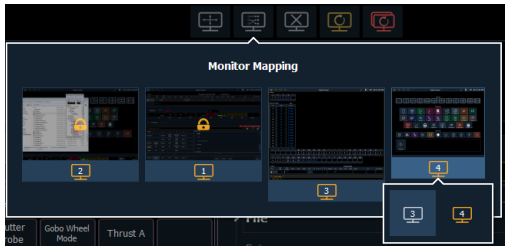
Monitor Mapping

Change monitor arrangement without having to go into the ECU. This function allows you better control of your *Snapshots*.

Click on a monitor to display the available numbers, and then click on the number to assign it.

On-board touchscreens are locked, and their arrangement cannot be changed.

Monitor Mapping



Classic Monitor Mapping

Close All Tabs In This Workspace

Closes all of the tabs in the active workspace on the active monitor only.

Reset This Workspace

Closes all tabs and frames and resets the layout for the active workspace to a single frame displaying the workspace layout menu, from which you can select new tabs to open.

Reset ALL Monitors & Workspaces

Closes all tabs and frames on all monitors, resets all layouts to a single frame, and returns their workspaces to the workspace layout menu, from which you can select new tabs to open.

Flip Monitors

This option is only available on Apex consoles, allowing you to temporarily flip the displays upside down if the monitors are angled to face the rear of the console.

Single Monitor Snapshots

The snapshots displayed here are single monitor-only snapshots recorded for the visible workspace. These snapshots can be recalled from any selected monitor from the workspace layout menu. You can recall a monitor-only snapshot from the command line by using the syntax **[Snapshot] [x] [Enter]**. When recalled from the command line, the selected snapshot will only affect the monitor from which it was originally recorded.

To record a monitor-only snapshot, press the **{New Snapshot}** button on the display controls menu screen. **[Delete] [Snapshot] [x] [Enter] [Enter]** will delete a monitor-only snapshot.

All snapshots can be viewed on the snapshot list display, which can be opened by pressing **[Snapshot] [Snapshot]** or from the workspace layout menu.

Updating a Single Monitor Snapshot

A single monitor snapshot can be updated or deleted by right-clicking on its icon in the Snapshot area of the Workspace Layout Menu.

Using Expand With Displays

[Expand] allows you to quickly create additional frames on a monitor.

- To add frames, press [Expand] & [Page Right] or [Expand] & [Page Down].
- To collapse frames, press [Expand] & [Page Left] or [Expand] & [Page Up].

This button will expand the Live / Blind tab from one display screen to other screens as well. This doubles the number of channels visible on any tab. Live, Blind, and Playback Status tabs may be expanded.

- To expand the Live / Blind tab to up to two additional monitors, press [Expand] & [Page Right]. Once you are in an expanded mode, hitting [Expand] contracts the tab by one monitor.
- To remove all displays from the monitor, press [Expand] & [Page Left].

Scrolling Within Displays

By default the page keys will advance / retreat a display by one page per press. However, to activate scroll lock and scroll through displays, you may press [Shift] & [Stage]. SCROLL LOCK will appear above the CIA when in scroll lock mode.

Scroll lock is a toggle state. When scroll lock is first pressed:

- [Page Up] - scrolls table, spreadsheet and channel views up
- [Page Down] - scrolls table, spreadsheet and channel views down
- [Page Left] - scrolls table and spreadsheet views left
- [Page Right] - scrolls table and spreadsheet views right

Selecting Displays

When a display is selected, the screen is highlighted in a gold border and the display name (such as "1. Live Channel") will be in gold as well. When a display is not selected, there is no border and the tab name is gray.

If a display is already open, it can be selected in the following ways:

- Press [Tab] to change focus between open tabs in numerical order.
- Press [Tab] & [n], where "n" represents the tab number of the desired tab.
- Press [Live] or [Blind] to automatically bring Live/ Blind into focus. If there are multiple instances of Live/ Blind, pressing [Shift] & [Live] / [Blind] brings the next Live/ Blind tab into focus.
- Double press a record target button (such as [Preset] or [Submaster]) to either open the associated display or select it if it is already open.

Zooming Displays

You may zoom in and out on displays. To do this, press and hold the [Format] button and scroll the Level Wheel to alter the display. Scrolling the wheel up zooms in. Scrolling the wheel down zooms out. Zooming the channel summary display when it is in 100 channel mode is not supported. You can also zoom by holding down the left mouse button and rolling the scroll wheel on a mouse.

Moving Displays

To move the active display from one monitor to another, press and hold the [Tab] key and use the page arrow keys to move the display in the direction of the desired screen. One press of the left or right page keys will move the display to the next screen in that direction. To move it back, press the opposite arrow key.

Clickable Displays

Several displays have click supported cells. Clicking on a cell will select and place it on the command line. You can click on multiple cells to select a range of items. Double-clicking a row header will select that row and deselect any other rows. In-Cell editing must be enabled in **Setup >** *Device > Displays*. See *{In-Cell Editing}*.

The following displays have clickable support:

- Show Control List
- Cue List
- Playback Status Display
- Palette Lists
- Sub List
- Preset List
- Effect List
- Group List
- Snapshot List
- Curve List
- Partition List
- Pixel Map List
- Magic Sheet List
- Park Address List
- Patch Display
- Spreadsheet Display
- Macro List

Quick Access Pop-Up Tools

Quick Access buttons are available at the top of each display, opening tools that appear in a pop-up window that overlays your current display.

Select an icon to open a tool, and select again to close the pop-up window.

{Popup Magic Sheet}

Allows quick access to a magic sheet (see *About Magic Sheets*) assigned in **Setup > User > Displays >** *{Popup Nav Lock}*. If a magic sheet has not been assigned, you will be able to choose one from a list of available magic sheets when you first select the icon.

In **Setup > User > Displays >** *{Popup Magic Sheet}*, you can enable or disable the zoom and scroll navigation for pop-up magic sheets. Enabled by default.

{Popup ML Controls}

Allows quick access to the *ML Controls [Tab 5]*.

{Popup Snapshot Browser}

Allows quick access to your favorite *Snapshots*. Snapshots can be assigned as favorites when you record them. Select a snapshot to recall it.

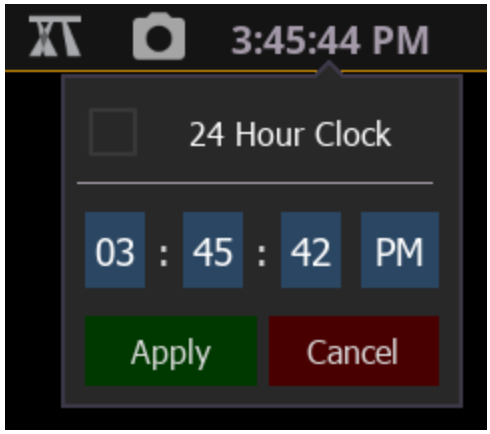
Virtual Keyboard [Tab 7]

{Popup Virtual Keyboard} allows quick access to the virtual keyboard available in **[Tab] [7]**. which mimics the hardkeys found on the physical face panel of Eos Family consoles.

By default, the alphanumeric keyboard shortcut for each hard key displays in the lower right hard corner. You can use the dropdown menu in the bottom right to instead display the key names used in OSC messages. For more information, see *Open Sound Control (OSC)*.

Time

The time the console is using. Defaults to 12 hour format. To use 24 hour format, make sure **{24 Hour Clock}** is checked.



Time can also be changed from the shell via *Time Service (SNTP)*.

ETCnomad time settings are determined by Windows or macOS, and cannot be edited here.

[Time] Key

Holding **[About]** and pressing **[Time]** allows you to view discrete timing data behind any channel parameter. **[Time]** exposes channel or parameter specific timing for any channels in the current cue. The first value is the delay time. If "--" is displayed, there is no delay. The value to the right of the / is the transition time.

You can lock this mode by holding **[About]** and double tapping **[Time]**. When in display time mode, "Display Timing" will display in the upper left of the live display. To exit this mode, press **[About]** again.

[Data] Key

Pressing and holding **[Data]** allows you to view the values behind any referenced or marked data. **[Data]** exposes the next lower reference level. So if you view a palette reference and press **[Data]**, the absolute data will be displayed instead. If you are viewing a preset, absolute or palette data will be displayed, depending on what is contained in the preset.

You can lock this mode by pressing **[Data]** twice. When in display reference values mode, "Data Latched" will display in the upper left of the live display. To exit this mode, press **[Data]** again

[Label]

[Label] is used to attach an alphanumeric label to an object such as cues, channels, submasters, etc.

[Label] [Label] when appended to a record target command, clears the current label. This includes show file labels.

Editing Labels

The page arrow keys on the console or an external alphanumeric keyboard can be used to move the cursor within a label to aid in editing.

- **[Page Up]** - takes the cursor to the beginning of the label.
- **[Page Down]** - takes the cursor to the end of the label.
- **[Page Left]** - moves the cursor to the left.
- **[Page Right]** - moves the cursor to the right.

View Reference Labels

Pressing and holding **[About] & [Label]** toggles the view to *{Show Ref Labels}* or numbers depending on what display setting is being used.

Live and Blind [Tab 1]

The *Live and Blind* display (**[Tab] [1]**) cannot be closed, but multiple instances of this display can be opened.

When in Live, the data displayed represents the data being sent from the console at that moment. In other words, the parameter data that is "live" on stage. When you edit data in Live, those changes will become active and visible on stage as soon as the command line is terminated, unless *{Auto Playback}* has been disabled in **Setup > User > Record Defaults**.

When in Blind, the data displayed represents data from the record target you choose to view (cues, presets, palettes, and so on). When you edit data in Blind, changes will not automatically appear on stage, since the data you are modifying is not live.

While in Blind, the background color of the displays will be blue, the title bar will be bright blue, and **Blind** will display in the top left corner of each monitor. You can select **Blind** to go back to Live.

Using [Format]

Live / Blind has multiple formats. When first opened, it opens in its default view, which is the *Channels Table [Tab 1]*. The default view can be set in the *Live and Blind Tab Configuration* . When the default format has been changed, those new settings will be used whenever the display is changed back to that format.

Press **[Format]** to rotate through any available formats.

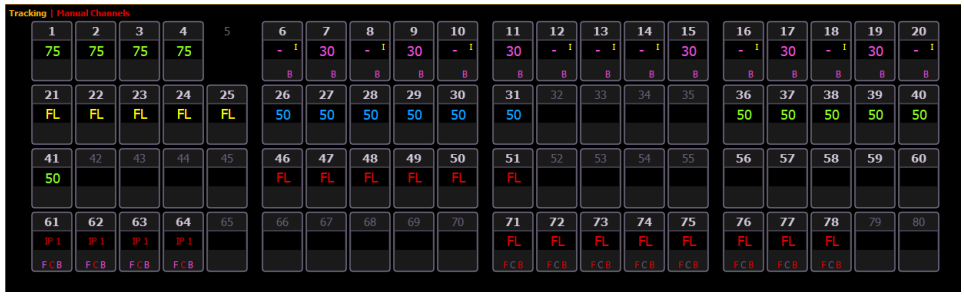
Live and Blind share formatting. When you change from one format to another format, you are always working with the same format until you change it. The exception to this is *Spreadsheet (Blind Only)*, which is only available in blind. If you are working in blind spreadsheet, when you return to live you will be working with the table or summary view, based on which one you were last using.

Channels Summary [Tab 1]

The summary view displays the largest number of channels of any of the formats. This format is best used to see large numbers of channels' intensity data and / or parameter category data. Individual parameters are not visible in this view.

FCB icons will appear at the bottom of the channel area for channels that have those parameters patched to them. See *Indicators in Live and Blind*.

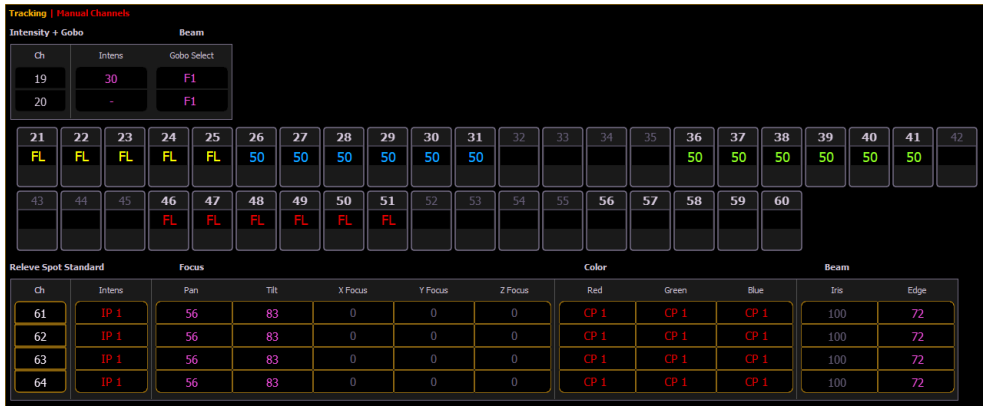
To collapse the summary view, hold down the **[Data]** or **[Params]** key and press any parameter category key. On Element 2, Ion Classic, and Element Classic, you will need to use **[Data].**



When the summary view has been collapsed to show only intensity data, you may include focus, color, or beam data in the summary view by holding down **[Data]** or **[Params]** and pressing any parameter category key to display all categories again.

Channels Table [Tab 1]

Table view is available in Live or Blind. Unlike summary view, table view displays the fixture type associated with channels and details about each channel's category and parameter levels.



In Live, table view displays all active channel data being output from Eos. In Blind, it will display all data for a single record target (cue, preset, palette) depending on what is viewed. In table view, focus, color, and beam information can be viewed in either a summary of these three categories or an expanded view to show all parameter data.

To expand a category to show detail, press the **[Data]** or **[Params]** key and the associated parameter key. On Element 2, Ion Classic, and Element Classic, you will need to use **[Data].**

For example, **[Data] [Color]** will change the color category from a summary view to a detailed one. To collapse a category, press the **[Data]** or **[Params]** key and the associated parameter key. You cannot hide a category from view.

When a category has been expanded, to hide or reveal only certain parameters, press and hold **[Data]** or **[Params]** and then select the parameter buttons of the appropriate parameters in the CIA. The parameters will be displayed or suppressed depending on the current view.

Notice that when you hold down the **[Data]** or **[Params]** button, the buttons of parameters that are currently selected for viewing will be highlighted in the CIA.

In the table, a slight space is provided between fixture types, giving a clear delineation between them. The name of the fixture type is displayed at the top of the section for that fixture.

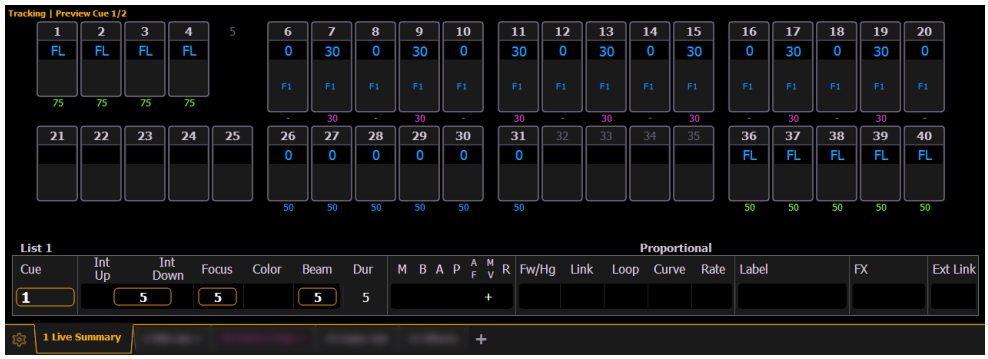
Channels with only intensity parameters will display the same as in summary view.

Preview Mode in Live

A **{Preview}** softkey is available when in Live Summary.

Note: ***{Preview}*** *is not available in Live Table.*

{Preview} allows you to display the intensity values for another cue under the current values in the Live Summary tab. An indicator of what Preview mode you are in will display in the upper left hand corner of the Live Summary display.



In {Preview} mode, the following softkeys are available:

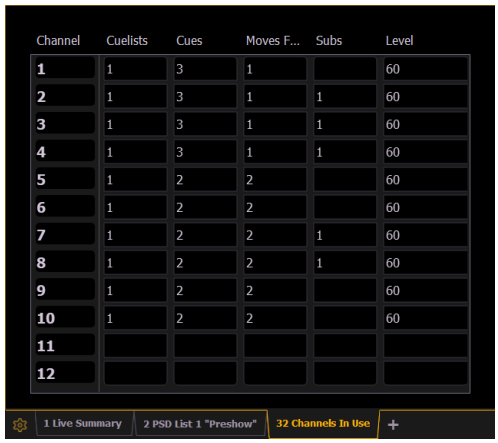
- {Previous} - previews the last cue run from the selected cue list.
- {Pending} - previews the pending cue from the selected cue list.

The following examples show other functions that are available in Preview:

- {Preview}[Next] will allow you to preview the cue higher than the one currently selected. If there is no cue already selected in preview mode, [Next] will behave the same as {Pending}.
- {Preview}[Last] will allow you to preview the cue lower than the one currently selected. If there is no cue already selected in preview mode, [Last] will behave the same as {Previous}.
- {Preview}<Cue>[5] will preview cue 5.

Channels In Use [Tab 32]

To open the Channels in Use display, select the {CIU} icon in the home screen or press [Tab] & [3][2].



This display shows the following information for each channel:

- Number of cue lists the channel appears in.
  - Not available on Element Classic.
- Number of cues the channel appears in.
- Number of cue moves from zero.
- Number of submasters that channel appears in.
- Maximum channel level.

Right-click on the CIU tab to limit see which channels are used with a specified cue list.

Channels In Use Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.

The **Channels In Use tab** configuration menu allows you to filter the displayed channels by **Cue List Selection**. Choose **All** cue lists or select an individual cue list name.

Spreadsheet (Blind Only)

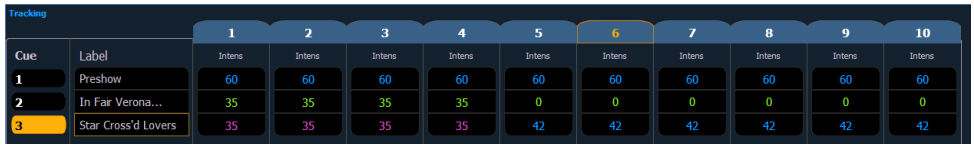
Spreadsheet format is available only in Blind mode. It is useful for viewing channel data and trends for multiple cues, submasters, palettes, or presets at one time. Cues and record targets are displayed on the vertical axis, and channel and parameter data on the horizontal axis.

Note: *Since this is a Blind-only view, changes made in this view are immediate and do not require a record or update.*

As with table view, spreadsheet format allows you to choose exactly which parameters you want to view. Parameters can be expanded/ suppressed by holding **[Params]** or **[Data]** and pressing the desired parameter buttons in the CIA. Category data is not available in spreadsheet, but you may hide all parameters of a specific category by holding **[Params]** or **[Data]** and pressing the desired parameter category button. On Element 2, Ion Classic, and Element Classic, you will need to use **[Data].**

To toggle between viewing just the intensity information and other parameters, press **[Shift]** & **[Format]**.

The label column can be hidden by selecting the **Suppress Target Labels** option in the *Live and Blind Tab Configuration*.



Indicators in Live and Blind

A variety of color, text, and layout conventions are used in **Live** and **Blind** to indicate various conditions.

When *Using [Format]*, color and text conventions apply regardless of the format of **Live** or **Blind** being used.

When manual channels are used, there will be a red Manual Channels advisory in the upper left hand corner of any **Live** display.

Color Indicators

Color indicates information about channel and parameter levels.

Channels

Gray Number	Unpatched channel number.
White Number	Channel number.
Bright White Number	Channel is parked.
Gold Number	Channel is captured.
Gold Outline	Channel is currently selected.
No Outline	Channel has been deleted.

Parameters

Bright Red	Manual data (any data that has been set but not yet stored to an active cue or submaster) on all consoles using the same user ID.
Dark Red	Manual data from consoles using different user IDs.
Blue	Intensity value is higher than in the previous cue. Non-intensity parameters (NPs) are in blue when any move instruction has occurred. Unmarked.
Green	Intensity value is lower than in the previous cue. Also used in reference marking to indicate a channel is marked.
Magenta	Value is unchanged from the previous cue (tracked).
White	A *Block* is applied to the value.
Underscored White	An *Auto-Block* is applied to the value.
Gray	Unowned data. This could be a default value, data not currently being controlled, or a null value (from either *{Make Null}* or a filter).
Yellow	Data set from *Submasters*.
Orange	Data set from *Staging Mode*.
Pink	Override data from *Augment3d Zones*.

When data is in transition (moving), it will appear in a lighter version of its color. This includes up- and down-fades for intensity, non-intensity moves from cues, submasters, and timed manual changes.

Text Indicators

Text indicators are used to show additional channel data.

Color indicators also apply to text indicators. For example, a red M indicates a manual mark, which changes to a blue M once the mark has been stored.

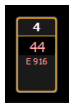
_	Underlined value (white) indicates a system-applied block (also called an auto-block).
+	Found in place of parameter data in summary view. Indicates that not all parameters in that category are at the same value. This indicator is found only in the summary view or in table views when the parameters are collapsed into a category view. If a majority of the values are the same, that value will be displayed along with the indicator. If there is no majority, just the indicator will be displayed.
!	Indicates an ACN, RDM, or dimmer *Errors and Warnings*.
?	Indicates an ACN, RDM, or dimmer *Errors and Warnings*.
A	Indicates the channel or parameter is asserted. Not available on Element Classic.
B	Indicates the channel or parameter is manually blocked. This block must be stored.
C	Captured channel if in yellow. Color Path if in any other color. Not available on Element Classic.
I	Channel is controlled by an inhibitive submaster. When displayed in the Block flag, "I" indicates a cue level intensity block.
IP, CP, FP, BP	Indicates that the value is referenced to a palette (Intensity, Color, Focus, or Beam). This text is followed by a number, indicating which palette is being referenced. This can be substituted with the palette label if the *{Show Ref Labels}* setting is activated . Holding down **[About] & [Label]** will toggle between the palette label and palette number.
M	Indicates a mark is placed, but manual, and must be stored. Is blue when stored."m" indicates cue is not marking. Not available on Element Classic.
MK	Indicates the channel is marked for a later cue. The cue number is indicated in the other categories (see "Q" below). Not available on Element Classic.
ND	Indicates that a channel has been patched as a non-dim fixture type.
N	Indicates the value is null (from either **{Make Null}** or a filter).
P	Indicates the channel is parked.
Ph	Indicates the channel is at a preheat level.
Pr	Indicates that the value is referenced to a preset. This text is followed by a number, indicating which preset is being referenced. The preset label may also be shown if this setting is enabled (see *{Show Ref Labels}*). Holding down **[About] & [Label]** will toggle between the preset label and preset number.
Q	Found in the non-intensity categories of a marked channel. The "Q" is followed by a number indicating which cue the mark is in preparation for.
t	The channel has discrete (parameter/category-specific) timing.
T	The channel has a By Type palette or preset applied.
◆	The channel has a Track SEM Focus Palette applied.
S	Indicates that a channel is stored to a shielded submaster.
R	Indicates a manual reference override. Manual changes have been made that override a previously stored reference (such as to a palette or preset). Once recorded, the reference will be broken. If updated, the referenced target will be updated as well, unless otherwise instructed.

Channel Appearance

The appearance of channel tombstones in **Live** and **Blind** is partially dependent on the fixture type patched to that channel.

Conventionals

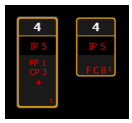
Conventionals are intensity-only fixtures.



Conventionals display the channel number, intensity, and any additional data below.

Multi-Parameter Devices

Multi-parameter devices can be LED or automated fixtures, as well as any controllable device like a hazer.



This view also has additional data fields beneath intensity for **Focus**, **Color**, and **Beam** information.

This information can be truncated by pressing **[Params]** and any of those parameter categories in the CIA, which will leave only the intensity field and FCB indicators at the bottom of the channel. On Element 2, Ion Classic, and Element Classic, you will need to use **[Data].**

Multicell Devices

Multicell devices display the channel number broken into decimals, based on how many cells the device has. Multicell fixtures can be controlled as an entire fixture, individual cells, or a combination of cells. Parameter data can also be suppressed in the same way as automated fixtures.

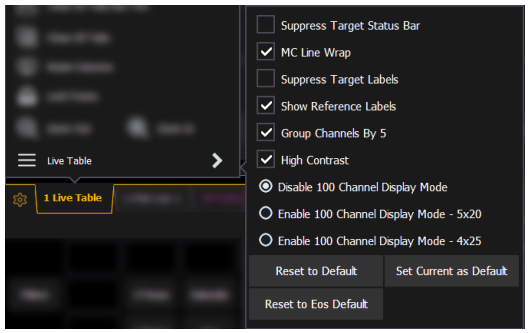
You can hide cells or top-level channels *Using Flexichannel*'s **Cells Off** mode. The top-level channel number will appear with a decimal, display its own information in the normal font size, and use the following data indicators for cells:

- **Value** - all of the cells are at the same value.
- **Value and Plus (+)** - the majority of the cells are at the same value.
- **Plus (+)** - no majority of cells share a value.

Live and Blind Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.

Each instance of Live and Blind may be configured individually.



The following options are available:

- **Suppress Target Status Bar** - hides the target status bar from the display. The target status bar displays at the bottom of the Live/ Blind displays.

- **MC Line Wrap** - when enabled, this option keeps all of the cells together of a multicell fixture when viewing it in Live summary view instead of breaking them up across multiple rows.
- **Suppress Target Labels** - hides the Label column in Blind spreadsheet view.
- **Show Reference Labels** - when enabled, referenced record targets (such as presets or palettes) with labels will have their labels displayed rather than their target type and number. This setting will only affect the selected instance of Live/ Blind. There is an option in setup, which determines the default that will be used when tabs are opened. It is modified from there in the configuration menu. See *{Show Ref Labels}*.

Note: *[About] & [Label] can be used to temporally toggle between views.*

- **Group Channels By 5** - when enabled, five channels are grouped together with space separating each group of five. This setting is enabled by default.
- **High Contrast** - when enabled, high contrast brightens the magenta used to show tracked values. This setting is enabled by default.
- **Disable 100 Channel Display Mode** - disables 100 Channel Display Mode (default).
- **Enable 100 Channel Display Mode - 5x20** - enables 100 Channel Display Mode, in 5 rows of 20 channels.
- **Enable 100 Channel Display Mode - 4x25** - enables 100 Channel Display Mode, in 4 rows of 25 channels.

Default

You can save your current settings as the default state for the tab. The current default is identified in parentheses.

- {Reset to Default} - returns the settings to the default state that you created.
- {Set Current as Default} - uses the current settings and tab number to create a new default state . The default tab will be shown in parentheses.
- {Reset to Eos Default} - removes your saved default and returns all settings to the Eos defaults.

Using Flexichannel

Flexichannel (use of the [Flexi] key) allows you to view only channels meeting a certain criteria in the Live/ Blind display, therefore removing unwanted data from view. Press and hold [Flexi] to see and select from a list of available states and modes in the CIA. You can also press [Flexi] multiple times to cycle through the list of available states.

Flexichannel has several available states which include allowing you to view only:

- All channels
- All patched channels
- Manual channels
- All show channels (any channels that have data stored in a cue or submaster)
- Active channels (channels with intensity above zero or a move instruction)
- In Use Channels (channels with intensities that are above zero or fading to zero, running effects, non-intensity moves, or marking.)
- Selected channels
- Channels with discrete timing

There are three Flexichannel modes, which can be used along with the Flexichannel states:

- Cells Off (displays only the master channels for multicell fixtures. Master channels will display with a "." after the channel number to indicate that they have cells hidden.)
- Masters Off (displays only the cells for multicell fixtures)
- Partitioned (displays only those channels defined in the current partition)

Note: *The multicell fixture views can be used in combination with other flexichannel states.*

Note: *You can use [Flexi] & [.] to quickly toggle cells on and off.*

In flexi, selected channels (including the last channel selection) are always included in the view. Gaps in channel numbers are indicated by a vertical line between the channels where a gap in numbering occurs.

To change flexi states in the Live/Blind display, press [Flexi] to cycle through the views listed above. When [Flexi] is held down, the softkeys change to represent all of the available flexi states and modes. You can select the desired flexi view from those keys.

[Next/Last] can be used to select the next or last channel in the current flexi state.

[Thru] can be used to view only channels in the current flexi state (except for selected channels) as long as either the first or last channel in the [Thru] range is included in the current flexi state. To include channels not in the current flexi state, [Thru] [Thru] can be used.

View Channels

You may select specific channels to appear in another flexichannel state called “View Channels”. This state does not exist until you select channels to view. After view channels is activated, it will appear in the rotation of flexichannel states when [Flexi] is pressed.

To select channels to view:

1. Select channels on the command line (do not press **[Enter]**).
2. Press and hold **[Flexi]**.
3. Press **{View Chans}**. The "View Channels" flexi state will be created and the channels you selected will be visible in it.

The channels you selected will be visible in this flexi state until you select other channels and press **{View Chans}** again. At any time, you can access the last channels you defined for this state by pressing **[Flexi]** until this state is visible.

To redefine the selected channels in the state, simply follow the steps above again.

Flexichannel with Timing

You may also engage the "channels with timing" flexichannel state by pressing **[Flexi] & [Time]**. This will display all channels that have discrete timing in the current cue and will remove channels without discrete timing from view.

You may still hold **[Time]** on Eos or double press **[Time]** on Eos Ti and Gio to view the discrete time behind any parameter or category.

The display will remain in this state until you disengage it by pressing **[Flexi]** again.

[About] and Display Toggles

While in Live or Blind, you can use the **[About]** key to view additional information. When in an **[About]** mode, the mode type will display in the upper left hand corner of the Live/ Blind display. See *[About] [Tab 29]*.

The following is a list of the **[About]** modes available in the Live and Blind displays:

Note: *Hold **[About]** and double tap the modifier key to latch the mode.*

*To page while in these modes, release the modifier key while keeping **[About]** held down.*

- **[About] & [Live]** - displays the DMX levels.
- **[About] & [Data]** - hides manual data from the Live / Blind display.
- **[About] & [Address]** - displays the DMX address for each parameter.
- **[About] & [Park]** - displays the parked levels.
- **[About] & [Part]** - displays the cue part number for each parameter.
- **[About] & [Cue]** - displays the source target type and number. For cues, the cue list and cue number that contained the last move will display.
- **[About] & [Mark]** - displays the mark cue used by the channels.
- **[About] & [Next]/[Last]** - displays the next cue with that the channels move in or the last cue with that the channels moved in.
- **[About] & [Label]** - displays the reference labels.
- **[About] & [Time]** - displays the discrete time.
- **[About] & [Path]/{Color Path}** - displays the color paths.

Playback Status Display (PSD) [Tab 2]

The playback status display (PSD) allows you to view a range of cues in the current cue list, all cue attributes for those cues, and a view of the fader configurations for 10 pages of 10 faders each (for a total of 100 visible faders.

The PSD opens on Tab 2. This display cannot be closed, but you can have multiple instances of the PSD open on different tabs.

Holding down **[Time]** while a cue is fading, will display the cue category times counting down in the cue list display area. The default action is to show the total time not the countdown.

To always show the countdown, a **{PSD Time Countdown}** option is available in PSD configuration menu (see *Playback Status Display Tab Configuration*). When the **{PSD Time Countdown}** is enabled, the cue category times will countdown as a cue is fading. To see the total time, hold down the **[Time]** key. **{PSD Time Countdown}** is "disabled" by default.

Most Eos Family consoles have three available formats for the playback status display:

- *Expanded Cue List Format*
- *Split Playback Status Display*
- *Fader Display Format*

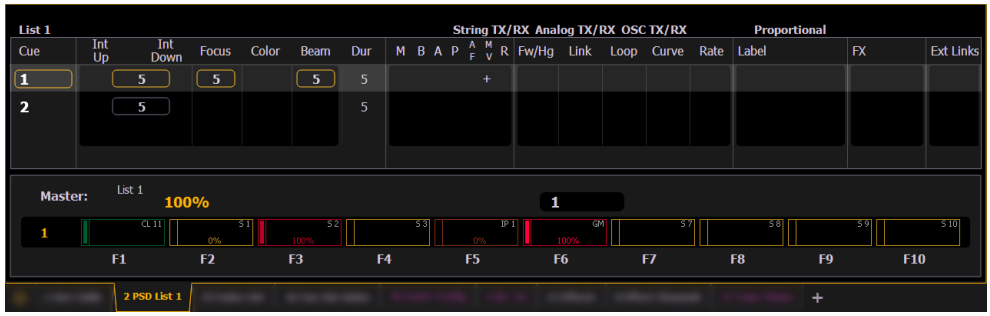
Expanded cue list format is the default. When the focus is on the playback status display, press **[Format]** to toggle between the displays.

Element 2 and Element Classic PSD

On Element 2 and Element Classic, the PSD allows you to view a range of cues in the single cue list along with the cue attributes for those cues. Fader information can be viewed in the *Element 2 & Element Classic Fader Status Display*.

Expanded Cue List Format

Note: *Not available on Element Classic.*



Pressing **[Format]** with the playback status display active will access this format. In expanded cue list, the view of the active cue list increases to the full size of the display. The current fader page is visible at the bottom of the screen.

Fader Display Format

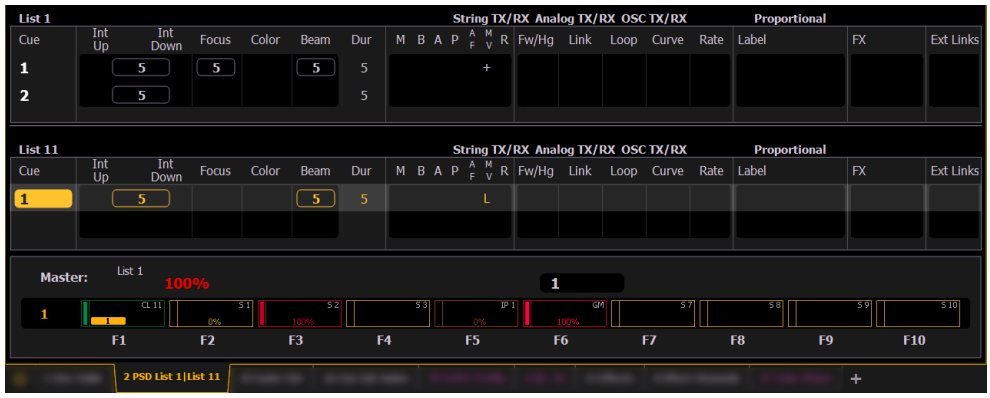
Note: *Not available on Element Classic.*

Pressing **[Format]** with the playback status display active will access this format, which shows a view of the fader configurations for 10 pages of 10 faders each (for a total of 100 visible faders.

Each fader is color coded based on its assigned target type. Grandmasters and inhibitive submasters are in red, additive submasters are yellow, playback faders display in green, and presets and palettes are orange.

Split Playback Status Display

Note: *Not available on Element Classic.*



Pressing **[Format]** with the playback status display active will access this format. With the playback status display split, two different cue lists can be displayed at the same time. This is set in the *Playback Status Display Tab Configuration* menu.

Note: *The first time you access the split playback status display, you may need to adjust the splitter bar between the two lists to see the second list.*

Paging the Playback Status Display

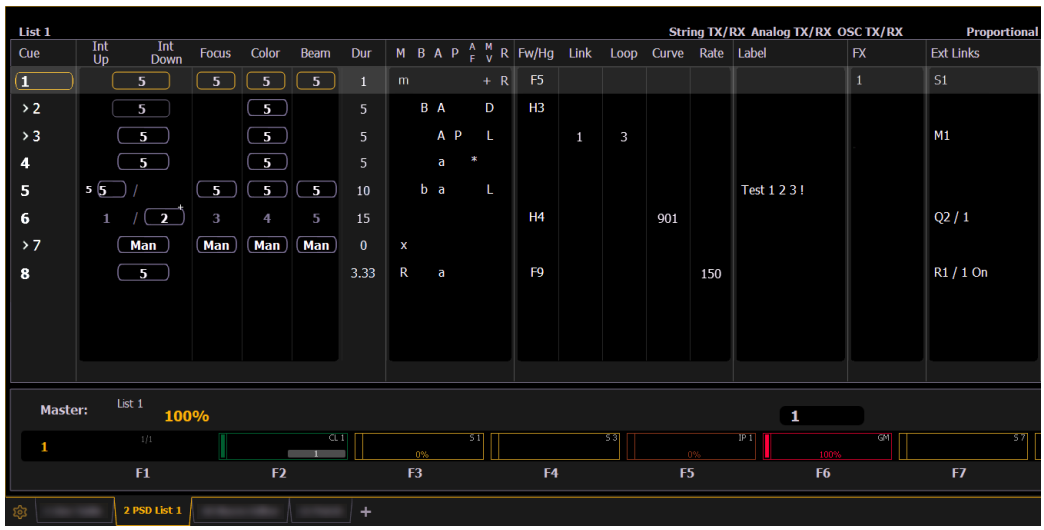
[Page ▲] or [Page ▼] will page the display up or down.

Note: *To page the Playback Status Display (PSD) if focus is on a Live/Blind tab, use **[Shift] & [Page ▲]** or **[Shift] & [Page ▼]**.*

Note: *This action will page the PSD that is showing the currently selected cue list. If there is no PSD visible showing that cue list, nothing will be paged.*

Indicators in the Playback Status Display

This section identifies the color and text conventions used to indicate various playback conditions in the *Playback Status Display (PSD) [Tab 2]*.



The Playback Status Display will show a red counter for sneak time.

Any show control options that are currently enabled in **Setup > System > Show Control** will display at the top of the Playback Status Display.

Color Indicators

Cue List

- **Gold** - Any item (cue, list, page) highlighted in gold indicates "current".Outlined in gold indicates "selected".
- **Red** - Cue fade is in progress

Fader Ribbon / Display

Note: *This option is not available on Element 2 and Element Classic.*

- **Red** - Grandmasters and inhibitive submasters
- **Yellow** - Additive submasters

- Green - Playback faders
- Orange - Presets and palettes

Text Indicators

- + (see cue 6) - Indicates that there is discrete timing within the associated cue. Found in the cue display “Timing” area.
- * (see cue 4) - Indicates the cue has an allfade command. Found in the cue display “Flags” area.
- * - Indicates a link to a non-existent cue. Found in the cue display "Link" area.
- D - Indicates a dark move, a cue that has any non-intensity parameters moving on channels whose intensity is at 0. Found in the cue display “Flags” area in the move column.
- x - Indicates that a mark has been placed, but the mark is broken.
- A or a (see cues 3 & 4) - Indicates an asserted cue. “A” indicates the entire cue is asserted. “a” indicates a channel or parameter assert only. Found in the cue display “Flags” area.
- B or b (see cues 2 & 5) - Indicates a blocked cue. “B” indicates the entire cue is blocked. “b” indicates a channel/ parameter block only. Found in the cue display “Flags” area.
- F1 - F10 - Indicate faders numbered 1 through 10 on the console. Found at the bottom of the fader display.
- > - Indicates a cue that will not require a Go, as the previous cue has a follow or hang time applied. Found to the left of the cue number.
- F5 (see in cue 1) - Indicates a follow time associated with the cue (in this case, 9 seconds). Found in the cue display.
- H3 (see cue 2) - Indicates a hang time associated with the cue (in this case 4 seconds). Found in the cue display.
- I - Indicates an intensity blocked cue. Found in the cue display “Flags” area.
- L - Indicates a live move. A “+” is used to show that both types of moves are in that cue.
- M or m (see cue 1) - indicates a cue with a *Mark*, or marked cue. “M” indicates an AutoMark or *Referenced Marks* used by a subsequent cue. “m” indicates a reference mark that is currently unused by any subsequent cue. Found in the “Flags” area.
- P (see cue 3) - Indicates the cue will preheat. Found in the cue display “Flags” area.
- R (see cue 8) - Indicates the source cue which refers back to an earlier mark. Found in the cue display “Flags” area.
- Number in the FX column (see in cue 1) - Indicates a cue level effects override.
- M1(see in cue 3) - Indicates a linked macro.
- Q2/1 (see in cue 6) - Indicates a linked cue.
- S1 (see in cue 1) - Indicates a linked string. The string will display here.
- Relay 1/1 (see in cue 8) - Indicates a linked relay.

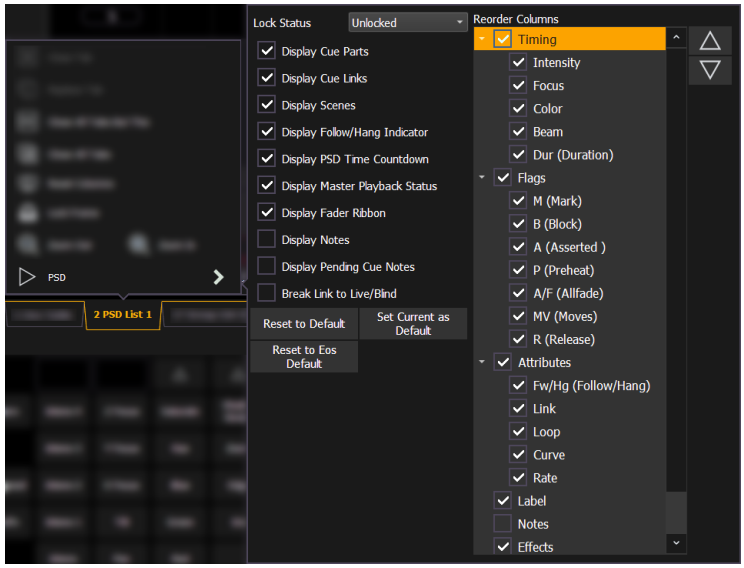
Element Classic Text Indicators

- * - Indicates a link to a non-existent cue. Found in the cue display "Link" area.
- + (see cue 6) - Indicates that there is discrete timing within the associated cue. Found in the cue display “Timing” area.
- B or b (see cues 2 & 5) - Indicates a blocked cue. “B” indicates the entire cue is blocked. “b” indicates a channel/parameter block only. Found in the cue display “Flags” area.
- F5 (see in cue 1) - Indicates a follow time associated with the cue (in this case, 9 seconds). Found in the cue display. Notice the arrow on Cue 2.
- H3 (see cue 2) - Indicates a hang time associated with the cue (in this case 4 seconds). Found in the cue display. Notice the arrow on Cue 3.
- M (see cue 7) - Indicates a marked cue. “M” indicates an AutoMark.
- L - Indicates a live move. A "D" in the Move column would indicate a dark move. A “+” is used to show that both types of moves are in that cue.

- **P** (see cue 3) - Indicates the cue will preheat. Found in the cue display “Flags” area.
- **Number in the FX column** - Indicates a cue level effects override.
- **M1** (see in cue 3) - Indicates a linked macro.
- **S1** (see in cue 1) - Indicates a linked string. The string will display here.
- **Relay 1/1** (see in cue 8) - Indicates a linked relay.

Playback Status Display Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



The following options are available:

- **Target Grid** - this option is only available when the PSD is split, and is used along with the Lock Status option. Target Grid allows you to select either the top or bottom display. Press **[Format]** to split the PSD.
- **Lock Status** - allows you to lock the PSD to a certain cue list. When the PSD is split, you will use Target Grid to first select top or bottom of the display, and then you can use Lock Status to select the cue list.

> **Note:** *Phantom cue lists will display but cannot be locked to. See Cue List Properties to learn more about phantom cue lists.*

- **Display Cue Parts** - displays the individual parts of a part cue. When not enabled, the number of parts for that cue will display as a superscript number beside the cue's number.
- **Display Cue Links** - displays *Link / Loop* information.
- **Display Scenes** - displays cue *Scenes*.
- **Display Follow/ Hang Indicator** - displays the Follow/ Hang arrow indicator before the cue number of any cue that will be triggered by a follow or hang.
- **Display PSD Time Countdown** - displays the cue category times countdown in the PSD as a cue is fading.
- **Display Master Playback Status** - displays the current cue's status information.

- **Display Fader Ribbon** - displays the fader ribbon, which shows the current fader page under the Master Playback Status. Not available on Element 2, Ion Classic, and Element Classic.

- **Display Notes** - displays the *Cue Notes* in a horizontal bar at the bottom of the PSD.
- **Display Pending Cue Notes** - displays the *Cue Notes* for the pending cue in a horizontal bar at the bottom of the PSD.
- **Break Link to Live / Blind** - When selecting the Live / Blind display, the PSD will also come into view if it is currently hidden. This option allows you to break the link between the PSD and the Live/ Blind displays so that the PSD will no longer come into view when selecting Live / Blind.

Reorder Columns

Reorder columns allows you choose what data displays in the PSD and what order it displays in. By default, all columns except notes will be displayed. The arrow keys on the right can be used to move columns around. Columns are moved in groups. To select a column header to move, click or tap the name. The check boxes suppress or enable. When an item is enabled to display, a check mark will be in the corresponding box.

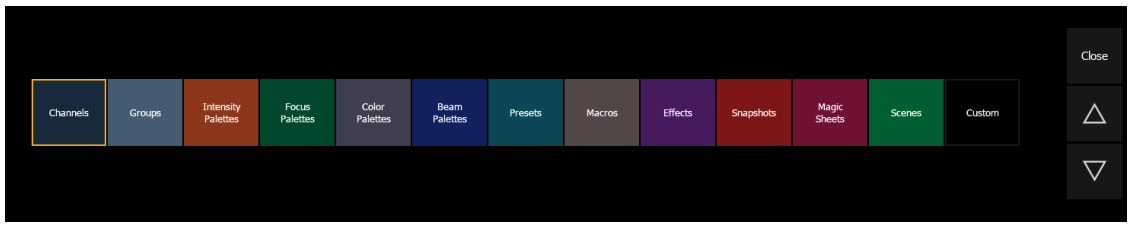
Default

You can save your current settings as the default state for the tab. The current default is identified in parentheses.

- **{Reset to Default}** - returns the settings to the default state that you created.
- **{Set Current as Default}** - uses the current settings and tab number to create a new default state . The default tab will be shown in parentheses.
- **{Reset to Eos Default}** - removes your saved default and returns all settings to the Eos defaults.

Direct Selects [Tab 4]

Direct selects utilize lists of existing show file components (targets) and assign them to a highly-configurable grid of buttons. Direct selects can be used to quickly access those targets, allowing you to easily interact with them, including placing them on the command line.



To open the direct selects, use the direct selects icon in the *Workspace Layout Menu* or **[Tab] [4]**. Direct selects for specific targets can then be opened using the corresponding button.

Using Direct Selects

Direct selects can be used to quickly access show file targets, allowing you to easily interact with them in a variety of ways.

Note: *Many buttons referenced in this section can be shown or hidden from the direct selects tab using the Direct Selects Tab Configuration menu.*

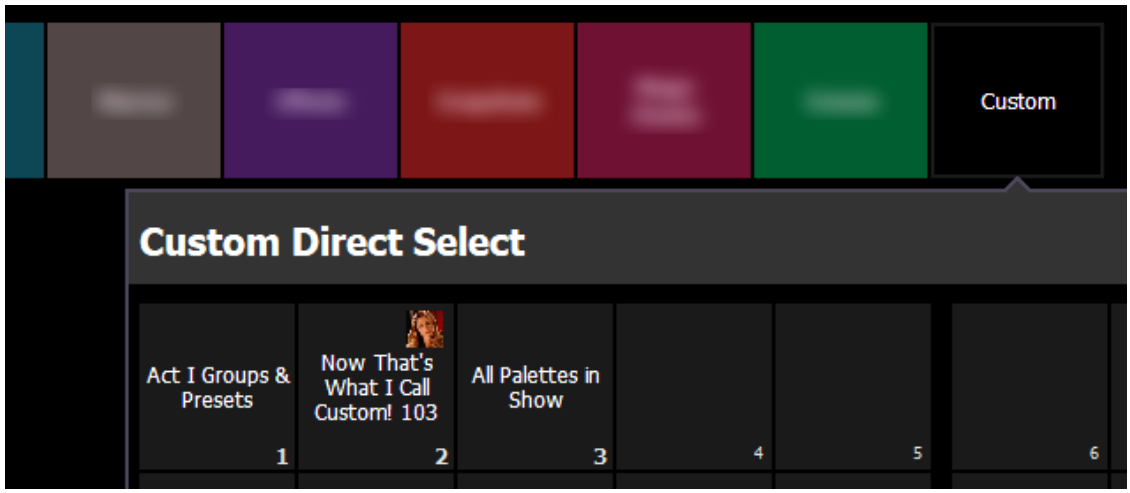
When you first open the direct selects tab, you will be presented with one or more banks that can be used to control specified targets.

Targets are specific elements of your show file that can be assigned to direct select buttons. With the exception of custom direct selects, only one target type can open in a direct select bank.

Select a target type to open direct select buttons for that target. You can then use the direct select buttons to select and control the chosen target.

Custom Direct Selects

Custom Direct Selects [Tab 39] allow you to assign multiple target types to the same grid layout. If **{Custom}** is selected on the direct selects tab, a popup will appear showing all available custom direct select lists in your show file.



Once a custom direct select list is open, selecting an empty button will display a pop-up of the target selection menu, allowing you to quickly assign a target or range of targets.

Note: *While applying a target range will configure multiple buttons, multiple-button-selection is only available via the custom direct selects editor in Tab 39.*

Navigating Direct Selects

To change the direct select type displayed in a bank, press the current target name, and choose the desired direct select target to display.

If there are more items in a direct select bank than can be viewed at once, you may view subsequent pages by using the **{Page Up}** and **{Page Down}** arrows. The **{Jump To...}** button, when enabled via the *Direct Selects Tab Configuration* menu, can be used to jump to a specific direct select.

Direct Selects & the Command Line

With the exception of channels and groups, all targets selected via direct selects will post a terminated command on the command line. To post an unterminated command, hold **[Shift]** as you press the direct select. This allows multiple commands to be selected and executed at once, and an optional sneak time to be entered.

Channels and groups selected via direct selects will post an unterminated command by default.

Recording to Targets Using Direct Selects

You may store a command line selection directly to a target's direct selects by pressing **[Record]** and the desired direct select key.

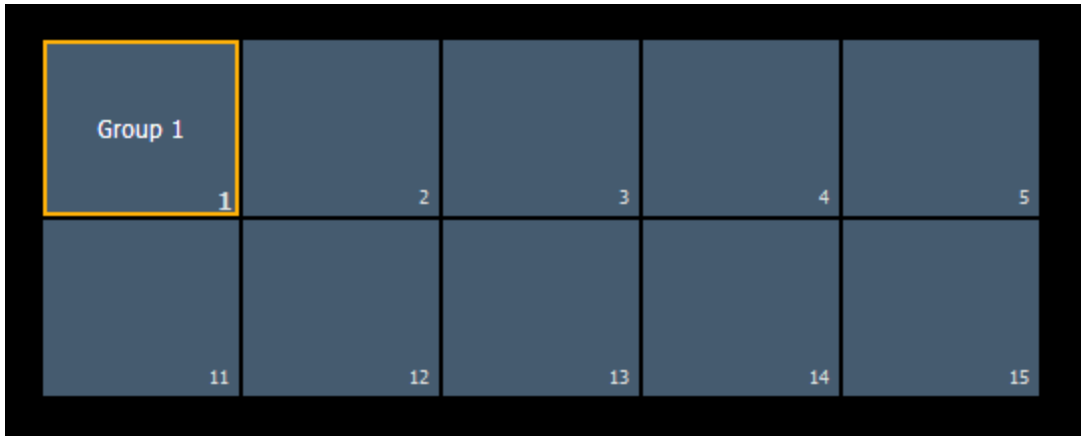
You can record decimal inserts to a direct select, which will add additional buttons to your direct select grid. All recorded targets will appear in numerical order in a direct select grid, including those with decimals in their number. For example, open a color palettes direct select bank with color palette 1 on button 1 and color palette 2 on button 2. Record color palette 1.5. A direct select button will be inserted between buttons 1 and 2.

Use the **{Increment}** setting in the *Direct Selects Tab Configuration* menu to set the granularity for displaying empty target buttons. Stored decimal targets will always be displayed, regardless of increment setting.

Direct Select Button Indication

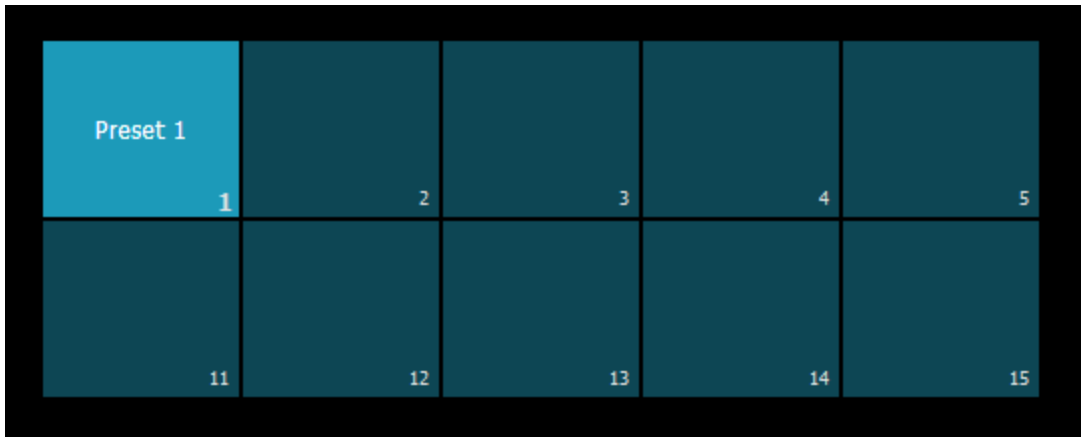
The appearance of direct select buttons will change depending on what is selected via the command line.

If a target is on the command line, the corresponding direct select tile will be outlined in gold.



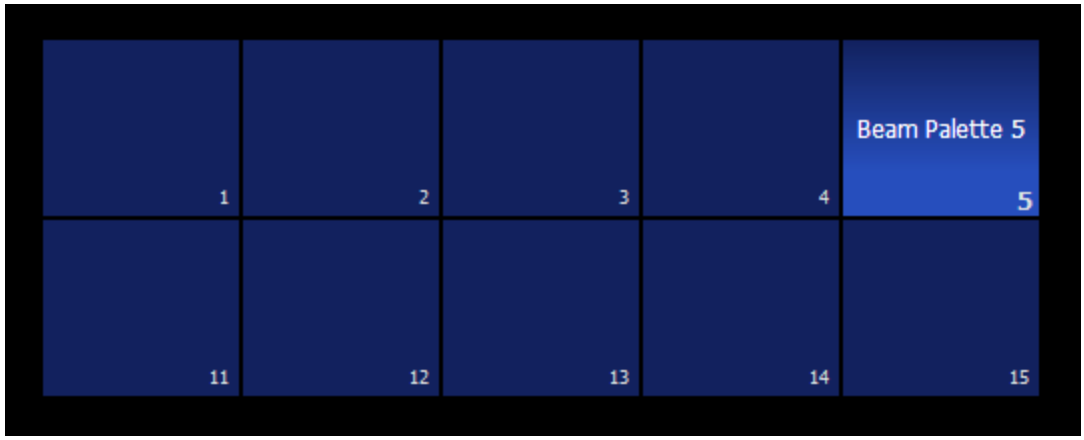
For example, open a direct select bank displaying groups. Type **[Group] [1] [Enter]**. The group 1 direct select button will be outlined in gold.

If channels are selected via the command line, and any direct select targets contain all of those channels, the direct select buttons will be highlighted.



For example, record preset 1, containing channels 1-10. Open a direct select bank displaying presets. Type **[1] [Thru] [10] [Enter]**. The preset 1 direct select button will be highlighted gray.

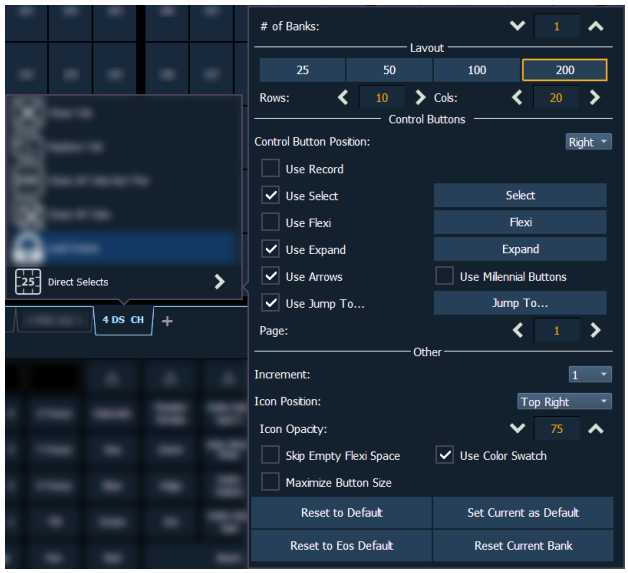
If channels are selected via the command line, and any direct select targets contain some but not all of those channels, the direct select buttons will be highlighted with a gradient.



For example, record beam palette 5, containing channels 10-20. Open a direct select bank displaying beam palettes. Type **[1] [Thru] [20] [Enter]**. The beam palette 5 direct select button will be highlighted with a gradient.

Direct Selects Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



The following options are available:

- **# of Banks** - sets the number of direct select banks that will display in the tab.

If multiple banks are selected, a drop-down menu will appear, allowing you to apply all of the additional configuration options below to a specific bank, or all open banks. Asterisks next to any of the additional configuration options indicate functions that are only enabled for specific banks.

Layout

This section allows you to configure the layout of the direct selects grid.

- **{25} / {50} / {100} / {200}** - quick-select options to easily set the grid size.
- **Rows** - allows you to select the number of rows in the banks.
- **Columns** - allows you to select the number of columns in the banks.

If the frame or window is resized, the direct selects grid layout will responsively change size to fit onscreen.

Control Buttons

This section allows you to configure which optional control buttons will appear alongside the direct selects grid. The checkboxes on the left toggle whether a button appears in the grid. The buttons that appear on the right allow you to use that function directly from the configuration menu without having to add the button alongside the direct selects grid.

- **Control Button Position** - allows you to set the control buttons to display on the left or right side of the banks.
- **Use Record** - displays the **{Record}** button, which posts Record to the command line.
- **Use Select** - displays the **{Select}** button, which will display the selected direct select type. Pressing it will allow you to select a different direct select type.
- **Use Flexi** - displays the **{Flexi}** button. See *Using Flexi Mode*.
- **Use Expand** - displays the **{Expand}** button, which will temporarily cover all other banks with the expanded target.
- **Use Arrows** - displays the page up and down arrows.
- **Use Millennium Buttons** - displays the century and millennium buttons. These buttons allow you to jump to pages in the hundreds and thousands.
- **Use Jump To...** - displays the **{Jump To}** button, allowing you to jump to specific target

numbers.
- **Page** - allows you to jump to a specific page of direct selects.

Other

- **Increment** - all recorded targets will display in numerical order, including those containing decimals. Increment sets the target granularity of the grid, allowing blank decimal targets to be shown between whole-number targets.
- **Icon Position** - configures the location of *Icons* on the direct select tile. Centered will apply the icon to the entire tile.
- **Icon Opacity** - configures the opacity of the icon from 0-100. 75 is the default. Lower opacities may allow the direct select label to be more visible in front of the icon.
- **Skip Empty Flexi Space** - removes the empty space between a range of nonsequential target buttons when in flexi mode.
- **Use Color Swatch** - displays a triangular color swatch in the lower left corner of a direct select. Color swatches are available for color palettes, macros, and snapshots only.
- **Maximize Button Size** - sets the size of the direct select buttons to fill the available space.
- **{Reset to Default}** - will restore the settings to the default state. If no default state has been set, the Eos default settings will be used.
- **{Set Current as Default}** - allows you to set the current settings to be used as a default state when opening additional direct select tabs.
- **{Reset to Eos Default}** - restores the settings to Eos defaults.
- **{Reset Current Bank}** - restores the settings of the currently-selected bank only.

Using Flexi Mode

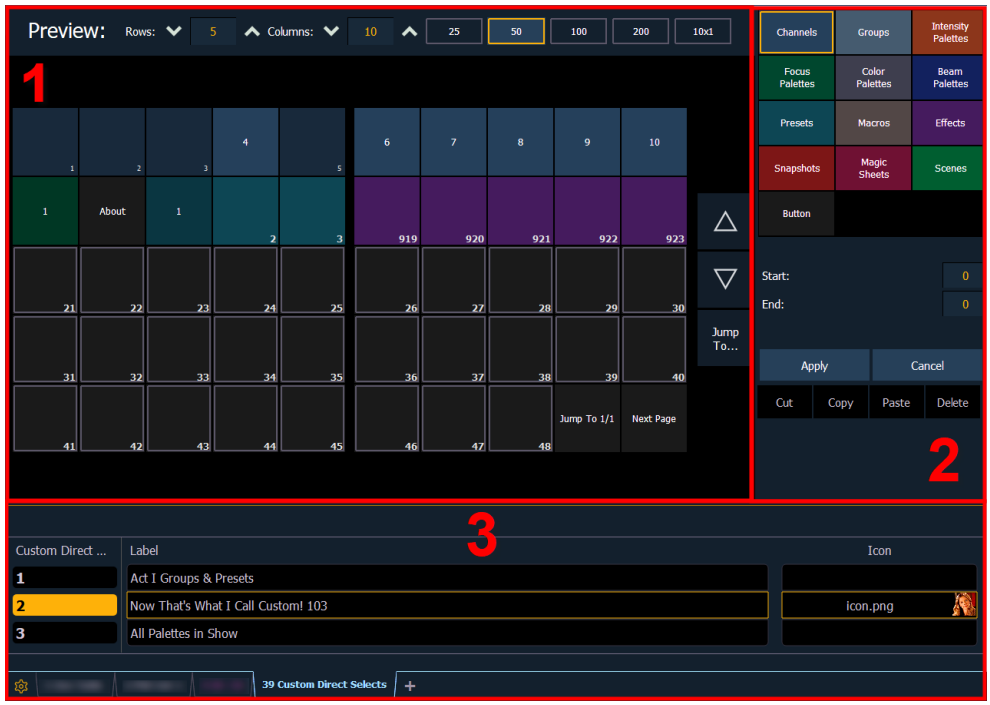
Direct selects can be placed into a flexi mode. **{Use Flexi}** needs to be enabled in the direct selects configuration menu. Once enabled, the **{Flexi}** button will display alongside the direct selects grid. This mode removes most of the empty buttons from the grid, but leaves a single blank tile between ranges. **{Skip Empty Flexi Space}** will remove this blank tile.

When in flexi mode, the **{Flexi}** button will be outlined in gold.

Custom Direct Selects [Tab 39]

Whereas direct selects display lists of specific target types, custom direct selects allow you to create a list with individual targets, regardless of type. The custom direct selects editor allows you to choose the targets used in these lists, and apply them to a configurable grid.

To open the custom direct selects editor, select the custom direct selects icon in the *Workspace Layout Menu*, or use **[Tab] [3] [9]**. You can also choose **{Custom}** on the direct selects tab, and then select **{Open Custom DS Editor}**.



The editor is divided into a preview of your custom direct selects grid, a target selection menu for configuring buttons, and an index of all custom direct select lists in your show file.

Custom direct select lists can be any number between 0.001 and 9999.999.

(1) Preview

This section displays the custom direct select list, laid out on a customizable grid for you to preview layouts. The options at the top allow you to adjust the number or rows and / or columns in your custom direct select grid, or choose from preset grid layouts.

(2) Target Selection Menu

This section allows you to configure which direct select targets are assigned to your custom direct select buttons. All buttons default to empty.

(3) Custom Direct Selects

This section displays an index of all the custom direct select lists in your show file. These lists can be assigned a label, as well as an icon.

Note: *Custom direct selects created in Eos software prior to v3.1.0 and stored in snapshots will be automatically converted to a custom direct select list, labeled with the relevant snapshot number.*

Configuring Custom Direct Selects

To assign targets to your custom direct select list, select one or more buttons in the grid. You can select multiple buttons at once by selecting them sequentially, or dragging to lasso a marquee around them.

Note: *The order in which the buttons are selected will determine the order that targets are applied to those buttons.*

Once the desired buttons are selected, choose a direct select target to assign to those buttons. You must define a starting number for the selected target. When a single button is selected, defining an ending number will assign that range of targets to the grid, starting with the selected button. For example, selecting Button 1 and the Channels target with a range starting at 10 and ending at 14 will assign Channels 10-14 to Buttons 1-5.

When multiple buttons are selected, the same number of targets as buttons selected will be assigned. You can define an offset instead of an end to distribute targets evenly across the selected buttons. For example, selecting Buttons 11-15 and the Presets target starting at 1 with offset 2 will assign Presets 1, 3, 5, 7, and 9 to Buttons 11-15.

Select **{Apply}** to assign the specified targets to the specified buttons. The specified targets can also be copied to additional buttons in any custom direct select list using **{Copy}** and **{Paste}**. Once **{Copy}** is selected, the targets to be copied will be noted at the bottom of the target selection menu.

Checking the "Include Non-Existant Whole Number Targets" box allows you to map buttons for targets that do not exist yet. If the box is left unchecked, only existing targets will be mapped. This box is checked by default.

Buttons on Custom Direct Selects

This target, unique to custom direct selects, allows you to place console buttons on your custom direct select grid. The following options are available:

- **Console Button** - duplicates the functionality of any console hard key or soft key
- **Jump To** - a button allowing you to jump to a definable spot in any custom direct select list
  - Type **[#]** to jump within the same list, or **[#] [/] [#]** to jump to a specific custom direct select list and button number
- **Next Page/Prev Page** - a button allowing you to jump to the next or previous page in your current custom direct select list

Assigning Icons

Icons can be assigned via the softkey **{Icon}**, or by clicking on the Icon field in the target table. This opens the icon library.

Any existing icons in your library will appear first, along with stock icons. You can also access additional default icons using the additional tabs below the icon library. Common fixture icons are available in the adjacent tab to the right. Select an icon to assign it to the specified target. To close the icon library, clear the command line, or select **Close**.

Clearing Custom Direct Selects

You can clear a custom direct select by selecting one or more buttons and pressing **{Delete}**. You can also hold down **[Escape]** and press the direct select that you want to clear.

To delete a specific custom direct select list, use **[Delete] [#] [Enter] [Enter]**.

Target Keys

Target keys are physical buttons with a customizable surface that can be assigned to control any target via direct selects.

To edit the direct selects assigned to your target keys, hold **[Displays]**. Configuration button overlays will appear on each bank of keys. Use **{Edit #}** to open the target editor for that bank. The arrows can also be used to change the page of keys displayed on the bank.

From there, assign targets to the bank using the direct select controls in the editor. Once a starting target is selected for the bank, targets will be assigned consecutively from there.

Target keys are available on *Eos Apex 5*, *Eos Apex 10*, and *Eos Apex 20* consoles, and the *Target Key 10* standalone accessory.

Encoders

The encoders are one of the ways to control the non-intensity parameters (NPs) of multiple parameter devices. See *Setting Non-Intensity Parameters with the Encoders*.

On Eos Ti, the top four encoders are identified by the encoder touchscreen, just to the left of the encoders. The bottom two encoders are always in control of pan and tilt respectively from left to right.

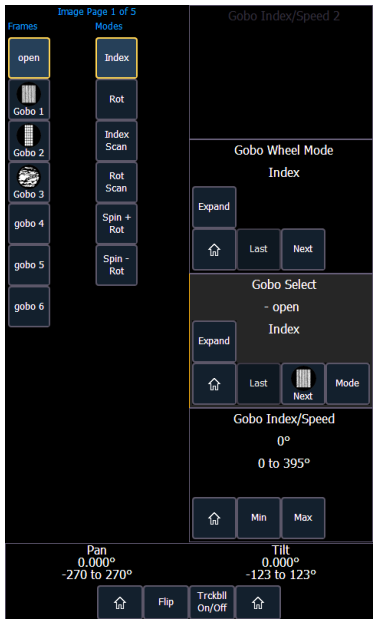
On Gio, Gio @5, and Ion Xe, the four encoders are identified in two ways, by the encoder controls display and the mini encoder status display.

On Element 2 and Element Classic, you can access encoder control by using the *ML Controls [Tab 5]* display.

On Ion Classic, the four encoders are identified by the encoder LCD, just beneath the encoders.

Eos Ti Encoder Display

The encoder display area will show the name of the parameter it controls, display stepped limits (if any) and also a **{Home}** button which allows you to set that parameter to its default position. You can also home any parameter.



Some buttons that may be available on the touchscreen are:

- Min
- Max
- Next
- Last
- Home
- Mode
- XYZ Format Enable/Disable

Buttons like **{Next}** and **{Last}** are used to step through ranges (such as colors in a color scroller) one step at a time. **{Min}** and **{Max}** allow you to send a parameter to its minimum or maximum limit with one press.

Modes allows you to switch between modes of a parameter (if any exist); for example, a rotating gobo wheel. If additional modes are available, their softkeys will display near the top of the encoder display.

Encoders can be switched from course mode into fine by holding down **[Shift]** while using an encoder will put it in fine mode for as long as **[Shift]** is held down. Once **[Shift]** is released, the encoder will return to course mode. See *Face Panel* for encoder options.

Press **{Expand}** to see all of the information about any device with a frame table. Press again to collapse to the normal view. You may make selections from the Expand screen. The colors/images in the device are established in Patch (see *Scroller and Wheel Picker and Editor*).

{XYZ Format Enable / Disable} toggles between storing position data in pan / tilt format, and XYZ format for use with Augment3d.

To the left of the encoder touchscreen are six hardkeys (five on Eos) that are for encoder control. From top to bottom, these encoder paging keys control intensity, focus, color, shutter, image, and form. Pressing any of these will change the parameters controlled by the encoders. To view other available encoder pages, simply press the encoder paging keys to advance the pages.

[Encoder Paging Keys**] & [#]** will take you directly to a page. **[Flexi] & [**Encoder Paging Keys**]** will toggle the flexi encoder states.

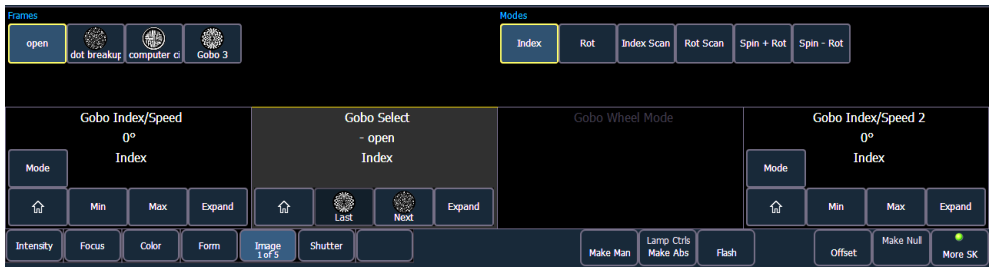
To post a parameter category to the command line, use the parameter category buttons.

To post beam to the command line, double press the shutter, image, or form parameter category buttons.

Some fixtures have more parameters than can be displayed on one encoder page. The number of. pages for each category is displayed at the top of the encoder touchscreen. To view the other pages, simply press the encoder paging button to advance the pages or hold the button and press a number key to go directly to the page you want to access.

Encoder Controls Display

The encoder controls display is available on Gio, Gio @ 5, and Ion Xe consoles. Press the **[Encoder Display]** hardkey to open the encoder controls display.



Directly under the middle two encoders are six hardkeys for encoder control. From left to right, these encoder paging keys control intensity, focus, color, shutter, image, and form. Pressing any of these will change the parameters controlled by the encoders. To view other available encoder pages, press the encoder paging keys to advance the pages.

On Ion Classic, the encoder LCD displays the active parameter category loaded on the encoders, as selected by the page buttons. To see additional encoder information, open the Encoder Display by using **CTRL + ALT + ** on an alphanumeric keyboard. **ALT +** , can be used to change encoder pages.

[Encoder Paging Keys**] & [#]** will take you directly to a page. **[Flexi] & [**Encoder Paging Keys**]** will toggle the *Flexi Encoders*.

To post a parameter category to the command line, use the parameter category buttons located in the CIA.

Note: *To post beam to the command line, double press the shutter, image, or form parameter category buttons.*

Each encoder's area will display the name of the parameter it controls, display stepped limits (if any) and also a **{Home}** button which allows you to set that parameter to its default position.

The encoder controls display allows you to cycle through parameter steps (if available). You can also home any parameter. Some buttons that may be available are:

- **{Min}** and **{Max}** - allow you to send a parameter to its minimum or maximum limit with one press.
- **{Next}** and **{Last}** - used to step through ranges (such as colors in a color scroller) one step at a time.
- **{Mode}** - allows you to switch between modes of a parameter (if any exist); for example, a rotating gobo wheel. If additional modes are available, their softkeys will display at the top of the encoder controls display.

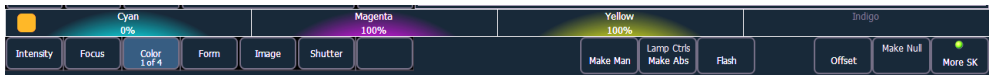
- {Expand} - use to see all of the information about any device with a frame table. Press again to collapse to the normal view. You may make selections from the Expand screen. The colors and images in the device are established in Patch > Attributes >*Scroller and Wheel Picker and Editor*.
- {XYZ Format Enable / Disable} - toggles between storing position data in pan / tilt format, and XYZ format for use with Augment3d.

Encoders can be switched from course mode into fine by holding down **[Shift]** while using an encoder will put it in fine mode for as long as **[Shift]** is held down. Once **[Shift]** is released, the encoder will return to course mode.

Mini Encoder Display

On Gio, Gio @ 5, or Ion Xe consoles, or ETCnomad using a Programming Wing, information on what the encoders are currently controlling can always be found in the mini encoder status display, even when the *Encoder Controls Display* is closed. This display is found above the softkeys in the CIA.

Use the parameter category hardkeys to choose which parameters are currently available on the encoders.



Some fixtures have more parameters than can be displayed on one encoder page. The number of. pages for each category is displayed at the bottom of the parameter category softkey. To view the other pages, simply press the button to advance the pages or hold the button and press a number key to go directly to the page you want to access.

Encoder Navigation

Use the encoder page buttons (located to the left of the encoder LCD) to choose which parameters are currently available on the encoders. There are five usable buttons: **[Color]**, **[Custom]**, **[Shutter]**, **[Image]**, and **[Form]**. Ion Classic consoles have the additional **[Focus]** key. Pressing any of these will change the parameters controlled.

Some fixtures have more parameters than can be displayed on one encoder page. The number of pages for each category is displayed on the encoder touchscreen. To view the other pages, simply press the **[Color]**, **[Custom]**, **[Shutter]**, **[Image]**, or **[Form]** button to advance the pages or press the button with a number key to go directly to the page you want to access.

Encoders can be switched from course mode into fine by holding down **[Shift]** while using an encoder will put it in fine mode for as long as **[Shift]** is held down. Once **[Shift]** is released, the encoder will return to course mode.

Encoders in Blind

The encoders and the level wheel are disabled by default when in the blind display. Pressing an [Encoder Page Keys], for example **[Color]**, will enable the encoders and level wheel. When the encoders are disabled, trackball functionality for pan and tilt will also be disabled.

Flexi Encoders

In Flexi mode, any empty locations for parameters not applicable for selected channels will be suppressed. By default, the encoder display will be in Flexi mode.

Holding down **[Flexi]** and an **[Encoder Page Keys]**, for example **[Image]**, can be used to exit or enter Flexi mode.

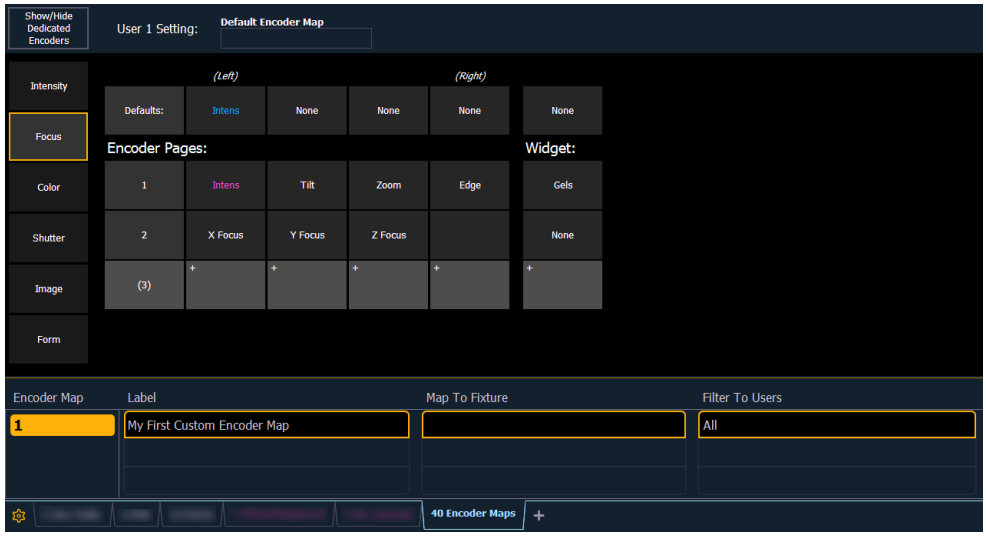
Locking the Encoders

It is possible to lock out the encoders. To lock out the encoders, press **[Escape]** & **[**Encoder Page Keys**]**. To unlock, press any of the **[**Encoder Page Keys**]**.

Encoder Maps [Tab 40]

Custom encoder maps allow you to create and store unique parameter layouts for your fixtures. A custom map can be assigned as a console-wide default, or applied more selectively to specific fixtures, groups of channels, or console users.

To open the custom encoder map editor, select the encoder maps icon on the *Workspace Layout Menu* or use **[Tab] [4] [0]**.



Custom mode must be enabled to use custom encoder maps, by selecting **{Custom}**. When custom mode is off, Eos will use the default parameter mapping.

Custom encoder mode, map assignments, and current positions can be stored in snapshots and recalled separately or together. See *Recording Snapshots*.

Creating Custom Maps

Create a map by entering the map number and pressing **[Enter]**, and select a parameter category (Intensity, Focus, etc) to customize.

Add parameters to the category by selecting an open encoder slot, and choosing a parameter from the list to assign to it. You can also search for specific parameters.

To edit parameters that have already been assigned, select the parameter again and choose from the following options:

- **Clear** - removes the parameter assignment from the encoder slot, leaving it blank.
- **Delete** - removes the parameter assignment from the encoder slot, moving all subsequent parameters to the left
- **Insert Before** - inserts a blank slot to the left of the selected parameter
- **Insert After** - inserts a blank slot to the right of the selected parameter
- **Change Parameter** - replaces the assigned parameter in that slot

Each parameter category can be given up to 25 pages of custom encoder layouts. If a parameter category is not assigned any custom encoder layouts, the default Eos parameter mapping for that category will be used instead.

Defaults

These parameter slots assign default parameters to each encoder in the specified parameter category. Unless a specific parameter has been chosen for an encoder on a page, the assigned defaults will track across encoder pages, indicated with the standard Eos tracking colors.If the defaults are left unassigned, parameters must be assigned on each encoder page individually.

Widgets

Additional fixture control options can be assigned in the Widget column. As with parameters, widgets can be assigned a default that tracks across all pages in a parameter category, or assigned on a page-by-page basis.

Softkey Options

The following softkey options are available in the custom encoder maps editor:

- **{Filter To Users}** - allows you to create a user-specific map
- **{Map To Fixture}** - allows you to create a fixture-specific map
- **{Create From Fixture}** - creates a map using the parameter layout of a specified fixture profile

Copying Maps

Maps may be copied using **[Copy To]**. This may be useful if you want to use the same map layout for multiple custom maps.

Custom Map Types

Default Map

A single custom encoder map can be assigned as the default encoder map for all devices in the show file. When custom mode is enabled, this map will be used for all patched devices.

Assigning a map as the default can be done at the top of the custom encoder map editor, or in **Setup > User > Manual Control**.

Note: *Default maps are specific to the current user number.*

Single-Fixture Maps

Custom encoder maps can be created for a specific device type, and will only appear when one or more devices of that type are selected.

Assign a map to a device profile via **{Map To Fixture}**, or by selecting in the Map To Fixture column. When fixtures with this profile are selected, the custom encoder map will populate.

If multiple fixture types are selected at once, encoder maps will stack in the encoder display, allowing you to select them individually. This includes any default maps for selected fixtures without custom maps assigned to them.

Multi-Fixture Maps

Maps can also be assigned to more than one device type, which can be useful if two or more separate devices are often used together. Simply assign additional device profiles when creating a fixture-specific map. Now when one or more fixture of any included type is selected, Eos will prioritize the multi-fixture map over any individual fixture maps or defaults.

Note: *At least one device type included in the multi-fixture map must be selected for the map to appear.*

User-Specific Maps

Custom encoder maps can also be specified to the user level. When creating or editing a map, assign it to a specific user number via **{Filter To Users}**, or by selecting in the Filter To Users column. As with device profiles, multiple user numbers can be selected. Once specified, only matching users will have access to that encoder map.

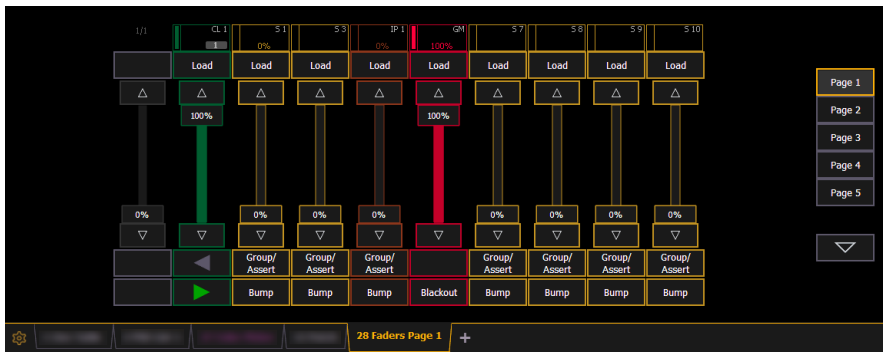
Faders

Faders in Eos have a variety of control and configuration displays.

- *Faders [Tab 28]* - pages of virtual fader modules for control.
- *Fader List [Tab 35]* - a list of all virtual faders and their assignments.
- *Fader Configuration [Tab 36]* - a list of all virtual faders and their assignments.

Faders [Tab 28]

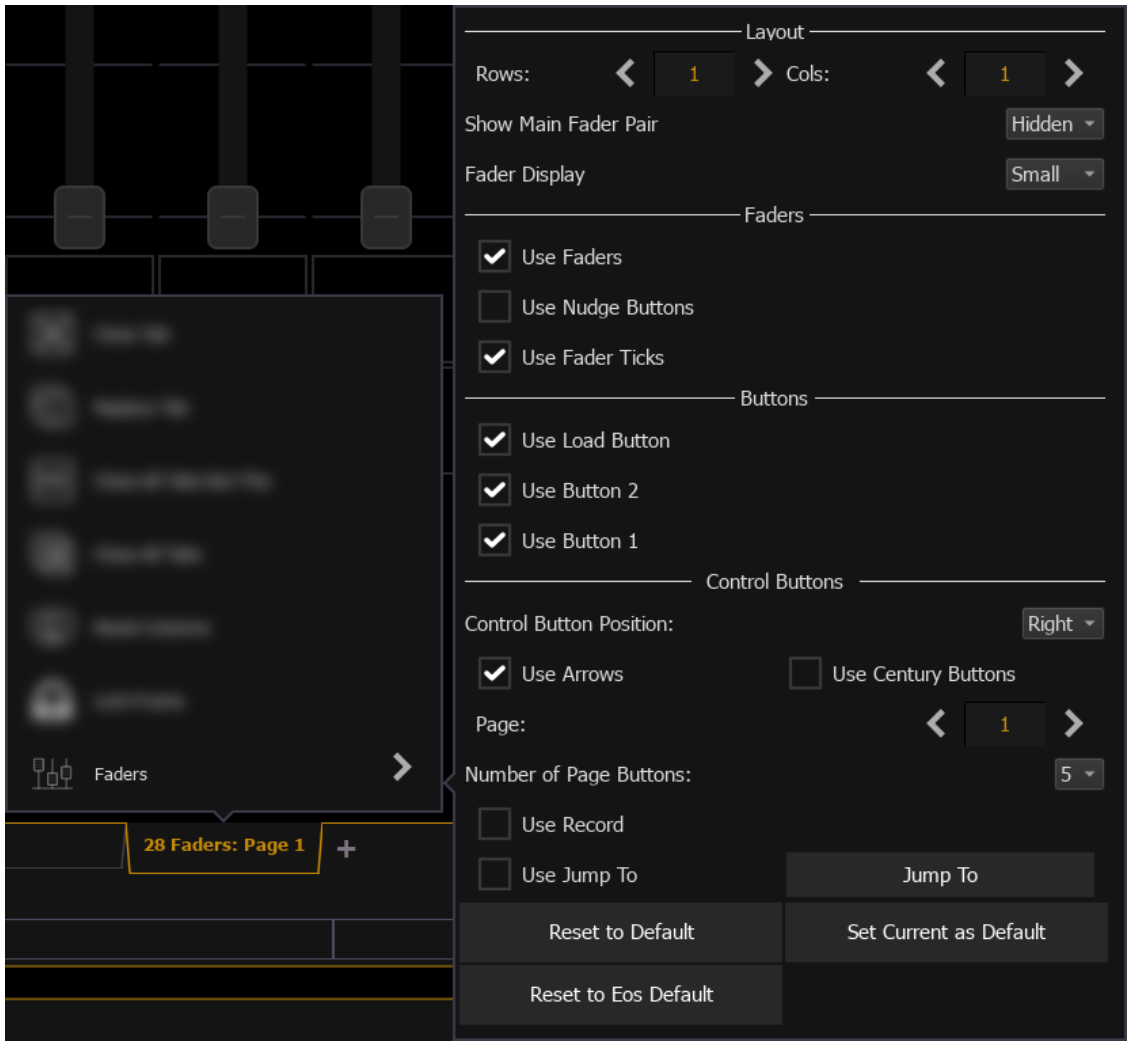
The **Faders** display (**[Tab] [2][8]**) provides pages of virtual fader modules.



For information about configuring your faders, see *Fader Configuration [Tab 36]*.

Faders Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



The following options are available:

- Layout
  - Rows - sets the number of rows used for the module. Maximum number of rows is six.
  - Columns - sets the number of columns used for the module. Maximum number of columns is six.
  - Show Main Fader Pair - check this box to display the virtual master fader pair. Unchecked by default.
  - Fader Display - check this box to display the virtual master fader pair. Unchecked by default.
- Faders
  - Use Faders
  - Use Nudge Buttons - Modern style faders only. Toggles the triangular nudge buttons at the top and bottom of the virtual fader. Disabled by default.
  - Use Fader Ticks - Modern style faders only. Toggles the horizontal lines behind the virtual fader. Enabled by default.

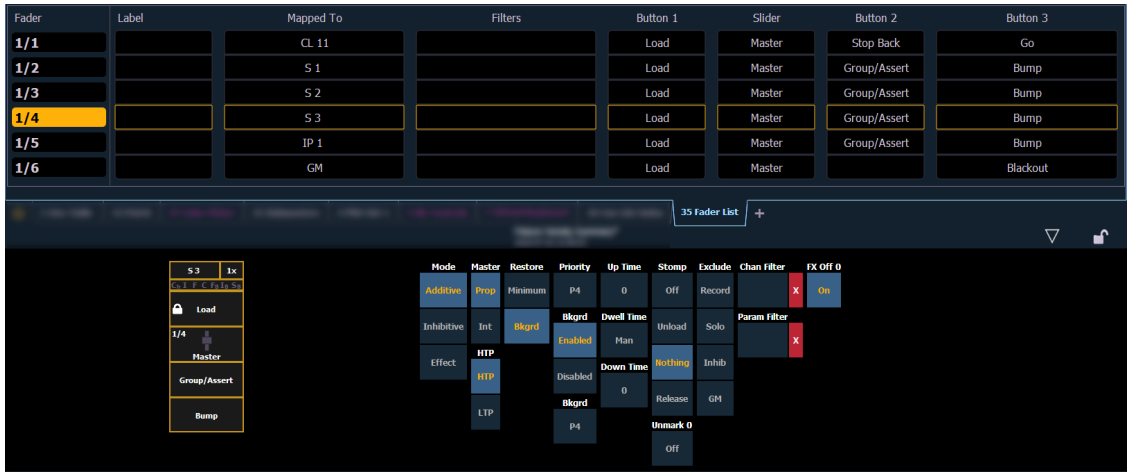
- Buttons
  - **Use Load Button** - toggles the load button above the fader. Enabled by default.
  - **Use Button 2** - toggles the top button below the fader. Enabled by default.
  - **Use Button 1** - toggles the bottom button below the fader. Enabled by default.
- Control Buttons
  - Control Button Position
  - Use Arrows
  - Use Century Buttons
  - Page
  - Number of Page Buttons
  - Use Record
  - Use Jump To
  - {Jump To}

You can save your current settings as the default state for the tab. The current default is identified in parentheses.

- **{Reset to Default}** - returns the settings to the default state that you created.
- **{Set Current as Default}** - uses the current settings and tab number to create a new default state . The default tab will be shown in parentheses.
- **{Reset to Eos Default}** - removes your saved default and returns all settings to the Eos defaults.

Fader List [Tab 35]

The **Fader List** display (**[Tab] [3][5]**) shows all of the virtual faders in your show file, along with their assignments.



You can also make changes to a fader's configuration while in the fader list display by clicking on a column. A virtual fader will be displayed. Click on the appropriate area of the fader to access the configuration options. Selection can be done by clicking in the column or from the command line.

Range editing is possible in this display by selecting all the needed faders. Changes made to the configuration will be made to all of the selected faders.

With a fader selected, the CIA will also display a virtual fader and the configuration options for that fader.

Fader Configuration [Tab 36]

The **Fader Configuration** display (**[Tab] [3][6]**) allows you to edit the settings of your pages of virtual faders.

At the top of the fader configuration display, you can select the fader page, which has 100 pages of 10 faders each page.

If your console has a main fader pair, you can configure it at the top of the display. See *Main Fader Configuration*.

Display

The fader configuration display shows a virtual mockup of each fader and its buttons. The various parts of the virtual fader can be clicked or tapped to open configuration options.

Each fader is color coded based on its assigned target type. Grandmasters and inhibitive submasters are in red, additive submasters are yellow, playback faders display in green, and presets, palettes, global effects, and manual time masters are orange.

Playback faders cannot be assigned on Element 2 and Element Classic consoles.

Fader Configuration

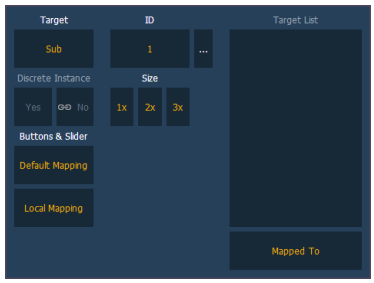
Element Fader Configuration

Fader Display Options

Use the gear icon at the left of the tab bar or right-click on Tab 36 to choose a fader display option. Select **Faders** to manually hide Apex endless fader wheels from the virtual fader, or **Apex Faders** to make them visible.

Fader Configuration Window

Click on the fader header to open the fader configuration window.



Target

This setting allows you to map a cue list, submaster, intensity, focus, color, or beam palette, preset, global effect fader, manual time master, or grandmaster to a fader.

ID

This sets the number of the target assigned to the fader, such as Preset 2 or Submaster 5. For a list of available Target IDs, click or press the **{...}** button beside ID.

Content can also be loaded to faders from Live, using the command line and load.

Discrete Instance

Note: *Not available on Element Classic.*

This setting defaults to Yes and applies to cue lists. When a fader is discrete, it will track other faders that are running the same cue list, BUT if a fader that it is tracking manually changes to a different cue list, a discrete enabled fader will not change its content. When set to No (or disabled), once a fader is in sync with another fader running the same cue list, it will stay in sync when content is changed. Discrete disabled is noted in the fader ribbon with a link icon.

Size

A fader can be mapped so its content takes up 1, 2, or 3 faders. 1x will take up 1 fader, 2x will use 2 faders, and 3x will use three.

If a fader is mapped to 1x, the top button will be locked as a load button. When mapped to 2x or 3x, the top left button will be locked as a load button.

Buttons & Slider

When set to Default Mapping, the button and fader configuration is drawn initially from the cue list or submaster list properties for that content. If changes are made to that mapping in Tab 36, it filters BACK to the cue or submaster list and changes any other instances where that content is mapped. If set to Local, any changes made in Tab 36 impact only that instance of the content. See *Cue List Properties* and *Submaster Properties* on default mapping.

Target List

If temporary fader mapping is being used, the list of content will display here. See *Temporary Fader Mapping*.

Additional Configuration

Clicking on the configuration box will open additional configuration options that are dependent on the target type assigned to the fader.

For detailed information on these various options, see the following topics:

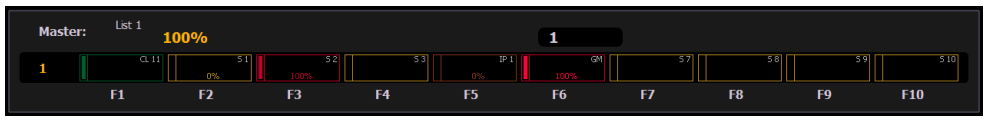
- *Master Configuration*
- *Cue List Properties*
- *Submaster Properties*
- *Preset and Palette Fader Properties*
- *Global Effects Fader*

Fader Ribbon

Note: *Not available on Element Classic.*

The fader ribbon shows the fader color coding that is used in the fader configuration tools.

Grandmasters and inhibitive submasters are in red, additive submasters are yellow ,playback faders display in green ,and presets and palettes are orange.



Main Fader Configuration

Use **{Main Fader}** to open the master fader configuration window.

Target

This setting allows you to choose a cue list to map to the main playback fader.

Note: *Although all fader target options are displayed in the dropdown menu, only cue lists can be assigned to the master fader.*

ID

This sets the number of the target assigned to the fader, such as cue list 2. For a list of available Target IDs, click or press the **{...}** button beside ID.

Element 2 and Element Classic can only map to cue list 1.

Discrete Instance

This setting defaults to Yes and applies to cue lists. When a fader is discrete, it will track other faders that are running the same cue list, but if a fader that is tracking manually changes to a different cue list, a discrete enabled fader will not change its content. When set to No (or disabled), once a fader is in sync with another fader running the same cue list, it will stay in sync when content is changed. Discrete disabled is noted in the fader ribbon with a link icon.

Size

The main playback is set to a size of 2 faders and cannot be changed.

Buttons & Slider

You can select to use default mapping for the fader, or you can use local mapping.

Note: *When a user first joins a session, the main playback fader is unmapped. Once a cue list is established for that user, any other devices joining the user group will have the same cue list automatically mapped to their main playback fader. If a device changes its user ID, the cue list on the main playback fader will be remapped accordingly.*

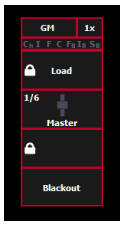
Additional configuration options are available. see *Cue List Properties*.

Master Configuration

There are a variety of different master configuration options for faders that have unique properties.

Grandmaster

When a fader is configured as a grandmaster, you can set the fader itself as a master or disable it. Fader size is set to 1x, and cannot be changed.



The first button is locked as a load button, and cannot be configured. The second button is disabled and cannot be configured. The third button can be configured as a blackout button or disabled. When configured as a blackout, both buttons must be pressed to set the grandmaster to blackout.

Manual Time Master

A manual time master can be used to impact any manual control timing (not to playback of cues). For a manual time master, you need to assign a minimum and maximum time setting to the fader. By default, the minimum is set to 0 seconds when the fader is completely down, and maximum is 5 seconds when the fader is at full. To change the timing, click on the box and enter the time from the pop-up number pad.

The fader ribbon will display the label of M Time to indicate a manual time master fader.

Channel and parameter filters can be assigned to a manual time master.

The fader buttons can be assigned as bump, disabled, or macro (see *Submaster Fader and Button Configuration*). It is recommended that the bottom button be set to bump for turning the fader on and off. When turned on, the LED will be solid green.

You can override a manual time master by using a command line entered sneak time.

The setting of the manual time master is ignore unless turned on. Changing the manual timing master will not impact any manual changes already in motion.

Master Only

Master Only faders are used to set a level for content to fade to. The slider can be used to live adjust levels when the fader has been activated via the bump button.

Master Only faders default to Full.

To set the fader level from the command line, use **[Fader]** [n] **[At]** [level] **[Enter]**.

If content is set to proportional, Master Only fades all content to the setting of the fader when bumped. If set to I-Master, the fader masters the intensity, but non-intensity goes to the end state in time when the content is triggered.

Rate Master

Consoles with rate wheels can use them to adjust the rate dynamically. Consoles without can configure a rate master.

Rate defaults to 100%, which is real time (example: 5 seconds = 5 seconds). Decrease the percentage to slow the cue down. Increase the percentage to speed up the event.

Following are some examples of rate:

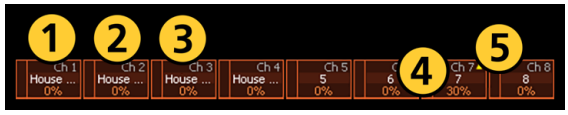
- A 50% decrease rate applied to a 5 second event will play the cue in 10 seconds.
- A 200% increase rate applied to a 5 second event will play the cue in 2.5 seconds.
- Setting the rate to 0% will stop the cue.

The top rate adjustment is 2000%. All timing values associated with a cue (including any follow or hang times) are affected by the rate modification proportionally.

Element 2 & Element Classic Fader Status Display

Each fader is color coded based on its assigned target type. Channel faders are orange. Grandmasters and inhibitive submasters are in red, additive submasters are yellow, and presets, palettes, global effects, and manual time masters are orange.

The fader status display can be disabled in **Setup > User > Displays >** *{Display Fader Ribbon}*.



1	Orange box indicates a channel fader.
2	Current channel number controlled by fader.
3	Label. Channel and target labels will display.
4	Current channel level. Level will display regardless of control from fader or keypad.
5	Up arrow indicates that there is a higher level currently set for the channel and that the fader needs to be raised to match.

1	Palette on a fader.
2	Current submaster number controlled by fader.
3	Red box indicates an inhibitive submaster.
4	Effect on a submaster.
5	Label. Channel and target labels will display.
6	Grandmaster on a fader.
7	Up arrow indicates that there is a higher level currently set for the channel and that the fader needs to be raised to match.
8	Down arrow indicates that there is a lower level currently set for the channel and that the fader needs to be lowered to match.
9	Level of submaster currently.
10	*Global Effects Fader*.
11	*Manual Time Master*.

Channel and Parameter Filters on Faders

Channel and Parameter Filters can be used to allow only specified data to be played back. These are playback filters, and do not impact how data is recorded.

Channel and Parameter Filters can be associated with the following targets for playback:

- Cue lists
- Submasters
- Presets
- Palettes

Note: *Channel and Parameters filters can also be used with Global Effects Faders. See Global Effects Fader*

Note: *For presets and palettes, channel and parameter filters can only be assigned in the fader configuration display (Tab 36) or in the fader list (Tab 35).*

For cue lists and submasters, channel and parameter filters can be set in the following areas:

- Cue List Index
- Submaster List
- Fader configuration display (Tab 36)
- Fader list (Tab 35)
- In Live using the **{Properties}** softkey

Tap or click on **{Chan Filter}** to assign channels or groups. Tap or click on **{Param Filter}** to open a list of available parameters that you can filter. Only the specified channels, groups, and parameters will be played back.

Note: *Filters will travel with their assigned cue lists and submasters wherever they are mapped.*

When a filter has been applied, an indicator will display in the fader ribbon. C will display for channel filter, and F is for parameter filter.

Clearing Channel and Parameter Filters

Press the red **[X]** to clear the channel or parameter filters listed.

Copying Faders Using Attributes Only

When copying faders, you can use **{Attrs Only}** to copy over all of the fader properties except levels, effects, and labels.

- **[Fader] [1] [Copy To] [Fader] [4] {Attrs Only} [Enter] [Enter]** - copies all of the fader properties from fader 1 and places it in fader 4. Levels, effects, and labels are not copied when using the **{Attrs Only}** softkey.

ML Controls [Tab 5]

The Moving Light (ML) Controls (**[Tab] [5]**) display provides access to non-intensity (NPs) controls for multiple-parameter devices.

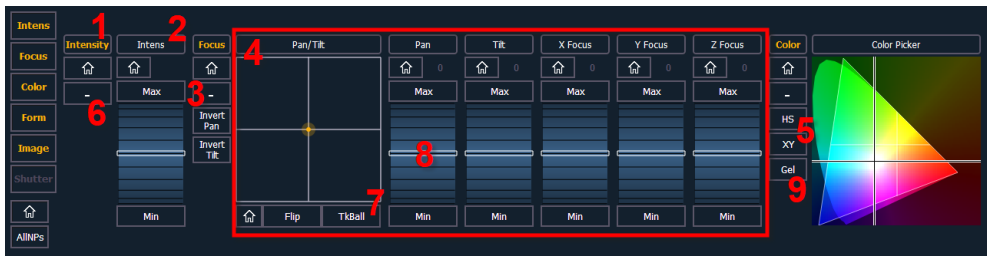
On Element 2 and Element Classic, the display can be opened in the CIA by pressing the **[ML Controls]** button.

You will need to have a multi-parameter device selected to properly view this display. The display will change based on the device selected. If you have a device that only has intensity and color parameters, the ML Control display will only show intensity and color parameters.

Note: *Controls available in this display will change based on the fixture selected.*

When there is room, multiple rows of parameters will display, and you can scroll the display vertically.

There are category shortcut keys on the left side of the ML Controls display. Press a key to quickly access those controls.



1. Category button (Clicking this button will put the category on the command line.)
2. Parameter button (Clicking the button will put the parameter on the command line.)
3. Home button allows you to home a specific parameter or attribute of a parameter.
4. Parameter attributes
5. Selects the color picker.

6. Collapses or expands categories.
7. Gives pan and tilt functionality to a mouse or trackball.
8. Virtual encoder (Click and hold close to the center line for slow movement, further away for faster movement.)
9. Opens the gel picker.

{Popup ML Controls}, a pop-up window version of the ML Controls can be opened for quick access to these functions.

Video Stream [Tab 41]

This display tab allows you to view incoming streaming video. Multiple instances of this tab may be opened at once.

Video streams must be added and configured via **Setup > System** > *Video Streams* before they can be viewed elsewhere in Eos.

The following viewing options are available via the dropdown menus at the top of the **Video Stream** display:

- **Stream** - select from available network video streams.
- **Size** - choose between the following video size options:
  - **Original Size** - video is displayed at full size. Video will be cropped if its full size exceeds the size of the tab.
  - **Fit** - video is scaled up or down to fit the size of the tab.
- **Time** - choose a time format between **ISO Date**, **SMPTE ms**, **SMPTE 24fps**, **SMPTE 25fps**, or **SMPTE 30fps**.

The **Quality** dropdown allows you to choose how this **Video Stream** tab renders the video from the selected stream:

- **High Quality** - the video is rendered with the most fidelity, using the most system resources.
- **Medium Quality** - default. Fewer resources are used to render the video.
- **Low Quality** - the video is rendered using the fewest resources possible.

Lowering the quality of video stream displays may help free up system resources and improve speed or responsiveness.

Streaming Video Specifications

Eos can receive and display the following formats of streaming network video:

- *Secure Reliable Transport (SRT)*
- *Real-Time Streaming Protocol (RTSP)*

Sources must use the H.264 codec.

Displaying Streams

Eos can connect to any number of separate video sources.

Total simultaneous video stream input is typically determined the *Source Stream Limits* of the devices providing network video, and, to a lesser extent, the processing power and bandwidth of your system.

Lowering the quality of video stream displays may help free up system resources and improve speed or responsiveness.

Eos can display video streams in the following ways:

- One or more instances of the **Video Stream** tab can be opened at once.
- *Video Stream* objects can be added to *Magic Sheets*.
- Videos can be used as *Augment3d Materials*.
- Videos can be overlaid on Augment3d using the *Camera Tool*.
- Videos can be used as *Pixel Map Media*.

Video streams must be added and configured via **Setup > System** > *Video Streams* before they can be viewed elsewhere in Eos.

Active streams will be indicated in the header at the top of the display.

Source Stream Limits

CAUTION: ***Streaming video sources are limited in the number of streams they can transmit simultaneously. Exceeding these limits can cause your system to not work as expected or desired. Consult the documentation of any third-party sources to determine the limits for your devices.***

The limits of your video sources may impact how streams can be viewed in Eos. For example, a source that only supports a single stream at a time could not be displayed on a **Magic Sheet** and in **Augment3d** at the same time.

In *Multi-Console Sessions*, each device in the session displaying video from a source counts as an individual stream, which can easily exceed the source's stream limit, especially in larger sessions or sessions utilizing pixel mapping.

Some source devices may activate a protection mode if their stream limit is exceeded and stop transmitting entirely.

Icons

Icons are images that can be applied in various places throughout Eos to customize your workspace.

Any targets that can be applied to a direct select (other than channels, scenes, and buttons) can be assigned an icon, which can be configured to appear on the *Direct Selects [Tab 4]* or *Custom Direct Selects [Tab 39]*.

Icons can also be added and configured as magic sheet objects via the *Magic Sheet Object Library*.

Importing Icons

Use the **Import** button to add new icons to the library. Use the pop-up menu to navigate to the appropriate folder, select one or more images, and select **OK**. SHIFT or CTRL can be held to select multiple consecutive or nonconsecutive images.

The following image formats can be imported:

- BMP
- GIF
- ICO
- JPG
- PBM
- PGM
- PNG
- PPM
- SVG
- SVGZ
- TGA
- TIFF
- XBM
- XPM

The maximum image size is 1920 x 1920 pixels.

Importing Fixture Icons

Additional fixture images in SVG format can be imported for use with *Magic Sheets* and linked to a target channel's color, intensity, or both.

SVGs are vector-based images which can be scaled to any size without losing resolution. Each image layer can be given an internal ID tag, which can be viewed and edited in an SVG editor, such as Inkscape, or directly in the code by opening the SVG file in a text or code editor, such as Notepad++.

1	Fill color (etc_symbol_base)
2	Outline (etc_symbol_outline)

Fixture SVG tags must meet the following criteria:

At least one element, typically the fixture fill color, must have one of the following IDs:

- **etc_symbol_base0** - links the fixture fill opacity to the target channel's intensity level.
- **etc_symbol_base** - links the fixture fill color to the target channel's color and the fixture fill opacity to the target channel's intensity level.
- **etc_symbol_base2** - links the fixture fill opacity to the target channel's intensity level.

At least one element, typically the fixture outline, must have one of the following IDs:

- **etc_symbol_outline0** - links the fixture outline opacity to the target channel's intensity level.
- **etc_symbol_outline** - links the fixture outline color to the target channel's color and the fixture outline opacity to the target channel's intensity level.
- **etc_symbol_outline2** - links the fixture outline opacity to the target channel's intensity level.

Any additional elements in the SVG that are given one of the ID tags above will also follow the target channel's color, intensity, or both.

Layers with tags not matching those above, or without tags, will be removed on import and not displayed.

Organizing Icons

Select the **Organize** button to enable the following additional button options:

- **Add Folder -** adds a folder to the current icon library directory.
- **Delete Unused -** deletes any unused icon images across all icon library folders. You can optionally delete subfolders and empty folders at the same time using the checkboxes.

Icons can be dragged in and out of folders. Selecting an image or folder in organize mode will enable the following options:

- **Replace -** images only. Replaces all show file instances of the selected image with a new image of your choice.
- **Rename -** changes the name of the selected image or folder.
- **Delete -** after confirmation, removes the selected image or folder from the icon library. Deleting a folder will also delete all images inside it.

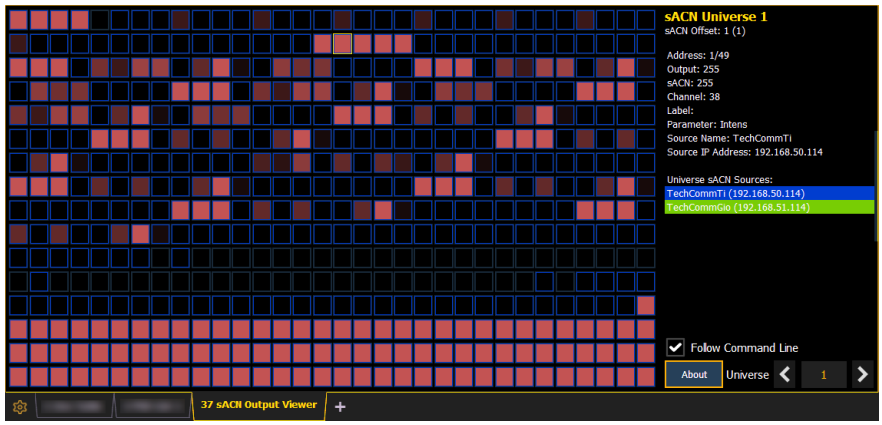
SVGs

Any SVG (Scalable Vector Graphic) file used as the icon for multiple targets can be given a unique color per instance. The files must be tagged using the same guidelines used when importing fixture icons.

sACN Output Viewer [Tab 37]

You can open the sACN Output Viewer by pressing **[Tab] & [3][7]** or selecting the sACN Output Viewer icon from the home screen.

The sACN Output Viewer is a place to check the current live outputs on a universe by universe basis.



The left side of the viewer is the universe grid. It displays 512 address cells. Cells outlined in a color are currently patched addresses. Each patched cell contains an address number and output value. Unpatched cells are black and only have an address level.

Output values are 0 through 255. 0 is displayed in black and 255 is in bright red. The red output value color will grow brighter as the output value increases.

If there is a channel or address selection on the command line, the appropriate address cell will be outlined in gold. You can also press on a cell to select it but it will not post to the command line. Information about the selected address will display to the right of the grid.

Any available sACN sources will be displayed in the right panel, and are color coded. The address cells will use that same color coding to indicate the device it is patched to.

Configuration Options

When the Follow Command Line box is checked, the viewer will follow the command line for selecting addresses. This is enabled by default.

Press {About} to open the About Address display in the CIA.

Press the left and right arrows to scroll through the available universes, or enter a specific universe number in the box.

Snapshots

Snapshots are record targets that store the current state of your console's control surface and external monitor configuration. These can then be recalled to instantly reset the console and displays to the state stored in the snapshot. You can choose which parts of the front panel and displays you wish to store as a part of the snapshot.

When you record a snapshot, aspects of the Eos user-interface, based on user-preference, are stored so that you can recall them in the future. This allows you to bring the console back to a desired state quickly.

Snapshots can be used on RPUs or RVIs to change what is currently displayed on the external monitors and how that information is displayed.

Snapshot contents are global. They can be stored and recalled on any control interface, other than Net3 RFRs. When recorded, they store the relevant settings of the device initiating the record. When recalled, they recall only the controls that are appropriate on the device the snapshot is recalled.

Snapshots that store the faders do not include the active cue in a fader. They only include pending cues and fader attributes.

Snapshots of just a single monitor can also be recorded. See *Recording Snapshots*.

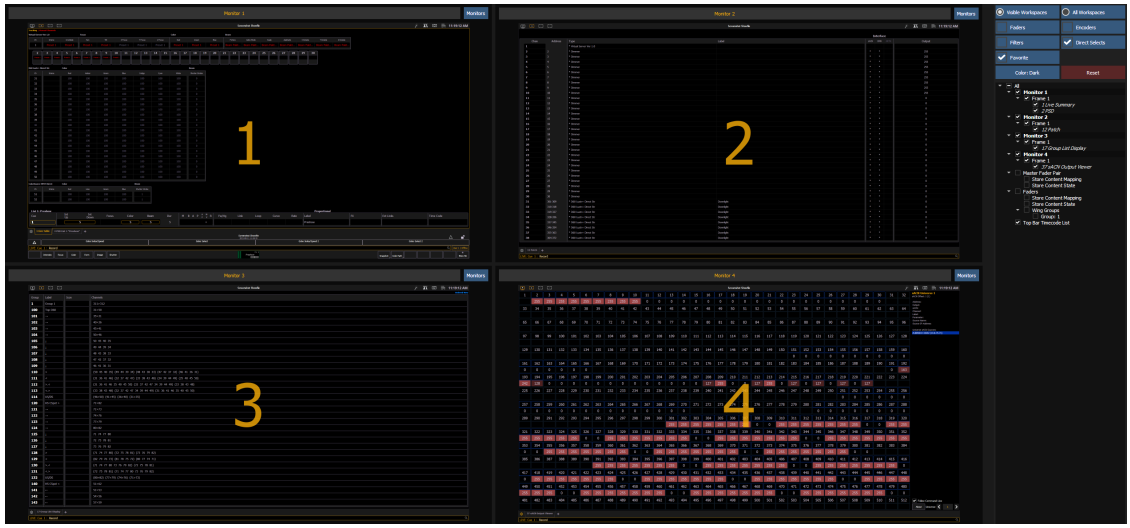
Recording Snapshots

Note: *On Element 2 and Element Classic consoles, **{Snapshot}** is a softkey.*

To store the current state of the console, record a snapshot.

- [Record] [Snapshot] [1]

When recording a snapshot, you will see a preview of all of the displays as they will be recorded in the snapshot. You can choose to select/ deselect various components, monitors, frames, etc from your snapshot.



The blue checkboxes at the top of the snapshot menu select different combinations of the display elements below. The following options are available:

- **Visible Workspaces** - includes only the visible workspaces.
- **All Workspaces** - include all workspaces, including those not visible at the time of recording.
- **Faders** - includes the current content or state of the faders including: fader page mapping, position of all submasters, and pending cues based on configuration.
- **Encoders** - includes the current page of the encoders.
- **Filters** - includes the current setting of the record filters.
- **Direct Selects** - includes all direct select tabs and their settings when used without visible workspaces selected.

Note: *The **Faders** and **Encoders** options are not available on Element 2.*

The following checkboxes control additional snapshot settings:

- **Favorite** - the snapshot will display in the *Quick Access Pop-Up Tools* window.
- **Other** - allows you to select a custom combination of items for inclusion in the snapshot.
- **Color** - assign colors (**{Red}**, **{Green}**, or **{White}**) or no color (**{Dark}**) to a snapshot. The colors will display beside the snapshots name in a direct select, and / or if that snapshot has been assigned to one of the customizable hardkeys on Eos Ti, Gio, Gio @ 5, and RPU.
- **Reset** - sets the menu back to its defaults.

If **Other** is enabled, you may also check or uncheck to include or exclude any of the following:

- Monitors - any of your console's internal or external monitors.
  - Frames - any of the open frames on that monitor.
    - Tabs - any of the open tabs in that frame.
- Master Fader Pair - the two master playback faders.
  - Content Mapping - the page and location of the content assigned to the faders.
  - Content State - the state or level of the content.
- Faders - any other internal or external faders.
  - Content Mapping
  - Content State
  - Wing Group - which page the wing group is currently displaying.
- Target Key Banks - Apex target keys.
- Keyboard Display - Apex keyboard display.
- Top Bar Timecode List - which timecode list is currently displayed in the top bar display

When one or more sublevel items are excluded, a minus (-) icon will appear next to the top level item to indicate that not every available option will be saved. A checkmark icon will display when every sublevel item will be saved.

Monitors and frames can also be selected or deselected in the preview area. Use {Frames/Monitors} in the top right to toggle between monitor or frame numbers. Deselected monitors and frames will be greyed out. Deselected frames will also display a slashed red circle icon.

Snapshots [Tab 19]

Note: *On Element 2 and Element Classic consoles, {Snapshot} is a softkey.*

When snapshots are recorded, you can view them in the snapshot list. To view the list:

- Press [Snapshot] [Snapshot].
- Press [Tab] [1] [9].
- Navigate to Browser > Record Target Lists > Snapshots.
- Select the Pop-up Snapshot Browser from the top-right menu icons.

Snapshots can be recalled in the following ways:

- From the keypad/ command line - [Snapshot] [5] [Enter].
- From cues using the execute list.
- From a recorded macro instruction.
- From the direct selects - {Snapshot 4}.

Since snapshots can be recalled from any device (except RFRs) on the Eos Family network, snapshots may be affected by the type of device they are recalled on. If the recalling device does not have the same physical layout or has other limitations that differ from the recording device, Eos will map the snapshot to the best of its ability.

In a system with multiple users, it is recommended that you allot discrete snapshot numbers for each user. Since snapshots are global and can be recorded/ recalled from most devices, assigning numbers for each user will ensure their snapshots are stored and edited properly for their device.

Editing Snapshots

Note: *On Element 2 and Element Classic consoles, {Snapshot} is a softkey.*

To edit or preview the contents of a snapshot, open the snapshot list by selecting **[Snapshot] [Snapshot]**, opening **[Tab] [1] [9]**, navigating to **Browser > Record Target Lists > Snapshots**.

You can use **[Next]** and **[Last]** to navigate the list or you may specify a snapshot in the command line.

Once a snapshot is specified, the list displays five columns, one for each element. You may change the enabled elements by pressing the CIA buttons or the softkeys found beneath the CIA. If an element is added to the command line using the softkeys, it will be enabled when **[Enter]** is pressed. All other elements will be disabled.

Snapshots can be labeled in the snapshot list by selecting the snapshot and pressing **[Label]** or by selecting the Label column.

- **<Snapshots> [3] {Monitors} [Enter]** - enables the monitors for snapshot 3 and disables any other elements.

Snapshots can be assigned *Icons*, which can be configured to appear on the direct select button in Direct Selects (Tab 4) or Custom Direct Selects (Tab 39).

Deleting Snapshots

Note: *On Element 2 and Element Classic consoles, {Snapshot} is a softkey.*

You may delete snapshots using the following syntax:

- **[Delete] [Snapshots] [2] [Enter]** / **[Delete] {Snapshots} [2] [Enter]**
- **[Delete] {Snapshot 5}** - selects a snapshot from the direct selects to delete it.

Eos Windows and macOS Keyboard Shortcuts

If a separate shortcut is not listed for macOS, the shortcut is the same as the Windows version.

On many macOS device keyboards, ALT is referred to or labeled as OPTION.

Eos Function	Windows Shortcut	macOS Shortcut
Shortcut List	Alt /	
	?	
0	0	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
. (Decimal)	. (Decimal)	
- (Minus)	- (Minus)	
+ (Plus)	= (Equals)	
	+ (Plus)	
+%	Shift =	
	Control Alt =	
-%	Shift -	
	Control Alt -	
/	/	
Augment3D (A3D) Camera Up	Up Arrow	
A3D Camera Up (Edit Mode)	W	
A3D Camera Forwards	Shift Up Arrow	
A3D Camera Forwards (Edit Mode)	Shift W	
A3D Camera Left	Left Arrow	
A3D Camera Left (Edit Mode)	A	
A3D Camera Down	Down Arrow	
A3D Camera Down (Edit Mode)	S	

Eos Function	Windows Shortcut	macOS Shortcut
A3D Camera Backwards	Shift Down Arrow	
A3D Camera Backwards (Edit Mode)	Shift S	
A3D Camera Right	Right Arrow	
A3D Camera Right (Edit Mode)	D	
About	Y	
Address / Dimmer	Alt A	
All NPs	Control N	
Assert †	Control W	
Assert (Playback) †	Control Alt A	
At	A	
	@	
	*	
Back (ECU)	Escape	
Beam Filter	Control B	
Beam Palette	Alt B	
Blind	F2	
	Control 2	
Block	B	
Capture	Control Alt P	
Clear	Backspace	
Clear Command Line	Shift Backspace	
	Control Alt Backspace	
Clear Label	Control Backspace	
Color Filter	Control C	
Color Palette	Alt C	
Color Path	Control Alt W	
Copy To	C	
Cue	Q	
Cue Only / Track	X	
Data	Control D	
Data Mode	Control Shift D	
Delay	D	
Delete	Delete	Fn Delete

Eos Function	Windows Shortcut	macOS Shortcut
Displays	F9	
	Control 9	
Effect	Alt E	
Encoder Display (Gio) †	Control Alt \	
Encoder Page Color ^†	Control Alt [	
Encode Pager Focus ^†	Control Alt ,	
Encoder Page Form ^†	Control Alt ;	
Encoder Page Image ^†	Control Alt]	
Encoder Page Intensity ^†	Alt .	
Encoder Page Shutter ^†	Alt ,	
Enter	Enter	
Escape	Escape	
Expand	F5	
	Control 5	
Fader Page †	V	
Fan †	W	
Filter	'	
FlexiChannel	F3	
	Control 3	
Focus Filter	Control F	
Focus Palette	Alt F	
Follow / Hang †	Shift D	
	Control Alt D	
Format	F4	
	Control 4	
(Scroller) Frame	Control Alt C	
Freeze †	Control Alt F	
Full	F	
Go	Spacebar	
	Control Alt Spacebar	Option Spacebar
Go To Cue	Control G	
Go To Cue Zero	Control Alt G	
Group	G	

Eos Function	Windows Shortcut	macOS Shortcut
Help	Alt /	
Highlight †	\	
	Control Alt H	
Home	Home	Fn Left Arrow
	Control H	
Intensity Block †	Shift B	
	Control Alt B	
Intensity Filter	Control I	
Intensity Palette	Alt I	
Label / Note	L	
Last	Page Up	Fn Up Arrow
	Control ,	
Learn	Alt L	
Level	Control V	
Live	F1	
	Control 1	
Load	Control Alt L	
Macro	M	
Macro 801*	Control Alt 1	
Macro 802*	Control Alt 2	
Macro 803*	Control Alt 3	
Macro 804*	Control Alt 4	
Macro 805*	Control Alt 5	
Macro 806*	Control Alt 6	
Macro 807*	Control Alt 7	
Macro 808*	Control Alt 8	
Macro 809*	Control Alt 9	
Macro 810*	Control Alt 0	
Magic Sheet (MS)	Alt M	
MS Editor Grid Toggle	Control I	
MS Editor Reset Zoom	Control 0	
MS Editor Zoom to All	Control 1	
MS Editor Zoom to Selection	Control 2	

Eos Function	Windows Shortcut	macOS Shortcut
MS Editor Center on Selection	Control 3	
MS Editor Flip Vertical	Control F	
MS Editor Flip Horizontal	Control Shift F	
MS Editor Mirror	Control M	
MS Editor Group	Control G	
MS Editor Ungroup	Control Shift G	
MS Editor Normal Layout	Control E	
MS Editor Renumber (By Click)	Control Shift R	
MS Editor Stretch	Control S	
MS Editor Cut	Control X	
MS Editor Copy	Control C	
MS Editor Paste Renumber	Control Shift V	
MS Editor Paste Duplicate	Control V	
MS Editor Clear Selection	Control D	
MS Editor Renumber In Item	Control R	
MS Editor Undo	Control Z	Command Z
MS Editor Redo	Control Y	Command Y
Manual Override	Control Alt M	
	Control Alt N	
Mark †	K	
	Control Alt K	
Mirror Start	Alt F1	
Mirror Stop	Alt F2	
ML Controls	F7	
	Control 7	
More Softkeys (More SK)	Alt 7	
Next	Page Down	Fn Down Arrow
	Control	
Off	Control Alt O	
Offset	Control O	
Out	O	
Page Left	Left Arrow	
Page Right	Right Arrow	

Eos Function	Windows Shortcut	macOS Shortcut
Page Up	Up Arrow	
Page Down	Down Arrow	
Parameters (Display)	Control D	
Park	Alt K	
Part	P	
Patch	;	
Pixel Map †	Alt X	
Preset †	Alt P	
Query †	Control Q	
Rate	Control Alt R	
Recall From	E	
Record	R	
RecordOnly	Control R	
Release	Control Alt S	
Rem Dim	H	
Scroll Lock	Control 6	
Select	Control Enter	
Select (ECU)	Return	
Select Active	Control A	
Select Last	Control L	
Select Manual	Control M	
Setup	Alt S	
Shift	Z	
Snapshot	Control S	
Sneak	N	
Softkey 1	Alt 1	
Softkey 2	Alt 2	
Softkey 3	Alt 3	
Softkey 4	Alt 4	
Softkey 5	Alt 5	
Softkey 6	Alt 6	
Spacebar Disable	Alt G	
Staging Mode	F6	

Eos Function	Windows Shortcut	macOS Shortcut
Stop / Back	Control Spacebar	
	Control Alt Q	
Stop Effect	Control Alt E	
	Shift Alt E	
Submaster	S	
Tab	Tab	
Time	I	
Time (Displays)	Control Alt I	
Timing Disable	Control Alt T	
Toggle Hotkeys	F8	
	Control 8	
Trace †	J	
Thru	T	
Undo	Control X	
Update	U	
Virtual Keyboard	Control K	
Workspace	] or [	
Zoom Selected Display	Left Mouse Button + Scroll Wheel	

** Some key combinations are not available on all physical keyboard layouts*

^ Alternatively use Encoder Display + category to change the encoder pages

† Commands are not available on Element Classic

Notes

- Scroll Lock must be off to use keyboard shortcuts.
- If an international keyboard requires that you disable **{Use Shift Key As Eos Shift}** in **Setup > Device > Face Panel > Input Devices**, replace SHIFT with Z to access shortcut functions.
- To enable Eos functions on macOS function keys, navigate to **System Preferences > Keyboard** and enable "Use all F1, F2,etc... keys as standard function keys."

Eos Console Hardkey Shortcuts

Displays

- [Data] (maintained press) - toggles the display to show data living under referenced data. Keep [Data] depressed to page. [Data] & [Data] locks this display.
- [About] & [Data] - locks the display to the absolute data display.
- [Time] (maintained press) - toggles the display to show discrete timing. Keep [Time] depressed to page.
- [About] & [Time] - locks the display to discrete time display. Press [About] & [Time] [Time] to unlock, or temporarily display discrete time.
- [Data] & [Focus] / [Color] / [Beam] - to expand/ suppress categories on displays. (Ion)
- [Data] & {Parameter Tiles} - to suppress/ display individual parameters from the display when not in summary view. (Ion)
- [Params] & [Focus] / [Color] / [Beam] - to expand/ suppress categories on displays. (Ti/ Eos/ Gio)
- [Params] & {Parameter Tiles} - to suppress/ display individual parameters from the display when not in summary view. (Ti/ Eos/ Gio)
- [Displays] & [Level Wheel] - controls the Main slider in Brightness Settings.
- [Displays] [Displays] - resets the CIA to the browser.
- [About] & [Path]/{ Color Path} - toggles the display to show the color paths.
- [Shift] & [Select] - reset display columns.
- [Shift] & [Tab] - clear all tabs on the current monitor (but keep locked frames) (Does not clear tab 1 and 2).
- [Shift] & [Tab] [Tab] - clear all tabs on all monitors (but keep locked frames) (Does not clear tab 1 and 2).
- [Shift] & [Tab] [Tab] [Tab] - clear all tabs on all monitors (including locked frames) (does not clear tab 1 and 2).
- [About] & [Label] - toggles the Live / Blind display to show reference labels or numbers, based on setup.
- [About] & [Label] [Label] - double press to lock reference labels on. Press [About] & [Label] again to unlock.
- [Shift] & [Live/ Blind] - advances the displays to the next instance of Live or Blind.
- [Live] (when already in Live) - re-syncs the selected cue to the most recently activated cue.
- [Blind] (when already in Blind) - re-syncs the selected cue to the live selected cue (when blind cue has been changed or when preserve blind cue has been enabled).
- [Flexi] & [Time] - to invoke Flexi time view on displays.
- [Format] & [Level Wheel] - zooms the display in focus.
- [Tab] & [Up/Down Arrow] - cycle workspaces.
- [Tab] & [Left/Right Arrow] - move displays.
- [Tab] & [number] - open or focus specific displays.
- [Flexi] & [.] - turns on Flexi multicells off mode. Press again to turn off.
- [About] & [Live] - displays the DMX values.
- [About] & [Mark] - displays the mark cue used by the channels.
- [About] & [Next]/[Last] - displays the next cue that the channels move in or the last cue that the channels moved in.
- [About] & [Park] - displays the parked levels.
- [About] & [Part] - displays the cue part number for each parameter.
- [Expand] & [Effect] - opens the Effect Status Display (Tab 8).

Operations

- [At] [Enter] - removes move information from selected channel/parameters.
- [At] [At] - set to Level (as defined in Setup).
- [Color] (Encoder Paging Key) & Encoder Movement - hold Color Point while adjusting parameters.
- [Copy To] [Copy to] - posts Move To on the command line.
- [Full] [Full] - sets selected channels intensity to "full" and self terminates.
- [Label] [Label] - appended to a record target command, clears the current label, this includes show file labels.
- [Recall From] [Recall From] - posts Recall From Cue to the command line.
- [Record] [Record] - posts Record Only to the command line.
- [Select Active] [Select Active] - Select Active minus submaster contributions.
- [Shift] & [Select Active] - posts Select Non-Sub Active.
- [Shift] & [Enter] - repeats last command line, unterminated; loops last five commands.
- [Shift] & [At] - recalls last channels and parameters without terminating; loops last five commands.
- [Shift] & [Block] - posts Intensity Block to the command line.
- [Shift] & [Clear] - clears the command line.
- [Shift] & [Delay] - posts follow.
- [Shift] & Encoder Paging Key - posts the category to the command line. For beam subcategories, press Image, Form or Shutter twice to post Beam. (Ion/Gio)
- [Shift] & Encoder Movement - accesses fine mode.
- [Shift] & Encoder Push/ Toggle - posts the parameter to the command line. (Ion)
- [Shift] & Gel Tile - cycles through three modes of Brightness.
- [Shift] & [Full] or [Shift] & [Out] - flash on or flash out.
- [Shift] & [+] or [Shift] & [-] - +% or -%.
- [Shift] & [Highlight] - appends highlight to the current channel selection.
- [Shift] & [Label] - opens the existing cue note for the selected cue or creates a new one.
- [Shift] & [Select Last] - posts additional channel selection options to the softkeys.
- [Shift] & [Sneak] - makes manual data un-manual.
- [Shift] & [Update] - shortcut to Save.
- [Shift] & restore manual faders - reset faders to zero without asserting control.
- [Shift] & {Direct Select} - posts DS to the command line without terminating.
- [Shift] & [Next] or [Shift] & [Last] - advances the cue without changing channel selection.
- [Sneak] [Sneak] - releases NPs of selected channels and self-terminates.
- [Timing Disable] & [Go] or & [Back] - cuts the next cue or cuts the last cue.
- [Thru] [Thru] - [Thru] command accesses only channels displayed in the current Flexi state (unless the range specified is not in the current display). [Thru] [Thru] selects the range regardless of the flexi mode.
- [Trace] [Trace] - forces a previously inactive light to track its new intensity setting backwards.
- [Undo] - clears an unterminated command line. Otherwise opens undo controls.
- [Update] & [Sub Bump] - to update a specific submaster.
- [n] [At] [/] [/] [m] [Enter] - sets direct DMX value (m) for channel (n).
- [Shift] & [Delay] [Delay] - posts hang to the command line.
- [Shift] & [About] - opens a command line search window.
- [Shift] & [.] - posts minus cells to the command line. This is for use with multicell fixtures.
- [.] - posts multicell fixture cells or cells only to the command line when used after channel numbers.
- [Shift] & [Int Palette] - posts preset on the command line (Element & Element 2).
- [Displays] & [Record] - puts a marker in the log file.

Face Panel

- [Shift] & [Escape] - to lock and unlock face panel.
- Encoder Paging Keys & [Number] - pages to the desired encoder control page.
- [Escape] & Encoder Paging Keys - locks the encoders. Press any encoder page button to unlock.
- [Flexi] & Encoder Paging Key - to invoke flexi encoder states.
- [Fader Controls] & [Bump Button] - select a fader page on wings.
- [Fader Page] & Rate Wheel - rolls the selected fader page. (Ti/Eos/Gio)
- [Fader Page] & [number] - select a fader page on integral faders. (Ti/Eos/Gio)
- [Fader Page] - increments the fader page by 1.(Ti/Eos/Gio)
- [Shift] & [Fader Page] - decrements the fader page by 1. (Ti/Eos/Gio)
- [Learn] & [Load] - opens the selected fader's configuration tools.
- [Off] & [Load] - releases control of content, restoring to background and leave cue list with pending cue in tact.
- [Release] & [Load] - releases control of content, restoring to background, and resets cue list to top.
- [Shift] & [Go] or [Shift] & [Back] - cuts the pending cue or the previous cue.
- [Shift] & [Load] - to remove content from a fader.
- [Shift] & [Stage] - toggles Scroll Lock on and off.

Chapter 4

Show Files

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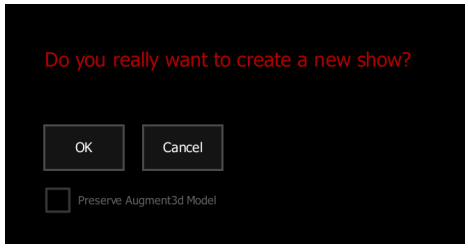
About Show Files

This section concerns show files, modular collections of all the data in your show, which are typically accessed and managed via the *Browser* in the *Central Information Area (CIA)*. Show files can also be managed from the shell via the *Eos Configuration Utility (ECU)* under **Settings > Maintenance >** *{File Manager...}*.

Eos launches in the previously-open show file. Running Eos for the first time launches a blank show file.

Creating Show Files

To create a new show file, select **File > New** in the browser.



The following options are available:

- **{OK}** - creates a new show file. Any unsaved show data will be lost.
- **{Cancel}** - discontinues the operation.
- **Preserve Augment3d Model** - includes any existing *Augment3d* model in the new show. Disabled by default.

An additional option is available on *Ion Classic* (disabled by default) and *Element Classic* (enabled by default) consoles:

- **{Patch 1to1}** - creates a new show file with a 1-to-1 patch and 1-to-1 channel to sub assignment.

Template Show Files

A template show file can be assigned in the ECU via *Settings > General*.

When a show file is assigned as a template, Eos will create a copy of the file in the **Templates** folder to be used as the default starting point for any new show files. A new option will appear in the CIA under **File > New From Template** (*Template Show File Name*) to create a new show file identical to the template. A blank show file can always be created with the **File > New** option.

Templates can be managed via **ECU > Settings > Maintenance >** *{File Manager...}*, and are unaffected by deep clears.

Deleting Show Files

To delete show files, select **File > Open**, navigate to the desired show file, and press **[Delete]**. Use **[Enter]** to confirm the deletion or any other key to cancel.

Use the same syntax to delete show file folders. Folders must be empty before they can be deleted.

Saving Show Files

Save

To save the current show data, select **File > Save** in the browser. A green **Success** message should appear when the file has finished saving. The new time stamp located beneath the show file name on the CIA indicates that the show file has been saved.

If a red **Failed** error appears, attempt to save to a different location, or exit and restart Eos as soon as possible.

Quick Save

To quick save without using the browser, hold down **[Shift] & [Update]**.

Quick save always saves to the most-recently-used save location.

Save As

To save a show file to a specific location or with a specific name, navigate to **File > Save As** and press **[Select]** to expand the list of available save locations. Navigate to the desired storage location and press **[Select]** to open the alphanumeric keypad in the CIA.

The current show file name will be used by default. Use **[Label]**, **[Delete]**, or DELETE to clear the entire label, or BACKSPACE to remove a character at a time. Name the show file and press **[Enter]**. The show file will be saved in the specified location with the name you entered and a timestamp suffix.

Save Location

By default, show files are saved to the **Show File Archive**, a folder stored locally on your Eos Family device or computer.

On Eos Family devices, this is the only default save location. In Eos on Windows and macOS, the user's **Desktop**, **Documents**, and **Downloads** folders are also displayed by default. Connected USB and network drives will also appear as save locations.

Note: *This option is only available on ETCnomad.*

Select **File > Configure Archives** to make changes to your save locations.

The following options are available:

- **Standard Locations** - when deselected, these locations will not appear in the **File** menu as available save locations. Selected by default.
- **Other Locations** - a list of the computer's custom save locations. Custom locations are stored locally and do not travel with show files.

To add a custom save location, use **{Add Location}** to navigate to the appropriate folder. Use **{OK}** to confirm the folder selection or **{Cancel}** to discontinue the operation.

The folder will be added as a custom location with a default label. The label and path can be edited by selecting in either field. Delete locations with the icon to the left.

Show File Formats

The **Save As** confirmation includes options for choosing your show file format. This confirmation also appears when a show file is saved for the first time.

The following options are available:

- **ESF3D** - includes both show data and the Augment3d model. Only compatible with Eos v3.0.0 and later.
- **ESF2** - includes show data and excludes the Augment3d model. Only compatible with Eos v2.9.0 and later.
- **ESF** - a legacy format for compatibility with Eos v2.9.0 and earlier.

Unsaved Data

Show File Indicator

An asterisk (*) will display beside the show file name to indicate when a show file has been modified but not saved.

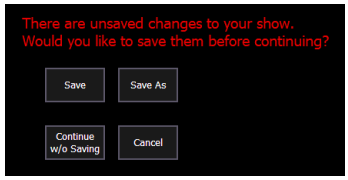
An asterisk beside the indicator *(Augment3d)* indicates there are unsaved changes in the *Augment3d* model.

Saving to a New Location

If a show file is saved to a new location, the open show file will still display an asterisk, as it remains unsaved in the original location.

Save Show File Warning

If there is unsaved data in the current show file, a save warning will display when you attempt to open a new or existing show file.



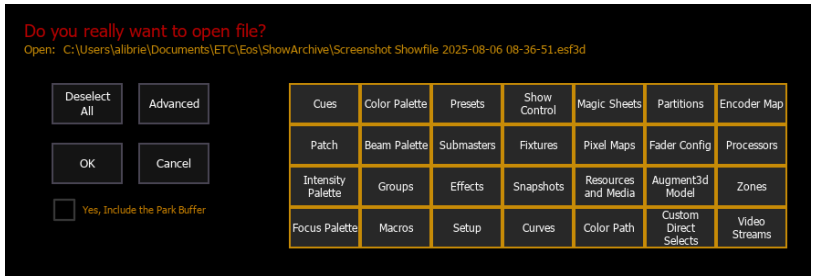
The following options will be available:

- **Save** - saves the current show file, and opens a new or existing show file.
- **Save As** - saves the current show file to a different location or with a different name, and opens a new or existing show file.
- **Continue w/o Saving** - opens the new or existing show file without saving any changes to the current show file. Changes will be lost.
- **Cancel** - returns to the current show file without saving changes or opening a different file.

Opening Show Files

To open an existing Eos show file, select **File > Open** in the browser and choose the *Save Location* of the show file.

Selecting the show file will open the open the partial show loading screen in the CIA.



From this screen you can select which components of the show file you wish to load. By default all components are selected (gray) and will be loaded. To withhold any show components from loading, deselect them in the CIA by touching the respective button. To reselect all show components, press the **{Reset}** button and all buttons will return to gray (selected). Use **{Deselect All}** to deselect all components at once.

Additional options are available when using **{Advanced}** for *Selective Partial Show Opening*.

When you have made your desired selections, use the {OK} button to load the selected show. To exit the show load process, press the {Cancel} button.

Show File Name Conventions

Names of show files may appear in the browser list in normal text or in **bold text**. Files in normal text indicate that there is only one show file stored by that name.

Bold show names indicate that there are several versions of the show file stored under that name, the bold one being the most recent. To access the most recent show file, simply select the bold name. You may right arrow from the bold name to expand a list of previous versions beneath it in the browser. Select the desired show from the expanded list.

Park Buffer

Any show file elements that have been added to the *Park [Tab 20]* display are stored in a buffer when the show file is saved, and by default will not open with the show file.

To load a show file with the parked elements from the buffer included, select the box labeled **Yes, Include the Park Buffer**.

Show File Advisory

If the loaded show file exceeds the console's output capacity, an advisory will display in the CIA. You will need to dismiss the advisory by pressing {OK} before continuing. To see the capacity of the console, press [About].

Selective Partial Show Opening

If you select the {Advanced} button when *Opening Show Files*, you will have the opportunity to load partial components from the show file and be able to specify the desired location of those partial components in the new show file.

For example, you could specify specific cues and load them to a different range of cue numbers in the new show. You could also specify only specific palettes, presets, effects, and so on.

As you specify components, they are added to a table in the CIA. In the table, fields with a dark background may be edited, fields with a light gray background do not apply to that component. For each component in the list, you can specify the desired range by pressing the proper area in the table and entering numbers from the keypad. The columns in the table are:

- **List** - the list you are taking data from (such as a cue list).
- **List Target** - the list you are adding the data to.
- **Start** - the first in a range of components (such as a range of cues).
- **End** - the last in a range of components. Use [Thru] to jump to this column.
- **Target** - the desired location of the components in the new show file. For ranges, this will be the location in the new show of the first component in the range, the others will follow in order. Use [At] to jump to this column.

To open only partial components from a show file:

1. From the browser, navigate to the desired show file.
2. When the partial show load screen appears, press the {Advanced} button. The partial components selection screen will appear in the CIA.
3. Select the show components that you wish to load by pressing on their respective buttons on the left side of the CIA. The components will appear in the list to the right as you select them.
4. Press any fields for which you want to enter specific numbers. The field (if editable) will highlight in gold.
5. Enter the numbers using the keypad to specify the desired cues / groups / effects and so on.
6. Press {OK} to load the components to the new show.

You may exit the partial show load screen at any time by pressing the {Cancel} button. This will return you to the browser.

You may clear all selected components from the table at any time by pressing the {Reset} button.

You may exit the advanced loading screen at any time by pressing the {Return} button. This will return you to the general partial show load screen.

Note: *Media is imported gobo and magic sheet images, and will be included by default when you select Patch, Fixtures, or Magic Sheets.*

Partial Patch Opening

You have the option to selectively open partial patch information or fixtures into a show file by selecting the {Advanced} button in the partial show opening screen. Select {Patch} or {Fixtures}.

You can specify the desired range by selecting the proper area in the table and entering numbers from the keypad. The columns in the table that relate to patch are:

- Start - the first in a range of components.
- End - the last in a range of components.
- Target - the desired location of the components in the new show file (for ranges, this will be the location in the new show of the first component in the range, the others will follow in order).

CAUTION: ***Any record targets not opened with the partial patch will have their data cleared from the show file. Data can be transferred from one show file to another by Merging Show Files.***

When partially opening the patch, any record targets that are not opened will have all data of that type cleared from the show file. Retain record target data by *Merging Show Files*.

Merging Show Files

All Eos family consoles support the merging of other Eos family show files.

Merging show files is different from opening show files. When you do a partial open of show components, untouched record targets are cleared. When you do a merge, those record targets remain.

Merging

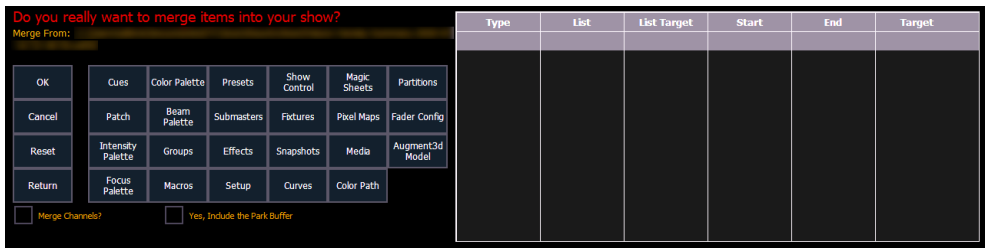
To merge a show file, select **File > Merge** in the browser. Navigate to the desired storage location and press **[Select]**. When using merge, Eos displays only the available files. Navigate to the specific file and press **[Select]**.

This will open the merge screen in the CIA. From this screen you can choose which aspects of the show file you want to merge. By default all aspects are unselected (black). Selected show aspects will appear in gray.

Note: *Media is imported gobo and magic sheet images, and will be included by default when you select Patch, Fixtures, or Magic Sheets.*

If you select the **{Advanced}** button in the merge show loading screen, you will have the opportunity to load partial components from the show file and be able to specify the desired location of those partial components in the current show file.

For example, you could specify only cues 5-10 and load them as cues 20-25 in the current show. You could also specify only specific palettes, presets, effects, and so on. To see the complete list of show components, press the **{Advanced}** key in the merge show loading screen.



As you specify components, they are added to a table in the CIA. In the table, fields with a dark background may be edited, fields with a light gray background do not apply to that component. For each component in the list, you can specify the desired range by pressing the proper area in the table and entering numbers from the keypad. The columns in the table are:

- **List** - the list you are taking data from (such as a cue list).
- **List Target** - the list you are adding the data to.
- **Start** - the first in a range of components (such as a range of cues).
- **End** - the last in a range of components.
- **Target** - the desired location of the components in the new show file (for ranges, this will be the location in the new show of the first component in the range, the others will follow in order).

Note: *In the **{Advanced}** view, you can use the **[Thru]** key to jump to the End column and **[At]** to jump to the Target column.*

To merge only partial components:

1. From the browser, navigate to the desired show file (see *Opening Show Files*).
2. When the merge show load screen appears, press the **{Advanced}** button. The partial components selection screen will appear in the CIA.
3. Select the show components that you wish to merge by pressing on their respective buttons on the left side of the CIA. The components will appear in the list to the right as you select them.

4. Press any fields for which you want to enter specific numbers. The field (if editable) will highlight in gold.
5. Enter the numbers using the keypad to specify the desired cues/groups/effects and so on.
6. Press {OK} to load the components to the current show

Partial Patch Merging

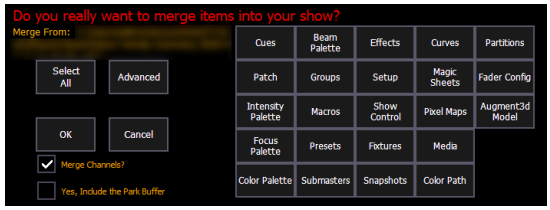
You have the option to selectively merge partial patch information or fixtures into a show file by selecting the {Advanced} button in the partial show merge screen. Select {Patch} or {Fixtures}.

You can specify the desired range by selecting the proper area in the table and entering numbers from the keypad. The columns in the table that relate to patch are:

- Start - the first in a range of components.
- End - the last in a range of components.
- Target - the desired location of the components in the new show file. For ranges, this will be the location in the new show of the first component in the range. The others will follow in order.

Checking the Only Merge Augment3d XYZ Location box will merge only the Augment3d position information of the selected range without merging any additional patch data.

Partial Show File Channel Merge



When Merge Channels is selected, channels from cues, submasters, groups, and other channel targets will be added to any existing channel targets of that same type.

With Merge Channels not selected, those channels will override any existing channels in the channel targets of the same type. For example, in show file 1, group 1 has channels 1 through 5. In show file 2, group 1 had channels 6 through 10. With Merge Channels and Groups selected for the merge, show file 2's group 1 will merge with show file 1's group 1. Group 1 will then have channels 1 through 10. If Merge Channels was not selected, group 1 would just have channels 6 through 10.

Note: *It is important to remember that if the same channels exist in both show files, the data merging in will override the existing data for those channels.*

Note: *Scenic Element and Scenic Element Movable Channels with nested items in an Augment3d model will import without their model items if the Augment3d model is not also merged.*

Importing Show Data

Eos supports importing data into your show file from a variety of sources.

CAUTION: ***The way data is stored and used is often different between different consoles. Imported data may not playback exactly the same between consoles. Not all data (such as effects and macros) may be imported. This varies by product.***

Formats

After choosing the appropriate option, navigate to the storage location of the file to be imported, choose the file, and press [Select]. Only files that can be imported will display.

USITT ASCII

Import ASC files, either in the standard USITT ASCII format or from Lightwright. When importing, choose from the following options:

- Import as Library Fixtures - allows Eos to try to match the fixtures in the file with fixtures in the Eos library.
- Import as Custom Fixtures - brings the fixtures in as they are in the file. Recommended.

Once a file is chosen, you can choose aspects of the file to import, similar to *Merging Show Files*. By default, the ASCII data will overwrite your current show data. If {Merge Data?} is selected, the ASCII data will be merged into your show instead.

Note: *Eos supports ASCII show file import from a number of other control consoles, including the Congo/Cobalt, Obsession, Expression and Emphasis product lines, as well as the Strand 500 Series. Please note that all show files must be saved in an ASCII format prior to importing them into Eos.*

Stamp

Import show data files output from the Stamp software.

CSV

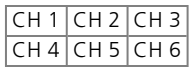
Import CSV spreadsheets of show data.

CSV Pixel Maps

Pixel map fixture layouts and definitions can be imported for complicated pixel maps using specific CSV formatting.

- The CSV block must start with START_PIXELMAP and end with END_PIXELMAP
- The title row is required and must immediately follow START_PIXELMAP
  - Columns may be in any order.
  - Optional or Ignored columns may be omitted entirely.
  - Either CHANNEL or ADDRESS must be present and nonzero.
    - If CHANNEL is nonzero, a channel-type pixel will be imported, using the fixture profile attached to the Channel in Patch.
      - ADDRESS, MANUFACTURER, FIXTURE_TYPE and FIXTURE_DCID are ignored.
    - If CHANNEL is omitted or zero, an address-type pixel will be imported. The fixture type will be chosen as follows:
      - Personality with matching FIXTURE_DCID
      - Personality with matching MANUFACTURER and FIXTURE_TYPE strings.
      - Generic Dimmer.
- The (1,1) pixel location is in the upper-left side of the map. X increases moving right, Y increases moving down.

- SCALE_X and SCALE_Y default is 1, even if data is omitted. X increases a pixel size moving right, Y increases a pixel size moving down.
- Importing to a new Pixel Map target will make the map sized to fit the Pixel Data rows, based on maximum LOCATION_X and LOCATION_Y values.
- Importing to an existing pixel map target will import the pixels and preserve the existing pixel Map height and width.

Imported CSV Block	Pixel Map Layout
START_PIXELMAP PIXELMAP,LOCATION_ X,LOCATION_Y,CHANNEL 1,1,1,1 1,1,2,2 1,1,3,3 1,2,1,4 1,2,2,5 1,2,3, END_PIXELMAP	

Pixel map fixture layouts and definitions are included when *Exporting Show Data* in CSV format.

Lightwright

Import TXT files from the Lightwright software. Lightwright ASC files must be imported using the USITT ASCII option.

Pixel Map Media

Import additional *Pixel Map Media* for use with pixel maps.

- Show Pixel Map Media - import all media needed for the current show file used by backup and client consoles.
- All Pixel Map Media - import all media.

Gobo Images

Supports all standard image formats except SVG for import as custom gobo images. Imported gobo images can be deleted via **Browser > Import > Gobo Images > Imported Gobos**, choosing the image, and selecting **[Delete] [Enter]**.

Augment3d (From Vectorworks)

Legacy import from versions of Vectorworks prior to 2023 Service Pack 2 for use with Augment3d. See Vectorworks Augment3d Plug-in.

MVR / Capture Model

Single-file import of models and fixtures for use with Augment3d. See *Importing Fixtures for Augment3d*.

GDTF Fixtures

Import of General Device Type Format (GDTF) fixture profiles. Any included *Color Configuration* information will also be imported and added to the profile in Eos. GDTF fixture imports do not include 3D models for use with Augment3d.

Augment3d Scenic Models

Import models for use with Augment3d. See *Importing Augment3d Objects*.

Augment3d Scenic Materials

Import materials for use with Augment3d. See *Importing Materials*.

Import Options and Mapping

When importing certain file types, you will likely need to adjust the data before proceeding.

Options

The following options are available:

- Starting / Ending Channel - defines a specific range of channels to be imported.
- Overwrite - overwrites the data in the show file when enabled, and merges the data when disabled. Disabled by default.
- Update fixture types - enables or disables the update of fixture types in the show file. Enabled by default.
- Only import Augment3d XYZ location - enables import of just Augment3d location data. Disabled by default.
- Only Import Text/Notes/Labels/Gels - enables import of just the patch database text. Disabled by default.

Mapping Fields

You can map Eos patch fields to fields in the source file being imported. Channel and Address are required; any other field can be ignored if desired. Options can be selected again for placement in multiple fields.

The text fields in the Patch display and database will rename based off of the Lightwright imported fields. See *Renaming Text Fields in Patch*.

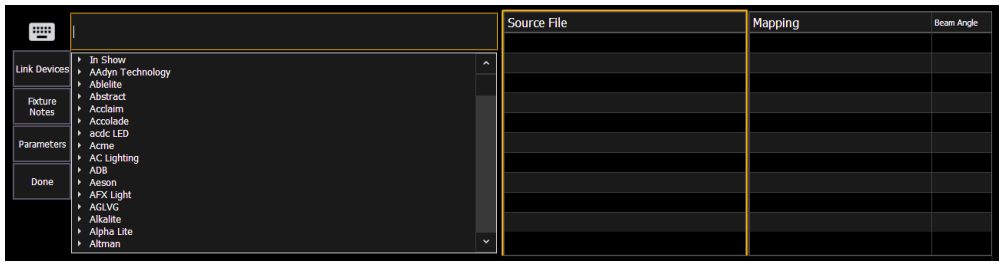
Note: *Eos does not currently support multiple gels per fixture from Lightwright.*

Address Formats

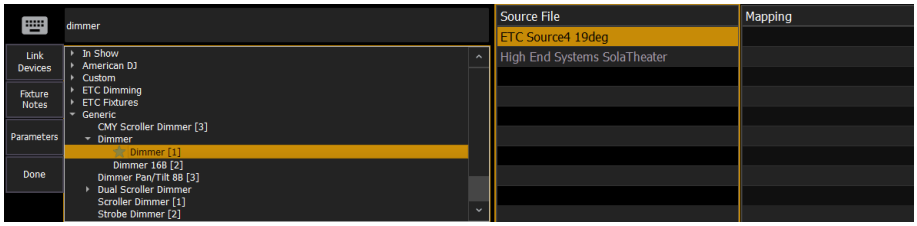
Eos can import addresses in both absolute and port/offset format. For example 513 or 2/1 are both valid formats for importing the first address of the second DMX universe. Eos will convert all formats to n/n.

{Map Devices}

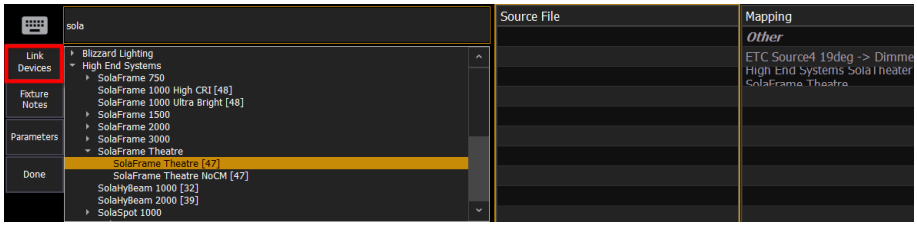
You can also map Eos fixture library devices to devices in the source file.



1. Select **{Map Devices}** to open the mapping utility.
2. Select a device from the Source File column and choose its matching Eos fixture profile. Multiple devices can be selected at a time.



3. Select **{Link Devices}**.



4. Repeat steps 2 and 3 until all devices have been associated with fixture profiles. To unlink a device, select it in the Mapping column and select **{Unlink Device}**.
5. When complete, select **{Done}**, then **{OK}**.

Device mapping and import fields are saved with the show file.

Exporting Show Data

Eos supports exporting show data in a variety of formats.

Formats

After choosing an export format, select the storage location where the exported file will be saved, press **[Select]**, and choose from any format-specific options. Press **{OK}** to export or **{Cancel}** to return to the *Browser*.

Name the show file export using the keypad displayed in the CIA or a connected keyboard, and press **[Enter]**. The show file will be exported to the specified location as the entered file name.

USITT ASCII

Export show data in ASCII format to an ASC file. When exporting, you can include any of the following options.

{Manufctr Data}

This key toggles between enabling and disabling manufacturer-specific data in the ASCII export showfile. The current ASCII standard has specific rules for conventional shows, but

requires that any additional data, such as moving lights, effects, show controls, palettes, etc. must be coded as manufacturer-specific data. If the application that you are using doesn't support or at least ignore this data, this key can disable it.

{Standard Delimiter}

The standard ASCII showfile delimiters include tab, space, and the following characters: , / ; < = > @. Some applications can only read show-files with commas as the delimiters. This key toggles between standard delimiters and commas.

{Hexadecimal Levels}

This key toggles between hexadecimal levels and decimal levels in the tracking channel levels, or 'Chan' section. Hexadecimal data gives better precision, but some applications do not accept it. In these cases, decimal levels can be enabled.

{Mixed Case}

This key toggles the keywords in the ASCII export showfile between upper case, as in 'LABEL', and mixed case, as in 'Label'.

PDF

Export show file information to Portable Document Format (PDF).

You can choose aspects of the show file to export, similar to when *Merging Show Files*. The following additional options are available:

- **Paper Orientation** - choose between portrait and landscape PDF orientation.
- **Paper Type** - choose a PDF page size from Letter, 11x17, A2, A3, and A4.
- **Tracked Levels** - prints all of the moves and tracked values.
- **Color Printout** - prints the cue data using the same color as the *Color Indicators* in **Live** and **Blind**.
- **Summary View** - prints cues without non-intensity parameter information.

PDF exports include the show name, date and time it was created, and date and times for when the show file was last saved. It also gives the Eos Family software version information. If multiple aspects were selected to save to the file, there will be links at the top of the PDF so you can quickly jump to a section. If you have cues selected, cue notes and scenes will display along with additional cue information.

CSV

Export show data in a spreadsheet to a CSV file.

You can choose aspects of the show file to export, similar to when *Merging Show Files*. The following additional options are available:

- **Use Decimal Format (Multi Cell)** - multicell fixtures will be written using decimal notation.
- **Encoding Format** - choose between ASCII/Latin1, UTF-8, or UTF-16.

Pixel map fixture layouts and definitions are included in CSV exports.

Not all show data is saved to CSV files. ETC recommends first exporting your show file to CSV, modifying the file as needed, and then *Importing Show Data*.

Fast Focus Pro

Export show data for Fast Focus Pro, which will generate a folder of CSV files in the chosen location. You can choose aspects of the show file to export, similar to when *Merging Show Files*.

FocusTrack

Export show data for FocusTrack to an ASC file.

Moving Light Assistant

Export show data for Moving Light Assistant, to a CSV file.

You can choose aspects of the show file to export, similar to when *Merging Show Files*. The following additional options are available:

- **Use Decimal Format (Multi Cell)** - multicell fixtures will be written using decimal notation.
- **Encoding Format** - choose between ASCII/Latin1, UTF-8, or UTF-16.

Show Pixel Map Media

Export any pixel map media used in the current show file. After choosing a location, use **{Start Export}** to export pixel map media files or **{Cancel}** to return to the *Browser*.

The progress of the export will be indicated onscreen. If no pixel map media is used in the current show file, the export cannot proceed. Use **{Done}** to return to the *Browser*.

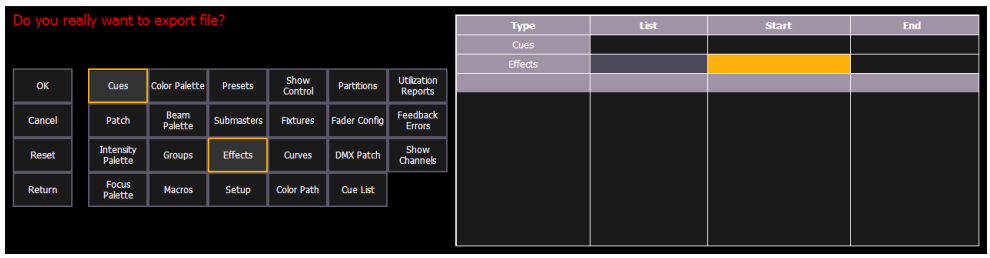
Augment3d Reference Point Images

Export AR target *Reference Point Images* for use when orienting a mobile remote in an *Augment3d* space.

Advanced Export

The **{Advanced}** button can be used on most export options to display additional options.

The buttons at the center of the CIA will again represent all of the show aspects that you can choose. By default all aspects will be deselected (black).



As you select aspects, they will be added to the table in the CIA. For each component in the list, you can specify the desired range by pressing the proper area in the table and entering numbers from the keypad. The following columns are available:

- **List** - the list you are taking data from (such as a cue list).
- **Start** - the first in a range of components (such as a range of cues).
- **End** - the last in a range of components.

You can use the **[Thru]** key to jump to the **End** column.

The following buttons are available on the left:

- **{OK}** - exports the selected show data.
- **{Cancel}** - exits the export screen completely.
- **{Reset}** - deselects all selected show data.
- **{Return}** - go back to the main export screen.

Exporting Logs

Logs saved with your show file can be useful tools for diagnosing issues. When getting *Help from ETC Technical Services*, they may request that you email logs if they are assisting you with an issue.

Creating Logs

Logs can be exported by selecting the **Logs** option in the browser, then selecting the location for the export. An exporting logs message will appear while the log files are being created.

Logs can also be created from the *Eos Configuration Utility (ECU)* via **Settings > Maintenance >** *{Save Logs...}*. This option allows you to include additional information in the file.

Flagging Logs

If you are actively experiencing an issue, press **[Displays] & [Record]** to flag the log file with a marker and an *Open Sound Control (OSC)* event. When the logs are sent in, these flags will assist in troubleshooting your problem.

Chapter 5

Patch

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About Patch

Eos treats fixtures and channels as one and the same, meaning each fixture is assigned a single control channel number. Individual parameters of that fixture, such as intensity, focus, color, and beam are also associated with that same channel number but as additional lines of channel information.

Patch is used to associate a channel with addresses and device types. Once a channel is patched to an address or addresses, and the output is connected to a device (for example a dimmer, automated fixture, or accessory), the channel will then control that device.

Patching can be done via two different methods: manually entering a patch and by patching devices using RDM via the Device List. RDM allows bi-directional communication between the console and any RDM devices over RDM or Ethernet. See *Patch > Device List*.

For manual patching, you are required to only enter the simplest data to patch a device and begin programming your show, such as the channel number, the device type (if needed), and address. When you provide more information in the patch, you will have more detailed control and improved function during operation.

One or more devices may be patched to a single channel. For example, you may want to patch a group of dimmers to the same channel. In addition you may patch multiple devices to the same channel for building compound or accessorized fixtures. For example, a Source Four® with a color scroller and a gobo changer may be patched to a single channel. This is referred to as a compound channel. See *Creating Multipart and Compound Channels*.

Depending on your situation, you may need to create a custom patch, which associates certain addresses with certain channels.

Note: *You can open or merge patch data from other show files, see Partial Patch Opening and Partial Patch Merging.*

A 1-to-1 patch can be created from the Clear display. See *Clearing the Patch*.

Element 2 and Element Classic Patching

Element 2 and Element Classic can create a 1-to-1 patch when you open a new show file. This means that the patch will automatically have channel 1 patched to address 1, channel 2 to address 2, and so on up to the maximum channel count of your console. When outlined in yellow, the **{Patch 1 to 1}** button is selected, and a 1-to-1 patch will be created.

Patch [Tab 12]

To access *Patch*, use any of the following shortcuts:

- **[Tab] [1] [2]**
- **[Displays] {Patch}**
- **[Address/Patch] [Address/Patch]**

Ion Classic users can use **{Address} {Address}**. Element Classic users can use **[Patch]**.

The patch display will open in the selected tab, and the CIA will display patch controls.

For patching fixtures, there are two different patch modes: *Patching By Channel* and *Patching By Address*. Eos defaults to patch by channel mode. Pressing **[Format]** while in the Patch display will toggle the mode between patch by channel and patch by address.

Patch > Device List allows you to use RDM to patch any RDM compatible devices.

The patch screen will display the following information if available:

- **Channel** - the patched channel number. In patch by address mode, channel will appear blank if not currently patched.
- **Address** - the patched output address. In patch by channel mode, address will appear blank if not currently patched. Pressing **[Data]** toggles the display from showing address as patched by the user, output address, and the port/offset. See *Using Output Address vs Port / Offset*.
- **Type** - device, dimmer, or scenic element type that is patched. An asterisk (*) next to the type indicates that the fixture profile needs to be updated. See *Updating Fixture Profiles*.
- **Label** - displays the assigned label of the channel or address. See *Labeling*.
- **Interface** - displays which interfaces will be used for the device. If *Patch > Patch*> **{Interface}** is enabled, an asterisk (*) will appear in the interface column on the *Primary* and any connected *Client*.
- **Output** - displays the current live intensity level. Value is displayed as 0 through 255, with 255 being full. 16 bit intensity values will display as 0 through 65535.

Status in the Patch Display

Status flags will display on the far left of the patch display to advise you when a channel or address requires your attention.

A red exclamation mark (!) or a yellow question mark (?) is used in **Patch**, **Live** (see *Indicators in Live and Blind*), **Patch**, *[About] Channel*, and *[About] Address* to indicate Eos has detected *Errors and Warnings* from connected RDM, CEM+, CEM3, or ACN devices.

A red exclamation mark (!) or a yellow question mark (?) is used in **Patch**, **Live** (see *Indicators in Live and Blind*), **Patch**, *[About] Channel*, and *[About] Address* to indicate Eos has detected errors and warnings from connected RDM, CEM+, CEM3, or ACN devices. Use **{!}** or **{?}** to open the error list.

Errors and warnings are indicated based on severity using the following colors:

- **Gray** - unknown or not an error.
- **White** - an advisory: something that might be worth knowing about but likely won't affect system operation.
- **Yellow** - a warning: something you should know about that may affect system operation. Warning messages could include:
    - Multiple device addresses overlap.
    - A mismatch between the patched fixture type and the real fixture.
    - A mismatch between the patched address and the fixture address.
    - A device is offline.

- **Red** - an error: something definitively wrong that is likely or certain to affect system operation. Error messages could include:
  - A circuit is over temperature (overtemp).
  - A breaker has tripped.
  - A lamp is out.

The relative severity of an error in any given device is determined by the device manufacturer.

Use **{Clear Errors}** to remove displayed errors from the list.

Flexichannel Views in Patch

In patch by channel mode, **[Flexi]** can be used to view only those channels that are currently patched. In patch by address mode, **[Flexi]** can be used to view only those addresses that are currently patched. By pressing **[Flexi]**, you can toggle the view between patched channels/addresses, selected channels, and all channels/addresses.

Holding down **[Flexi]** will display the following softkeys:

- **{Flexi All}** - displays all the channels or addresses depending on which view is used.
- **{Patch}** - displays only the patched channels or addresses.
- **{Selected}** - displays any selected channels or addresses.
- **{View Channels}** - displays those channels selected for the View Channels flexichannel state.
- **{Partitioned}** - only available when partitioning is enabled. Displays the following options:
  - Partitioned Channels
  - Partitioned Patched Channels
  - Partitioned Select Channels
  - Partitioned View Channels

Scenic Elements and Scenic Element Movable channels use no addresses when patched, and will appear in the Flexi Patched display.

Patching Conventional Fixtures

For patching fixtures, there are two different patch modes: *Patching By Channel* and *Patching By Address*. Eos defaults to patch by channel mode. Pressing **[Format]** while in the patch display will toggle the mode between patch by channel and patch by address.

Note: *When working with conventional devices, you can patch in either mode easily. When working with compound channels or multiple parameter devices, such as automated fixtures, it is recommended to work in patch by channel.*

Patching By Channel

In patch by channel mode, **[2] [0] [At] [1] [Enter]** patches channel 20 to address 1. Pressing **[At]** will post address to the command line while patching by channel.

Additional examples of patch by channel:

- **[5] [At] [1][0][0] [Enter]** - patches channel 5 to address 100.
- **[2][0][3] [At] [1][2] [Enter]** - patches channel 203 to address 12.

Range Patching

Range patching using the **[Thru]** key allows you to quickly patch a group of channels. **[1][Thru] [2][0] [At] [1] [0] [Enter]** patches channels 1 through 20 to addresses 10 through 29.

You can also use the **[+]** and **[-]** keys. **[1] [+] [4] [+] [8] [At] [1] [Enter]** patches channel 1 to address 1, channel 4 to 2, and channel 8 to 3. The **[Group]** key can also be used if groups have been created.

Note: *Range patching only works with channels. If you try to range patch addresses, parts for the channel will be created. See Creating Multipart and Compound Channels.*

Note: *If you try to patch a channel or address that exceeds the console's output, an error message will display on the command line.*

Patching By Address

Pressing **[Format]** while in the patch display will toggle the mode between patch by channel and patch by address.

[2] [0] [At] [1] [Enter] patches address 20 to channel 1. Pressing **[At]** will post channel to the command line while patching by address.

Additional examples of patch by address:

- **[5] [At] [1][0][0] [Enter]** - patches address 5 to channel 100.
- **[2][0][3] [At] [1][2] [Enter]** - patches address 203 to channel 12.

Note: *If, at any point, you try to patch an address that is already in use, Eos will post an advisory to indicate this, preventing you from duplicating addresses in your patch.*

Using Output Address vs Port / Offset

The output address is the DMX or network DMX address. Examples of output addresses are 510, 1, and 1024.

Port / offset refers to the DMX universe or port and the offset of the address. For example, since a single DMX port can transmit 512 addresses (known as a "universe"), the port / offset for address 515 would look like 2/3 because address 515 is the 3rd address of universe 2.

An example of patching by port / offset in patch by address mode is **[2][/][1][0] [At] [2][0] [Enter]**, which patches universe 2 address 10, or 522, to channel 20.

[At] [/] [n] **[Enter]** can be used to patch an address on the same universe that was last used.

It is possible to patch by either address or port/ offset. Pressing the **[Data]** key will move between showing the patch as it was originally entered, then the output address values, and last the port/ offset.

An address cannot be assigned to multiple channels, but a channel can have multiple addresses assigned to it.

Replace

By default, if you patch an address to a channel that is already patched, Eos will create a new part for the new address. If you want to replace the current address with the new, use **{Replace}**:

- [n] **{Replace}** [n] **[Enter]** - replaces the address in part 1 of the selected channel.
- **[1] [Part] [3] {Replace} [5] [Enter]** - replaces the address of part 3 with a new address of 5.

At Next

[At] [Next] [Enter] finds the next available address range large enough to accommodate the selected device.

Examples of **[At] [Next]**:

- **[At] [2] [/] [Next] [Enter]** - finds the next available address range on universe 2.
- **[At] [7] [7] [7] [Next] [Enter]** - finds the next available address after 777.

Select Full Universe

Note: ***[Address/Patch]*** *is used in the examples below. Ion Classic users will need to use* ***{Address}****, and Element Classic users* ***[Dimmer/Address].***

The syntax **[Address/Patch]** [n] **[/]** or **[At] [n] [/]** can be used to select a full universe in patch.

- [Channel list] **[Address/Patch]** [n] **[/] [Enter]**or [Channel list] **[At] [n] [/] [Enter]** - changes the addresses of all the selected channels to a new universe while using the same offset.
- **[Address/Patch] [2] [/] [Copy To] [Copy To] <Address> [3] [/] [Enter]** - moves all channels with addresses in universe 2 to the same offsets in universe 3.
- **[Address/Patch]** [n] **[/] {Unpatch}** - unpatches all patched addresses in the selected universe.

Dimmer Doubling

You can patch channels in Eos to accommodate for dimmer doubling with Sensor dimmer racks. This is done using the softkeys available in patch ({No Dim Dbl}, {A}, and {B}).

- [1] [Thru] [9] [6] [At] [1] [Enter] - patches 96 channels of dimmers to addresses 1 through 96.
- [9] [7] [Thru] [1] [0] [8] [At] [1] {B} [Enter] - dimmer doubles 1 through 12 of your Sensor rack, patched to channels 97 through 108.

Channels 97 through 108 are patched to address 1 through 12 B, while channels 1 through 12 are now patched to address 1 through 12 A.

To remove the dimmer doubling from these addresses, you must first press [Format] to enter Address mode and then press:

- [1] [Thru] [1] [2] {NoDimDbl} [Enter]

Addresses 1 through 12 have been returned to single dimmer modes and channels 97 through 108 are now unpatched.

By default, doubled dimmers start with an offset network DMX address value of 20000. Therefore, in the above example, address 1B (channel 97) is actually controlled by network DMX address 20001. Address 2B is actually controlled by network DMX address 20002 and so on. This offset matches the default offset in CEM+ / CEM3 when configuring your Sensor dimmer rack for dimmer doubling. To change the default offset value, see *Dim. Dbl. Offset*.

Note: *For Sensor Classic racks using dimmer doubling, the offset value should be set to 256.*

Note: *Dimmer doubling needs to be turned on per DMX port in* ***Setup > Device >*** *Local Output.*

Note: *There is also a Dimmer Doubling setting for Net3 Gateways with DMX outputs. This is used with Sensor racks that are connected via DMX. The Gateway must be properly configured.*

Moving and Copying Channels

Channels can be moved from one location to another within patch.

- [1] [Copy To] [Copy To] [2] - moves channel 1's data to channel 2. Channel 2's data is replaced by channel 1's. Channel 1 is unpatched.
- [1][Copy To] [Copy To] [2][Part][2] - creates a part 2 for channel 2 and moves channel 1's data to the new part. Channel 2's data remains in part 1. Channel 1 is unpatched.

The second press of the [Copy To] key changes the command from Copy To into Move To.

Note: *Move To always impacts the entire show.*

The following options are available with [Copy To]:

- [Copy To] - copies a channel to another location within patch.
- [Copy To] {Plus Show} - copies a channel to another location within patch and all record targets in the show.

- **[Copy To] {Only Show}** - copies a channel to another location with all record targets in the show but not the patch data.
- **[Copy To] {Only Text}** - copies only the notes and keyword fields from one channel to another.

Swapping Channels

Channels can be swapped for each other in patch:

- **[1] {Swap} [2] [Enter]**

This syntax will replace channel 1's data with channel 2's and vice versa in patch and throughout the entire show.

Note: *Swap always impacts the entire show.*

The following options are available with **{Swap}**:

- **{Swap}** - swaps only the patched address
- **{Swap} {Plus Show}** - swaps all show and patch data
- **{Swap} {Only Show}** - swaps only the show data and not patch data
- **{Swap} {Plus Patch}** - swaps addresses and patch data but not show data

Unpatch a Channel

To unpatch a channel while in patch you can press:

- [n] **{Unpatch} [Enter]**

The **{Unpatch}** softkey will reset all the properties of the channel to the default. This includes removing the device type if specified.

To retain all the elements of a channel except its address, you would instead use:

- [n] **[At] [0] [Enter]**

Using **[At] [0]** will allow unpatched channels to still be manipulated and have data stored for them, but they do not output any information (as they are unpatched).

Deleting Channels

It is possible to delete channels in patch. Deleting channels is different from unpatching in that deleted channels cannot be manipulated or have data stored for them. When deleted, the channel numbers will still be visible in the live/blind display, but the channel graphic will be removed from the display.

To delete channels in the patch display, use either of the following syntaxes:

- **[6] [Thru] [1] [0] [Delete] [Enter] [Enter]**
- **[Delete] [1] [Thru] [1] [0] [Enter] [Enter]**

CAUTION: ***If a channel with programmed data is deleted, the recorded data will be lost.***

[Query] {Unpatched}

To quickly delete channels without addresses in the Patch display, you can use the command **[Query] {Unpatched} [Delete]**. This will post to the command line all channels without addresses. By pressing **[Enter][Enter]** you will delete them.

On Element Classic, **{Query}** is a softkey.

Using Offset in Patch

Using the *Offset* feature in patch allows you to force a numerical offset between the starting address of channels in patch or for offsetting your channel selection. This feature is useful when you have configurable devices in your show, such as a Source Four Revolution, which has option slots for additional addresses (scrollers, indexing pattern wheels, and so on), or when your devices' start addresses use a known multiplier.

When patching using a fixture type, this is a two step process because the command line terminates after a fixture type has been selected.

1. **[1] [Thru] [5] {Type} {Source Four Revolution}**
2. **[At] [1] [Offset] [3] [1] [Enter]**

Selecting **[At]** will reselect the previously selected channels. The channels can then be patched with an address offset of 31 channels, allowing you to have additional space within the patch for a given fixture type regardless of configuration or personality.

Note: *On non-Apex Eos Family consoles, **{Offset}** is a softkey.*

For multiple parameter devices, Eos will automatically offset the addresses based on the fixture type.

Creating Multipart and Compound Channels

A multipart channel is any channel that has more than one dimmer patched to it. A compound channel has multiple profiles patched to it that make up one channel, an example would be a dimmer with a scroller and auto-yoke. By default, Eos will add a part if you are trying to patch to a channel that has already been assigned an address.

To patch a multipart channel in channel format:

- **[9] [At] [5] [4] [0] [Enter]**

Assuming that channel 9 is already patched to an address, this will create a part 2 and address it at 540.

- **[8] [Part] [2] [At] [5] [1] [3] [Enter]**

This will create a part 2 for channel 8 and address it at 513. If you wish to patch by address while in the channel view, press:

- **[Address] [5] [1] [3] [At] [8] [Enter]**

Assuming channel 8 was previously patched to an address, this will create a part 2 and address it at 513.

To patch a multipart channel in address format:

- **[5] [1] [3] [At] [8] [Enter]**

This will perform the same action as the previous example, assuming channel 8 was previously patched to an address.

To select multiple parts for editing:

- **[1] [Part] [1] [Thru] [5]**

This is useful for deleting or assigning new addresses to existing parts.

To patch a compound channel in channel format:

- [1] [Part] [2] [At] [5] {Type} <scroller profile>

Creates a part 2 for channel 1 and assigns it the selected scroller profile. See *Patch > Patch* on using **{Type}**.

Use multiple parts without addresses to assign multiple fixtures in Augment3d positions that share the same channel.

Patching Automated Fixtures, LEDs, and Accessories

The process of patching automated fixtures requires more detail than patching a dimmer. Specific information is required for more advanced control of the features offered by automated fixtures.

Note: *Patching By Channel is recommended when patching automated fixtures, LEDs, and accessories.*

After you have entered the channel number, click **{Type}**. You will then select a device type from the fixture library.

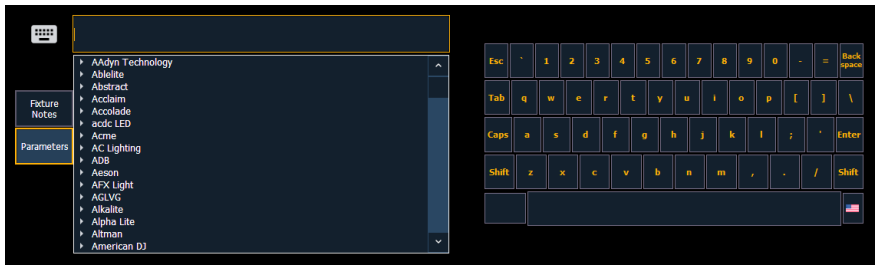
Notice the softkeys **{Show}**, **{Manfctr}**, and **{Search}** located beneath the CIA.

{Show} provides you with the option of showing only the library of fixtures or devices that are already patched in the show, your favorites, and default devices. **{Manfctr}** shows all fixtures or devices available in the library sorted by manufacturer.

Press **{Manfctr}** from the CIA to display the fixture library. The two columns on the left are pageable and show manufacturer names. Use the arrow buttons to scroll the list of manufacturers. Selecting a manufacturer repaints the device columns with all devices from that manufacturer that are available for patching.

Scroll through the device list and make your selection. If a fixture has multiple modes or types, it will display in blue text. Clicking on its name will open a list of available modes. After the selection is made, the fixture or device type will be placed on the command line after the channel number and displayed in the box beneath the **{Type}** button.

Press **{Search}** to open the search window. You will need an external alphanumeric keyboard or you can click the keyboard icon in the search window to open the virtual keyboard. You can also navigate the list as you would the browser. You can search by manufacturer name, fixture name, part of a name, and by DMX footprint. For example, if you searched for 31, you would see all of the fixtures that have a DMX footprint of 31. Double clicking on a fixture name will patch it.



In the search window, press **{Parameters}** to view a parameter list for a fixture, or press **{Fixture Notes}** to see any notes that exist for it. You can also view this information in the Fixture Editor.

Press **[At]** and then enter a starting address for the selected channel or group of channels. The console will automatically offset addresses based on the fixture type selected.

Fixtures can be added to your show list without first patching them. With nothing on the command line, click **{Type}**. You can then select a device type from the fixture library, and click **{Add Show}** to add to your show list. If you want to delete a fixture or device from the show list, click **{Edit}** while in the show display. Select the device you wish to remove and click **{Delete}**.

To select a device interface (optional), click **{Interface}**. See *Patch > Protocols*.

Click the **{Attributes}** softkey to set detailed automated fixture attributes. The following buttons may be available on this page depending on the device selected: **{Preheat}**, **{Proportion}**, **{Curve}**, **{Fan Curve}**, **{LD Flags}**, **{GM Exempt}**, **{Invert Pan}**, **{Invert Tilt}**, **{Swap P/T}**, **{Color Path}**, **{Scrollers}**, **{Gobo Wheels}**, **{Color Wheels}**, and **{Effect Wheels}.** Additional buttons maybe available based off of your fixture type. See *Patch > Attributes*.

If your automated fixture includes parameters such as a color scroller or gobo wheel and you have custom gels or non-standard patterns installed, use the *Scroller and Wheel Picker and Editor* to modify the device patched. The more specific your patch data (including accurate colors and patterns), the more detailed programming and operating will be.

Patching Multicell Fixtures

Fixtures that have multiple same-type parameters can have a multicell profile assigned to them. The process for patching multicell fixtures is similar to patching automated fixtures. There are a few differences that are important to understand though.

Note: *It is recommended that when patching multicell fixtures that you work in patch by channel mode. See Patching By Channel.*

After you have entered the channel number, click **{Type}**. You will then select a device type from the fixture library.

Fixtures that have multicell functionality will be listed with a MC in their mode description in the device list, and in the **{Show}** list.

Note: *When using **{Search}**, the number of cells for a multicell fixture will also be displayed.*

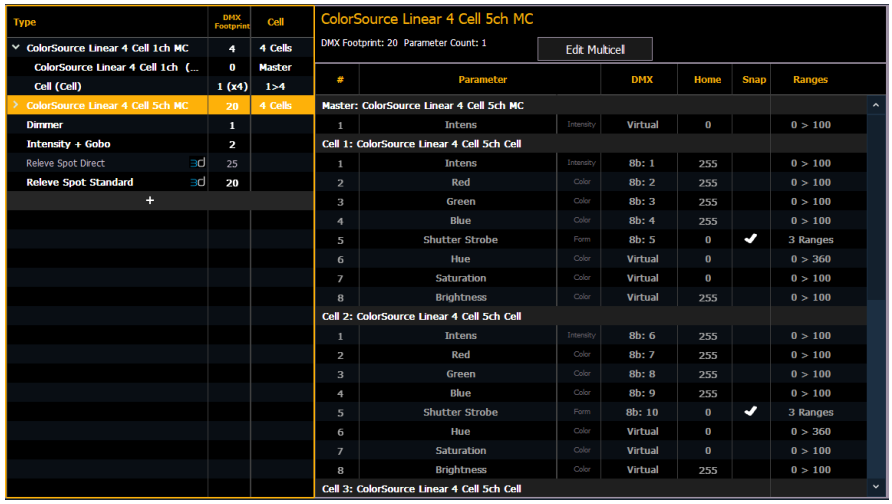
When these devices are patched, they will patch a master channel with a whole number for a channel number and the appropriate number of additional cells, which will have point numbers for their channel numbers.

- **[1][0] [At] [5] [Enter]** - patches channel 10 and all of its cells starting at address 5.
- **[1][0] [.] [1][2] [Thru] [1] [At] [5] [Enter]** - patches channel 10's cells 12 through 1 starting with cell 12's address beginning with address 5.

Note: *If the master channel has only a virtual intensity over the cells, an address will not be displayed, as that is a virtual parameter.*

In the *Fixture Editor*, you can view and edit the personality for your multicell fixture. For creating a new multicell fixture, see *Creating Multicell Fixtures*.

On the left of the fixture editor, you can see the fixture name, overall DMX footprint and number of cells. Click on the caret to see the DMX footprint for the master and the cells. The cells will be grouped with their profiles.



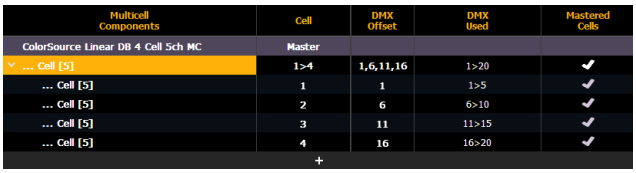
On the right, you can see the full personality of the selected multicell fixture. If you have the whole fixture selected, you will be able to see all of the parameters for each cell and the master but changes cannot be made here.

See *Editing Multicell Fixtures* .

Editing Multicell Fixtures

You will need to select the master or cell profile to edit parameters. In this view, you'll be able to edit parameters, DMX, Home, Snap, and ranges and modes. See *Creating a New Fixture* and *Range Editing Parameters*.

To change specific cell data such as DMX offset, you will need to use **{Edit Multicell}**. With a multicell fixture or a master cell selected in the fixture editor, press **{Edit Multicell}**. In the Edit Multicell window, you can edit cell numbers, DMX offset, and mastered cells for each cell.



Once you are finished editing, press **{Save Fixture}** to save your changes or **{Cancel Edit}** to remove the changes and exit the edit mode.

Labeling

To label a channel or address, press the **[Label]** key with the channel or address selected on the command line. You can use the virtual alphanumeric keyboard or an external keyboard to enter the desired label text.

If you would like your label to wrap, use CTRL+J or type || to create a line break between words.

Scroller and Wheel Picker and Editor

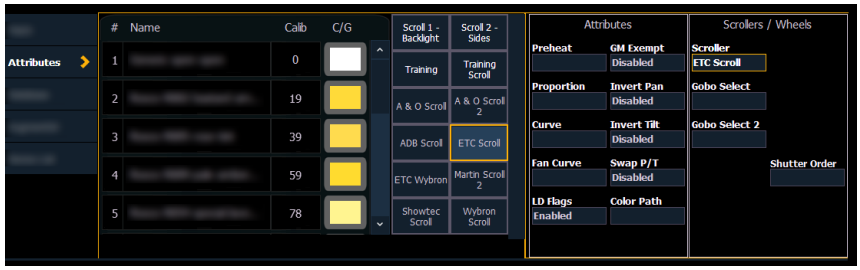
The scroller and wheel picker allows you to choose a specific scroll, color wheel, gobo wheel, or effect wheel from standard manufacturers and associate them with fixtures. You may also create customized scrollers or wheels using the editor to match custom devices installed in your fixture.

Note: *Scrollers, color wheels, gobo wheels, and effect wheels can be created without first selecting or patching a fixture.*

Using the Picker

Default color and pattern media for the selected fixture, as determined in the fixture library, is displayed in the **{Attributes}** page. Only the media attributes that are available for the selected fixture will display.

In the image below, the selected channel is a Source Four Revolution® with a color scroller and two gobo wheels. If the selected channel included other wheels, each device would be represented in the display with a button.



The picker displays on the left half of the CIA when you select the specific attribute (**{Scroller}**, **{Color Wheel}**, **{Gobo Wheel}**, or **{Effect Wheels}**). The picker displayed is specific to the selected attribute; the scroll picker will display when **{Scroller}** is pressed, the color wheel picker will display when **{Color Wheel}** is pressed, and so on.

The picker displays buttons for the standard scroll or wheel type of the selected channel. The default selection is the wheel as shipped from the manufacturer (derived from the fixture library). Displayed to the left of the standard scroll and wheel selection is a list of each color and gobo as they are installed in the selected device (frame by frame). When the color or pattern image is available, it will display next to the frame name.

In the above image, **{ETC Scroll}** is the default scroll for the selected ETC Source Four Revolution. The list of gel colors as they are installed in the scroll are displayed to the left with a color chip for easy reference. Selecting any other type, such as **{Martin Scroll 2}**, updates the frame list.

The softkeys displayed beneath the picker are **{Clear Calib}**, **{Copy Scroller}**, **{Clear}**, **{New}**, **{Copy}**, **{Edit}**, and **{Delete}**.

- **{Clear Calib}** - clears out the calibration data for the whole scroller wheel and returns to the wheel's default data.
- **{Copy Scroller}** - used to copy a scroller wheel and its calibration to another channel. See *Scroller Calibration Column*.
- **{Clear}** - clears the selection type from the selected channel in the picker.
- **{New}** - creates a new scroll or wheel and provides additional softkeys to enable the Editor.
- **{Copy}** - makes a copy of the currently selected scroll or wheel type, which can then be edited using the editor.

- **{Edit}** - used to edit an existing scroll or wheel.
- **{Delete}** - used to remove the selected frame only from a scroll or wheel that you have created.

Using the Editor

The editor is used to create new or edit copied scrolls and wheels. While in the picker display, you can create a new scroll or wheel with the **{New}** softkey or make a copy of an existing scroll or wheel by selecting the source, then using the **{Copy}** softkey.

The editor does not limit how many frames you can add to the scroll or wheel for the selected fixtures. Keep in mind that any fixture has its own limitations. For example, if you have created a custom color scroll with 30 frames, your selected fixture type may only provide you access to the first 24 frames that you created. This applies to wheels as well.

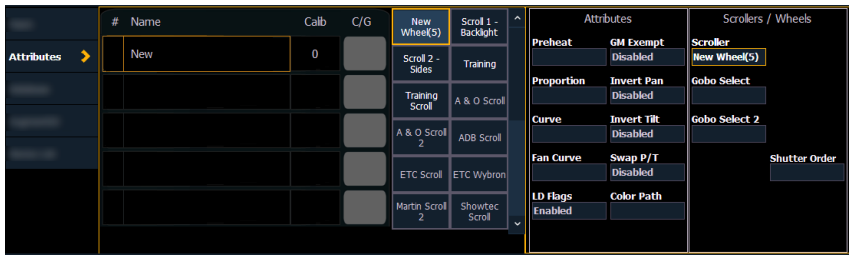
Note: *If you try to select an existing scroll or wheel, the console will display a warning if it has more frames than are supported by your device.*

When using the editor, the following softkeys are available for use:

- **{Insert}** - inserts a new frame above the selected frame.
- **{Delete}** - removes the selected frame.
- **{Edit}** - changes the selected frame.
- **{Invert}** - reverses the order of the frames.
- **{Done}** - completes the editing process.

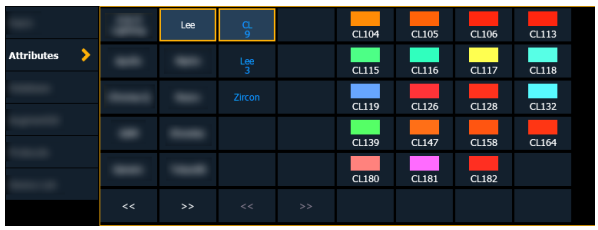
Creating a New Scroll or Wheel

When you create a new scroll or wheel, **{New Wheel** n**}** appears in the wheel list as the selected button. The frame list will be empty with only "New" displayed in frame 1.



You can label the new wheel by pressing **[Label]** and typing the desired label on the virtual keyboard and pressing **{Enter}**.

To select a color or pattern for the specific frame in the scroll or wheel, select the "NEW" text and press **{Edit}** or click the gray box in the C/G column of the frame. The available gel, color, gobo and effect media selections will be displayed.



The media selection includes the following softkeys:

- **{Gel}**, **{Color}**, **{Gobo}**, and **{Effect}** - each will display available media selections as they are cataloged by the associated scroll or wheel manufacturers.
- **{Open Frame}** - places the frame in Open White. Generally, the first media frame is open.
- **{Cancel}** - cancels the media selection and returns to the frame editor.

When a manufacturer is selected from the list, the catalog selection changes to display only the selected manufacturer's offerings. When a specific catalog is selected, the selected media will display.

When you make a media selection, the display returns to the new wheel frame list where additional frames can be added to the scroll or wheel by selecting the next frame area to add more frames.

Note: *An **{Invert}** softkey will display when creating or copying a wheel or scroller. **{Invert}** is used to reverse the order of frames.*

Note: *It is possible to import custom gobo images. See Importing Show Data.*

Editing a Copy of a Scroll or Wheel

If a copy has been made of an existing scroll or wheel, the copied scroll or wheel will display as **{New Wheel** n**}** before the standard manufacturer offerings. The frame list will include an exact duplicate of the copied selection.

To make a change to a frame, first select the frame then press **{Edit}** or click the gray box in the C/G column to display the media selection. Or you can insert a new frame above a selected frame using the **{Insert}** softkey.

For example, to insert a new frame in between existing frames 2 and 3, select frame 3 and press the **{Insert}** key. The media selection will display.

The media selection includes the following softkeys:

- **{Gel}**, **{Color}**, **{Gobo}**, and **{Effect}** - each will display available media selections as they are cataloged by the associated scroll or wheel manufacturers.
- **{Open Frame}** - places the frame in Open White. Generallly, the first media frame is open.
- **{Cancel}** - cancels the media selection and returns to the frame editor.

When a manufacturer is selected from the list, the catalog selection changes to display only the selected manufacturer's offerings. When a specific catalog is selected, the selected media will display.

When you make a media selection, the display returns to the new wheel frame list where additional frames can be edited in the scroll or wheel.

Scroller Fan Curves

Curves can be applied to the scroller fan parameter allowing for the output of the fan to be controlled by the intensity of the channel. The curves available for this are the same used for intensity parameters and cues. See *Applying a Curve To Scroller Fans*.

To set a curve to a scroller fan, go to **Displays > Patch > Attributes > Fan Curve** for each scroller.

Calibrating a Scroller Using the Encoders

You can calibrate the center point of any frame in a scroller using the calibrate feature. Calibrating a scroller is normally done from the live display. You can also calibrate using the ML display. See *Calibrating a Scroller Using ML Controls*.

On Element 2 and Element Classic, you will need to use the ML Controls display.

Note: *It is recommended that you calibrate your scroller frames starting with the last frame and working backward to the first frame. This will help ensure a complete and accurate calibration.*

Note: *Calibration may need to be performed when you initially patch a scroller and may need to be adjusted through the course of operation as spring tension changes in a color scroller.*

To calibrate a scroller:

1. Select the channel of the scroller you wish to calibrate.
2. Press the **[Color]** encoder button. Multiple presses may be required before the scroller encoder is visible in the encoder LCD.
3. Use the encoder to move all the way to the last frame of the scroller.
4. Continue adjusting the frame in fine mode until the frame is centered in the desired position.
5. Press **{Calibrate}** in the encoder LCD. The new center position is now stored for the selected channel.
6. Press **{Last}** in the encoder LCD to move to the center point of the previous frame.
7. Visually verify if the center point of the new frame is accurate. If it is, press **{Last}** again to move to the previous frame in the scroll. If not, follow the calibration procedure again.
8. Repeat steps 4 through 8 until you have calibrated all of the frames

Calibrating a Scroller Using ML Controls

You can calibrate the center point of any frame in a scroller using the calibrate feature. This will ensure that color scroll frames will be centered over the aperture of the fixture when you advance a color scroll frame-by-frame. You can do this using the ML Controls display. See *ML Controls [Tab 5]*.

Note: *It is recommended that you calibrate your scroller frames starting with the last frame and working backward to the first frame. This will help ensure a complete and accurate calibration.*

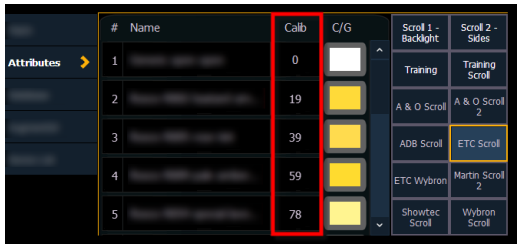
Note: *Calibration may need to be performed when you initially patch a scroller and may need to be adjusted through the course of operation as spring tension changes in a color scroller.*

To calibrate a scroller:

1. In the Live display, select the scroller channel.
2. Open the ML Controls from the home screen or by using **[Tab] [5]**. On Element 2 and Element Classic, you can open the ML Controls via **[ML Controls]**. The color category will display automatically with the Hue and Saturation and scroller encoders and a frame picker open. If the scroller encoder isn't open, click the **{Scroller}** button.
3. To begin calibrating, use the scroller encoder to adjust the centerpoint of a frame. It is recommended that you start with the last frame in the scroll.
4. When the frame is centered, click **{Calibrate}**.
5. Repeat for any remaining frames that need to be calibrated.

Scroller Calibration Column

Calibration information will be displayed in the scroller calibration column. Values in gray are the default data, and the values in blue are calibrated data.



The displayed calibration information is the DMX level that puts the frame into its center position. Information in the calibration column can be manually edited by clicking on it and typing in a new DMX level.

Note: *Calibration data will only be applied to scroller wheels that are assigned to a channel. Data will not be displayed when viewing a wheel with an empty command line.*

Note: *Calibration data can be returned to its default by clicking on the data and pressing **[Clear]**. If you are entering in new data and hit **[Clear]**, the data will return to the default and not any previously calibrated data.*

Pressing the softkey **{Clear Calib}** will clear out the calibration data for the whole scroller wheel, returning it to the default data.

Scroller wheels and their calibration data can be copied to other channels.

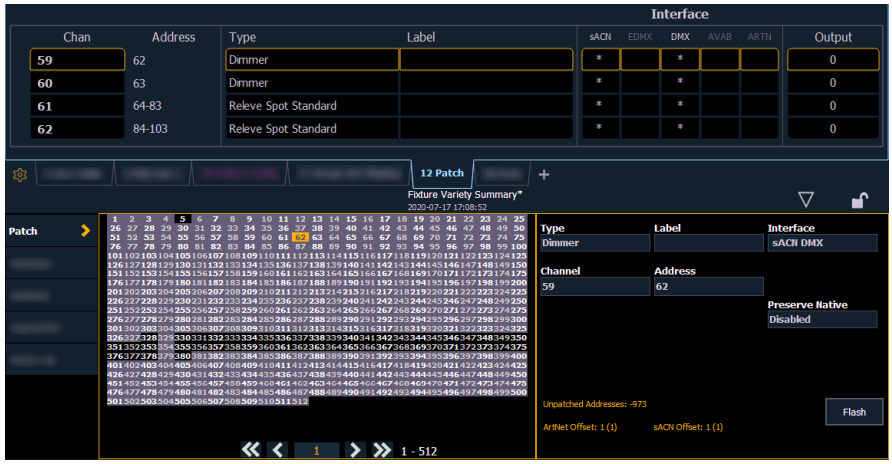
- **[1] {Copy Scroller} [2] [Enter]** - copies the scroller and calibration data from channel 1 to channel 2.

Scrollers that have calibrated data will display a "~" after their name.

The **{Calibrate}** button will now only appear on scroller parameters that are currently not at the center of a frame.

Patch > Patch

With Patch open, Eos defaults to this section. It provides access to data input fields that you may use to define devices in your lighting system. The Art-Net and sACN offset is also displayed here.



{Type}

Eos defaults to patching dimmers. To specify a specific device type for the selected channel, press the **{Type}** button from the CIA.

The two columns on the left side of the CIA are pageable and show manufacturer names. The four columns to the right of the manufacturer's list are pageable devices that are available from the selected manufacturer for patching.

Selecting a specific manufacturer repaints the display with all devices that are available from that manufacturer. After you select a device, the fixture/ device type appears in the command line, in the **{Type}** box in the CIA, and in the "Type" field for that channel in the patch display.

{Channel}

In the patch display, all channels are displayed in numerical order. When multiple devices are patched to the same channel, the channel number is only displayed in the first row, additional devices are indicated with part extensions (example P2) on the next row of the table.

Select the channel number using the control keypad or the direct selects.

{Label}

An optional user-defined label. You can use the **[Label]** key to display the virtual PC keyboard on the CIA. Pressing **{Label}** or **[Label]**, after a label has already been assigned, will display the label on the command line for editing purposes. Pressing **[Label] [Label]** will clear the text.

[1] [At] [5] [Label] <S4 house right**> [Enter]** - patches channel 1 to output 5 and labels channel 1 as "S4 house right".

{Address}

Required for DMX control of devices. You may use the either the **[At]** or **[Address/Patch]** key instead of the **{Address}** button. Use the keypad to define the starting address for the device (from 1 to 32,767,488) or a port and offset value.

You may enter a start address without defining an end address. Eos will draw this information from the library data. If you wish to leave a larger output gap than required by the library, use **{Offset}**. See *Using Offset in Patch*. If you specify a start address that conflicts with other channels already patched, the conflicting channels will be unpatched after a confirmation is provided by the user.

{Interface}

An optional field used to specify what protocols and interfaces should be used for the output. When the field is left blank, the default data output is used as selected in *Patch > Protocols* or **Setup > Device >** *Network*. If an output option is not enabled, it will appear grayed out in the **{Interface}** list. If the interface is enabled, an asterisk (*)will appear in the interface column on the Primary and any connected Clients.

If per-address priority is enabled, the Interface column above can be used to enter individual priority levels for separate addresses.

{Preserve Native}

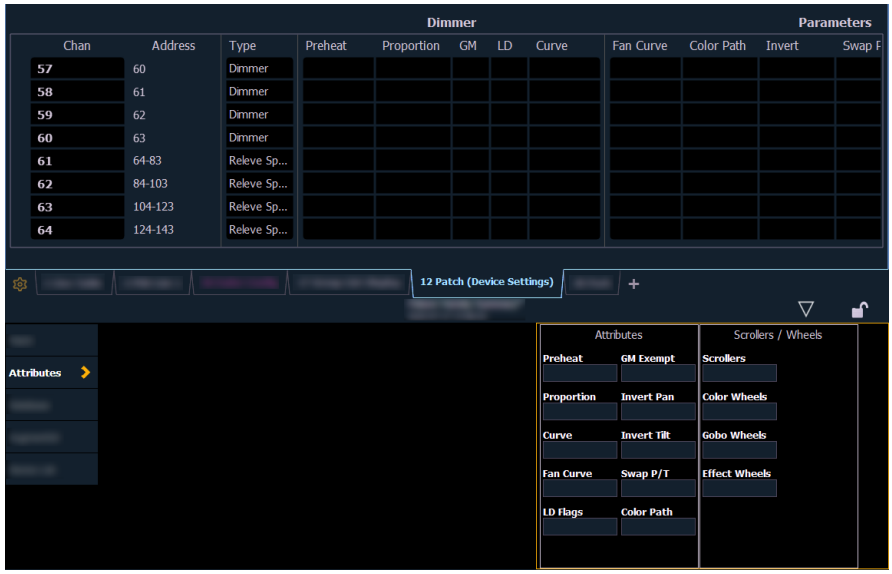
When Preserve Native is enabled, and you make changes to patch, your cues' real world levels (like pan degrees) will be converted so that the DMX output is preserved instead of the degrees. This is primarily useful for fixture substitutions.

{Flash}

Brings a channel or address to full, and then every other second the level will move to 15%. That will hold for 1 second, and then the level will return to full. The channel or address will keep flashing until either the command line is cleared or **{Flash}** is selected again.

Patch > Attributes

The **Attributes** tab provides you with optional fields for additional information and details about the configuration of your patched devices.



Attributes

{Preheat}

This field allows you to specify an intensity value or preset to preheat incandescent filaments. When a preheat flag is applied to a cue, any channels that are fading from zero to an active intensity and have been assigned a preheat value in patch will preheat in the immediately preceding cue. The preheat flag is applied to a cue as an attribute when the cue is recorded.

- **[1] {Preheat} [0] [3] [Enter]** - channel 1 is assigned a patched preheat value of 3%.
- **[1] {Preheat} [Preset] [Enter]** - channel 1 is assigned to use the preheat value of the preheat preset. See **Setup > System >** *System* **> Preheat Preset**.

{Proportion}

An attribute to set a modifier for the intensity of the device. For example, if the proportion is set at 90%, the actual output will always be 10% lower than the specified intensity parameter, as impacted by the various playbacks or submasters. This value is set numerically in a range of 0% to 200%.

- **[1] {Attributes} {Proportion} [1] [2] [5] [Enter] -**applies a 125% proportion to channel 1.
- **[1] {Attributes} {Proportion} [Enter]** - removes the applied proportion from channel 1.

{Curve}

Used to assign *Curves [Tab 21]* to a channel in **Patch**. Curves can be applied to intensity and non-intensity parameters.

- From channel view:
  - **[1] {Curve} [4] [Enter]** - applies curve 4 to the intensity parameter of channel 1.
  - **[2] [Part] [3] {Curve} [3] [Enter]** - applies curve 3 to the intensity assigned to channel 2, part 3.
- From address view:
  - **[3] {Curve} [3] [Enter]** - assigns curve 3 to address 3.
  - **[3] [/] [2] {Curve} [4] [Enter]** - assigned curve 4 to universe 3, address 2.

{Fan Curve}

Used to assign a curve to the scroller fan parameter, which allows for the output of the fan to be controlled by the intensity of the channel. Curves available for this are the same used for intensity parameters and cues.

When **{Curve}** or **{Fan Curve}** is pressed, a list of the available curves will be displayed. Selecting an available curve will assign it.

- **{LD Flags} -** This field allows channels to contribute to live and dark move flags in the playback status display. Disabling will prohibit those channel moves from contributing to the live and dark move flags. Enabled by default.
- **{GM Exempt}** - Used to exempt the intensity of channels from grandmaster, blackout, rem dim, and go to cue 0 operations.
- **{Invert Pan} {Invert Tilt}** - an automated fixture attribute used to invert the output of pan, tilt, or both. Select either the **{Invert Tilt}** or the **{Invert Pan}** button on the CIA.
  - **[2] {Attributes} {Invert Pan}** - inverts the output of the pan parameter on channel 2.
- **{Swap P/T}** - an automated fixture attribute used to exchange pan and tilt levels. Select the **{Swap}** button on the CIA.
  - **[2] {Attributes} {Swap}** - swaps the pan and tilt parameters for channel 2.

- {Color Path} - A default Color Path can be assigned at the channel level in Patch. That color path will be used for all of that channel's color fades unless overridden at the cue level. Submasters and manual transitions that use that channel will use the default color path as well. See *Color Path [Tab 33]*.
    - [1] [Path] [2] [Enter] - will assign color path 2 to channel 1
        - Ion Classic and Element Classic users will need to use {Color Path}
- {Shutter Order} - allows you to invert the {Shutter Order} or rotate the order using the arrow buttons. After you have created the order needed, press {Apply} for your changes to take effect.
- {Invert Rack} - when disabled, a encoder will move the frame assembly from the right. When enabled, the frame assembly will move from the left.

Scrollers / Wheels

The following options pertain to the *Scroller and Wheel Picker and Editor*.

With one or more channels selected, Scrollers / Wheels will display only the parameters that apply to those fixtures will appear.

- {Scrollers} - An attribute used to change the scroll loaded in a scroller or automated fixture. Select the {Scrollers} button on the CIA to display the scroller picker and the scrolls available for your device.
    - [2] {Attributes} {Scrollers} -opens the Scroller Picker in the CIA for scroll selection for channel 2.
- {Color Wheels} - An attribute used to change the color wheel loaded in an automated fixture. Select the {Color Wheels} button on the CIA to display the wheel picker with the options available for your device. “More” as shown in the patch display, indicates additional parameter properties are available for the selected device, such as the color and gobo wheels.
    - [4] {Attributes} {Color Select} - selects channel 4 and opens the wheel picker in the CIA for color wheel selection.
- {Gobo Wheels} - An attribute used to change the gobo wheel loaded in an automated fixture. Select the {Gobo Wheels} button on the CIA to display the wheel picker with gobo options available for your device.
    - [3] {Attributes} {Gobo Select} - selects channel 3 and opens the Wheel Picker in the CIA for gobo wheel selection.
- {Effect Wheels} - An attribute used to change the effect wheel loaded in an automated fixture. Select the {Effect Wheels} button on the CIA to display the wheel picker with the options available for your device. “More” as shown in the patch display, indicates additional parameter properties are available for the selected device, such as the color and gobo wheels.
    - [5] {Attributes} {Beam FX Select} - selects channel 5 and opens the wheel picker in the CIA for effect wheel selection.

Curves [Tab 21]

A curve is a relationship between the timing of a fade and the output level of a cue, cue part or dimmer at each point of time during that fade. By using a non-linear curve, you can create of variety of effects, accommodate variations and deficiencies in your lighting equipment, alter the transition ramp and protect equipment from stress.

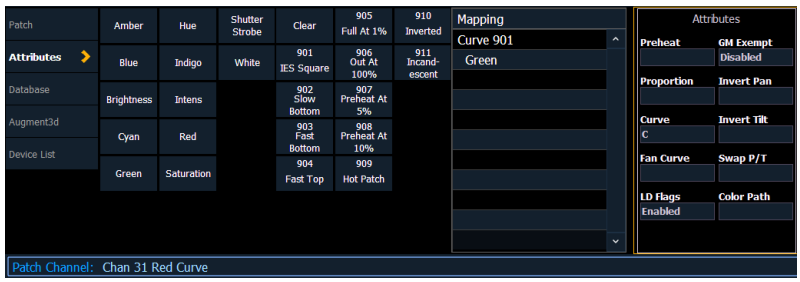
You may apply curves to dimmers in patch. Curves may also be applied to cues, to cue parts, and to scroller fans. When applied to a cue, the curve impacts only the intensity moves in that cue. When applied to a cue part, the curve impacts all parameter moves stored in that cue part.

When applied in patch, the intensity transition will follow the ramp defined by the curve during its fade. This value is determined by referencing the output value of the curve at that percentage and outputting the curved level rather than the percent level. Up to 100 points of delineation can be established in a curve, each with its own intensity value if desired.

When applied to a cue, the "percent completion" of the cue is determined by applying the curve's output level as the percent completion for all fade calculations. For single-part cues, the calculation applies only to intensity. For multipart cues, however, the curve applies to all parameters in the part.

When applied to a scroller fan, the output of the fan will be controlled by the intensity of the channel.

Curves can also be applied to fixtures with non-intensity parameters (NPs). When a channel with NPs is selected in **Patch > Attributes > Curve**, individual buttons for each available parameter will be displayed in the CIA. Click one or more buttons to apply a curve to the desired parameters.

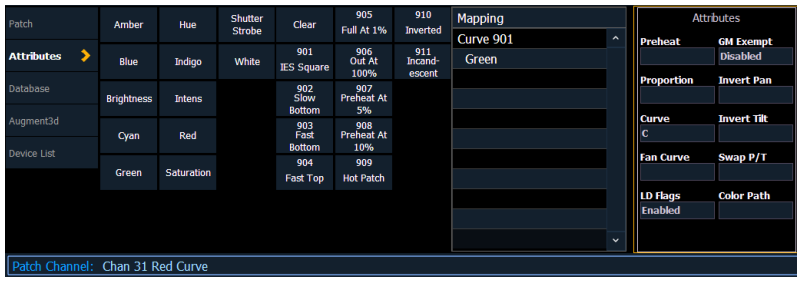


Eos provides 11 default, commonly used curves. They can be edited or copied to a new curve location. When a default curve is deleted, it will return to its original state.

The curve editor can be accessed by pressing **[Tab] [2] [1]** or **[Displays] {Curve}** or from the browser, **Browser > Record Target Lists > Curves**. When selected, the curves list will open as a separate tab and the CIA will show the graphical output of the first curve in the list.

You can scroll through the list using the **[Next]** and **[Last]** keys, or you can specify a curve in the command line.

- **{Curve} [9] [0] [4] [Enter]** - selects curve 904 from the list and displays its shape in the CIA.



Working with Curves

Creating Curves

From the curves display, you can select a curve or create a new curve by pressing **{Curve}** [x] **[Enter]**. If the curve is already stored, the contents are displayed in the CIA. If this is a new curve, a linear curve is displayed.

Editing Curves

Using the Keypad

Once selected and displayed in the CIA, you can edit a curve from the keypad. Points are established in increments of five. You can add more points from the keypad.

- **[3] [At] [1] [Enter]** - adds control input point "3" and sets its curve level at 10%.
- **[7][7] [At] [Full] [Enter]** - adds control input point "77" and sets its curve level at full.
- **[5][0] [At] [Enter]** - removes control input point "50."

You can specify points and adjust their levels in the command line or you may use the keys below to alter the curve:

- **[Page ▶]** - selects the next fade completion point.
- **[Page ◀]**- selects the previous fade completion point.
- **[Level Wheel]** - adjusts the output level of the selected point.
- **[Page ▲]** - raises the selected point's output by 1%.
- **[Page ▼]** - lowers the selected point's output by 1%.
- **[Full]** - sets the selected point's output to full.
- **[Out]** - sets the selected point's output to zero.
- **[+%]** - raises the selected point by the amount for **[+%]** established in **Setup > User > Manual Control >** *Button Values*.
  - Ion Classic and Element Classic users will need to use **[At] [+] [+]**.
- **[-%]** - lowers the selected point by the amount for **[-%]** established in **Setup > User > Manual Control >** *Button Values*.
  - Ion Classic and Element Classic users will need to use **[At] [-] [-]**.

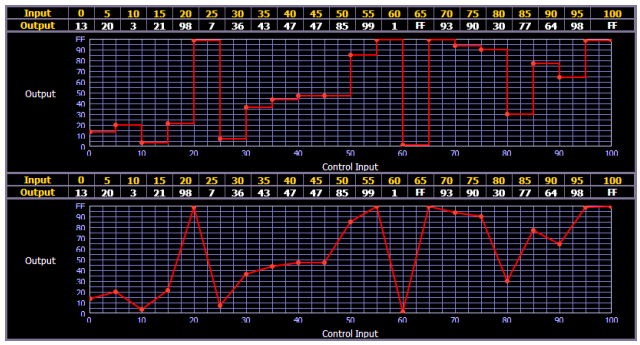
Using a Touchscreen

Once a curve is displayed in the CIA, you can press **{Edit}** to edit the curve in the editor display.

In the curve editor you can trace the desired shape of the curve using your finger or a mouse on the touchscreen. As you progress through drawing the curve, intensity values will be added for existing points on the curve. If you add points to the curve (from the keypad) those points will be adjusted as well.

You can also toggle between an "interpolated" or "stepped" curve shape. Eos defaults to "interpolated". To switch to "stepped", press the **{Stepped}** softkey. Once pressed, this softkey changes to **{Interpolated}**, which allows you to switch back.

Below are two examples of the same curve. The first is stepped and the second is interpolated.



Clearing the Curve

At any time, you can clear a curve from the curve editor display by pressing the **{Clear Points}** softkey. This will return the curve to its original linear shape or to its default shape if it is a pre-established curve.

Deleting Curves

While in the curve display, you can delete a curve in the following ways:

- **[Delete] {Curve} [3] [Enter] [Enter]** - deletes curve 3 from the list.
- **[Delete] {Curve} [9] [0] [1] [Enter] [Enter]** - since curve 901 is a pre-established curve, this command will return curve 901 to its default state, thereby removing any edits to it.
- **[Delete] [Enter]** - deletes the currently selected curve.

Applying a Curve To Channels In Patch

Curves can be applied to any intensity parameter in patch. Once added, the curve number appears in the channel's "Curve" column of the patch display. Pressing **{Curve}** in **Patch > Attributes** will display a list of available curves.

- **[Patch] {Attributes} [1] {Curve} [9] [0] [1] [Enter]** - applies curve 901 to channel 1 intensity.
- **[Patch] {Attributes} [2] [Thru] [8] {Curve} [2] [Enter] -** applies curve 2 to intensity for channels 2 thru 8.
- **[Patch] {Attributes} [1] {Curve} [At] [Enter] -** removes the curve from channel 1.

When a curve is applied to a Focus, Color, or Beam parameter, an F, C, or B indicator will appear.

Curves Applied to Cues

Curves can also be applied to cues or cue parts in Live or Blind. This affects the percent completion of the cue or part by applying the curve's output level as the percent completion for all fade calculations. Once added to a cue, the curve number appears in the cue's "Curve" column of the cue list in the *Playback Status Display (PSD) [Tab 2]*.

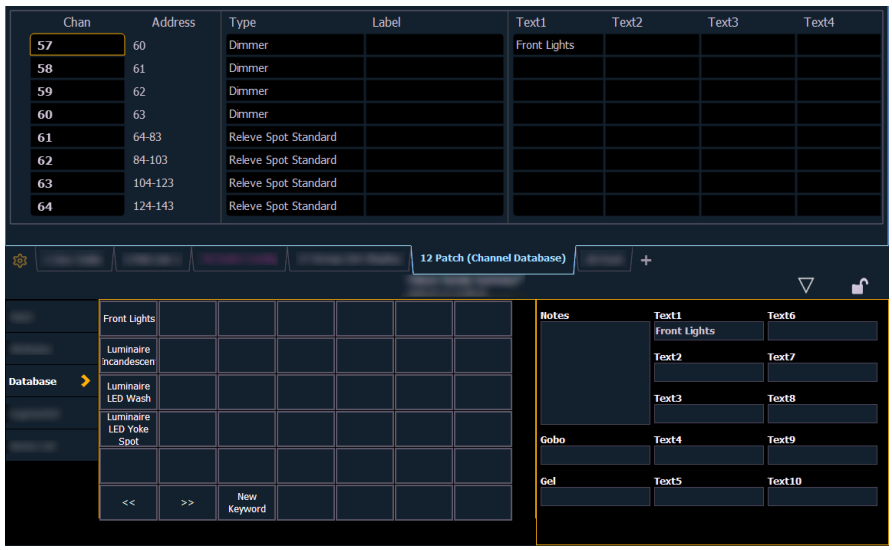
- **[Cue] [5] {Attributes} {Curve} [4] [Enter]** - applies curve 4 to cue 5.
- **[Cue] [4] [/] [6] [Thru] [9] {Attributes} {Curve} [9] [0] [6] [Enter]** - applies curve 906 to cues 4/6 through 4/9.
- **[Cue] [5] {Attributes} {Curve} [At] [Enter]** - removes any curve from cue 5.
- **[Cue] [8] [Part] [3] {Attributes} {Curve} [6] [Enter]** - applies curve 6 to part 3 of cue 8.

Applying a Curve To Scroller Fans

Curves can also be applied to a scroller fan. When applied to a scroller fan, the output of the fan will be controlled by the intensity of the channel. To apply a curve to a scroller fan, go to **Patch > Attributes > {Fan Curve}**. See *Scroller Fan Curves*.

Patch > Database

The **Database** section provides you with additional fields for entering information that can be used by the *[Query]* function. These fields include **{Notes}** and **{Text 1}** through **{Text 10}**. Clicking on **{Text 1}** through **{Text 10}** will open up a display for selection of keywords. It will display keywords that were already created as well as showing an option for creating new keywords. Clicking on **{New Keyword}** will display an alphanumeric keyboard for entering in a new keyword.



- **{Text}** - Text fields are used to provide up to ten keywords about any channel or group of channels. These fields can be anything that you think is important about a channel, such as its location (FOH), an attribute of it (wash, spot), or other characteristics of the channel (such as gel). Select **{New Keyword}** and use the virtual keyboard in the CIA, or an external keyboard, to provide up to 30 characters of key words about the device.
    - **[5] {Database} {Text 1} <** FOH right**> [Enter]** - adds text to channel 5.
    - **[5] {Database} {Text 2} [Label]**downstage right **[Enter]** - adds text to channel 5.
- **{Notes}** - Provides you the ability to attach a text note to a channel or group of channels. Select the **{Notes}** button on the CIA to display the virtual keyboard. You may type a label or any length of note regarding your channel in this space.
    - **[5] {Database} {Notes} <**this fixture is a backup to channel 15 for front of house right / new lamp installed on 10/4/17**> [Enter]** - adds a note to channel 5.
- **{Gel}** - The Gel field is a dedicated location for notes about gels.

Adding Keywords in Patch

If you plan on being able to query channels based on a keyword association, the keyword must be defined in Patch.

Keywords entered are automatically used by Augment3d as tags on the associated channel / fixture in the *Hierarchy*. Spaces are replaced with an underscore (_).

To enter a keyword for a channel:

1. In **Patch > Database**, select a channel or range of channels in the command line.
2. Use one of the **{Text (1-10)}** buttons in the CIA to specify which keyword you are entering. A list of previously defined keywords will be posted. Select from these or press **{New Keyword}**. A virtual alphanumeric keyboard will appear.
3. Type the keyword or words you wish to use.
4. When finished, press **[Enter]**.

Once keywords have been created, they will appear in the keyword section of the CIA when a query is performed.

Deleting Keywords from the Database

Keywords can be deleted from any of the ten text fields in the database. To delete a keyword from the entire database, you would use the following syntax:

- **[Delete] {Text1}** <orange> **[Enter] [Enter]**

This will delete orange anywhere it was used in any text field of any channel.

To just remove a keyword from a specific channel, you would use the following syntax:

- **[1] {Text1} [Enter]**

That would remove the text from channel 1's first text field only. If you wanted to clear the second text field, you would select **{Text2}** and so on.

Renaming Text Fields in Patch

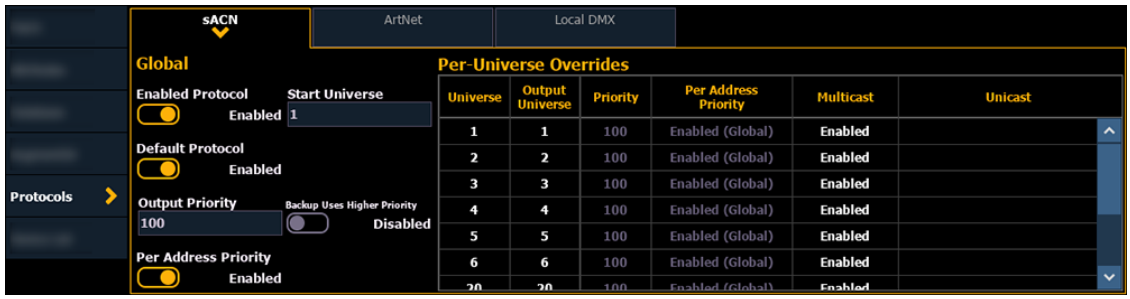
You can rename the text fields. By default, the text fields are named **{Text 1}** through **{Text 10}**. Text fields 1 through 10 display in the Patch display. Renaming those fields will rename the columns associated with them in the Patch display.

- **{Text 1} [Label]** <Position> will rename the text 1 field to Position.

Patch > Augment3d

The **Augment3d** section provides you with position, orientation, related properties, and FPE data for any patched items present in your Augment3d model. See *Fixtures in Augment3d*.

Patch > Protocols



The **Protocols** section allows you to configure settings for your console's data output. These settings are saved in your show file or template show file (see *About Show Files*).

Protocols can also be enabled or disabled via **Setup > Device >** *Network*.

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

sACN

Enabled Protocol

Enables or disables output of the sACN protocol. Defaults to enabled.

CAUTION: ***Protocols must also be enabled in Setup > Device > Network.***

Start Universe

Choose a starting sACN universe between 1 and 63,999. Defaults to 1.

Changing the start universe will offset your patch; for example, if you start at universe 3, anything patched to address 1 will actually output to address 1025 (universe 3, address 1).

Default Protocol

Enables or disables sACN as a default output protocol. Defaults to enabled.

Output Priority

Sets the sACN output priority level from 1 (lowest) to 200 (highest). Defaults to 100.

Backup Uses Higher Priority

This enables the backup device in a multi-console system to take over at one priority level higher than the current priority if the primary goes offline. Any per-address priority levels will also increase by one.

Per Address Priority

Enables or disables per-address priority for all sACN universes (commonly referred to as the "DD packet"). When enabled, individual sACN output priority levels can be entered for any patched addresses via the sACN Interface column in the *Patch [Tab 12]*. See *Patch > Patch*.

Per-Universe Overrides

The following options are available in the table:

- Universe - the sACN universe number.
- Output Universe - the universe number on which sACN outputs, based on the start universe.
- Priority - override the default output priority level of the selected sACN universe.
- Per Address Priority - enable or disable per-address priority for the selected sACN universe.
- Multicast - enable or disable multicast output for the selected sACN universe.
- Unicast - you can transmit to one or more unicast IP addresses. Enter IP addresses via the box, then select one or more addresses to enable output.

Unicast destinations can also be added from the command line with the syntax **{sACN} {Universe} [#] {Unicast Destinations}** #.#.#.# **[Enter]**, e.g. sACN Universe 1 Unicast Destinations 10.101.1.1. Additional sACN universes can be added with **[Thru]** and additional unicast addresses with **[+]**.

When Eos is configured to output to unicast addresses, generally only a single universe will need to be sent to a single IP address. However, Eos can output up to 64 universes and IP addresses total. This total can be divided however you see fit; for example, you could output 64 universes to a single IP address, 16 universes each to four IP addresses, 10 universes to one IP address and the other 54 to a second IP address, and so on.

Art-Net

Enabled Protocol

Enables or disables output of the Art-Net protocol. Defaults to disabled.

CAUTION: ***Protocols must also be enabled in Setup > Device > Network.***

Start Universe

Choose a starting Art-Net universe between 0 and 255. Defaults to 0 (0:0:0). Art-Net addresses can be displayed as a single number (e.g. 1) or divided into a network number, subnet number, and port number (e.g. 0.0.1).

Changing the start universe will offset your patch; for example, if you start at universe 3, anything patched to address 1 will actually output to address 1025 (universe 3, address 1).

Default Protocol

Enables or disables Art-Net as a default output protocol. Defaults to disabled.

Broadcast Mode

Choose between the following options:

- Directed Broadcast - broadcast packets are directed to a subnet based on the IP address and subnet mask of the sender.
- Limited Broadcast - the limited broadcast address is 255.255.255.255. Since routers will never forward datagrams with that destination address, datagrams with the limited broadcast address are confined to the particular network segment on which they originate.

ArtPoll

Enables or disables the sending of ArtPoll packets for device discovery via Art-Net2 and later. Currently, Eos only uses ArtPoll to identify itself on the network. Older or incompatible Art-Net devices can experience issues interpreting ArtPoll packets, which may be mitigated by disabling it. Enabled by default.

Per-Universe Overrides

The following options are available in the table:

- Universe - the Art-Net universe number.
- Output Universe - the universe number on which Art-Net outputs, based on the start universe.
- Broadcast - enable or disable broadcast output for the selected Art-Net universe.
- Unicast - you can transmit to one or more unicast IP addresses. Enter IP addresses via the box, then select one or more addresses to enable output.

Unicast destinations can also be added from the command line with the syntax **{sACN} {Universe} [#] {Unicast Destinations}** #.#.#.# **[Enter]**, e.g. sACN Universe 1 Unicast Destinations 10.101.1.1. Additional sACN universes can be added with **[Thru]** and additional unicast addresses with **[+]**.

When Eos is configured to output to unicast addresses, generally only a single universe will need to be sent to a single IP address. However, Eos can output up to 64 universes and IP addresses total. This total can be divided however you see fit; for example, you could output 64 universes to a single IP address, 16 universes each to four IP addresses, 10 universes to one IP address and the other 54 to a second IP address, and so on.

Local DMX

Controls are available to enable or disable local DMX and designate it a default protocol. Both default to enabled.

Patch > Device List

Device List is used to discover, configure, and monitor compatible Remote Device Management (RDM) and network devices. RDM allows for bi-directional communication between a RDM compatible device, such as a lighting fixture, and your console.

{Dimmers}

Handles setting up dimmer feedback from CEM+, CEM3, and FDX 2000/ 3000. You can also do some configuration of dimmers from this list.

{RDM}

Handles RDM feedback with devices. You can also do some configuration of devices from this list. Once RDM compatible devices have been patched, they keep communicating with the console to allow you to know when things like blown lamps happen or if a device goes offline for some reason. See *RDM Device List*.

Device List displays all discovered devices during the current session and all devices that have been stored in the show file.

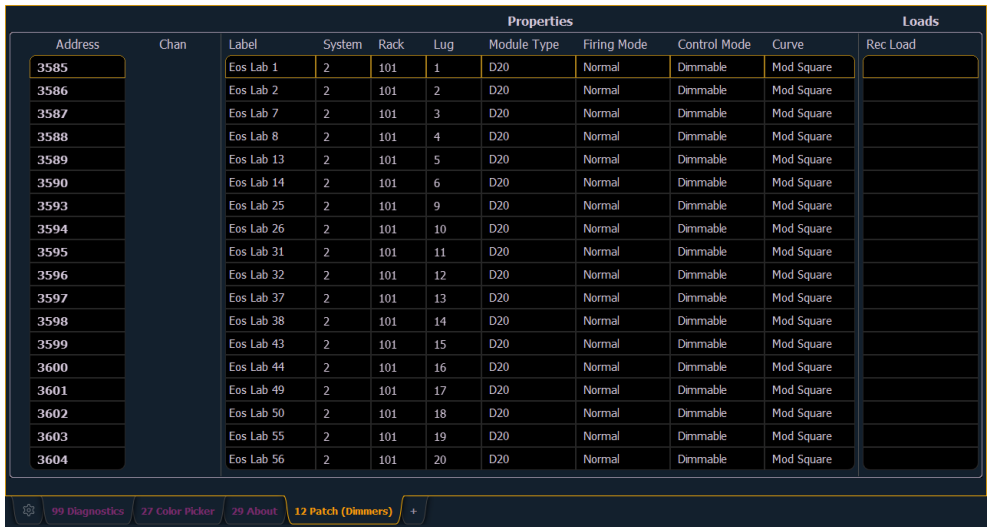
Note: *Consoles only support RDM devices that are connected through a Gadget, Local I/O, or external ACN gateway (running version 5.1 or higher).*

Dimmer List for CEM+, CEM3, and FDX 2000/3000

Note: *For Dimmer Feedback, these software versions are required: CEM+ v3.0 and newer, CEM3 v1.3.1 and newer, and FDX v3.4.0 and newer.*

To use the Dimmer Feedback area of the Device List, you must first enable feedback. In the network tab of the ECU, when using CEM+ or CEM3, make sure **{Sensor/ FDX3000 Feedback}** is enabled, or when using FDX 2000/ 3000, make sure that **{Sensor/ FDX3000 Feedback}** or **{FDX2000 Feeback}** is enabled. The default setting is disabled for both. See *Interface Protocols*

Open the Dimmer Feedback display while in the Patch display by pressing **{Device List}> {Dimmers}**. When the dimmer list is opened, the dimmers will be displayed in Patch by Address mode.



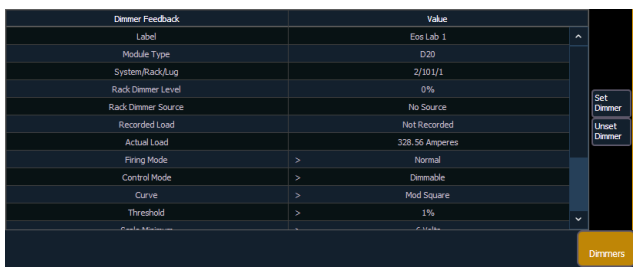
Eos will display the following information that it receives from the dimmers:

- Address
- Channel
- Label
- System
- Rack
- Lug
- Module Type
- Firing Mode
- Control Mode
- Curve
- Recorded Loads

Note: *The System ID number from CEM3 is not currently supported.*

Note: *Rack numbers and dimmer numbers need to be unique for Eos to properly recognize them. For CEM+, dimmers also need to be patched to different sACN addresses.*

With a dimmer or dimmers selected, you can edit various dimmer settings in the property view, which will display in the CIA. Items with a caret (>) are editable. When multiple dimmers are selected together for editing, an "*" will show for data that is different between the selected dimmers.



FDX dimmers will not display data for the following:

- Recorded Load
- Actual Load
- Rack Dimmer Source
- Threshold
- Scale Minimum
- Preheat Enable
- Preheat Timing
- AF Enable

Note: *When dimmers are discovered, they are not automatically attached to patched channels in Eos; you must attach a dimmer to a channel. See Patching Discovered Dimmers and RDM Devices*

RDM Device List

Before you can start using the RDM Device List, you must first enable **{RDM}** for the appropriate DMX ports in **Setup > Device >** *Local Output*, or for the appropriate ethernet ports via **ECU Settings > Network >** *Device*. RDM is disabled by default. If using Network RDM, this must be done via an ETC Net3 or Response Mk2 Gateway with RDM enabled on the DMX ports. The gateway needs to be running version 5.1 or newer.

Open the RDM Device List while in the patch display by pressing **{Device List} > {RDM}**.

You will need to make sure that **{Device Discovery}** is enabled.

{Device Discovery} is disabled by default. The **{Device Discovery}** option will not display if **{RDM}** is disabled in the ECU. **{Device Discovery}** will automatically disable when you leave the Patch display.

When the RDM device list is opened, the devices will be displayed in Patch by Address mode. At the top of the list is a RDM indicator. This indicator shows incoming and outgoing RDM traffic.

Eos will display the following information that it receives from the RDM devices:

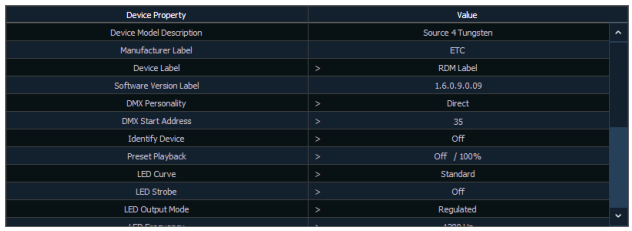
- **Address** (a part will be added if multiple devices are discovered with the same address)
- **Channel**
- **Label**
- **Manufacturer**
- **Model**
- **Footprint**

Eos will also display what personality from the library the device matches in the **Eos Type** column. This information will not display until you first select the device. Once the device has been selected for the first time, Eos will extract the type information from the device and display it.

The following messages may display in the **Eos Type** column:

- **No RDM Data Available** - no model specific RDM data has been extracted from the device.
- **Extracting RDM Commands** - currently getting the command data from the device.
- **Extracting RDM Fixture** -currently getting the data required to create a fixture definition for the device.
- **Extracting RDM Sensors** - currently getting the sensor definitions from the device.
- **Offline** - no model specific RDM data has been extracted from the device and it is now offline.

With a device or devices selected, you can edit various device settings in the property view, which will display in the CIA. Items with a caret (>) are editable. When multiple devices are selected together for editing, an asterisk (*) will appear by data that is different between the selected devices.



The following buttons will also display in the property view:

- **{Device Properties}** - opens the properties list for the selected RDM device.
- **{Sensors}** - displays if the selected device has sensors. Pressing **{Sensors}** will open the sensors list.
- **{Lamp Controls}** - displays if the selected device has lamp controls.Pressing {Lamp Controls} will open the lamp controls list.
- **{Channel}** - channel number of the selected device.
- **{Address}** - address of the selected device.
- **{Device Discovery}** - allows for discovery of RDM devices.
- **{Ignore Errors}** - when enabled, errors messages will not display in the live/blind displays. They will still display in about and the properties display in patch.
- **{Reload RDM Data}** - deletes the fixture data from the console and reloads it from the device.
- **{Flash}** - triggers the identify function of the RDM device. The identify function may defer between different manufacturers' devices. For example, Wybron scrollers identify by wiggling their gel back and forth.

Errors and Warnings

A red exclamation mark (!) or a yellow question mark (?) is used in **Patch**, **Live** (see *Indicators in Live and Blind*), **Patch**, *[About] Channel*, and *[About] Address* to indicate Eos has detected errors and warnings from connected RDM, CEM+, CEM3, or ACN devices. Use **{!}** or **{?}** to open the error list.

Errors and warnings are indicated based on severity using the following colors:

- **Gray** - unknown or not an error.
- **White** - an advisory: something that might be worth knowing about but likely won't affect system operation.
- **Yellow** - a warning: something you should know about that may affect system operation. Warning messages could include:
    - Multiple device addresses overlap.
    - A mismatch between the patched fixture type and the real fixture.
    - A mismatch between the patched address and the fixture address.
    - A device is offline.
- **Red** - an error: something definitively wrong that is likely or certain to affect system operation. Error messages could include:
    - A circuit is over temperature (overtemp).
    - A breaker has tripped.
    - A lamp is out.

The relative severity of an error in any given device is determined by the device manufacturer.

Use {Clear Errors} to remove displayed errors from the list.

Patching Discovered Dimmers and RDM Devices

When dimmers/devices are discovered, they are not automatically attached to any patched channels in Eos. If you want the benefits of dimmer or RDM feedback, you must attach a dimmer or device to a channel.

If you patch a dimmer/device's address to a channel, while in the device list display, the dimmer/device will be automatically attached to that channel. However, if you patch outside of the device list, you will need to {Attach} the device to the channel.

Note: *If the dimmer/device's address is not yet used in the patch, it is easiest to patch the address to a channel in the dimmer list or device list screen.*

<Chan> [X] {Attach} or <Address> [X] {Attach} will link that channel/address in patch and the dimmers/devices at that address.

When a channel number is attached to a dimmer/device, by patching it or using {Attach}, the channel's fixture type is changed to the dimmer or device fixture type.

The advantages of attaching a dimmer to a channel are:

- The console warns you when a channel's attached dimmer has an error or is offline.
- Items that are attached between patch and the device list will display a caret (>) beside their channel/address in patch.

The advantages of attaching a device to a channel are:

- Its fixture type is copied to the channel.
- The console warns you when a channel's attached device is offline or has an error.
- The device will always appear in the device list display, even if the device is offline.
- Items that are attached between patch and the device list will display a caret (>) beside their channel/address in patch.

Detaching Devices

Use {Attach} {Attach} to post the {Detach} command.

Use <Chan> [Channel Number] {Attach} {Attach} or <Address> [#] {Attach} {Attach} will remove the link between the device and the channel or address.

RDM Errors and Warnings

One of the advantages of using dimmer and RDM feedback is error and warning reporting. If something happens with a patched and attached dimmer/ device, you will be notified in Live, Patch, and About with an exclamation mark.

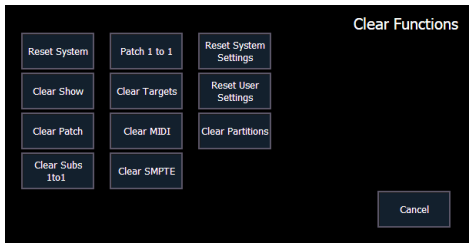
Errors can be viewed in the About Channel and About Address displays.

The notifications you can see are:

- A red "!" means that the dimmer/ device has errors, such as overtemp, breaker trip, and lamp out.
- Yellow "?" means that the dimmer/ device has a warning message.

Clearing the Patch

You can clear the patch entirely by accessing the clear functions from Browser> Clear. The clear functions window will open in the CIA.



To clear the patch, click **{Clear Patch}**. A confirmation is required before the patch will be cleared.

To create a 1-to-1 patch, click **{Patch 1 to 1}**. This will remove the current patch.

To exit the clear functions screen without clearing, press the **[Displays]** key at any time or select a clear button and then select **{Cancel}** from the confirmation screen.

Updating Fixture Profiles

When a new library is installed on Eos either from a software update or a separate fixture library file from the ETC website, changes in library data will not automatically update your show files. This is to prevent library changes from affecting a functional show file.

Using the **{Fixtures}** softkey in patch will open up the list of fixtures used in the current show file. In this view, you will be able to tell which fixtures in the currently loaded show file differ from the console's fixture library. Fixtures that have either been edited or their profile does not match the current library will display with an "*" beside their name. For fixtures that have a library update, the **{Update Profile}** softkey will display in white, and for fixtures that don't have an update, the **{Update Profile}** softkey will be grayed out.

Note: *When updating a fixture in Patch, a warning message will display that includes what changes will be made to the fixture by updating it. Press **{Ok}** to update the profile or **{Cancel}** to return to the fixture editor.*

All devices in a multi-console system have to use the same fixture library. If the fixture library is different between devices, a warning will be displayed on the device trying to connect to the system.

Fixture Editor

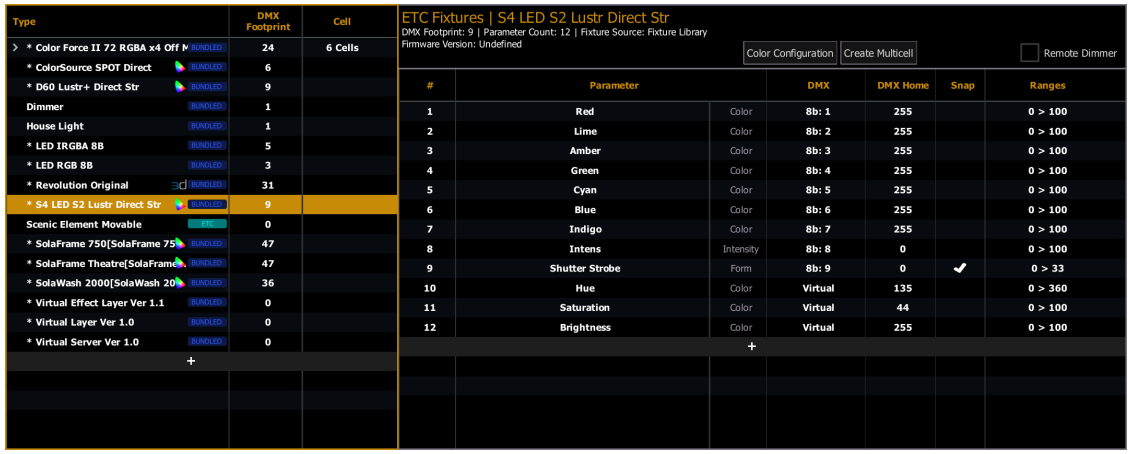
Eos provides you with the ability to create your own fixture type within patch and store it with your show file. You can name the fixture, assign all necessary parameters, define the address and operational range of those parameters, see fixture modes and their properties, and set lamp controls.

Note: *Before you create a new fixture, it is helpful to look at a few fixture personalities of similar fixtures to get an idea of how to set yours up. You may even want to look at their user manuals to see how their defined DMX footprints look as a fixture profile. This is especially helpful when creating Modes.*

The fixture creator is accessible from *Patch [Tab 12]*. Once a fixture has been created, it is stored in the show file. It is **not** added to the fixture library. If you want to use the created fixture in another show file, see *Merging Custom Fixtures into a New Show File*.

Use **{Delete Unused}** to remove any unused fixture profiles from the list.

Fixture Profile List



To open the fixture editor, open the patch display and press the **{Fixtures}** softkey. This will open a list on the left displaying those same fixtures that are currently patched or have been added to the show, and the list on the right are the parameters for the selected fixture.

Creating a New Fixture

New fixtures are created from the fixture editor, either by creating a new fixture, or by *Copying a Fixture* to edit.

Before you create a new fixture, it is helpful to look at a few fixture personalities of similar fixtures to get an idea of how to set yours up. You may even want to look at their user manuals to see how their defined DMX footprints look as a fixture profile. This is especially helpful when creating *modes*.

CAUTION: ***ETC does not create or provide fixture definitions for pyrotechnics and otherwise dangerous DMX-controlled devices. This includes rigging devices such as winches, and Class 3B, Class 4, or unclassified lasers.***

Naming a New Fixture

Use **{New}** to add a new fixture to the fixture list. Once the new fixture appears in the list, it is recommended that you name the fixture you are about to create.

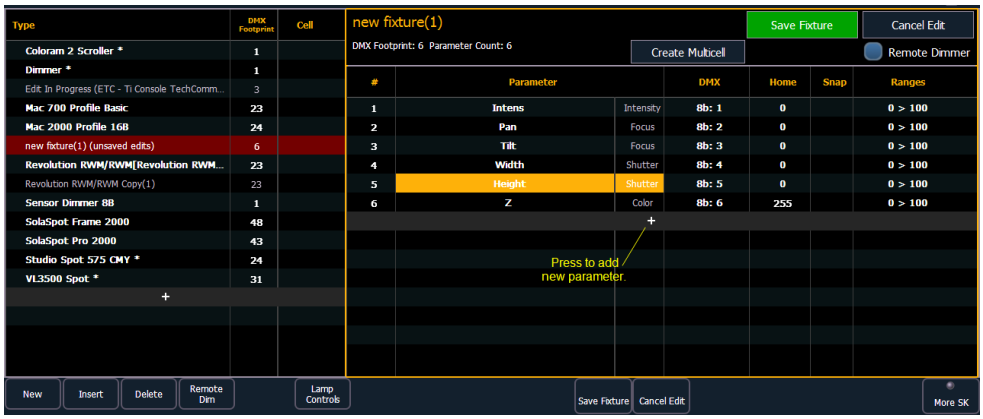
1. Use the **[Page]** keys, mouse, or touchscreen to select the new fixture.
2. Press **[Label]** or tap on the new fixture. You can press **[Label]** twice to clear the name. The virtual keyboard will open in the CIA.
3. Enter the desired name for the new fixture on the virtual (or attached alphanumeric) keyboard.
4. Press **[Enter]**. The name will appear in the "Type" column of the fixture list.

Adding Parameters

After naming the fixture, you can specify which parameters the new fixture contains.

To add parameters to a new fixture:

1. Use the **[Page]** keys, mouse, or touchscreen to select the new fixture.
2. Select the parameter list by clicking on it or touching it.



3. Determine the total number of parameters that your fixture has. Do not count 16-bit parameters as two parameters, this will be done in a later step.
4. Press **{New}** or **{+}** to add parameter slots. Repeat this step until you have as many slots as are required by the number determined in step 3.

Note: *When **{New}** or **{+}** is pressed, the parameter slot will appear in the list with a default name in the "Parameter" column. You may disregard these default parameters as you will redefine the designations in a later step.*

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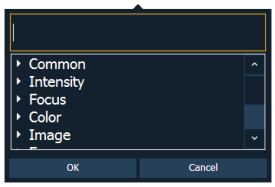
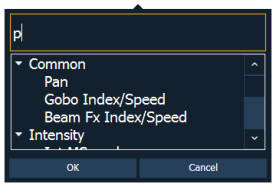
5. Use the **[Page]** keys, mouse, or touchscreen to navigate to any parameter slots that you wish to alter the default parameter designations for.
6. Click on the slot to open a dropdown list of available parameters.



7. Click on a category to open the dropdown list to see the parameters, or use the search box to find the parameter.



8. Press the desired parameter to assign it or press **[Enter]** when the parameter is selected.
9. Repeat steps 5 through 8 until you have entered all of the required parameters for the new fixture.

If you are missing a parameter slot: At any point you can use the **[Page]** keys and **{Insert}**, to insert a parameter slot above the selected one.

If you want to remove a parameter: you can use the **[Page]** keys and **{Delete}**, to remove a parameter from the list.

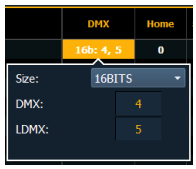
Locked Value

A parameter can be assigned as a locked value. When used, the output address and value will be locked at the profile level. This option is available under Control in the parameter dropdown list.

Define Parameters

Once you have added and specified all of the parameters for the new fixture, you can now define the address requirements, size, and ranges for each of them.

To define the size (8-bit or 16-bit), DMX address, and LDMX address of any parameter:



You can alter the default DMX address assigned to any parameter in the list. This is not the actual address that will be used when patched, but rather it is the order of address for the parameter relative to the other parameters in the fixture.

LDMX or "low-DMX" is the DMX address for the second half of any 16-bit channel. If used in Coarse/ Fine determination, the DMX channel defines the "Coarse" adjustment and the LDMX defines the "Fine" adjustment. Do not count 16-bit parameters as two parameters.

1. Use the **[Page]** keys to navigate to any parameter that you wish to alter the size of. The system defaults to 8-bit for any new parameter.
2. When selected, click Size to choose between 8-bit or 16-bit. If 16-bit is selected, the system automatically displays a LDMX option. This value can be altered.
3. Enter the desired address for the DMX and/ or LDMX addresses using the keypad.

To define the value for any parameter's "home" value.

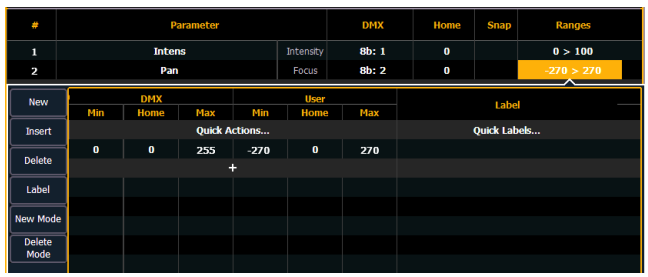
1. Click on the "Home" column of the desired parameter.
2. Enter the desired home value (0 through 255 for 8-bit, and 0 through 65535 for 16-bit) using the keypad.

You can enable *Snap Parameters* to exempt them from cue timing, so they snap to their new value:

1. Use the **[Page]** keys to navigate to the "Snap" column of the desired parameter.
2. Click in the 'Snap" column for the selected parameter to enable.

Range Editing Parameters

You can enter the operational ranges for specific slots within any specific parameter (such as color scroller, color wheel, gobo wheel, and so on). You can do this by either defining each range individually or you can use the *Quick Actions* tools to define multiple ranges at once.



If a parameter has only one range, the values for that range will display in the range column. If that parameter has multiple ranges, the number of ranges will be displayed. If a range is used in a *Modes*, the range will not be in bold.

For example, if the parameter were "Gobo Wheel", and the fixture included a four-slot gobo wheel, you can use ranges to determine the minimum/ maximum values for each of those slots. You can also label the slots and define the minimum/ maximum values that will appear in the channel display for that parameter.

To define the range values individually for any parameter:

1. Use the **[Page]** keys to navigate to the parameter that you want to add ranges to.
2. Click on the range. The range window will open.
3. Determine the total number of slots required by the parameter. **Be sure to include "open" slots when needed.**
4. Press **{New}** or **{+}**to add ranges. Repeat this step until you have as many slots as are required by the number determined in step 3.
5. Use the **[Page]** keys to select the range and field you wish to edit. Fields are:
   - **DMX Min** - enter the minimum value (0-255 8bit / 0-65,535 16bit) for the range slot you are defining.
   - **DMX Home** - enter the default value (0-255 8bit / 0-65,535 16bit) for the range slot you are defining.
   - **DMX Max** - enter the maximum value (0-255 8bit / 0-65,535 16bit) for the range slot.
   - **User Min**- enter the value that will be displayed to users (for example, what will be displayed in the live summary view) when the slot is at its minimum value. Value can range from -32767 to 65535.
   - **User Home**- enter the value that will be displayed to users (for example, what will be displayed in the live summary view) when the slot is at its default value. Value can range from -32767 to 65535.
   - **User Max**- enter the value that will be displayed to users when the slot is at its maximum value. Value can range from -32767 to 65535.
6. Press **{Label}** to add a label to any range slots. These will appear in the encoder display (if available) and ML Controls when the related parameter is displayed for the new fixture.
7. Press **{Patch}** when you have finished editing the ranges.

To delete a range value, select it and press **{Delete}**.

Quick Actions

Quick Actions provides tools that allow for the creation of multiple ranges at once according to predefined actions.

Note: *Quick Actions supports 8bit and 16bit parameters.*

Click on **Quick Actions** to open the menu. In this menu, you select the desired action and the number of slots needed.

The following actions are available:

- **As-Is** - this is the initial mode. The ranges are unchanged. This allows you to view the range as it was.

- User Values - these actions affect the user values.
  - Framed - enter the number of frames that you would like to have on your collection of ranges. The console then distributes the DMX values and assigns a user range exactly as any of the wheel or frame parameters are automatically created. (Frames 1, 2, 3, etc would be represented as 0.5-1.4, 1.5-2.4, 2.5-3.4, etc)
  - Matched - the user values are set to match the DMX values. This is required for a virtual parameter (one that has no DMX address) and is used as a *Modes* for another parameter.
  - Scaled - users can enter the minimum and maximum user value to map their DMX ranges to an arbitrary user range. This is useful when creating pan/tilt ranges (e.g., -180 to 180), or color temperature ranges (e.g., 3000 to 15000). DMX ranges are not changed and are assumed to be as the user intends. The DMX values are scaled into the new user range.
- DMX Values - this action affects the DMX values.
  - Distribute - select the number of ranges you wish to create. DMX values are then evenly distributed as specified.

Quick Labels

Click on Quick Labels to open a dropdown menu with labeling options. These options are broken down into two categories: units and labels.

- Units
  - Degrees
  - Percent
  - (none)
- Labels
  - Open
  - Open/Color N
  - Blackout
  - Animation
  - Animation N
  - Color
  - Color N
  - Color M/N
  - Color N/Open
  - Effect
  - Effect N
  - Gobo
  - Gobo N
  - (clear)

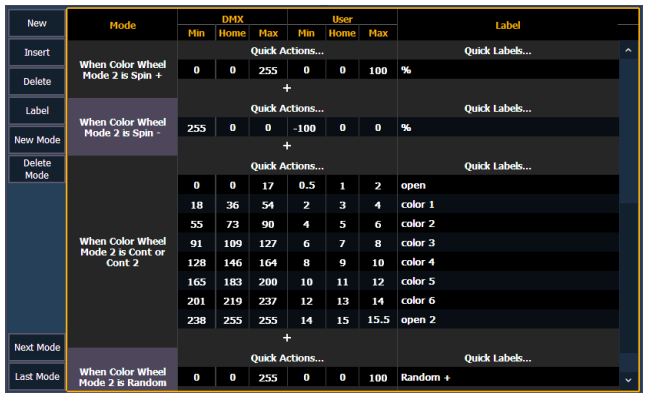
Units are used to add a degree or percentage symbol to the end of a label when it displays in the encoder display or ML controls. If you want to remove a unit, select **(none)**.

Labels are used to replace the text for all of the ranges. Labels that have an N after them will display the appropriate number in the encoder display or ML controls. For example, Gobo N will display the number of the gobo. Select **(clear)** to remove the labels.

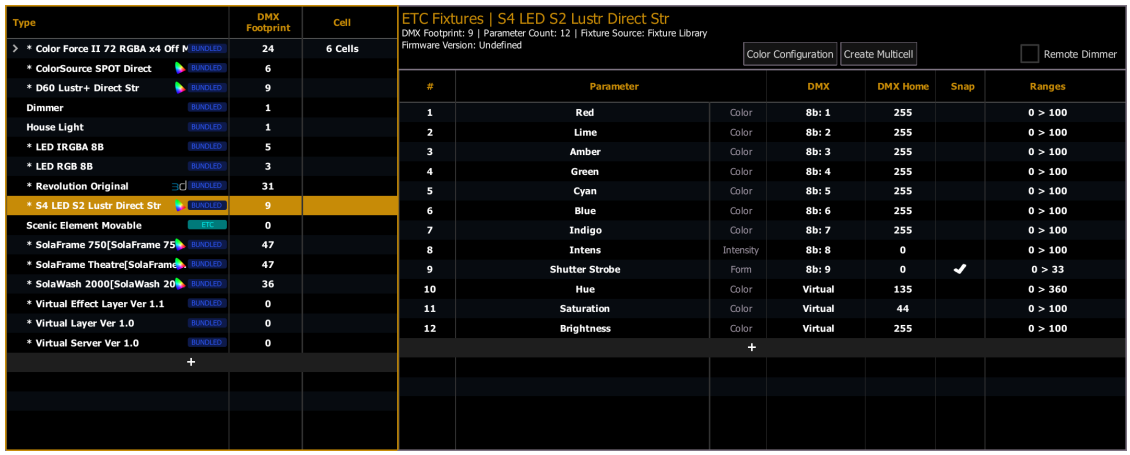
Modes

A mode is a collection of ranges that will display in the encoder display and in ML controls when the mode's conditions are true. These ranges are part of one DMX address that is used to control two or more different by related functions, such as gobo index and rotate.

Examples of mode conditions are "When Gobo Mode is Indexed" or "When Strobe Mode is Random". Multiple conditions can be assigned. An example of this would be "When Gobo Wheel Mode is Index or Index Scan".



When viewing a fixture profile, the parameters that have modes will display the number of modes in the ranges column.

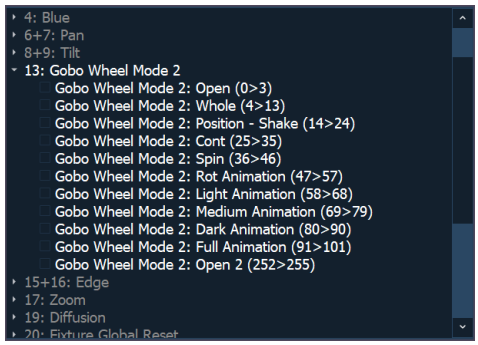


Note: *When adding a new mode, you will need to first add the parameter that the mode needs to be associated with before you will be able to assign the mode. See Creating Modes.*

Modes can be edited in the range editor; see *Range Editing Parameters*. The following buttons are available for editing modes:

- **{New Mode}** - adds a new mode.
- **{Delete Mode}** - deletes the selected mode.
- **{Next Mode}** - advances your selection to the new mode.
- **{Last Mode}** - returns your selection to the previous mode.

Clicking a new or existing mode will open the mode selection window.



This window displays all the possible conditions that can be applied to the fixture. The active ranges for the mode will already be selected with a checkmark.

A condition can only be present on a single mode. Similarly, if a parameter has multiple ranges, and it is selected as a condition for another parameter, all ranges need to be present on some modes of the fixture. For example, if gobo wheel has ranges of index, rotate, and shake, and you place index on a parameter for a mode, rotate and shake must also be used.

Once a parameter is used as a condition, it becomes read only. Only the labels for the ranges can be added/ edited.

Note: *A single range parameter is not useful as a condition so those will not be available for selection.*

Note: *Some fixtures use virtual modes. Those are modes without a DMX address assigned to them.*

Creating Modes

Let's take a look at how to create modes for a gobo wheel. This gobo wheel can be indexed or rotated.

In the fixture's manual, you will see something similar to this:

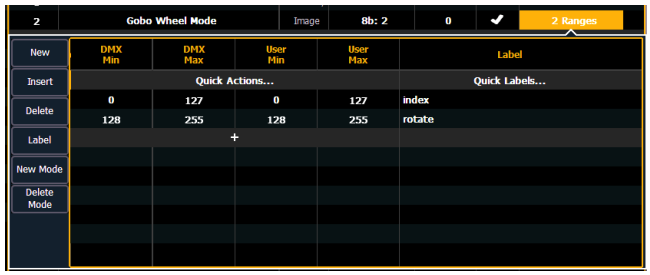
16	Gobo Function	Index 0 127 Rotate 128 255

The sixteenth DMX slot for this fixture is gobo function, which has two ranges for index and rotate.

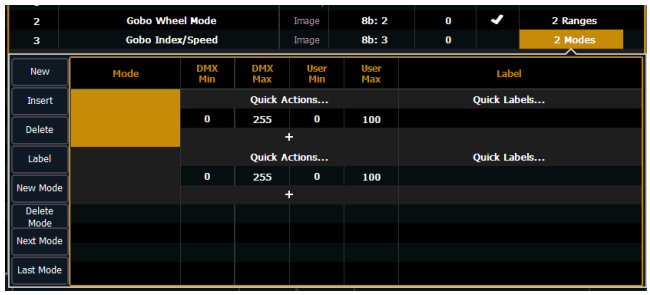
In the fixture editor, you assign a parameter as gobo wheel mode. Click in the range column to open the range editor. Use **{+}** to add a second range slot. Assign the appropriate range values, and label each range.

Note: *For this example, the DMX min and max values were entered and then the Quick Actions Matched function was used so the user values and DMX values match.*

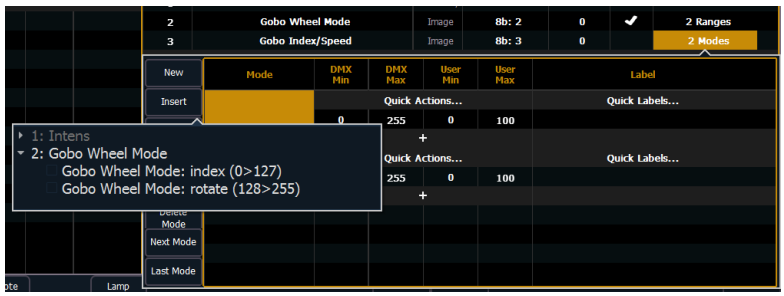
Note: *It is important to name your ranges. Without labels, only the range values will display when selecting conditions, and the mode buttons in the encoder display and ML controls will be blank.*



Back in the fixture editor, assign a parameter as gobo index/speed. Click in the range column to open the range editor. Press {New Mode} to create two modes.

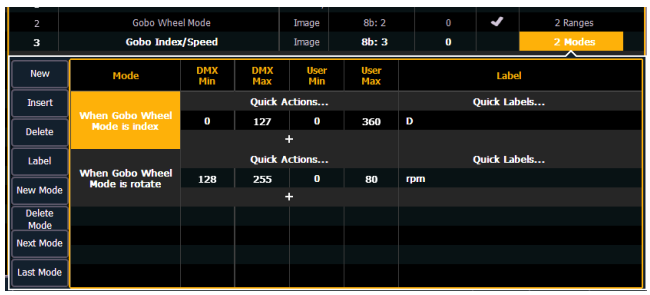


Click in the mode cell to open the mode selection window.



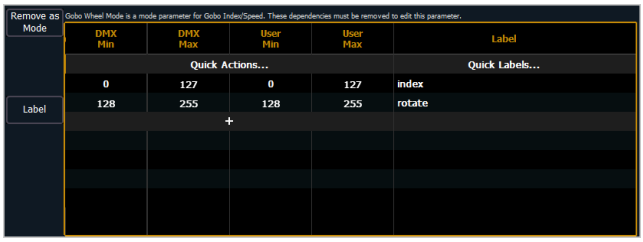
This window will display all possible conditions that can be applied to your fixture. In this case, there are only two possible.

If a parameter has multiple ranges and is selected as a condition for a mode parameter, all the ranges for that parameter must be used. The fixture editor will allow you to select a condition for a mode and it will automatically place the other ranges on the next mode.



Assign the DMX and user values. The range values were used for the DMX values. For index, the user values were set to 0-360 degrees. The *Quick Labels* degree unit was used so the degree symbol will display in the encoder display. For rotate, the user values were to 0-80 rpms.

Once the modes are created using the index and rotate ranges, the gobo wheel mode parameter will be read only. The range editor for gobo wheel mode will give an advisory saying which mode the ranges are used in. If changes are needed to those ranges, press **{Remove as Mode}** in the range editor. After the changes are made, you will need to reassign the modes.



After patching the new fixture, you will be able to check your modes in the encoder display and ML controls. There are now buttons for the modes, and for index, the degree symbol is displayed with the user value.

Fixture Lamp Controls

For many devices, their lamp and motor control functions can be controlled remotely using DMX. These will often require use of a timed sequence of DMX levels to control various functions such as striking the lamp, resetting the fixture, and other specific actions.

To define the lamp controls for a device:

1. With the fixture selected, press **{Lamp Ctrls}**. The lamp control display will open.
2. Press **{New}** or **{+}** to add as many lamp control options as needed.
3. Click on the name in the lamp control column to name it.
4. Click in the Steps columns (#, Time, DMX, and Level).
    - **#** - the step number. Each step is tied to a time value, and will execute in order of the step number.
5. Press **{New}** or **{+}** to add as many steps needed for the lamp control.
6. Select the time column to change the timing for each step.
    - **Time (seconds)** - Timing is in seconds. The standard time in the Eos Family library is 12 seconds.Hold can be assigned as a timing value.

Note: *It is not recommended that you set the time to **Hold** unless the DMX value should permanently remain at that level. In order to alter a level set with a time of **Hold**, another lamp control to change that DMX value would need to be created.*

7. For each step created, click in the DMX column and press {New} or {+} to add as many DMX addresses and levels as needed. You may setup as many levels as needed for each step.

Note: *While a step is active, the DMX levels for the channel will be held. When a step is no longer active, the levels will be released back to their playback levels.*

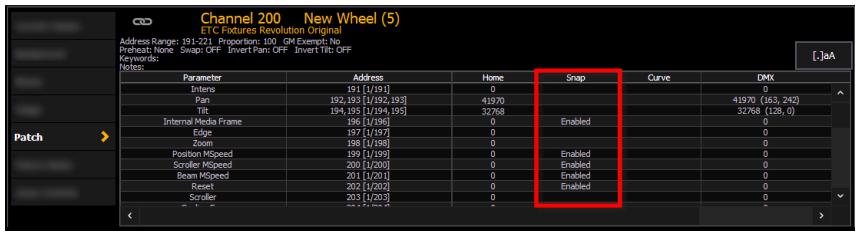
- DMX - the DMX offset of the parameter you wish to control. DMX can be set to All Offsets, which means that all DMX parameters for the fixture will be held at the specified level.
- Level - the 0-255 level of the parameter.

Snap Parameters

Certain parameters may not want to be subjected to cue timing. Those parameters can be set to snap. By default, Eos will snap the parameters listed in the following table:

Beam FX Index/Speed	Effect Library	MSpeed	Shutter
Camera IR Image	Enable	Negative	Shutter Strobe
Clip Directory	File	Object Directory	Strobe Mechanism
Color Effect	File Type	Object File	Sync Source
Color Index	Front/Rear Projection	Output Command	Text
Color Mix	Generator	Page	Texture
Control	Generic Control	Position Blink	Timeline
Copy Mod	Image Movement Speed	Projector Input	Timeline Position
Cue	Internal Media Frame	Relay	Tracking Object
Dimmer Curve	Library	Select	Transition Speed
Edge Blend Profile	Macro	Shape	Transition Time
Effect File	Mode	Shape Library	Transition Type

In the [About] channel patch screen, the snap column shows which parameters for that channel are currently set to snap. These parameters can be edited for any profile using the Fixture Editor. See *Fixture Editor*

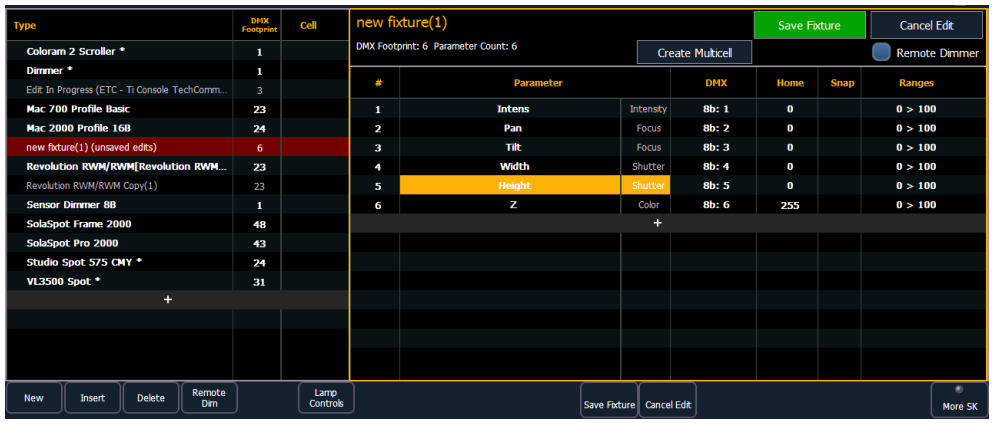


Saving Fixture Profiles

Unsaved fixture profiles will have a red background in the fixture editor.

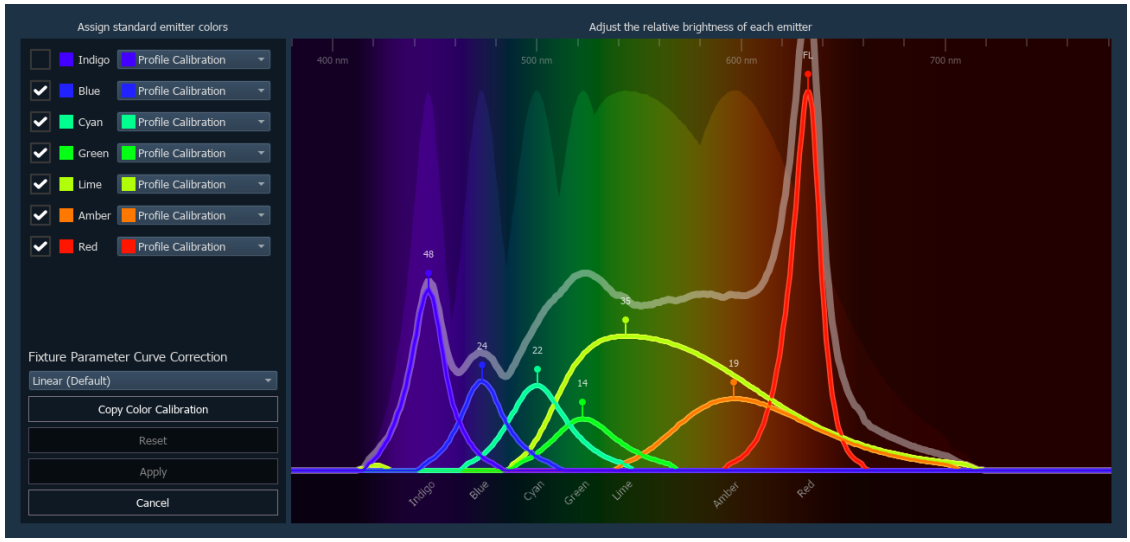
Press **{Save Fixture}** to store the new profile, or **{Cancel Edit}** to exit out and not save your changes.

Note: *If you leave the patch display without saving or using **{Cancel Edit}**, an advisory will display above the command line letting you know that you have unsaved data.*



Color Configuration

Color configuration information is stored within fixture profiles in your show file. Fixtures with additive color properties will display a color configuration button in the fixture editor, which will open the color configuration editor window.



Editing Color Configuration

For accurate color control, each color parameter in an additive fixture profile needs an accurate definition of the correct emitter color, wavelength (in nanometers), and relative brightness compared to the brightest emitter in the fixture.

The following options are available:

- **Colors** - a list of each color parameter present in the fixture profile.
- **Wavelengths** - the dropdown menus beside each color allow you to choose the correct wavelength for that parameter.

- **Brightness** - the sliders on the right allow you to adjust the relative brightness of each color.

Color parameters can be excluded from color mixing by deselecting the box to their left. Excluded parameters can still be controlled directly, and none of their stored data will be cleared. UV parameters are deselected by default.

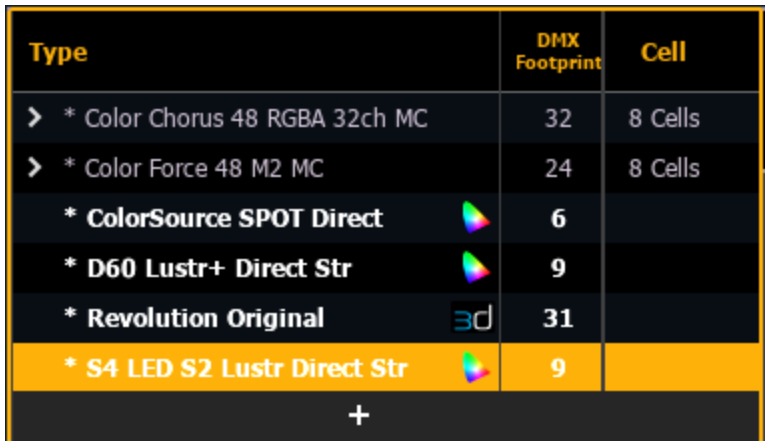
Use the **Fixture Parameter Curve Correction** dropdown to choose between **Linear (Default)** and **Quadratic** curves.

Color Configuration Data

The data required for color configuration can originate from a variety of sources.

Calibrated

Calibrated color configuration data has been gathered using lab-quality equipment and measuring techniques. This generally provides higher quality color picking and gel matching.



Fixture profiles with calibrated color configuration are indicated in the fixture profile editor with a CIE icon.

Color calibration data can be copied between fixture profiles using **{Copy Color Calibration}**, selecting the destination fixture from the pop-up list.

Manufacturer

This type of color configuration data is provided by the fixture's manufacturer and can be manually entered into the profile via the color configuration editor. The quality of this data, and the subsequent color performance of the fixtures that use it, will depend on the quality of the manufacturer's initial measurement process.

Field Survey

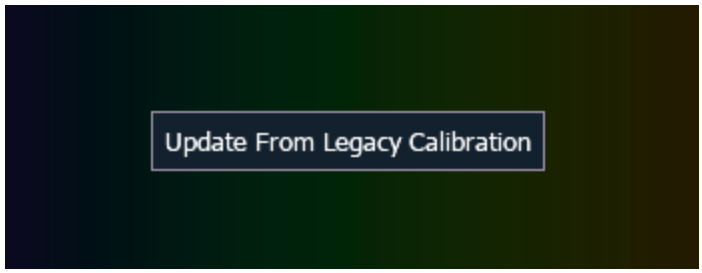
There are a variety of ways to measure a fixture's color information with tools in the field. The fixture profile can then be updated with the gathered configuration data.

Default

If a fixture profile has none of the above types of color configuration data, Eos will create an auto-generated configuration based on the fixture's color parameters.

Legacy Color Calibration

If a pre-v3.2.0 show file with additive color RGB and RGBA fixtures is opened, Eos will automatically simplify the color calculations being used for those fixture profiles. This can greatly improve fixture performance and speed for use in pixel maps.



These fixture profiles can be updated via the color configuration editor to get the full set of color configuration tools.

CAUTION: ***Updating a fixture profile or library will update all legacy calibration.***

Creating Multicell Fixtures

Multicell fixtures can be created by using the fixture editor. You can either create a new fixture, or copy an existing fixture to edit.

To create a new fixture, press **{New}**. A new fixture will be added to the fixture list.

Naming a New Fixture

Once the new fixture appears in the list, it is recommended that you name the fixture you are about to create.

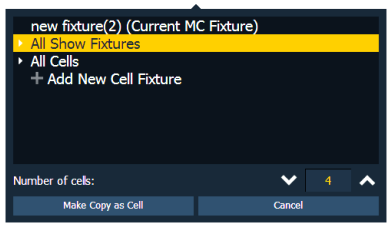
To name a fixture in the creator list:

1. Use the **[Page]** keys, mouse, or touchscreen to select the new fixture.
2. Press **[Label]** or tap on the new fixture. You can press **[Label]** twice to clear the name. The virtual keyboard will open in the CIA.
3. Enter the desired name for the new fixture on the virtual (or attached alphanumeric) keyboard.
4. Press **[Enter]**. The name will appear in the "Type" column of the fixture list.

Create Multicell

1. With the new fixture selected, press **{Create Multicell}**.

2. Press **{+}** to add cells. This will open a fixture list display. Only fixtures added to your fixture list will be here.



3. Select a fixture, a cell profile from an existing multicell fixture, or create a new cell profile by selecting **+ Add New Cell Profile**.
4. Select the number of cells.
5. Press **{Ok}** . When selecting a fixture, you will need to select **{Make Copy as Cell}** or **{Convert to Cell}**.
   - **{Make Copy as Cell}** - makes a copy of the existing fixture profile and patches the copy as a cell. This will break any references to the original profile.
   - **{Convert to Cell}** - converts to the fixture into a cell. This option will not be available for any library fixture or fixture currently patched in the show file.
6. Make any changes needed to cell numbers, DMX offset, or mastered cells. These settings can be edited later by selecting the **{Edit Multicell}** button. See *Editing Multicell Fixtures* .
7. Press **{Save Fixture}** to save your changes or **{Cancel Edit}** to remove the changes and exit.

Note: *If you need to delete a cell profile that has been accidently selected, select the cell and set the number of cells to 0.*

You can now add or edit parameters as needed. See *Editing Multicell Fixtures* .

Editing Fixtures

You can view and edit existing fixtures in the Fixture Editor. Edited fixtures will display with an "*" beside their name.

With the fixture selected, you can change the name by pressing **[Label]** or tapping on the fixture. You can press **[Label]** twice to clear the name. The virtual keyboard will open in the CIA. The fixture's name as it is in the library will still display by the new name.

Note: *Using **[Update Profile]** will remove any edits made to existing fixtures. Fixtures that have been copied will retain any edits. See Copying a Fixture*

Physical Data Editor

The Physical Data Editor provides options for editing Augment3d-related fixture information. The following options are available:

- Fixture Model
- Hang to Focus Offset X
- Hang to Focus Offset Y
- Hang to Focus Offset Z

Fixture Model allows the selection of the model displayed in Augment3d when the fixture has position data. Selecting "No model" will tell Eos to use the default fixture model closest to the fixture type. Practical light emitting objects (like desk lamps) can be found in the Practicals manufacturer.

Hang to Focus Offset is the XYZ offset from the center of the base to where the fixture will pan / tilt. It is used when converting between a desired XYZ beam end, and pan / tilt values.

Copying a Fixture

It is possible to copy an existing fixture and edit its parameters. In the fixture editor, there is a {Copy} button. Pressing {Copy} when a library fixture is selected will create a copy of that fixture and will assign it a new name.

Merging Custom Fixtures into a New Show File

Custom fixtures are saved with your show file and not in the fixture library. If you want to use custom fixtures in a different show file, you will need to use the advanced merge function while in the new show file. See *Partial Patch Merging*.

Importing Custom Fixtures

You can import custom fixtures from the browser. See *Importing Show Data*

Chapter 6

Setup

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About Setup

To access Setup, select **[Displays]**, then **{Setup}**, or navigate to **Setup** via the browser. Apex and Element Classic console users can also use the dedicated **[System]** and **[Setup]** hardkeys.

The CIA will repaint to display the following setup sections and their subsections:

- *Setup > System*
- *Setup > User*
- *Setup > Device*

Selecting a subsection will display any associated settings fields. To change the setting for any of these fields, press the field in the CIA to activate it. If the field requires data, enter it from the keypad, pop-up, or dropdown menu. If the field is a toggle state, one press of the button will switch the field to its other state.

Additional settings not found in Setup may be found in the *Eos Configuration Utility (ECU)*.

Setup > System

This section provides settings for the entire system. Changes to these settings are system-wide and will impact all connected consoles and clients connected to the system.

System

Num of Channels

You may use this field to set the number of channels in your console to the number of channels in your system. Eos supports a maximum of 99,999 channels. The default is 5,000. Only 32,768 channels can exist in the patch, but they can be distributed throughout the entire 99,999 channel count. Enter the number of channels for your system using the keypad. This entry must be confirmed with the **[Enter]** key.

Note: *Every part in a multipart channel will count as an additional channel for the channel count total.*

Element Classic consoles are limited to either 250 or 500 total channels, which can be numbered up to 10,000.

Dim. Dbl. Offset

This allows you to set the address offset for dimmer doubling. The default for this is 20000, to match the Net3 standard offset, including Sensor dimming software. For dimmer doubling over Local DMX, this value should be set to 256.

{Create Virtual HSB}

Allows you to disable creation of virtual hue and saturation parameters. Disabled by default.

When Virtual HSB controls are disabled, the hue and saturation columns will not display in Table view. You will not be able to record just the Hue or Saturation values into a cue, submaster, preset, or palette, and you cannot apply an effect to Hue and Saturation. You will still be able to control Hue and Saturation from the encoders, ML Controls, Color Picker, and the command line.

{Display Colors In D65}

Displays colors of gels and current light output on the encoder display, color picker, pixel map, and magic sheet link to channel color using a D65 white point. Enabled by default.

Disabling this option switches Eos back to using a D50 white point, as in software versions prior to v3.0.0.

{Zones}

Enables or disables *Augment3d Zones*. Enabled by default.

Home Preset

Allows you to specify a preset that will be used as the home level for all non-intensity parameters in the preset, instead of the fixture library defaults. This preset will be applied for all "Go to Cue Out" and home commands. Channels not included in the assigned home preset will continue to home to their library defaults.

Preheat Preset

Allows you to specify an intensity preset that will be used as the preheat level for all channels assigned to use "Preset" as a preheat value in Patch. See *Patch > Attributes*.

Metric / Imperial

Specifies the units used for distance measurements. Choose between Meters, Feet, or Feet/Inches. Defaults to Metric.

System Startup Macro

This field allows you to set up a startup macro that will trigger after the console initialization has completed.

System Shutdown Macro

This field allows you to set up a shutdown macro that will trigger at power off.

Note: *The system shutdown macro does not trigger when the primary console exits to the welcome screen (shell).*

Disconnect Macro

Note: *Not available on Element Classic.*

This field allows you to set up a disconnect macro that will trigger when the primary disconnects from its backup, or when a backup disconnects from the primary.

Session

Backup Auto Take Control

When enabled, if the *Primary* is not seen on the network for a few seconds, the *Backup* takes over control of the system. Disabled by default and in all new show files.

{Use Higher Priority (sACN)}

When this setting is disabled (default), if a Backup takes over control from a device it was assigned to (either manually or automatically), it will continue outputting the sACN its paired device was outputting, at the same sACN priority level. When enabled, upon taking control the Backup will increment the priority of each universe by 1 and output at that level, instead.

{Hold Last Look}

When this setting is disabled (default), if an *Expansion Processor (EEP)* loses connection with the *Host*, it will stop outputting and wait for a Host to rejoin the session.

When enabled, the EEP will continue to output its last known playback state, including dynamic playback of effects and media, for the amount of time specified below.

Hold Last Look Timeout

If **{Hold Last Look}** is enabled, choose one of the available values determine how long the EEP should continue to output. If the time expires without a Host rejoining the session, the EEP will stop outputting and wait for a Host to rejoin the session.

{FDX2000 Feedback}

Enables or disables FDX2000 reception. Disabled by default.

Broadcast Mode

Choose between Directed or Limited broadcast. Defaults to Directed.

FDX2000 Subnet

Assign a particular subnet for FDX2000 transmission.

Cue Settings

{Auto-Mark}

Note: *This option is not available on Element 2 and Element Classic.*

Enables or disables AutoMark. Disabled by default. See *AutoMark*.

Mark Time

This field allows you to set the time that mark instructions will use, and is disabled by default. When disabled, mark instructions will use cue timing unless overridden with discrete timing.

When you enter a mark time in setup, all NPs that mark (either via referenced marking or AutoMark) will use this time. The only way to override the mark time in Setup is to use discrete timing.

Select **{Mark Time}[Enter]** to clear the field and disable the default mark time.

See *Mark*.

Preheat Time

If this option is disabled, the cue's up intensity time will be used when preheating. The default setting is "Disabled".

Cue Default Times

This area allows you to set the default cue times for the parameter categories of your system. To change a time, touch the parameter category button in the CIA and enter the desired time on the keypad. To set a time for all categories at once, select the first category and press **[Thru]**. Pressing **[At]** selects manual times.

The categories for which you may set default times are:

- Intensity Up
- Intensity Down
- Color
- Focus
- Beam

System > Show Control

This section allows you to adjust settings for MIDI show control, timecode (MIDI or SMPTE), analog, and serial functions. See *About Eos Family Show Control*.

SMPTE

{SMPTE Timecode Rx}

Allows your console to receive SMPTE timecode. Disabling this setting will disable all timecode lists that have a SMPTE source. Enabled by default.

Resync Frames

Allows you to configure how many frames between 1 and 30 need to be synced before timecode starts running. Defaults to 2 frames.

MIDI

{MSC Receive}

Toggles whether the console can receive MIDI Show Control from an external source. Disabled by default.

{MSC Transmit}

Allows the console to send MSC messages for actions taken on the console, such as cue actions, macros firing, and submaster bumps. Disabled by default.

MSC Rx Device ID

Configures the MIDI channel for the console to receive MIDI Show Control information. Only MSC data with the same device ID will be received. A device ID can be from 0-126. MSC commands can be sent to ID 127, which is the All Call device ID. While Eos cannot be set to ID 127, it will respond to commands sent to the All Call device ID.

- MSC Rx Device ID [5] [0] [Enter]

MSC Tx Device ID

Choose the devices through which the console will send MIDI data. When set, the console will transmit MIDI data to any Net3 Show Control or Response MIDI gateway that has a matching "ACN MIDI Tx ID." The console will send the MIDI data over an ACN connection to the gateways.

- MIDI Tx Source ID [2][5] [Enter]

MIDI Cue List

Specifies the cue list that the console will use to send MSC data. If left blank and MSC Tx is enabled, all cue lists will generate MSC events. Otherwise, only the particular list (or lists) selected will fire MSC events. Multiple cue lists can be selecting using **[Thru]** and **[+]**.

MIDI Rx Source ID

Choose the devices from which the console will receive MSC. When set, the console will respond to MSC data from any Net3 Show Control or Response MIDI gateway that has a matching "ACN MSC Rx ID." Gateways will send the MIDI data over an ACN connection. The

setting needs to match or at least contain the MSC Rx ID of built-in MIDI ports to enable them.

- MSC Rx Source ID [2] [5] [Enter]
- MSC Rx Source ID [1] [Thru] [1][0] [Enter]

MIDI Tx Source ID

Allows you to choose the device which the console will send MSC to.

{Network List Receive}

Enables or disables whether the console can receive incoming MIDI, UDP, and OSC. Enabled by default.

{MIDI Timecode Rx}

Enables or disables whether the console can receive MIDI timecode. Enabled by default.

{MIDI Raw Send}

Enables or disables whether the console can send raw MIDI strings. Enabled by default.

{MIDI Ignore Active Sensing}

Enables or disables whether Eos ignores incoming active sense MIDI. Active sense messages (hex 0xFE) may be sent by MIDI-capable musical instruments to indicate they are still active in the system. Eos cannot respond to these messages, but will include them in logs if not ignored. Enabled by default.

{MIDI Ignore Beat Clock}

Enables or disables whether Eos ignores incoming beat clock MIDI. Beat clock messages (hex 0xF8) may be sent by MIDI-capable musical instruments to synchronize tempo between devices. Eos cannot respond to these messages, but will include them in logs if not ignored. Enabled by default.

OSC

ETC recommends using 8000 and 8001 respectively for port numbers. Remember that when setting port numbers on your external device that they should be set to the opposite of what Eos is set. For example, if {OSC UDP TX Port} on Eos is set to 8000, then the RX (incoming) port on your external device needs to be set to 8000, and vice versa.

<PORTS SNIPPET>

{OSC RX}

Globally enables receiving OSC, excluding third party OSC connections. Enabled by default.

{OSC TX}

Globally enables transmitting OSC, excluding third party OSC connections. Enabled by default.

OSC TCP Mode

Choose between Packet Length (v1.0) and SLIP (v1.1).

OSC UDP RX Port

Specifies the UDP port that the console will listen to for OSC receiving strings. Multiple ports can be assigned. A space needs to be used to separate the addresses.

OSC UDP TX Port

Sets the UDP destination port to which the console will send OSC strings. Up to 16 ports can be assigned at once. A space, comma, or semicolon should be used to separate the addresses.

OSC Cue Receive String

OSC Cue Receive string you to specify a different incoming OSC string format for integration with other applications, using the following wildcards:

- **%1** - cue number.
- **%2** - cue list number.

For example:

- **/go/%1** - when Eos receives an OSC string matching (ex. /go/32.5), it fires the matching cue number (Cue 1/32.5)
- **/go/%2/%1** - when Eos receives /go/2/18.2, it fires Cue List 2 Cue 18.2

This setting can be overridden on specified cue lists using **Cue Triggers >** *{OSC Cue Recv String}*.

OSC Cue Send String

OSC Cue Send String allows you to specify a different outgoing OSC string format than the standard Eos implicit string for integration with other applications. The following wildcard options can be used:

- **%1** - cue number
- **%2** - cue list number
- **%3** - cue whole number
- **%4** - cue point number
- **%5** - cue label

This setting can be overridden on specified cue lists using *Cue Triggers*> {OSC Cue Send String}.

OSC TCP Server Ports

Allows you to specify custom port numbers for multiple OSC TCP connections. Multiple ports can be entered, separated by a comma or a plus.

OSC UDP TX IP Address

Sets the destination IP address or addresses to which the console will send OSC strings. Multiple ports and IP addresses can be entered, separated by either a space, comma, or semicolon.

Be careful when using a network with a DHCP server. If your external device reboots or is issued a new IP address from a DHCP server, it will no longer receive OSC strings from Eos until you change this setting to match your new IP address at your external device.

OSC TCP Clients

Sets one or more destination IP addresses and ports for which the console will act as a TCP client. The IP and port should be separated by a colon. Multiple clients can be entered, separated by either a space, comma, or semicolon.

UDP Strings

{String RX}

Enables or disables receiving strings on all Serial RX formats. Enabled by default.

{String TX}

Enables or disables sending strings on all serial TX formats. Enabled by default.

{String MSC TX}

When enabled, this setting will cause the console to send serial strings when certain actions happen at the console. See *Sending From User Events*.

String RX Source IDs

Choose the Net3 I/O or Response Serial gateways through which the console will receive serial strings. When set, the console will receive serial from any Net3 I/O or Response Serial gateway that has a matching "ACN Serial Group ID." The gateway will send serial data over an ACN connection to the console. This only affects serial traffic from gateways and not network UDP messages, ACN strings, or OSC. Source IDs can be from 1-32. Multiple group IDs can be selected by using **[Thru]** and **[+]**.

String TX Source IDs

Choose the Net3 I/O or Response Serial gateways through which the console will transmit serial string data. When set, the console will transmit serial to any Net3 I/O or Response Serial gateway that has a matching "ACN Serial Group ID." The console will send the serial data over an ACN connection to the gateways. This only affects serial traffic to gateways and not network UDP messages, ACN strings, or OSC. Serial Group IDs can be from 1-32. Multiple group IDs can be selected by using **[Thru]** and **[+]**.

String RX Source Name

Allows the user to specify a comma separated list of names for receiving strings (from Paradigm, for example).

String TX Source Name

Allows the user to specify a list of specific comma-separated names of devices to send strings to (for use with Paradigm, for example).

String RX Port

Specifies the UDP port that the console will listen to for receiving strings.

String TX Port

Setting for the UDP destination port that the console will send strings to.

String TX IP Address

Sets the destination IP address that the console will send UDP strings to. Multiple IP addresses can be entered, separated by either a space, comma, or semicolon. Port numbers can also be appended to IP addresses with a colon to send UDP strings specifically to that port (10.101.2.99:8001, for example).

A combination of UDP and ACN devices is not supported. See *String Commands*.

Contacts

{Analog Inputs}

This is a master setting for receiving analog inputs from a Net3 I/O or Response Analog I/O Gateway, or the built-in I/O port when available. When disabled, it will no longer trigger any analog input actions on any event lists. Enabled by default.

{Relay Outputs}

This is a master setting for triggering external relays from a Net3 I/O or Response Analog I/O Gateway, or the built-in I/O port when available. When disabled, it will no longer affect any external relays normally triggered from the console via cues, submasters, or macros. Enabled by default.

Mobile Apps

{Allow App Connections}

Allows Net3 RFR, aRFR, iRFR, SpaceBuilder, and third-party OSC applications to connect to Eos. Enabled by default.

{Visible to Mobile Apps}

Allows your console to be automatically detected by WiFi mobile RFR applications. If disabled, you will need to manually configure a connection to your console. Enabled by default.

Note: *The application will identify the consoles by their name and IP address, so it is useful to know the device names and addresses to ensure that you are connecting to the right one.*

Partitions

This display provides partition controls and an overview of any recorded partitions, including the four default partitions.

{Partitioned Control}

Enables or disables partitioned control system-wide. Defaults to disabled.

User Settings

When partitioned control is enabled, the partition assigned to the current user ID is displayed here. Select the field to change the assigned partition.

Partition List

Four default partitions are included:

- Partition 0 - no channels and no fader control. This is the default for all users when partitioned control is enabled for the first time on a show. To gain control, you must select a different partition.
- Partition 901 - all channels. Allows the user access to all channels.
- Partition 902 - single parameter channels. Allows the user access to only channels with a single parameter.
- Partition 903 - multiple parameter channels. Allows the user access to only channels with multiple parameters.

To select a partition in the list, enter it in the command line.

- {Partition} [9][0][2] [Enter]

If partitioned control is enabled, this will now be your assigned partition.

Any recorded partitions will also appear here. See *Using Partitions*.

Processors

This display provides configuration options for *Eos Expansion Processing* device profiles.

Devices that are able to act as an *Expansion Processor (EEP)* can be added to a multi-console session from this screen and assigned output universes. Expansion Processor device profiles can also be created directly and assigned to a hardware device later.

{Expansion Processing}

Enables or disables Eos Expansion Processing. Disabled by default.

{Exceed 75k Output}

Allows Apex hardware to output up to 153,600 addresses (300 universes) from a single multi-console session. All Eos Family devices have distinct *Expansion Processing Session Capacities*.

Default Processor for New Universes

Indicates which processor or device will be assigned new output universes added to the show file.

Select the box to choose a default from the dropdown list of available processors and devices.

Processor Selection

Available online devices will appear in the dropdown menu.

- {Add Processor} - adds the processor selected in the dropdown menu to the show file.
- {Auto Assign Universes} - automatically distributes output universes between available processor profiles.

Once processors are added, a device profile is saved within your show file.

Processor profiles can also be created first by typing an unused profile number, then [Enter]. Profiles may be assigned to different hardware from the *Expansion Processing User Interface* via {Setup} > *{Device}* > Bind to Device Profile.

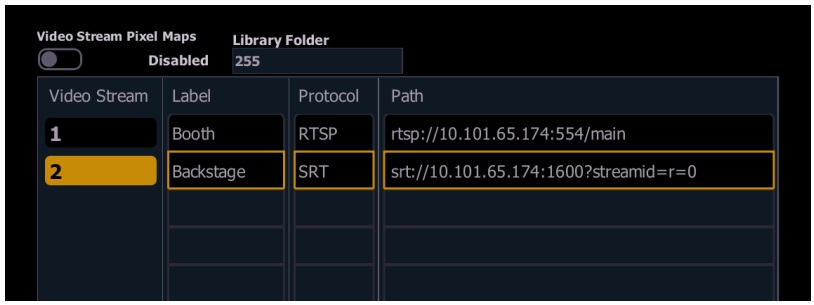
Processor List

A list of all Expansion Processor profiles in the show file. The following information is available for each item in the list:

- Processor - the processor number or device role.
- Label - the processor or device *[Label]*.
- Status - the current *Console Status*.
- Name - the hardware device name, if applicable. Select the field to choose from the list of available online devices.
- IP - the *Internet Protocol (IP)* address of the processor or device.
- Outputs Added - the number of outputs the processor contributes to the session.
- Params - the number of parameters assigned to the processor or device.
- Universes - the number of universes assigned to the processor or device.
- Output Universes - the universes in use by the processor or device.

Video Streams

This display allows you to configure video stream sources for use in Eos.



Streaming Video Specifications

Eos can receive and display the following formats of streaming network video:

- *Secure Reliable Transport (SRT)*
- *Real-Time Streaming Protocol (RTSP)*

Sources must use the H.264 codec.

Displaying Streams

Eos can connect to any number of separate video sources.

Total simultaneous video stream input is typically determined the *Source Stream Limits* of the devices providing network video, and, to a lesser extent, the processing power and bandwidth of your system.

Lowering the quality of video stream displays may help free up system resources and improve speed or responsiveness.

Eos can display video streams in the following ways:

- One or more instances of the *Video Stream [Tab 41]* display can be opened at once.
- *Video Stream* objects can be added to *Magic Sheets*.
- Videos can be used as *Augment3d Materials*.
- Videos can be overlaid on Augment3d using the *Camera Tool*.
- Videos can be used as *Pixel Map Media*.

Video streams must be added and configured via Setup > System > *Video Streams* before they can be viewed elsewhere in Eos.

Active streams will be indicated in the header at the top of the display.

Source Stream Limits

CAUTION: ***Streaming video sources are limited in the number of streams they can transmit simultaneously. Exceeding these limits can cause your system to not work as expected or desired. Consult the documentation of any third-party sources to determine the limits for your devices.***

The limits of your video sources may impact how streams can be viewed in Eos. For example, a source that only supports a single stream at a time could not be displayed on a Magic Sheet and in Augment3d at the same time.

In *Multi-Console Sessions*, each device in the session displaying video from a source counts as an individual stream, which can easily exceed the source's stream limit, especially in larger sessions or sessions utilizing pixel mapping.

Some source devices may activate a protection mode if their stream limit is exceeded and stop transmitting entirely.

{Video Stream Pixel Maps}

Enables **Video Stream** display access to videos that are already accessible for use as *Pixel Map Media*.

Specify the number of the source **Library Folder** of media in the field to the right.

Stream List

A list of all streaming video sources in the show file. Add new streams by typing the desired stream number, then **[Enter]**.

The following information is available for each item in the list:

- **Video Stream** - the stream number.
- **Label** - the stream *[Label]*.
- **Protocol** - whether the stream is using the SRT or RTSP protocol. This field only displays information and cannot be used to change protocols.
- **{Path}** - the network address of the streaming video source. Select anywhere in the field to open the keyboard and enter text.

Stream Address Formats

The **{Path}** must be formatted specifically based on the source type and protocol, typically containing the following elements:

- **Protocol** - RTSP addresses start with an **rtsp://** prefix. SRT addresses begin with an **srt://** prefix.
- **IP Address** - the *Internet Protocol (IP)* address of the network camera source.
- **Port** - the appropriate port for the protocol used. RTSP defaults to port 554. There is no default port for SRT.
- **Video Path** - this will vary depending on the camera and protocol used.

For example, **rtsp://10.101.65.174:554/main** or **srt://10.101.65.174:1600?streamid=r=0**.

Cameras and Other Sources

Consult the documentation of any third-party streaming video sources for detailed specifications on enabling RTSP or SRT output and formatting addresses.

RigPOV Cameras

RigPOV is a streaming video camera that can optionally be attached to ETC High End Systems moving lights.

RigPOV cameras default to port 1600 for SRT. Addresses must follow this format:

- **srt://##.###.##.###:###?streamid=r=0**

For example, a camera with an IP of 10.101.65.174 would use **srt://10.101.65.174:1600?streamid=r=0** as the address.

Set the **r** value to **1** to receive a lower-bandwidth stream.

Users

In this display, you can set the *User ID* for the console under **User ID** by entering a number from the keypad.

The table displays all current users IDs and their online status. Selecting a user number allows you to select the user, or set them as the current user. Augment3d can be enabled or disabled per user. Name fields can also be edited from this screen. Users can be added, copied, and deleted with the softkeys on the right.

When multiple programmers are working on the system, *Partitions* can be used to restrict a specific user's access to certain channels. This can help avoid overlapping control of channels by multiple programmers at once.

Recall User Settings

When multiple users are in a system, this option allows you to select a user from which to recall the following settings:

- Manual Time
- Sneak Time
- Go to Cue Time
- Back Time
- Assert Time
- Timing Disable Time
- Off Time
- Release Time
- Record Confirm
- Delete Confirm
- Cue Only
- Auto Playback
- Plus %
- Minus %
- Level
- Update Defaults (all)
- Partition
- Highlight
- Lowlight
- Highlight Remdim
- Live Remdim Level
- Preserve Blind
- Encoder Degrees Per Rev
- Encoder Percent Per Rev
- *{Preserve Native}*
- Gel Match Type (Color Picker setting)
- Gel Swatch Type (Color Picker setting)
- Pop-up Magic Sheet
- Pop-up Nav Lock

Setup > User

This section provides settings for a specific user. Changing these settings does not impact other users on the network.

Record Defaults

Track

Switch between *Tracking vs. Cue Only* modes. Defaults to tracking mode.

{Record Confirm}

Enable or disable the confirm action when storing over a previously recorded target. Enabled by default.

{Delete Confirm}

Enable or disable the required confirmation before any delete command is executed. Enabled by default.

{Auto Playback}

When enabled, this feature automatically plays back cues and submasters as they are stored and releases manual control. For submasters to automatically play back, the slider must be at full. When auto playback is disabled, all manual levels are maintained and cues must be loaded and executed on playbacks. Enabled by default.

{Record Effects In Presets}

Enables or disables whether running effects are recorded into presets. Disabled by default.

Update Mode

This field allows you to select a default update mode (see *Update Dialogue Box*). The default is "Make Absolute".

{Break Nested}

This setting allows you to enable/ disable the update modifier break nested. Enabled by default.

{Update Last Ref}

Enable or disable the update modifier update last ref. Enabled by default.

{Intensity Cue Only}

Enable or disable intensity cue only. When enabled, intensity updates will be cue only, regardless of the tracking mode of the desk. Non-intensity parameter updates will continue to follow tracking vs cue only. Defaults to disabled.

Emergency Mark

Note: *This option is not available on Element 2 and Element Classic.*

Can be used to automatically set a mark flag if you had not previously done so. If using Earliest and no cue with a mark flag has already been set, Emergency Mark will set a mark flag.

Emergency Mark can be set to either Earliest or Latest. Latest is the default setting.

- If set to Earliest, Emergency Mark will set the mark flag on the earliest cue after the cue which fades the intensity out for the selected channel.
- If set to Latest, Emergency Mark will not set a mark flag. It will instead create a broken mark, which will display an x in the previous cue in the Playback Status Display.

Manual Timing

Manual Timing

In this section you may change the default times for manual changes to occur in live. Times can be set for each parameter category (Intensity Up, Intensity Down, Focus, Color, and Beam). You may use the **[Thru]** key to enter a value for all categories.

- **{Int Up} [Thru] [9] [Enter]**

The default for each of these is 0 seconds.

Default Times

In this section you may change the default times for sneak commands and the respective feature response times based upon parameter category. The default for these is 5 seconds, except for back time, which uses a default of 1 second. You can assign separate timing values to the Release and Off functions.

You can assign **[Cue]** as a timing value for the **{Go to Cue Time}** and **{Back Time}** The syntax, **{Go to Cue Time} [Cue] [Enter]** or **{BackTime} [Cue] [Enter]** will assign cue as the timing value.

When **[Go To Cue] [n] [Enter]** or **[Back]** is used, the fade will happen in the time set in the destination cue.

You can assign a separate time value for **[Timing Disable]**. When a fader has been set to timing disable mode, cues will use the time set in Setup. The default time is 0.

Manual Control

Encoders

This section allows you to define how much a parameter changes when an encoder is rotated one full revolution.

Note: *Hold down **[Shift]** while moving the encoder for fine control. Releasing the **[Shift]** key will restore the encoder to its default mode.*

Percent Per Rev

How much any associated parameters (excluding pan and tilt) change in one full revolution of an encoder. Measured in a percentage of the parameter's entire range. Defaults to 35.

Degrees Per Rev

How much the pan and tilt parameters change in one full revolution of an encoder. Measured in degrees. Defaults to 30.

Mini Percent Per Rev

Note: *This option is only applicable to Eos Apex consoles.*

How much any associated parameters change in one full revolution of a mini encoder. Defaults to 35.

Scroll Percent Per Rev

Note: *This option is only applicable to Eos Apex consoles.*

How much any associated parameters change in one full revolution of an endless fader wheel. Defaults to 125.

Button Values

This section allows you to specify the values for certain buttons or settings used in manual control. The following settings are available:

- **Level** - sets the value for the **[Level]** key. Any value between 0-100 may be entered. Defaults to 80.
- **Plus%** - sets the level for the **[+%]** key, which will increase the selected channel by the set percentage. You can assign +% to values that have up to five digits. Defaults to 10%.
- **Minus%** - sets the level for the **[-%]** key, which will decrease the selected channel by the set percentage. You can assign -% to values that have up to five digits. Defaults to 10%.
- **{Live RemDim Level}** - enables or disables RemDim. Disabling RemDim causes **[Rem Dim]** to return an error when used in Live. Enabled by default.
- **Live RemDim Level** - allows you to set the level for all remainder dim commands in live. Defaults to 0. An intensity level or a preset can be assigned in this field.

Highlight

This section allows you to specify highlight preferences. The following settings are available:

- **Highlight Preset** - the preset that will be used for any highlight commands.
- **Lowlight Preset** - the preset that will be used for any lowlight commands.
- **Highlight Rem Dim** - enables a remainder dim when in highlight mode, thereby temporarily dimming any channel not participating in the High/Low. An intensity level or a preset can be assigned in this field. Channels not in highlight or lowlight that are not included in the preset are not affected.

Encoder Map

This section allows you to specify a mapping from your *Encoder Maps [Tab 40]* to be used as the default for all
fixtures. If left blank, any fixture types without a custom map assigned will use the default Eos encoder mapping.

User > Displays

{Preserve Blind Cue}

This enables the console to display the last selected cue in blind when you return to blind. Disabled by default.

{Blind Next/Last Affects Target}

When enabled, in Blind the Next and Last commands will always apply to channels, if a channel selection is on the command line. Disabled by default.

{Popup Magic Sheet}

Assigns a magic sheet (see *About Magic Sheets*) that can be accessed via the *Quick Access Pop-Up Tools* tools.

{Popup Nav Lock}

Enables or disables the zoom and scroll navigation for your *{Popup Magic Sheet}*. Enabled by default.

{Augment3d Display Behavior}

The following Augment3d display behaviors are available:

- Normal Display - the display will behave the same as other display tabs.
    - A locked tab will not be skipped.
    - A single click or tap on the tab will draw focus to that tab.
- Channel Display - this mode uses the following rules:
    - When focus is drawn to the playback status display, an Augment3d channel display will be brought to the front.
    - [Shift] & [Live] will cycle through Augment3d channel displays alongside Live channel displays.
    - Pressing [Live] or bringing a Live tab into focus will restore your last focused Augment3d channel display.
    - Augment3d channel displays in the locked frame will not be skipped when using the [Tab] key to cycle through tabs.
- Control - the display will behave the same way *Control Tabs* do.
    - Locked tabs will be skipped.
    - A single click or tap will not draw focus.
    - A double click or tap will draw focus to the tab.

These settings are also available in the *Augment3d Tab Configuration* menu.

{Display Fader Ribbon}

Element 2 and Element Classic only. Enables or disables the ribbon display showing the status of the faders. When disabled, the fader ribbon will not display. Enabled by default.

{Display Help Prompts}

Element 2 and Element Classic only. Enables or disables the context-sensitive *Key Help* display in the CIA. Enabled by default.

Setup > Device

This section provides settings for the specific device being used. Changing these settings does not impact other controllers on the network.

Config

Device Name

Note: *Changes to this setting will require a restart. A warning message indicating a needed restart will display.*

This specifies the name the console will use to identify itself on the network to other devices (for example, "Booth Primary" or "Rack Backup"). This setting is also available in ECU > *Settings > General*.

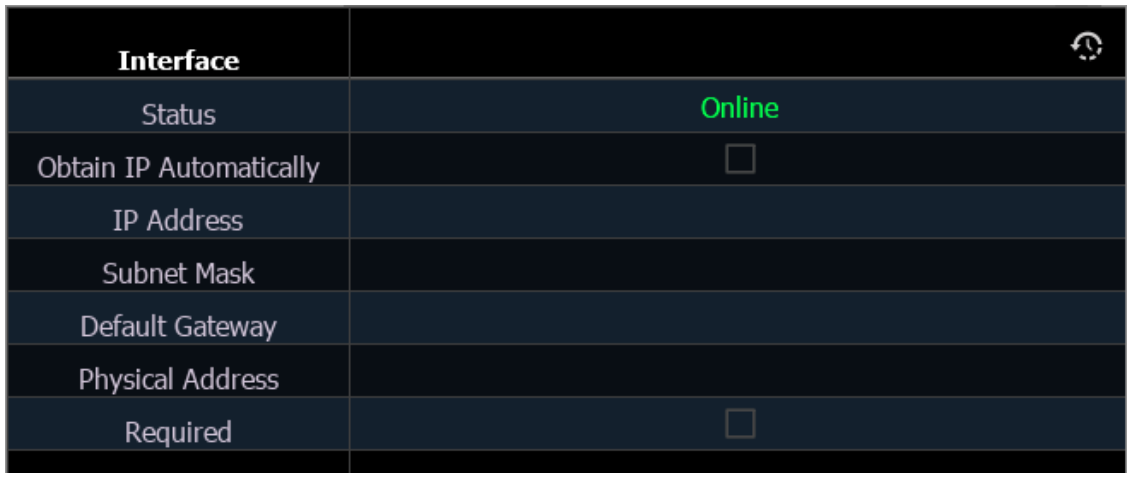
{Multiconsole Power On} and {Multiconsole Power Off}

Note: *Not available on ETCnomad.*

These settings reflect the *Remote Startup and Shutdown* options in *Eos Configuration Utility (ECU)* > *Settings > Network* > *Device*.

Network

Note: *Additional network settings are available via Settings > Network in the ECU. Additional output protocol settings are available via Patch > Protocols.*



These are the settings that determine the method to get an IP address and / or the actual IP address information that Eos uses for network communication. On ETCnomad devices, these settings are determined by Windows or macOS and cannot be edited here.

Devices with more than one network interface card (NIC) should avoid connecting more than one port to the same network or subnet. Eos supports one network interface per physical network port. For more information, see *Eos Network Requirements*.

Status

A port is "online" in green if it is configured, connected to a network and operational. If any of those conditions is not true, it reports as “offline" in red.

IP Address

Allows you to assign a static IP address if **Obtain IP Automatically** is disabled. Select the field to open a pop-up allowing you to enter the address.

If **Obtain IP Automatically** is enabled, this field will display the IP address that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

For more information about IP addresses, see **Eos Network Overview > Network Protocols >** *Internet Protocol (IP)*.

Subnet Mask

Allows you to assign a static subnet mask if **Obtain IP Automatically** is disabled. The default subnet mask is 255.255.0.0.

If **Obtain IP Automatically** is enabled, this field will display the subnet mask that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

Default Gateway

Allows you to assign a static gateway IP address if **Obtain IP Automatically** is disabled.

Eos consoles controlling a Net2 system should use their IP address as the default gateway. All other consoles should default to 10.101.1.1.

If **Obtain IP Automatically** is enabled, this field will display the gateway IP address that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

Obtain IP Automatically

Note: *ETC recommends the use of a static IP address for compatibility with other ETC devices, though the needs of your particular installation may vary.*

When enabled, this allows the console to request an IP address from a DHCP server during startup. If one responds, it will use the assigned IP address.

If no DHCP server is available, the console will default to a self-generated link-local IP address in the range of 169.254.X.X. The IP address used by the console in this configuration may change dynamically as needed. A change should typically only occur when there are changes to the network configuration or to resolve an IP address conflict.

Enabling or disabling this setting will require you to reboot the console for the new setting to take affect.

Note: *You cannot set the console to receive an IP address via DHCP and act as a DHCP server at the same time. It can either send dynamic addresses or receive them, but not both at the same time.*

Physical Address

The physical address is the *Media Access Control (MAC) Address*, a unique identifier of a network port that cannot be modified.

Network Interface Delay (Required)

Note: *Not available on ETCnomad.*

When **{Required}** is enabled, the console will wait for the network connection to be fully initialized before launching the Eos application.

When enabled, a launching window will display on start-up. If a network connection is not made, you will have the option to **{Start Anyway}**, **{Start Offline}**, or to **{Cancel}**.

- **{Start Anyway}** - launches without a network interface. Only User 1 is displayed above the CIA.
- **{Start Offline}** - starts in offline mode.
- **{Cancel}** - remains in start-up without launching into the Eos application.

Output Protocols

Note: *Eos software v3.2.0 and later, Apex consoles, Windows 10 consoles, and ETCnomad devices do not support Net2 or AVAB UDP output protocols.*

CAUTION: ***Protocols must also be enabled in Patch > Protocols.***

sACN

Enables or disables output of the sACN protocol.

Art-Net

Enables or disables output of the Art-Net protocol.

Interface Protocols

FDX2000 Feedback

Allows your console to receive FDX2000 dimmer feedback over the network. Disabled by default.

Mobile Apps

Enables or disables the connection of WiFi mobile RFR applications to Eos. Enabled by default.

UDP Strings and OSC UDP

Allows the selected port to send and receive UDP and OSC strings. Enabled by default.

OSC TCP

Allows the selected port to send and receive OSC via TCP port 3032. Select the OSC TCP format. Defaults to OSC 1.0.

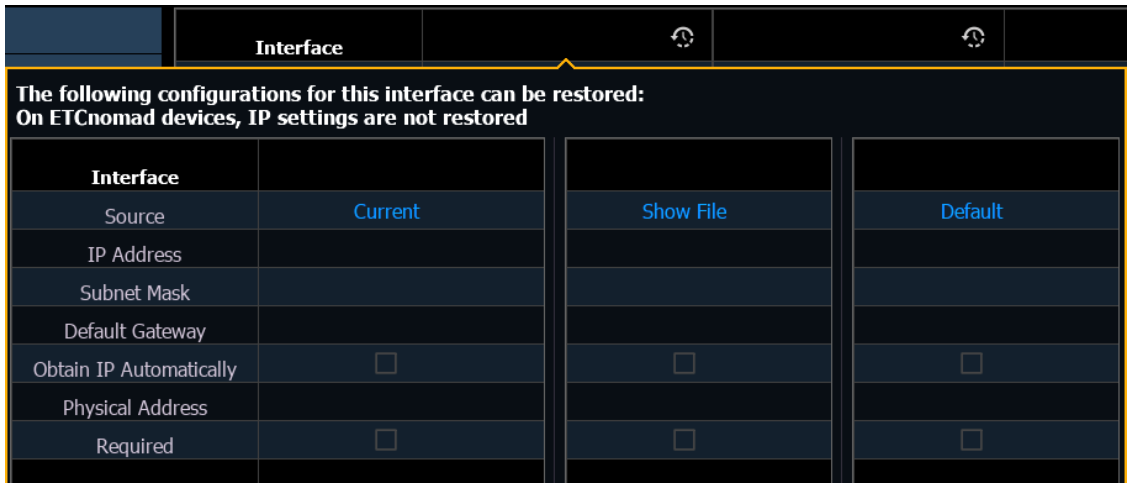
- OSC 1.0 (packet-length headers)
- OSC 1.1 (SLIP)

Check the documentation for the OSC device you wish to use over a TCP connection to see which mode it supports.

Third Party OSC

Enables or disables dedicated server port 3037 for use with third-party OSC applications. Enabled by default.

Restore Defaults



Selecting the title header of each port allows you to access a restore defaults overlay, displaying a comparison of the current settings, those saved in the show file, and the defaults, allowing you to choose which to keep.

Local Output

Note: *Changes to these settings may require a restart. When required, a warning message will display.*

The table displays all connected device names and their port, address, RDM, doubling, and speed information. The following settings can be edited by selecting a cell:

- Address - sets the starting address for the port.
- RDM - enables RDM on the port.
- Doubled - enables dimmer doubling on the port.
- Speed - choose a port speed from maximum, fast, medium, or slow. The speed may need to be adjusted for certain devices. Defaults to Maximum.

{Output In Client Mode}

When enabled, all client consoles will calculate and output DMX levels through their local DMX ports, including DMX ports provided by Gadget / Gadget II / Programming Wing. Defaults to disabled.

Dim. Dbl. Offset

See *Dim. Dbl. Offset*.

Device > Show Control

USB MIDI/SMPTE

The table displays all connected device names and whether they are receiving or transmitting. In the right two columns, this behavior can be toggled enabled or disabled, and the displayed timecode source ID can be edited.

{Local MIDI/SMPTE Rx}

Enables or disables the console's ability to locally receive MIDI or SMPTE. Enabled by default.

{Local MIDI Tx}

Enables or disables the console's ability to locally transmit MIDI. Enabled by default.

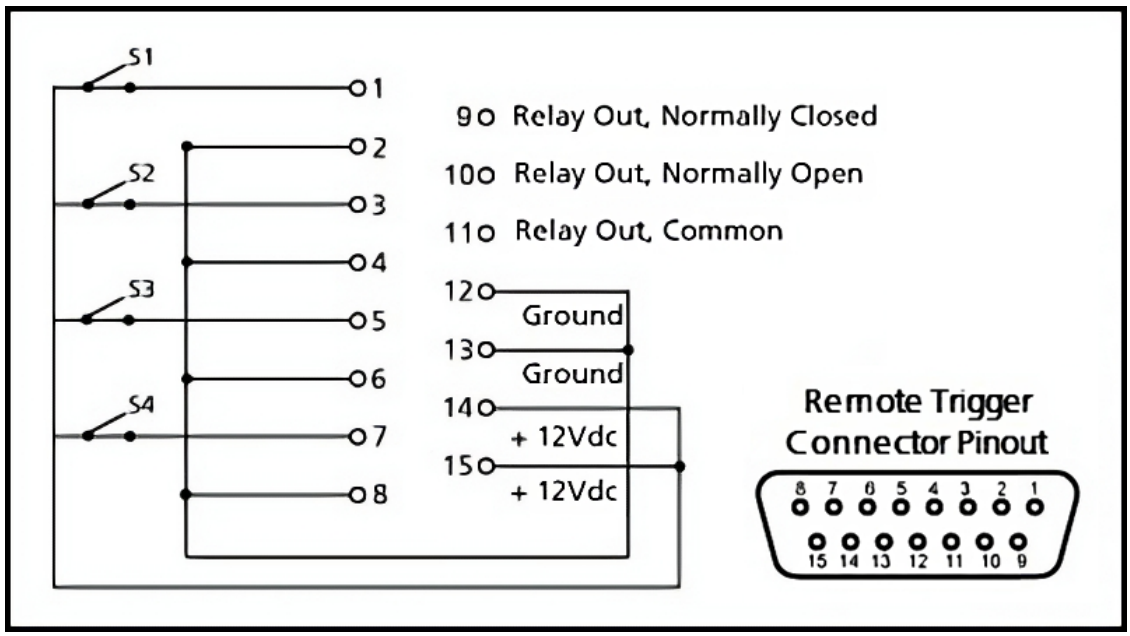
{USB MIDI/SMPTE}

Enables or disables local USB connection to supported MIDI or SMPTE devices. Disabled by default.

Note: *This setting must be enabled for virtual MIDI devices on ETCnomad.*

Contacts

Contact closures require DC voltage, which is supplied by the console on pins 14 and 15.



In Source Id

Specifies which analog input group ID the console should receive contact closures from.

In Address 1-4

Specifies up to four contact addresses within the analog input group to monitor for closures.

Relay Out Source Id

Specifies the source ID for the relay output.

Relay Out Address

Specifies the address for the relay output.

USB Serial

The table displays all connected device names and their baud rates, parity, and stop bits.

{Response Serial USB}

Enables or disables local USB connection to Response MIDI and SMPTE devices. Enabled by default.

OSC

Enables or disables use of OSC USB devices, such as Lighthack. Enabled by default. Disabled by default on macOS.

Face Panel

Input Devices

{Swap Pan/Tilt}

Trackball settings to swap the pan and tilt parameters. Defaults to disabled.

{Reverse Pan}

Reverses the range of the pan parameter. Defaults to disabled.

{Reverse Tilt}

Reverses the range of the tilt parameter. Defaults to disabled.

{Spacebar [Go]}

Allows you to enable the spacebar on an external keyboard as the hotkey for **[Go]**. Defaults to enabled.

{Use Shift as Eos Shift}

Allows the SHIFT key on an alphanumeric keyboard to be used as the console's **[Shift]** key. The Z key on an alphanumeric keyboard will function as the **[Shift]** key. Defaults to enabled.

{Protect Wheels in Blind}

Requires you to select a category to use with encoder wheels when you enter **Blind**. Enabled by default.

{Hide Mouse}

When enabled, if the mouse is left idle for 10 seconds, the cursor will go away. Once the mouse is used again, the cursor will return. Defaults to disabled.

Delay

Sets the auto repeat delay for keystroke input from an external device.

Speed

Sets the external device keystroke speed from an external device.

Sounds

Disabled by default. When enabled, allows you to adjust the volume level of the following system alert sounds:

- Error
- Advisory
- Click
- Cue Alert 5s Warning

All sounds default to 0.

Haptics

Note: *This option is only applicable to Eos Apex consoles.*

Allows you to enable or disable haptic feedback.

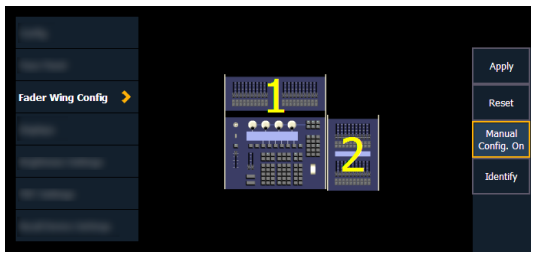
Fader Wing Layout

Note: *This option is not available on Element 2.*

This screen allows you to manually configure the positions of fader wings connected to your console. The console will default to configuring the wings on its own. To manually configure, you must click on the **{Manual Config. Off}** softkey.

Clicking on the **{Manual Config. Off}** button turns manual configuration on and displays the Fader Wing Configuration screen.

Clicking **{Identify}** will display numbers on each wing's display to aid in configuration. The numbers do not identify the wings as to their actual order. Order is determined from left to right. The left most wing will contain the first faders.



Click and drag the wings to match your physical layout. Click **{Apply}** to save the changes. Clicking **{Reset}** will restore to the last saved configuration. Clicking **{Manual Config. On}** will turn off manual configuration and will require a restart of the application before the console will automatically configure the wings.

Wing Paging Groups

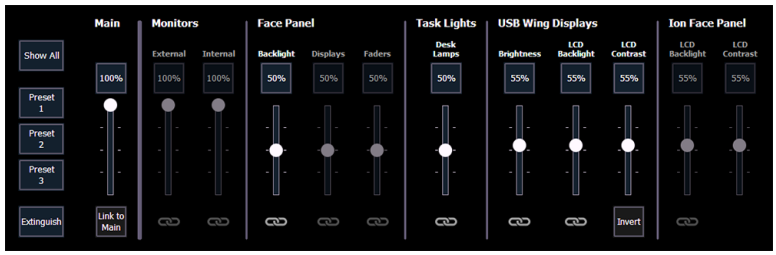
This screen allows you to organize both internal and external faders into wing paging groups. All configuration and navigation settings are applied to any fader wings or banks included in a group.

- **ID** - a unique identifier assigned to all connected internal and external faders, which appears on the fader bank displays while in this menu.
- **Type** - information about the connected fader wing or bank.
- **Group** - select in this column to edit the group number for a wing or bank.

Note: *Internal banks default to Group 1. External wings default to Group 2.*

When advancing fader pages by group, Group 1 is the default used with **[Fader Page]** or **[+]**. To control a specific group, you can use **[Fader Page] [Group]** and the paging group number.

Brightness Settings and Presets



This menu allows you to adjust the brightness and contrast settings for your console's face panel, as well as any internal monitors, supported external monitors, fader wings, and task lights. All sliders have a range from 0% (dimmest) to 100% (brightest). Up to three preset combinations of light levels can also be recorded.

At any time, holding **[Displays]** will display a pop-up of this menu on your console screen.

Main

The Main brightness slider can be used to set an overall limit to the brightness of any other linked brightness settings, and defaults to 100%. This slider can also be controlled by holding **[Displays]** and scrolling the level wheel.

Show All

Brightness sliders not pertinent to your console's hardware setup are disabled and grayed out by default. **{Show All}** enables control of all sliders, regardless of your console, allowing you to record presets for specific hardware.

Presets

Up to three brightness presets can be recorded, containing any combination of brightness levels from this menu. To record a preset, hold down the preset button you wish to overwrite until it displays **Hold to Record**. Continue holding until the preset button displays **Recorded**.

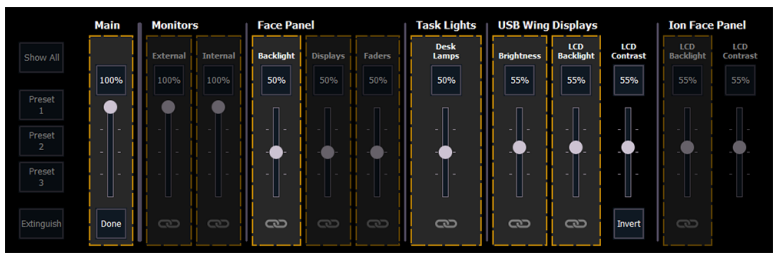
Presets are stored in the show file with the device configuration.

Extinguish

This button instantly sets all brightness settings to 0%, and darkens all console screens and buttons (excepting the power button). **[Displays]** pulses to indicate this mode is enabled. Click or tap onscreen, or press **[Displays]** to exit extinguish mode.

Link to Main

This option allows you to link any combination of sliders to the Main slider. Linked sliders display a link icon underneath. Unlinked sliders is display a slashed link icon.



When **{Link to Main}** is selected, any linked brightness sliders are outlined in yellow. Unlinked sliders are not outlined, and display a broken link icon underneath. Click the icon to toggle between linked and unlinked. LCD Contrast sliders cannot be linked.

{Control External Monitors}

Enables or disables control of external monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port.

Monitors

The Internal slider controls the brightness of any internal console monitors.

If Control External Monitors is enabled, the External slider will control the brightness of any connected external monitors that support Display Data Channel / Command Interface (DDC/CI) via Display Port.

Both sliders default to 100%.

Face Panel

These sliders control the brightness of your console's face panel backlit keys, and any built-in displays or faders. All default to 50%.

Task Lights

This slider controls the level of any task lights connected to your console, such as Littlites, and defaults to 50%.

USB Wing Displays

These sliders control the brightness, backlight level, and contrast of the displays of any connected USB fader wings. Selecting **{Invert}** will invert the LCD. All sliders default to 55%.

Note: *Additional sliders may appear to control brightness settings for any additional detected displays.*

Ion/Xe Display

These sliders control the backlight level and contrast of any internal Ion Xe and Ion Classic LCDs.

Apex Rackmount

These sliders control the display brightness and highlight level of any Apex rackmount devices.

Augment3d

The table displays the status of running Augment3d instances, and associated information. See *Running Augment3d*.

To select which instance of Augment3d the console uses, highlight the desired instance and click the **{Connect to Server}** button. To switch from a tethered computer back to the console, highlight the instance with address "Local" and select **{Connect to Server}**.

Device Enable A3D

Enables or disables Augment3d on the current device. Enabled by default.

Device > Displays

See *Live and Blind Tab Configuration* and *Playback Status Display Tab Configuration* for additional display settings.

{Show Ref Labels}

When enabled, referenced record targets (such as presets or palettes) with labels will have their labels displayed rather than their target type and number. Enabled by default.

{Show Reference Labels} is a global setting that will affect all displays. For some displays such as Live and Blind, **{Show Reference Labels}** can be enabled at the individual tab level by accessing the tab's configuration menu. This will override the setting in Setup.

Default Display Order

Determines the appearance of the *Workspace Layout Menu*.

{In-Cell Editing}

When disabled, cells in the Live/Blind and Playback Status Displays cannot be selected or edited. Enabled by default.

Options in the CIA are not affected by this setting.

{DirSel.Dbl Clk}

When enabled, double clicking a direct select button will act as **[Recall From] [Record Target]** to place the entire contents of that preset, palette, or step-based effect on stage. Disabled by default.

{Force Hide Encoder Ribbon}

Note: *This option is only available on ETCnomad.*

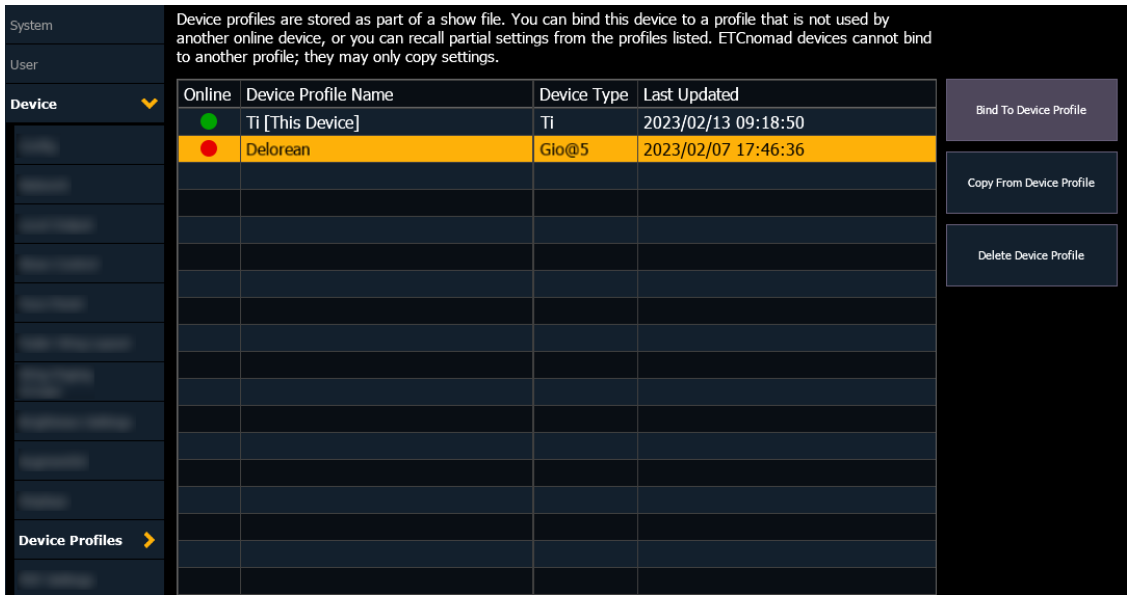
When enabled, forces the encoder ribbon to stay hidden. Disabled by default.

Record Target Color Brightness

Sets the brightness of record target colors. Defaults to 50%.

Device Profiles

The configuration settings of any device that has joined your Eos system are saved in your show file as device profiles. You can select a profile to overwrite your current device's settings entirely, or select partial settings from a profile to copy.



The table displays all device profiles saved in the show file, including the online status, name, and type of the associated device in the system.

Device profiles are updated automatically whenever the associated device syncs with the system. The date and time of the most recent update are also displayed in the table.

{Bind To Device Profile}

Binds your current device to the profile selected in the table. The associated device must be offline. This will overwrite your current configuration data, including network interface settings, device name, and local output settings, with that from the offline device's profile.

After binding your device to a profile, it must be restarted.

Note: *ETCnomad devices cannot be bound to another profile, and may only copy settings.*

{Copy From Device Profile}

Choose individual settings from the selected profile to copy to your current device. The following settings can be copied:

- **Network (Protocols)** - sACN and Art-Net settings for any Ethernet ports.
  - These settings can only be copied between like devices, and cannot be copied from ETCnomad to a console or vice versa.
- **Local Output (DMX)** - DMX and RDM settings for any DMX ports or Gadgets.
- **Show Control** - all settings from *Device > Show Control*.
- **Face Panel** - all settings from **Device >** *Face Panel*.
- **Fader Wing Layout*** - all settings from **Device >** *Fader Wing Layout*.
- **Brightness Settings (Presets)** - presets 1, 2, and 3 from **Device >** *Brightness Settings and Presets*. No current brightness levels will be modified.
- **Displays** - all settings from *Device > Displays*.
- **Saved Shell Settings*** - all settings not migrated from the shell (ECU). See *Eos Configuration Utility (ECU)*.
  - These settings can only be copied between like devices, and cannot be copied from ETCnomad to a console or vice versa.

Any settings marked with an asterisk (*) will require a restart to apply. Certain settings may be unavailable to copy while the device is online.

{Delete Device Profile}

Removes the selected profile from the show file. The associated device must be offline. If the device rejoins your system, its profile will reappear in the list.

Diagnostics [Tab 99]

This display shows diagnostic information about the console. Diagnostics can be opened via **Browser > Setup**, or via **[Tab] [9][9]**.

The diagnostics display is divided into the following areas:

Command Feed

All logged internal and external actions appear in the scrollable command feed at the top of the diagnostics display, with new logs at the top. The list can be searched by typing in the **Filter** box above the feed.

Diagnostic Information

Additional software, hardware, and network information is displayed in the live-updating fields below the command feed.

Device Health

The device health graph indicates the status of the console.

The live graph shows an ongoing 30-second window of the following health metrics:

- **DMX Output** - elapsed time since the last DMX output packet was sent in milliseconds (ms). Values above 24 for extended periods may result in dropped packets.
- **Fade Engine Tick** - elapsed time between fade engine ticks (refreshes) in milliseconds (ms).
- **Network Queue** - the number of queued commands from the multi-console *Host* waiting to be executed.
- **Packet Errors** - the number of packets received with ACN NAK errors. Higher values may indicate network issues.

The solid line indicates the peak observed value for a metric. The darker line indicates the average of all observed values.

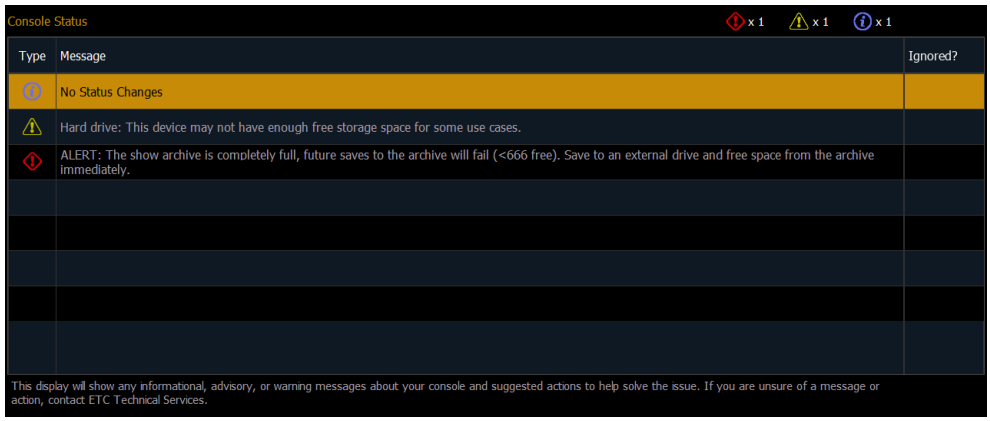
Diagnostic Controls 4

The following buttons are available on the right side of the display:

- **{Clear}** - clears the list of logged items.
- **{Network Info}** - adds current network information to the logs.
- **{Incoming OSC}** - toggles incoming OSC on or off. Off by default.
- **{Outgoing OSC}** - toggles outgoing OSC on or off. Off by default.
- **{Log UDP}** - toggles UDP logging on or off. On by default.
- **{Profiler}** - toggles profiler logging on or off. Off by default.
- **{Profiler Export}** - save profiler information to disk.

Console Status

This display shows informational, advisory, or warning messages about your device. **Console Status** can be opened via **Browser > Setup**, or through **About > Console Status**.



The **Type** column displays the category of the message:

Message Type	Icon	Description
Informational		Instructional data that does not impact console functionality.

Message Type	Icon	Description
Advisory		Console operation can continue, but with caution.
Warning		Urgent issues that require immediate attention.

The **Message** column displays the message details and any applicable suggested actions to help resolve the issue. The counter in the top-right displays the total quantity of each type of message. The column on the right indicates whether or not the message has been ignored.

Possible Status Messages

Hard Drives

- ALERT / Hard Drive / Show Archive
  - This device does not have enough available hard drive space to operate safely.
  - Minimum amount of free space recommended.
  - The show archive is completely full, future saves to the archive will fail.
  - Save to an external drive and free space from the archive as soon as possible.

Memory Problems

- Memory Fragmentation / System Memory
  - Largest Free Block is under a certain amount.
  - RAM usage is at or above a certain amount.
  - Application memory usage is at or above a certain amount, which is close to exhausting addressable memory space.

Chapter 7

Manual Control

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Selecting Channels

There are multiple ways to select channels including the control keypad, direct selects, and groups.

Selected channels are available for manual control through keypad commands, level wheel, and / or ML controls.

Channels are deselected when any action is taken on the keypad that is unrelated to manual control, such as recording groups and cues, or updating a record target, etc. You can also press **[Clear]** after a terminated command line to clear the channel selection.

When manual channels are used, there will be an advisory that says "Manual Channels" in red in the upper left hand corner of any Live display.

Selecting channels from the summary or table displays will start a new command line.

Selecting Channels From the Keypad

The keypad defaults to selecting channels. Channels may be selected on the control keypad using the **[+]** and / or **[-]** and **[Thru]** keys for consecutive or non-consecutive channel selection.

The following examples illustrate various methods of selecting channels from the control keypad:

- **[5] [Enter]** - selects channel 5.
- **[5] [+] [7] [Enter]** - selects non-consecutive channels 5 and 7.
- **[5] [Thru] [9] [Enter]**- selects channels 5 through 9.
- **[2] [Thru] [8] [-] [5] [Enter]** - selects a range of channels 2 through 8, except channel 5.
- **[-] [6] [Enter]** - removes channel 6 from the current selection list.
- **[+] [1] [Enter]** - adds channel 1 to the current list of channels.
- **[7] [Thru] [-]** - selects channel 7 and all subsequent consecutive channels of the same fixture type.

You may use **[+]** and / or **[-]** multiple times to add or remove multiple channels from the selection. **[Thru]** lists may be entered in ascending or descending order.

Note: *The **[Thru]** command uses the current flexichannel state. Channels not included in the flexichannel mode (except selected channels mode) are not collected in a thru range. **[Thru] [Thru]** can be used to collect all channels in the range, even if they are not in the current flexi mode. See Using Flexichannel.*

Using Groups

[Group] can also be used as a quick way to collect channels from various targets.

- **[Group] [Cue] [#] [Enter]** - selects all the channels in the specified cue.
- **[Group] [Sub] [#] [Enter]** - selects all the channels in the specified submaster.
- **[Group] [Int Palette] [#] [Enter]** - selects all the channels in the specified intensity palette.
- **[Group] [Effect] [#] [Enter]** - selects all the channels currently using the specified effect. Channels are selected in the order they were used or stored in the effect.

Modifying a Terminated Channel Selection

It is possible to add or remove channels from a previously terminated command line. You will need to first press **[+]** or **[-]** and then you can add to or remove from your current channel selection. This includes selecting channels from the direct selects, summary view, and Magic Sheets.

[Next] and [Last]

The **[Next]** and **[Last]** buttons increment and decrement channel selection. If only one channel is selected, **[Next]** increments the channel selection to the next sequential channel, while **[Last]** decrements the channel selection by one. For example, select channel 10 then change the selection to channel 11 using the **[Next]** key:

- **[1] [0] [Enter]** - channel 10 is selected with a gold outline around the entire channel and the channel number is indicated in white.
- **[Next]** - channel 11 is now selected with a gold outline and white channel number while channel 10 is no longer selected.

When a group of channels is selected, pressing **[Next]** or **[Last]** selects the first or last channel in the channel list. For example, channels 11 through 20 are selected:

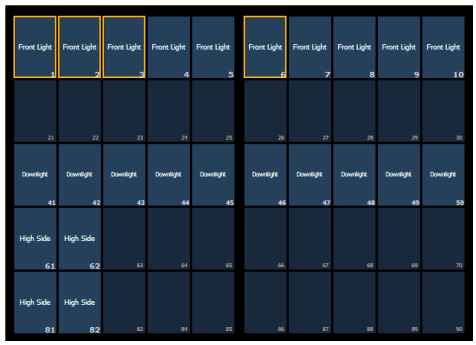
- **[Next]** - channels 11 through 20 are still the specified channel list but only channel 11 is selected for control. You can now sequentially press **[Next]** or **[Last]** to cycle through the list. Press **[Select Last]** to reselect the entire range.

[Next] and **[Last]** work with the current flexichannel state. See *Using Flexichannel*.

Selecting Channels From the Direct Selects

Direct selects provide one-touch selection of channels, groups, palettes, presets, effects and macros. You can configure an array of channels on direct select that display with paging buttons provided for easy scrolling. See *Direct Selects [Tab 4]*

Open a direct select display by selecting **{Direct Selects}** from the Home Screen and then select the **{Channels}** button. When channels are posted to the direct selects, you can select one simply by pressing the channel's button. The command line will show the appropriate channel and the selected direct select will be outlined in yellow.



Channel selection from the direct selects is an additive process. When a channel is selected, it is added to the current selection set. To select only one channel and deselect all others, double-press the channel button. For example, if channels **[1] [Thru] [5]** are selected from the keypad, pressing **{Channel 6}** from the direct selects adds channel 6 to the current channel selection. If channels **[1] [Thru] [5]** are selected from the keypad, pressing **{Channel 6} {Channel 6}** deselects channels 1 through 5 and selects channel 6.

The following examples illustrate the various methods of selecting channels using the direct selects:

- **{Channel 1}** - adds channel 1 to the currently selected channels, if not currently selected. This is similar to pressing **[+] [1] [Enter]** from the keypad. However, if channel 1 were currently selected when you pressed **{Channel 1}**, this would deselect channel 1 from the channel selection.
- **{Channel 5} {Channel 6}** - adds channels 5 and 6 to the current channel selection. This is similar to pressing **[+] [5 [+] [6] [Enter]** from the keypad.

- {Channel 5} {Channel 5} - selects channel 5 and deselects all other channels. This is similar to pressing [5] [Enter] on the keypad, when the previous instruction is terminated.

Deselecting Channels

Channels are deselected when any action is taken on the keypad that is unrelated to manual control, such as recording groups and cues, or updating a record target, etc. You can also press [Clear] after a terminated command line to clear the channel selection.

Note: *[Select Last] is a fast way to regain your last channel selection. See Select Last. Not available on Element Classic.*

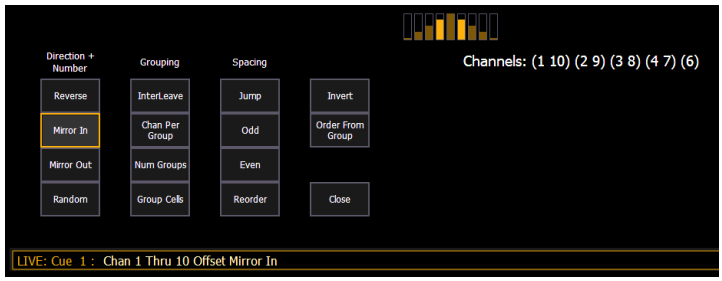
Any manual control action taken while record or update is on the command line will automatically reselect your last channel selection.

Offset

[Offset] (Apex consoles) or {Offset} (other Eos consoles) can be used to select a range of channels from a broader channel selection when storing groups, submasters, presets, palettes, effects, and using park.

Options

When [Offset] is pressed, a channel distribution display will open.



Use {Close} to exit the offset display.

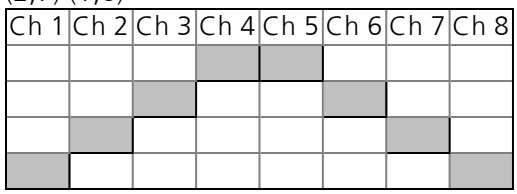
The following [Offset] extension options are available, and can be used individually or in combinations to create *Subgroups*.

Direction

- {Reverse} - creates a group with the channels in the reverse order that they were selected in.
- {Mirror In} - creates subgroups of channels that mirror inward.
  - [1] [Thru] [8] {Mirror In} [Enter] would create 4 subgroups in this order: (1,8) (2,7) (3,6) (4,5)

Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8
■							■
	■					■	
		■			■		
			■	■			

- {Mirror Out} - creates subgroups of channels that mirror outward.
  - [1] [Thru] [8] {Mirror Out} [Enter] would create 4 subgroups in this order: (4,5) (3,6) (2,7) (1,8)



- {Random} - randomizes the order of the selected channels.

Grouping

- {InterLeave} creates a number of distributed sets of channels, that are not clustered together.
  - [1] [Thru] [1][2]{Chan Per Group} [4] {InterLeave} [Enter] would create these 4 subgroups: (1,4,7,10) (2,5,8,11) (3,6,9,12).
  - [1] [Thru] [5] [+] [1][1] [Thru] [1][5] [+] [2][1] [Thru] [2][5] {Chan Per Group} [3] {InterLeave} [Enter] would create these 5 subgroups: (1,11,21) (2,12,22) (3,13,23) (4,14,24) (5,15,25).
- {Chan Per Group} creates a specified cluster of channels.
  - [1] [Thru] [1][2]{Chan Per Group} [3] [Enter] would create these 4 subgroups of 3 channels each: (1,2,3) (4,5,6) (7,8,9) (10,11,12).
- {Num Groups} creates a specified number of subgroups.
  - [1] [Thru] [1][2]{Num Groups} [3] [Enter] would create these 3 subgroups: (1,2,3,4) (5,6,7,8) (9,10,11,12).
- {Group Cells} creates subgroups of the cells from a group of *Multicell Fixtures*. Posts to the command line as Cells Only Group Cells.
  - For example, group 1 contains only multicell fixtures. [Group] [1] [Offset] {Group Cells} would select only the cells of each fixture in the group.

Spacing

- {Jump} is used to skip over a specified number of channels.
  - [1] [Thru] [1][2]{Chan Per Group} [3] {Jump} [1] [Enter] would create these 3 subgroups of 3 channels each: (1,2,3) (5,6,7) (9,10,11). Channels 4, 8, and 12 will be jumped over and will not be in the subgroups.
- {Odd} selects only the odd numbered channels.
- {Even} selects only the even numbered channels.
- {Reorder} is used to reorder the channels of a group into numeric order.

Using Offset

For the offset feature to function, you must first select multiple channels, then press [Offset]. Choose from the options described above to modify your channel selection.

- [1] [Thru] [10] [Offset] {Even} [Enter] - selects channels 2, 4, 6, 8, 10.
- [1] [Thru] [2] [0] [Offset] [3] [Enter] - from the selected group, this syntax would select channels 1, 4, 7, 10, 13, 16, 19 which is an offset of every third channel from the selection.
- {Group 5} [Offset] {Random} [Enter] - selects all channels in Group 5 and places them in random order. This selection may be used only temporarily or it may be recorded to a new Group.

- **[1] [Thru] [2] [0] [Offset] {Even} {Random} [Enter]** - selects all even channels within the range and puts them in random order.
- **{Group 3} [Offset] {Reorder} [Enter]** - reorders the channels in group 3 so they are in numeric order.
- **[Offset] [4] [Enter]** - selects every fourth channel in the current channel selection.
- **[1] [Thru] [2] [4] [Offset] [4] [/] [4] [Enter]** - selects channels 4, 8, 12, 16, 20, and 24. You can select to offset by 2/2, 4/4, 3/3 etc.
- **[Record] <Cue> [1] [Thru] [Thru] [1] [0] [0] [Offset] [10] [Enter]** - records cues with numbers between 1 and 100, offset by 10 (cue 1, 11, 21, 31... 91).

[Offset] can be used more than once to apply different offset commands to different channel selections on one command line.

- **[1] [Thru] [20] [Offset] [Even] [+] [60] [Thru] [80] [Offset] [3] [Enter]** - selects all even channels between 1 and 20, and all odd channels between 60 and 80.
- **[1] [Thru] [10] [Offset] [2] [+] [20] [Thru] [30] [Offset] [Jump] [1]** - channels 1-10 are offset by 2 (1,3,5,7,9) and 20-30 are jump 1 (20, 22, 24, 26, 28 ,30).

[Offset] can also be used to select steps and actions in an effect.

- **[Effect] [1] {Step} [1] [Thru] [20] [Offset] [Even]** - selects all even steps between 1 and 20 in stepbased effect 1.
- **[Effect] [2] {Action} [1] [Thru] [7] [Offset] [Odd]** - selects all odd actions between 1 and 7 in absolute effect 2.

Setting Intensity

Channel intensity may be manually entered from the keypad, set with an intensity palette (if programmed) or set with a level wheel. Pressing **[At]** after channel selection assumes an intensity value will be added to the selected channels. You may also use the **[Full]** button to bring the selected channels to their full intensity or you may use the **[Out]** button to fade the intensity out.

Use the **[Level]**, **[+%]**, and **[-%]** keys to affect the intensity value of selected channels. Each of these keys are set at a specific value established in the **Setup** (*Manual Control*).

- **[Level]** is set by default to 80%.
- **[+%]** and **[-%]** are each set by default value of 10 points.

The following examples illustrate the various methods of setting intensity:

- **[1] [+] [3] [At] [5] <0> [Enter]** - selects channels 1 and 3, and sets an intensity level of 50%.
- **[1] [Thru] [5] [-] [4] [Full] [Enter]** - selects a range of channels 1 through 5, except channel 4, and sets the intensity to full.
- **[1] [Thru] [8] [At] [+] [3] <0>[Enter]** - adds 30% to all intensities in the channel selection. If they were at 50, they will now be at 80. If channels 1, 3 and 5, were at 30 and 4 was at 50, they would be 60% and 80% intensity, respectively.
- **[5] [Thru] [8] [At] [/] [3] <0> [Enter]** - scales the intensities of the selected channels in the list down 30% of their current values.
- **[1] [Thru] [4] [At] [/] [1] [3] [0] [Enter]** - scales the intensities of the selected channels in the list up 30% of their current values. If channels 1 through 4 were at 40% intensity, this would scale them up by 30% to a value of 52.
- **[2] [+] [5]** [level wheel] - roll the wheel up for greater intensity or down for less intensity.
- **[1] [Level]** - selects channel 1 and sets it to the level as established in **Setup**.
- **[Group] [9] [Out]** - selects all channels in Group 9 and sets the intensity values for those channels to zero.
- **[1] [0] [At] [At]** - selects channel 10 and sets an intensity level as established in **Setup**.

- **[1] [Full] [Full]** - selects channel 1 and sets it to full and self terminates the command line.
- **[1] [At] [/] [/] [2][3][9] [Enter]** - puts channel 1 at DMX value 239.
- **[1] [Thru] [5] [Full] [Enter]** - the selected channels are highlighted in gold, with white channel text and red intensity values (indicating manual data). You may continue to modify channels 1 through 5 since they are still selected and displayed on the command line.
  - **[-%] [-%]** - reduces the intensity of channels 1 through 5 by 20%. This command is self-terminating.

On Element Classic, you will need to use **[Shift] & [-] [Shift] & [-]**.

You can continue manipulating the selected channels so long as the channels are selected and displayed on the command line.

Element 2 & Element Classic Channel Faders

One way to bring up channel levels with Element is using the channel faders. The fader position switch is used to select between channels 1 through 40, channels 41 through 80, or channels 81 through 120. Element will ship with the fader position switch in channels 1 through 40 mode.

With the fader position switch in channels 1 through 40 mode, channel 1 will be controlled by the leftmost fader in the first bank of faders. Channel 40 will be controlled by the rightmost fader in the second bank. When the fader position switch is in channels 41 through 80 mode, channel 41 will be controlled by the leftmost fader in the first bank of faders. Channel 80 will be controlled by the rightmost fader in the second bank.

Note: *If you have an Element Classic 60 console, the third bank of faders are always in submaster mode.*

Channel faders will only control the first 120 channels. Channels 121 and above must be controlled via the keypad. See Selecting Channels.

Raising a channel fader will bring up the corresponding channel's level. This will be reflected on Element's live display. The channel intensity level will appear in red to indicate the level is being set manually.

Element's fader status display will also show the channel's level. See *Element 2 & Element Classic Fader Status Display*.

Element's channel faders are LTP or Latest-Takes-Precedence, which means that you can take control of a channel simply by moving the fader to match the current output level. Channel faders, like the keypad and level wheel, can then take levels above or below the current playback level. See *HTP vs. LTP*.

Holding down **[Shift]** while moving the channel faders, will allow them to move without changing the channel levels. This is helpful when you have used your channel faders to record a cue. This allows you to restore your faders to zero, while leaving the cue values on stage. If you don't do this, the LTP behavior will drive the channels toward zero.

Manual Control of Non-Intensity Parameters

Non-intensity parameters (NPs) can be set with a variety of controls including the control keypad, buttons on the central information area (CIA), and encoders or ML Controls.

Using the Parameter Display

The parameter display in the CIA is populated with only those parameters that are found in the patched devices. As channels are selected, the parameter display will change to show only parameters relevant to the selected channels.

The parameters are divided into the following categories: Intensity, Focus, Color and Beam. Each parameter category is represented with buttons in the parameter tiles. These buttons allow you to select the entire collection of all parameters within that category. You can also select a single parameter from a category using that parameter's button in the parameter display.

Beam has three subcategories: **{Form}**, **{Image}**, and **{Shutter}**. These subcategories are represented with buttons in the CIA. Pressing these buttons allows you to select all parameters within those subcategories. On consoles with encoders, these subcategories correspond to the way the encoders are mapped.

Within the CIA, in the upper left corner, notice the **{All NPs}** button. When pressed, this collects all non-intensity parameters for further editing.

Some examples of using parameter buttons are:

- **[1] {Iris} [5] [Enter]** - Places the iris parameter of channel 1at 50%.
- **[Group] [4] {Zoom} {Edge} [Out] [Enter]** - Sends any zoom and edge values for all fixtures in group 4 to their home value.
- **[1] [Thru] [3] {All Speed} [At] [2][5][Enter]** - Sets all the available speed parameters for channels 1 through 3 to 25.

Setting Parameters with the Keypad

When the CIA is placed in parameter mode, all parameters of selected channels may be given numeric values through the keypad.

When no channels are selected, the CIA shows all of the parameters that are available in the lighting system. When channels are selected, the CIA condenses to show only the parameters that are appropriate to the selection set. If channels are selected that have different device types, such as spot and wash lights, the CIA will show all of the available parameters.

The following examples illustrate how to set parameter values with the keypad:

- **[5] {Iris} [5] {Zoom} [6] [5] {Edge} [5] [Enter]** - sets channel 5 to an iris value of 50%, a zoom value of 65%, and an edge value of 50%.

Note: *Pressing **[Shift] & [**Encoder Paging Key**]** will place the associated parameter onto the command line for numeric entry. Not available on Element Classic.*

Using **[At] [/] [/]** will place the direct DMX value on the command line. For example, **[1] [At] [/] [/] [2][3][9] [Enter]** would put channel 1 at DMX value 239.

You can also set a channel's parameter levels with the DMX value by using **[/][/]**.

- **[1] {Pan} [/][/] [2][5] [Enter]**

You can add or subtract from the DMX value by using **[+]** or **[-]**.

- **[1] {Pan} [/][/] [+] [5] [Enter]**
- **[1] {Pan} [/][/] [-] [7][5] [Enter]**

Adjusting Parameters Using [+] and [-]

[+] and **[-]** can be used to adjust parameters from the command line. When using **[-]**, you will need to preface the command with **[+]** if you want to remove from the current value. For example:

- [Channel list] **{Pan} [1][0]** - sets to 10 degrees.
- [Channel list] **{Pan} [+] [1][0]** - adds 10 degrees.
- [Channel list] **{Pan} [-] [1][0]** - sets to -10 degrees.
- [Channel list] **{Pan} [+] [-] [1][0]** - removes 10 degrees.

Setting Non-Intensity Parameters with the Encoders

Note: *On Eos Family consoles without physical encoders, virtual encoders can be accessed via the ML Controls [Tab 5] display.*

Encoders provide a quick method to adjust current values for non-intensity parameters. See *Encoders* .

- **Eos Apex and Eos Ti** - the bottom two encoders always control pan and tilt functions. The four vertical encoders are pageable using the encoder page buttons near the encoder LCD.
- **Gio, Gio @ 5, and Ion Xe** - the four horizontal encoders are pageable using the encoder page buttons directing under the encoders.
- **Ion Classic** - the four encoders are pageable using the six encoder page hardkeys to the upper right of the encoder LCD.

Form, Image, and Shutter are subcategories within the broader parameter category of Beam.

- **Custom** - includes intensity and intensity MSpeed.
- **Color** - includes all color mixing controls (CMY, RGB, HS), as well as scrollers, color wheels, and color effects.
- **Form**- includes parameters that affect the quality or size of the light output, such as edge, zoom, iris, frost, etc.
- **Image** - includes anything that drops into the gate, such as gobos, effects wheels, etc.
- **Shutter** - includes all of the framing devices for the luminaire.

Note: *Pressing **[Shift] & [**Encoder Page Key**]** will post that parameter to the command line. For example, pressing **[Shift] & [Color]** would place Color on the command line.*

Encoder Display

Note: *On Eos Family consoles without physical encoders, virtual encoders can be accessed via the ML Controls [Tab 5] display.*

On Eos Apex and Eos Ti consoles, the encoder display LCD to the left of the encoders indicates the parameters they control and provides additional information about the current status of those parameters. See *Eos Ti Encoder Display*.

On Gio, Gio @ 5, and Ion Xe consoles, the *Mini Encoder Display* indicates the parameters the encoders control and provides additional information about the current status of those parameters. To see additional encoder information, use the **[Encoder Display]** button to open the encoder display. See *Encoder Controls Display*.

On Ion Classic, the encoder LCD displays the active parameter category loaded on the encoders, as selected by the page buttons. To see additional encoder information, open the Encoder Display by using **CTRL + ALT + ** on an alphanumeric keyboard. **ALT + ,** can be used to change encoder pages.

Note: *For ETCnomad, RPU, and RVI, the encoder display can be accessed by using **CTRL + ALT + ** on an alphanumeric keyboard. **ALT + ,** can be used to change encoder pages.*

Encoder pages populate with parameters relevant to fixtures in the show patch. When you access a parameter page, controls that are not available for selected channels are suppressed.

Note: *Flexi encoders is used to suppress parameters not applicable to the selected channels. This is used by default for the encoder display. See Flexi Encoders.*

Each encoder has an associated control section that provides visual indication of:

- the parameter it controls.
- the current setting (value) of the parameter.
- and the current mode if the encoder controls more than one function.

Coarse/ Fine

Allows for control of "coarse" (8 bit) or "fine" (16 bit) control. Default is coarse control. You may toggle between the two by pressing **[Shift]** while moving the encoder.

- **Coarse** - provides larger changes for non-segmented parameters and advances/decrements full frames for segmented parameters. The encoder is clutched in this mode, meaning you will feel each frame change distinctly.
- **Fine** - provides unlimited, high granularity control. When used in this mode the encoder is not clutched, allowing you smooth and detailed control.

Encoder Paging

The number of encoder pages for each category will display.

- **Eos Apex and Eos Ti** - displayed in blue at the top of the LCD display.
- **Gio, Gio @ 5, and Ion Xe** - displayed at the bottom of the parameter category softkeys.
- **Ion Classic** - the number of pages for each category is displayed at the right of the LCD.

You can go directly to the page required by pressing the encoder page button and a page number. For example:

- **[Form] & [3]** - this will take you to the third page of the form category.

Information in the encoder display is only as accurate as the patch information for that channel. For example, when you are working with color scrollers, the standard manufacturer color frames will be displayed for scroller controls unless you have created a custom scroll for the selected channel in patch using the Scroll Editor.

When you have created a new scroll or wheel in patch for any channel and that channel is selected, that information will be displayed in the associated encoder display. See *Scroller and Wheel Picker and Editor*.

When you access a parameter page, the encoders will automatically load and display the first page that has a valid parameter for the selected channels.

Encoder Softkeys

A series of buttons are included in each of the four encoders sections of the display including **{Home}**, **{Last}**, and **{Next}** or **{Min}** and **{Max}**, and depending on the type of parameter, a **{Mode}**, **{Expand}**, or **{Calibrate}** button.

Note: *To access these softkeys at any time, press down on an encoder.*

Home

Each parameter has an associated **{Home}** key in the encoder LCD. This accesses any parameter and returns it to its default position. Additionally, the control keypad has a **[Home]** key located below **[Sneak]**. See *Home*.

Min and Max

{Min} and **{Max}** are displayed when the parameter is linear, such as a shutter. Use these keys to set a minimum and a maximum setting for a parameter.

Next and Last

{Next} and **{Last}** are displayed when the parameter is segmented such as a fixed gobo or color wheel or a color scroller. Use these keys to increment or decrement in full frames.

Mode

The **{Mode}** key is provided to select different modes for the encoder wheel such as rotate, index, or special effects.

- When more than two modes are available, the **{Mode}** key can be pressed repeatedly, advancing through the various modes. Each mode will display beneath the current parameter setting.
- When only two modes are available, the alternate mode is indicated instead of a **{Mode}** key. Toggling that button switches the encoder wheel to the alternate mode.

Expand

Some parameters will have an **{Expand}** button, which indicates that this parameter has "Expanded" functions. When that button is pressed, the display repaints to display all the media settings available for the specific wheel.

Flip

The **{Flip}** button, as displayed in the Pan/Tilt section of the encoder LCD, is used to flip the unit into its exact same position, but from the other direction. Depending on the current values of pan and tilt, there may be multiple flips.

This allows you to correctly focus a fixture that may be at the end of its pan or tilt range or to correct a fade that may be moving in an undesired direction.

- [Channel list] {Flip}

Trackball On/Off

The {Trackball On/Off}, as displayed in the Pan/Tilt section of the encoder LCD, is used to give pan and tilt functionality to a mouse or trackball device.When this function is turned on, above the CIA will be a message saying "Cursor as Pan/Tilt".

Left-clicking the mouse will exit trackball mode.

XYZ Format Enable / Disable

Toggles between storing position data in pan / tilt format and XYZ format for use with Augment3d.

Form Control

Note: *Not available on Element Classic.*

Form (a subcategory of Beam) collects the parameters that affect the quality of the beam, including the iris, edge, frost, etc. 'Shutter' and 'Image' are the other two subcategories of Beam

When the form encoder page button is selected, the LED will illuminate and the encoders automatically populate with the "Form" parameters as specified in the show patch. If there are more parameters in the show patch than will fit on the first page of the encoders, press the [Form] button again to page through the remaining parameters in the category or press [Form] and a page number to jump to a specific page.

The form parameters may include:

- Edge - controls the hard/soft qualities of a spot luminaire. While some fixtures may call this parameter "focus", it is always represented as "edge" in Eos, to avoid confusion with "Focus" which refers to pan and tilt data. These values are set to the system default value for the selected luminaire, but may be modified as required on a per fixture basis
- Iris, Zoom, Strobe and IMF- each parameter has in/out, narrow/wide, or fast/slow settings. Iris and Zoom also have programmable limits, called in/out and narrow/wide respectively. The strobe mode setting varies based on the fixture type.

Image Control

Image is the collection of parameters that affect the contents of the beam (gobo, prism, effects wheel, etc.).

Shutter Control

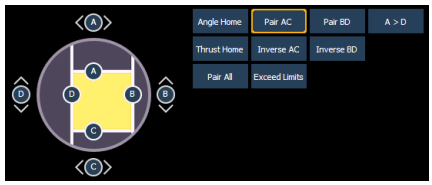
Pressing the [Shutter] button displays shutter controls, if there are any fixtures with framing devices patched.

Note: *For Ion, ETCnomad, RPU, and RVI, the encoder display can be accessed by using CTRL + ALT+ \ on an alphanumeric keyboard. ALT + ,can be used to change encoder pages.*

Shutter Graphic

Tap or click on the shutter graphic to open up the shutter controls window.

The shutter controls window allows you to move individual shutters by holding down one of the letters inside of the shutter graphic. To rotate the shutters, use the **<A>**, **<B>**, **<C>,** or **<D>** buttons around the outside of the shutter graphic.



Encoder Buttons

Note: *The encoder buttons are used with the encoders for shutter control. These buttons do not work with the shutter graphic control.*

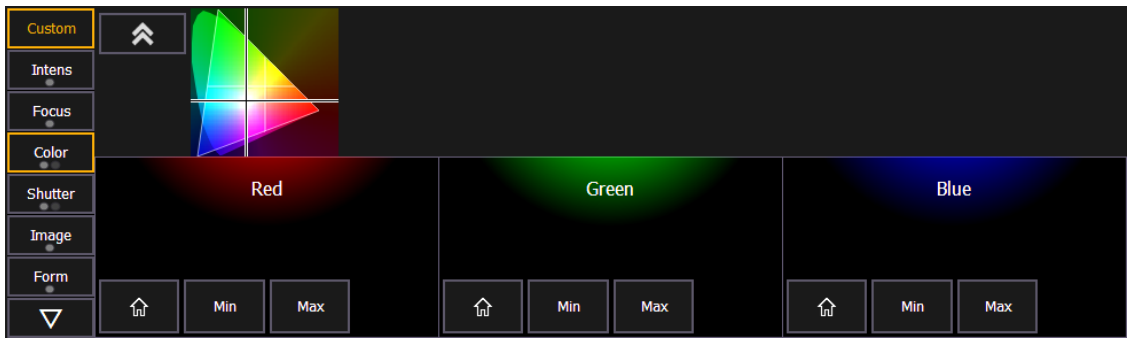
The following buttons are available for shutter control:

- **Angle Home** - sets the angle of all of the shutters to their home position.
- **Thrust Home** - sets the thrust (how far in or out of the beam the shutter travels) of all of the shutters to their home position.
- **Pair AC** - pairs the A and C shutters together so they move together.
- **Pair BD** - pairs the B and D shutters together so they move together.
- **Pair All** - pairs all of the shutters so they move together.
- **Inverse AC** - pairs the A and C shutters so they move in the opposite directions from each other.
- **Exceed Limits** - ignores the limits angle and thrust place on each other, prioritizing whichever parameter is adjusted, regardless of the impact on the other.
- **Inverse BD** - pairs the B and D shutters so they move in the opposite directions from each other.
- **A>D** - sets the encoders to use the custom encoder pages for the shutters. Thrust for all of the shutters is on one page, Angle for all is on another page.

Color Control

Depending upon the specific device, color can be established manually with the encoders using:

- CMY color-mixing
- Hue and saturation color mixing
- RGB color-mixing
- Selection from a color wheel or scroller
- CIE color picker tool



You may also specify color by using the full color picker on **[Tab] [2] [7]**. See *Color Picker [Tab 27]*.

It is also possible to set non-intensity parameter data with direct entry using the control keypad and using the parameters on the CIA.

- **[1] [At] [4] <0> {Cyan} [5] [5] [Enter]**

The first page of the color encoder will provide some scroller control, such as frame selection, on the top encoder. The next three encoders will control HS, CMY, or RGB color mixing. There will be buttons on the first page for switching between HS, CMY, and RGB. The HS controls will include buttons for **{Home}**, **{Min}**, and **{Max}**. The CMY and RGB controls include buttons for **{Home}** and **{Max}** for each of the parameters. No **{Min}** button will be displayed.

Note: *Color scroller data will display on the encoders and displays as frame numbers, F1, which would be frame 1, F2 for frame 2, etc. F1.5 is halfway between 1 and 2. F2+ will display if the frame is less than 2.5 and F2- if the frame is greater than 1.5. After the frame number, the gel number will also be displayed. This is also true for color and gobo wheels.*

Note: *Frame numbers can be used from the command line.* ***[2]{Scroller}[5] [Enter]*** *will send channel 2's scroller to frame 5. Frames can also be selected by using the DMX value for that frame. Pressing* ***[/]*** *twice will post DMX to the command line.* ***[3] {Scroller} [/][/][2][5][5] [Enter]*** *will send channel 3's scroller to the frame with the DMX value of 255.*

Note: *Dual scroller fixtures are addressed as 0-100% instead of by frame numbers. You may need to update your fixture before this feature will work. See Updating Fixture Profiles*

Custom Control

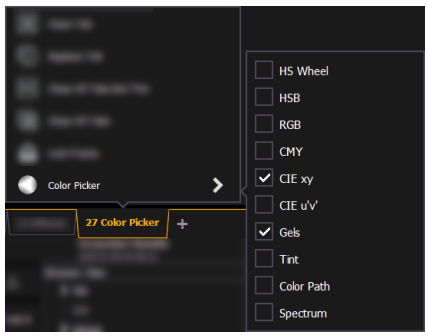
Pressing the **{Custom}** button enables *Encoder Maps [Tab 40]*.

Color Picker [Tab 27]

The color picker can be opened from the *Workspace Layout Menu* or by using **[Tab] [2][7]**.

Color Picker Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



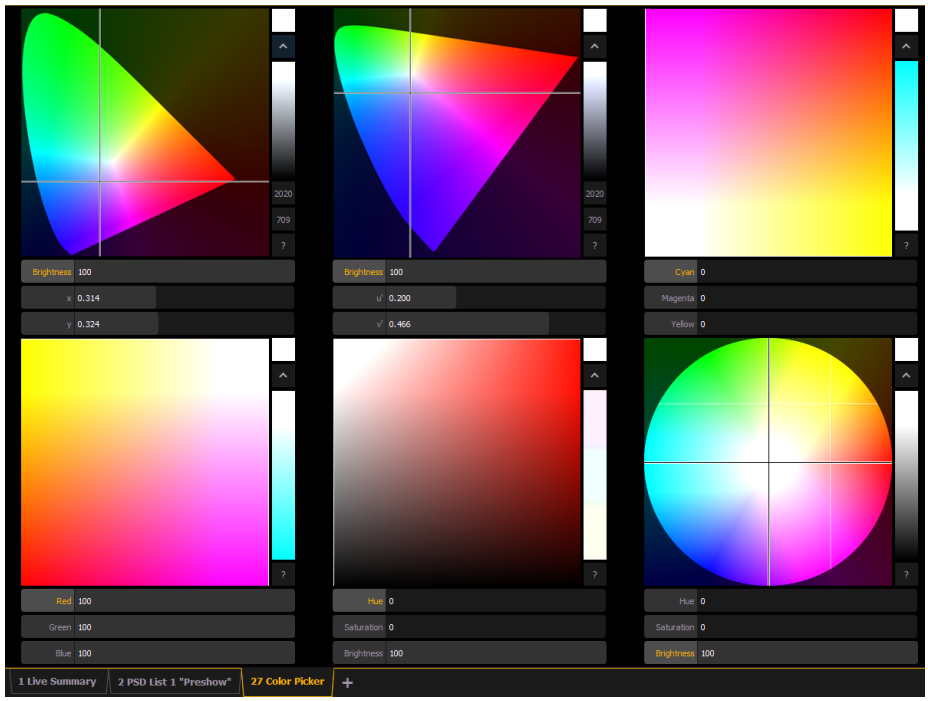
With the color picker open, you have the choice between six different *Color Spaces*, a *Gel Picker*, *Color Path [Tab 33]*, *Tinting Tools*, and *Spectrum Tools*.

Color Spaces

When the color picker is first opened, the CIE xy color space and the gel picker will open by default. You can select other color spaces and tools via the display configuration tool (the gear icon) in the bottom left corner of the tab bar, or by right-clicking on the tab.

Note: *Multiple color picker tabs with different color spaces can be opened at the same time. Multiple color spaces can be opened on the same tab.*

The available color spaces are:



Note: *When a fixture is in HS mode, the brightness control is not provided. Intensity controls the brightness.*

The cone in the CIE xy (CIE 1931) and CIE uv (CIE 1976) spaces represents the color spectrum that we can see.

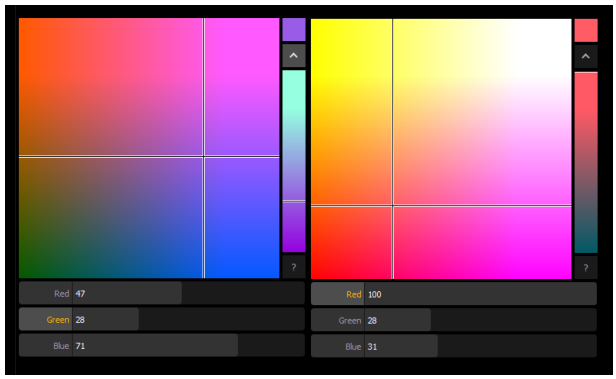
Color Space Controls

Each color space has three virtual encoders, a vertical encoder, a **{?}** button, and a **{^}** button.

The encoders will change based on the color space selected. Double tapping in a virtual encoder will cause it to jump to the location of your finger. Pressing and holding will cause the encoder to fade toward your finger.

Tapping anywhere in the color space will cause the crosshair to move to that location. Press and hold, then move your finger to fade the crosshair toward that location.

The **{^}** button will create the brightest version of the selected color. Press the **{?}** button to display labels on all of the controls.



For the RGB and CMY color spaces, you can change which color control is on the vertical encoder. Touch the label of the virtual encoder to change which color control is located on the vertical encoder. In the following graphics, Red is on the vertical encoder in the first one and green is on the vertical encoder in the second one. This is also indicated by the highlighted encoder name.

The vertical encoder in the HS Wheel and HSB color spaces always controls brightness.

CIE xy Control

CIE xy control is available via virtual parameters. "CIE X" and "CIE Y" can be put on the command line either via the associated parameter tiles or the **{x}** and **{y}** buttons in the CIE xy color space. This allows you to define specific values for x and y.

Note: *CIE x and y are measured from 0-1. If whole-number values are entered, they will be automatically translated to the relative decimal amount; for example, "43" would become "0.43."*

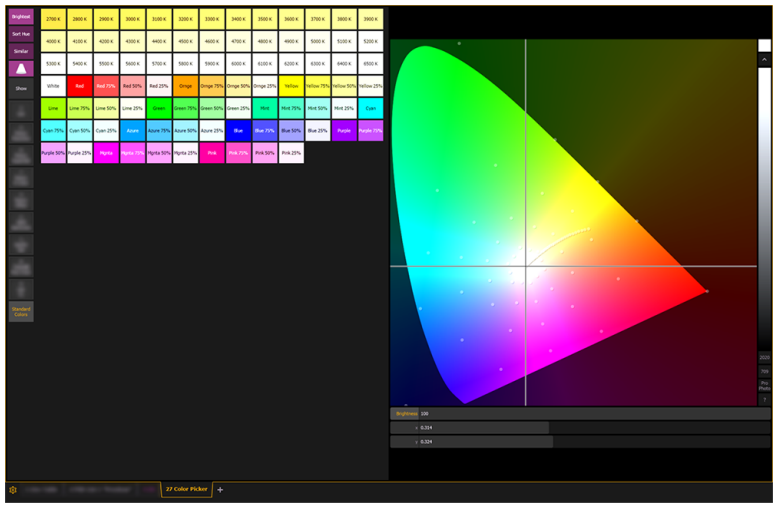
Automatic Color Control

Eos automatically creates a virtual control gamut for any additive color parameters contained in a fixture profile, including virtual hue and saturation (see **{Create Virtual HSB}** under **Setup > System >** *System*). This means a fixture with any emitter combination can be used with the controls available in the above color spaces; for example, two-color warm and cool white light fixtures.

Regardless which of the six color spaces you work in, Eos will translate the information to work with your fixtures.

Gel Picker

When the gel picker is opened up with a color space, dots will display on the color space. These dots represent the gels in the currently selected gel book. Hovering over a dot with a mouse will display the gel's name and a color swatch.



The following buttons are also available:

- **{Brightest}** - determines the color match used. This is helpful when working with fixtures that have more than three color components, such as RGBA, RGBWm or ETC's fixtures. Pressing **{Brightest}** or **[Shift] +**a gel from the picker will cycle through the three modes.
  - **{Brightest}** - matches to the brightest match of that chromaticity.
  - **{Spectral}** -matches to the best spectral match chromaticity. However, this mode can remove a lot of the intensity. This is based off of a 575w long life Source Four®.
  - **{Hybrid}** - halfway between the brightest and the best spectral match. In the channel display, a single dot shows best spectral match, 2 dots indicates hybrid, and no dot shows brightest.
- **{Sort Hue}** - takes the selected gel library and sorts it by hue instead of by gel number.
- **{Similar}** - will show gels that are in the same selected area of the color picker. Only gels in the same selected gel book will display. You can switch to another gel book though to discover gels in that area.
- **{Show Gels as Gel Against White Background}** displays the raw gel color as it would look against a white background. This option toggles with **{Show Gels as Gel + Lamp Output}**.
- **{Show Gels as Gel + Lamp Output}** displays the gel swatch color as if it was being used with a tungsten lamp.
- **{Show}** - displays all of the static gels in the show file. This populates from Patch.
- **{Standard Colors}** - shows a range of White Point from 2700K to 6500K. Also shown are colors located around the cone and variations of those colors at 25% increments.

How the Gel Picker Affects Scroller and Color Wheel

When possible the gel picker will select the closest gel as defined in a scroller or color wheel.

Note: *Some devices contain manufacturer specified gel mixes, and will only allow selection from the Gel Picker of the exact gels in their list.*

The channel display will show the frame number and the corresponding label that is defined for that frame.

Tinting Tools

The Tinting Tools option is found by right-clicking on the Color Picker tab (*Color Picker [Tab 27]*).

Tint allows you to easily adjust color regardless of the color space that you're working in.

You can increase or decrease the saturation and brightness. You can make a color warmer or cooler, and you can add or remove colors.

Color Path [Tab 33]

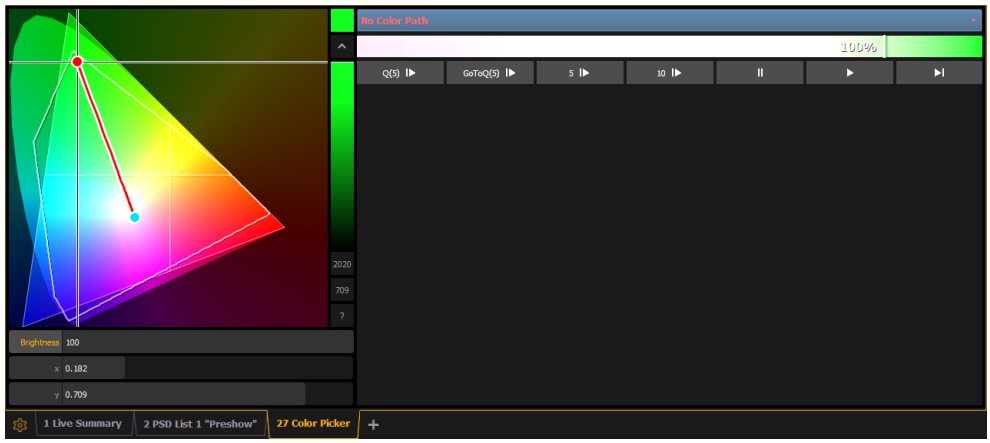
Color path is a option for controlling color fades between cues. By default, color fades happen in the native space of the fixture. If you want a fade that resembles a fade in a different color space, you can do that using color paths. There are eight preprogrammed color paths, and you can also record your own . Up to 1000 color paths are supported.

To open the color path display, click on the gear icon in the color picker display and select Fade. You can open the color path list display by pressing **[Path] [Path]** (if available), by pressing the **{Color Path}** icon in the home screen, use **[Tab] [3][3]**, or from the CIA by going to **Browser > Record Target List > Color Path**.

Color paths are selected either by clicking on the drop down above the color path or by using **[Path]** [n]. Ion Classic and Element Classic users will need to use **{Color Path}**.

Note: *Channels involved in the fade have to be selected before you can choose or modify a color path.*

The color path display has a drop down list of the available paths, a color path preview bar, and control buttons. An indication line will display on the color space to show the color fade.

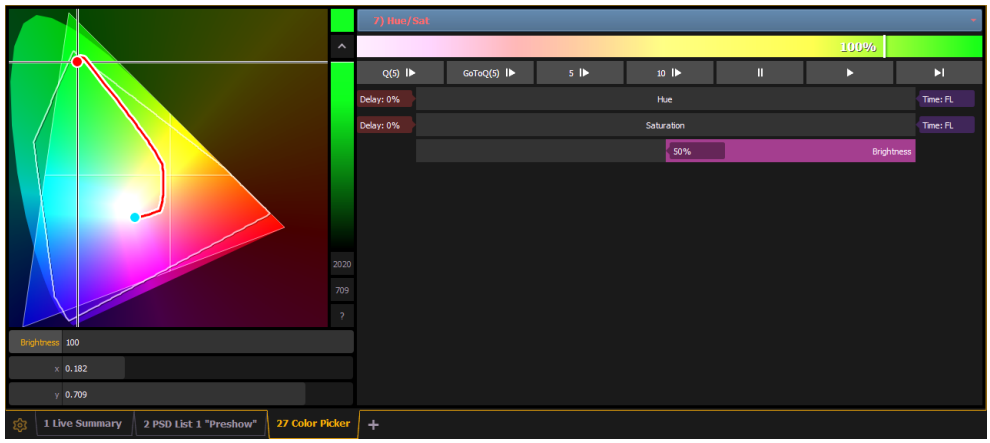


Available control buttons are:

- - replays the color fade using the cue time.
- - replays the color fade using the Go to Cue time from Setup.
- - replays the color fade in five seconds.
- - replays the color fade in ten seconds.
- - pauses the color fade.
- - plays / resumes the color fade.
- - skips to the end of the color fade.

You can also click on the color path preview bar to scrub to any point along the fade.

Additional controls may be available based on the color path selected. For example, Color Path 7 has additional controls for Hue, Saturation, and Brightness. You can move those controls to adjust the fade, and you'll see a representation of those changes in both the color path preview bar and in the color space.



Changes can be stored in the destination cue as absolute data by using **[Update]** or **[Record]**. When there's a change to the color path information, a red c will display next to the channel number and the color path's name will display in red in the color path display. When that data has been saved, a blue c will display. The color path's name will also display in blue in the color path display.

You can save changes to a new color path by using **[Record] [Path] [**n**]**. Ion Classic and Element Classic users will need to use **{Color Path}**.That data will then be referenced, and any changes made to that path will be used anytime that path is used. Press **[About] & [Path]** to see the values behind the referenced data.

Note: *If multiple channels are selected that have different color paths assigned to them, a **+** will display by the color path name in the color path preview bar.*

See *[About] Color Path* and *Patch > Attributes*.

Spectrum Tools

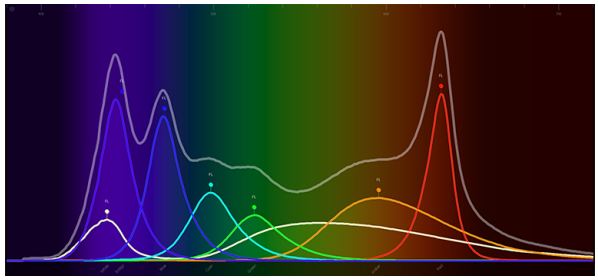
The Spectrum option is found by clicking on the display configuration tool (the gear icon) in the bottom left corner of the display tab bar.

This option displays all the color parameters across the color spectrum, and allows for individual control of each parameter. Press a color point to move it.

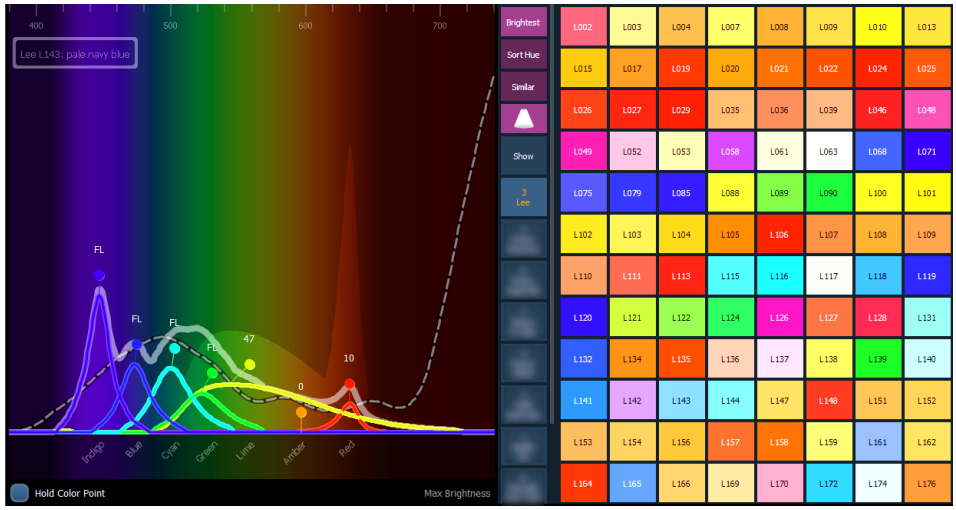
This display is a good visual of what the fixture is outputting.

The following screenshots show a 7 color fixture. This display will change based on the type of fixture being used.

Note: *The gray line shows the composite color of the fixture. If multiple fixtures are selected, the gray line represents the first channel selected.*



With the *Gel Picker* open and a gel selected, a dotted line will appear in the Spectrum display. That line represents the selected gel.



{Hold Color Point} allows you to adjust individual emitters and the other emitters will automatically adjust to hold the color selected. This can only be used with fixtures that have more than three color parameters.

If you are working outside of this display, holding down **[Color]** while adjusting the encoders will cause Hold Color Point behavior.

Fan

Note: *[Fan] is used in the examples below. Ion Classic and Element Classic users will need to use {Fan}.*

When **[Fan]** is pressed after a channel selection, the softkeys will repaint to the following fan styles:

- **{Center}** - The middle channel in the order is set as the start and will remain unchanged, and the first and last channels will change in different directions. The level wheel will decrease the lower number channels and increase the higher number channels.
- **{Reverse}** - The selected channel order is reversed before applying the fan.

- {Mirror Out} - The middle channel in the selected order is used as the starting channel and the first and last channels in the order are the end channels.
    - [1] [Thru] [1][0] [At] [1][0] [Thru] [3][0] [Fan] {Mirror Out} [Enter] - sets channel 1 to 30%, 2 to 20%, 3 to 10%, 4 to 20%, and 5 to 30%.
- {Repeat} - The number of channels that are fanned before the pattern is repeated.
    - [1] [Thru] [1][2] [At] [5][0] [Thru] [7][0] [Fan] {Repeat} [3] [Enter] - sets channels 1,4,7, and 10 at 50%, 2,5,8, and 11 at 60%, and 3,6,9, and 12 at 70%.
- {Cluster} - The channels are put into collections, which contains channels with all of the same value.
    - [1] [Thru] [1][2] [At] [5][0] [Thru] [8][0] [Fan] {Cluster} [4] [Enter] - sets channels 1 through 3 at 50%, 4 through 6 at 60%, 7 through 9 at 70%, 10 through 12 at 80%.
- {Random} - The selected channels are put in a random order before fan is applied.

Fanning Parameter Data

Note: *[Fan] is used in the examples below. Ion Classic and Element Classic users will need to use {Fan}.*

Fan values can be adjusted with encoders (if available), ML Controls, or via the keypad. To adjust the fan values with an encoder, select the required channels and provide a baseline, if necessary, followed by [Fan].

If no value is entered, the current values will be used. If using physical or virtual encoders to adjust fan, it is not necessary to specify the parameter to be fanned. This is determined by the encoder used.

- [1] [Thru] [5] [Fan] [Enter] - selects the channels 1 through 5 and puts encoders and level wheel into fan mode.
- [1] [Thru] [5] [At] [5] <0> [Fan] [Enter] - selects the channels 1 through 5, sets a start level of 50% and puts encoders and level wheel into fan mode.
- [1] [Thru] [5] [Fan] {Mirror} [Enter] - selects the channels 1 through 5 and puts encoders and level wheel into fan mode with mirror style.

Fan From the Command Line

Note: *[Fan] is used in the examples below. Ion Classic and Element Classic users will need to use {Fan}.*

A level or time command that uses [Thru] or a list of references is a command line fan command. Using the [Fan] key is not necessary unless a fan style other than the default is needed.

To adjust the fan values from the command line:

- [1] [Thru] [5] [At] [1] <0> [Thru] [5] <0> [Enter] - sets channel 1 to 10%, 2 to 20%, 3 to 30%, 4 to 40%, and 5 to 50%. This is the default fan adjustment and the [Fan] command is not necessary.
- [1] [Thru] [5] [At] [1] <0> [Thru] [3] <0> [Fan] {Mirror} [Enter] - sets channel 1 to 30%, 2 to 20%, 3 to 10%, 4 to 20%, and 5 to 30%.

Fanning References

When fanning references, such as palettes, if there are more than 2 reference lists are used then the data will be referenced data. The fan will be repeated if there are more channels than references.

- **[1] [Thru] [5] [Int Palette] [1] [Thru] [3] [Enter]** - sets channel 1 to IP1, 2 to IP2, 3 to IP3, 4 to IP1, and 5 to IP2.

If the list contains 2 or less references, fan will be set to the levels between the references as absolute data.

- **[1] [Thru] [5] [Int Palette] [1] [Thru] [2] [Enter]** - (Intensity palette 1 is all channels at 0% and Intensity palette 2 is all channels set to 100%.) sets channel 1 to 0%, 2 to 25%, 3 to 50%, 4 to 75%, and 5 to 100% as absolute data.

Fanning Timing and Delays

Fanning timing and delays work exactly like fanning parameters.

- **[1] [Thru] [5] [Time] [6] [Thru] [1] [0] [Enter]** - sets the discrete times for channel 1 to 6 seconds, 2 to 7 seconds, 3 to 8 seconds, 4 to 9 seconds, and 5 to 10 seconds.
- **[Cue] [1] [Thru] [5] [Time] [6] [Thru] [1] [0] [Enter]** - sets the times for cue 1 to 6 seconds, 2 to 7 seconds, 3 to 8 seconds, 4 to 9 seconds, and 5 to 10 seconds.
- **[Cue] [1] [Part] [1] [Thru] [3] [Time] [6] [Thru] [8] [Enter]** - sets the times for cue 1's parts to part 1 to 6 seconds, part 2 to 7 seconds, and part 3 to 8.
- **[1] [Thru] [5] [Delay] [6] [Thru] [8] [Fan] {Mirror} [Enter]** - sets the discrete delays of channel 1 to 8 seconds, 2 to 7 seconds, 3 to 6 seconds, 4 to 7 seconds, and 5 to 8 seconds.
  - Ion Classic and Element Classic users will need to use **{Fan}**

Using Subgroups with Fan

Subgroups can be used with fanning. Channels in the same subgroup will act as a single channel when fanned. For example, group 1 is made up of channels 120 -130. Channels 120 - 123 are one subgroup, channels 124 - 126 are not in any subgroup, and channels 127 - 130 are another subgroup.

- **[Group] [1] [Fan] [Enter]** - selects group 1 and puts it into fan mode. Increasing the intensity overall would result in channels 120 - 123 sharing an intensity, channels 124 - 126 each at different intensities, and channels 127 - 130 sharing an intensity.

Ion Classic and Element Classic users will need to use **{Fan}**.

Home

As with the **{Home}** button on the Encoder Display (see *Home*), the **[Home]** hardkey allows you to home a specific parameter. Additionally, you may home all of a channel's non-intensity parameters or home only a specific category (I, F, C, B).

Element Classic users will need to use the **{Home}** softkey located in the ML Controls.

Homing a channel, category, parameter, or submaster will return it to the default value.

- **[1] [Home] [Enter]** - homes all parameters for channel 1, except intensity.
- **[1] [Color] [Home] [Enter]** - homes all color parameters for channel 1.
- **[Group] [1] [Color] [Focus] [Home] [Enter]** - homes the color and focus parameters of all channels in group 1.
- **[Sub] [1] [Home] [Enter]** - homes submaster 1.
- **[Sub] [1] [Thru] [Home] [Enter]** - homes all submasters.

Home Preset

You can select a preset to provide home values for all non-intensity parameters (instead of fixture library default values) when home commands are used. Store a preset with modified home values for only the channel parameters you would like at a different value than default, and then assign that preset to Home in Setup (see *Home Preset*). Any channels that are not included in the preset assigned to Home in Setup will use their library defaults.

Multiple Intensity Channels

When a fixture with multiple intensity parameters is patched, Eos assigns it a master intensity. The master intensity can be used to control the multiple intensities together. The master intensity is handled in the same way as the intensity of a single intensity channel.

Levels can be set via the level wheel, from the keypad, and the encoders (if available). The other intensities will default to 100%.

Control of the individual intensities of a multiple intensity channel is handled using the parameter buttons in the CIA (see *Manual Control of Non-Intensity Parameters*) or the encoders (see *Custom Control*). Levels assigned to the individual intensities will act independent of each other and the master intensity.

- **[1][0][0] {Intens 3} [At] [5][0]** - sets intensity 3 of channel 100 to 50% intensity.
- **[1][0][0] [At] [7][5]** - sets the master intensity of channel 100 to 75% intensity. All intensities for channel 100 will be mastered to 75% unless they have a separate intensity set.

In Table view, Eos will default to showing all intensity parameters associated with the channels.

In summary view, the master intensity is shown. If one of the multiple intensities has a value, an '+' will display beside the master intensity.

Multicell Fixtures

Fixtures that have multiple same-type parameters can have a multicell profile assigned to them, as designated by MC in the fixture editor. See *Patching Multicell Fixtures*.

Multicell fixtures have a master channel with a whole number for a channel number and the appropriate number of additional cells, which will have point numbers for their channel numbers.

To control the whole fixture (master + cells), select the channel number.

To control individual cells, use **[.]** to put **{Cell}** on the command line.

To control just the master, use **[Shift] & [.]** to put **{Minus Cells}** on the command line. You can also use the syntax **[1] [.] [0]** or **[1] {Cell} [0]** to only control the master.

To select the master and any or all of the cells, you can use the following syntax examples: **[n] [.] [0] [Thru] [n]**, **[n] [.] [0] [+] [n]**, or **[n] [.] [0] [Thru] [n] [-] [n]**. The **{Cell}** softkey can be used instead of the **[.]** hardkey. For example, channel 1 is a multicell fixture with four cells.

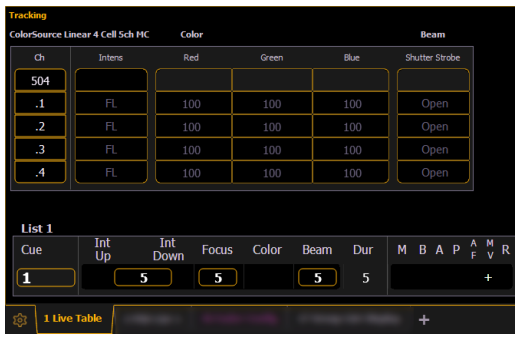
- **[1] [At] [Full] [Enter]** - sets the intensity of the master channel to full. Note that the intensity parameter for cells defaults to full.
- **[1] [.] [1] [At] [5] [0] [Enter]** - sets only cell one at 50% of the intensity of the master. Cells are a percentage of the master level. **[.]** puts cell on the command line.

This can be especially useful when applying effects or palettes. For example, channel 1 through 4 are multicell fixtures with four cells.

- **[1] [Thru] [4] [Color Palette] [1] [Enter]** - sets channels 1 through 4 to color palette 1. All four cells of each fixture are set to color palette 1, which is red.
- **[1] [Thru] [4] [Color Palette] [1] [Thru] [4] [Enter]** - channel 1 with its four cells will be set to color palette 1, channel 2 will be set to color palette 2, and so on.
- **[1] [Thru] [4] [.] [Color Palette] [1] [Thru] [4] [Enter]** - for each of the channels, cell 1 will be in color palette 1, cell 2 in color palette 2, cell 3 in color palette 3, and cell 4 in color palette 4.

With a cell selected you can apply data to the master channel as long as the cell does not also have that parameter. When you have selected a cell, if you apply data that does not apply to the master, Eos understands to apply it to the cells instead. In the example above, if the master had color parameters, this action would apply color data ONLY to the master.

Cells will not send data to other cells. Table view is helpful for seeing which cells control what parameters.



For example, cell 2 of a fixture is currently selected. You can adjust the encoders for pan and tilt even if the master actually controls those parameters. The cell will send that information to the master. This allows for greater ease of control.

The following are additional multicell syntax examples:

- **[5] [.] [2] [+] [+]** - pressing **[+]** twice will put channel on the command line.
- **[5] [.] [Thru]** - automatically puts the first cell's number on the command line before the **[Thru]** command.
- **[5] [.] [1] [Thru] [Enter]** or **[5] [.] [1] [Thru] [At]** - automatically puts the last cell's number on the command line before a **[Enter]** or **[At]** command.
- **[5] [.] [-] [4] [Enter]** - selects all of the cells except cell 4.
- **[1] [+] [+] [2] [.] [3] [Enter]** - selects all of channel 1, and only cell 3 of channel 2.
- **[1] [+] [3] [.] [2] [Shift] & [.]** - appending **[Shift] & [.]** after a cell number will post [All Cells] to the command line, selecting all cells of channel 1, and only cell 2 of channel 3.

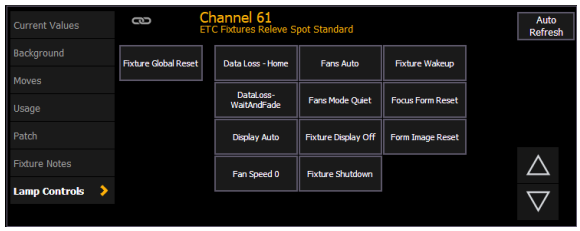
Offset can be very useful when applied to multicell fixtures, and can be useful for creating subgroups. See *Offset* and *Subgroups*.

Lamp Controls [Tab 31]

Lamp Controls (**[Tab] [3][1]**) allow you to execute control functions of selected fixtures such as calibrate, douse lamp, strike lamp and reset. Each fixture type has its own set of lamp control options which are available to you when you select the fixture from Live and press the **{Lamp Ctrls}** softkey. This information is also available *Using [About]*.

- **[1] [1] [Enter] {Lamp Ctrls}**
- **[1] [1] [Enter] [About] {Lamp Controls}**

If the channel is a conventional (intensity-only) fixture, no control options will be displayed. When the selected channel is an automated fixture, options specific to the fixture type will display for use. Available RDM functions will also display here.



Pressing any of these control options will affect the selected channel after a confirmation.

Using [+%] and [-%]

Note: *[+%] and [-%] are used in the examples below. Ion Classic and Element Classic users will need to use [Shift] & [+] and [Shift] & [-].*

Use **[+%]** and **[-%]** keys to incrementally change parameter values. Ion Classic and Element Classic users will need to use **[Shift] & [+]** or **[Shift] & [-]**.

By default, the **[+%]** and **[-%]** keys are assigned a value of 10. This can be changed in **Setup**. See *Manual Control*.

Channel Intensity

When channels are selected, pressing **[+%]** increments the intensity level by 10 (or by the value established in Setup, see *Manual Control*. Alternatively, you may press **[-%]** to decrement the intensity level by 10. You may use these keys consecutively to "add to" or "subtract from" the intensity level.

- **[1] [Thru] [1] [0] [At] [4] [5] [Enter]** - selects channels 1 through 10 and set them to an intensity level of 45% from the keypad.
- **[+%] [+%]** - changes the intensity level to 65% using the [+%] key, which is set to its default value of 10% in the setup menu.

Non-Intensity Parameters

The **[+%]** and **[-%]** keys may be used to incrementally adjust non-intensity parameters as well.

- **[1] {Iris} [+%] [+%]**
- **{Zoom} [-%] [-%]**

Remainder Dim

Note: *By default, [Rem Dim] will set to zero. In Setup, you can assign a remainder dim value of something other than zero. See Manual Control. For the purposes of this discussion, the default value of zero will be used in examples.*

[Rem Dim] temporarily provides a zero intensity to all channels except those that are currently selected, those that are parked, or those with intensity contributions from submasters. If the remainder dim command is reversed, the stage returns to its previous state. You may use the following commands for remainder dim:

- **[Next]** and **[Last]**- moves through the channel list.
- **[**select channels**] [Rem Dim] [Enter]** - sets all non-selected channels to zero.
- **[1] [At] [6] <0> [Rem Dim] [2][0] [Enter]** - sets channel 1 to 60% and all non-selected channels active over 20% to a rem dim level of 20.
- **[Rem Dim]**- clears the rem dim function and returns the stage to its previous state

Pressing **[Rem Dim]** again releases all channels from rem dim mode and restores the stage to its previous state. Using the **[Next]** and **[Last]** buttons releases the current selected channel from remainder dim mode and sets its intensity to zero, while selecting the next or last channel and continuing rem dim operation. For example, assume channels 5 through 9 are selected and set at an intensity level of 50% and channels 10 through 15 are selected and set at an intensity level of 70%. Select channel 9 and dim the remaining channels.

- **[9] [Rem Dim] [Enter]** - channel 9 is set at an intensity level of 50% and all remaining channels are dimmed to zero.
- **[Next]** - selecting **[Next]** changes the channel selection to channel 10 which is set at an intensity level of 70%, the level set in the previous state, and all remaining channels including channel 9, are dimmed to zero.
- **[Rem Dim]** - pressing **[Rem Dim]** again will return all channels to their previous levels.

[Rem Dim] can be used in groups including the use of **[Next]** and **[Last]** buttons to progress through the channels within the selected group. For example, assume you have group 1 selected (includes channels 1 through 10) with an intensity value of 50%, group 5 selected (includes channels 11 through 20) with an intensity value of 70%, and group 7 selected (includes channels 21 through 30) with an intensity value of 100%

- **[Group] [1] [At] [5] [Enter]**
- **[Group] [5] [At] [7] [Enter]**
- **[Group] [7] [At] [Full] [Enter]**

Use the following syntax to select only Group 1 and dim the remaining Groups using the **[Rem Dim]** feature.

- **[Group] [1] [Rem Dim] [Enter]**

Channels 1 through 10 are selected with an intensity value of 50%, and all remaining channels are at a 0% intensity. You may progress channel by channel through the selected group (Group 1, channels 1 through 10) using the **[Next]** or **[Last]** key. Each press of the **[Next]** or **[Last]** key cycles you through only the channels of the selected group.

Pressing any other key terminates the **[Rem Dim]** mode and leaves channels at their remainder dim value.

You can set the dim level for all remainder dim commands in Setup (see *Manual Control*). When set to a value other than zero, all rem dim commands will bring intensity to this level instead. However it won't bring an intensity up. For example, if the rem dim level in setup is set to 50%, **[Rem Dim]** will drop any value above 50% to 50%, but not add intensity to any channels below 50%.

It is possible to override the dim level temporarily by specifying a level after the **[Rem Dim]** command.

[Rem Dim] can also be used to remove channels from a submaster or cues during a **[Record]**. For example, assume that channels 1 through 10 are at full. You've recorded that to submaster one. Using **[Rem Dim]**, you can modify the record so only channels 1 through 5 are recorded to the submaster.

- **[1] [Thru] [1] [0] [At] [Full] [Enter]**
- **[Record] [Sub] [1] [Enter]**
- **[1] [Thru] [5] [Record] [Sub] [1] [Rem Dim] [Enter]**

A **[Rem Dim]** command can also be used on a selective cue record. It will force any channels not included in the record, but that are tracking forward from a previous cue, to zero.

Rem Dim Values

Rem Dim levels can either be an absolute value, such as Full or 50%, or a proportional value, which would set the levels to a percentage value of their current levels. To use a proportional value, press **[/]** before entering the percentage value. For example, assume that channels 1 through 10 are selected and set to an intensity level of 60. Select channel 1 and dim the remaining channels.

- **[1] [Rem Dim] [/] [5][0] [Enter]** - channels 2 through 10 will be dimmed to 30.

Highlight and Lowlight

Note: *[High] is used in the examples below. Ion Classic and Element Classic users will need to use {Highlight}.*

Channels selected while in highlight mode will either go to a default setting, or to a value provided by a highlight preset. Modifications can then be made to those channels. Any changes will be maintained when the highlight mode is removed.

To place Eos in highlight mode, press **[High] [Enter]**. The command line will show that highlight is currently in use.

If no highlight preset is established, or for channels that have no value stored in the highlight preset, the following values will be applied to channels as they are selected:

- **Intensity** - full.
- **Focus** - no change from present state.
- **Color** - home value.
- **Shutter** - no change from present state.
- **Image** - home value.
- **Form** - no change from present state.

For example:

- **[1] [Thru] [5] [High] [Enter]** - places channels 1 - 5 in highlight.
- **[Next]** - specifies channel 1, which is now at the highlight value. Channels 2 - 5 are in the lowlight value. All other channels go to the defined rem dim level.

You may assign both a highlight and a lowlight preset in **Setup > User >** *Manual Control*. Any preset may be used. Channels with only one parameter included in the preset assigned to Highlight and Lowlight will not reset other parameters back to their default highlight values (see above).

On a command line with a channel selection, you can use **[Shift] & [High]** to go into Highlight mode and send the selected channels to the default Highlight setting. This command will self terminate the command line.

If you just use **[High]** , the command line will be cleared.

Lowlight Preset

The **{Lowlight Preset}**, which is set in **Lowlight Preset**, is used to define the behavior of specified but not selected channels while using **[Next]/[Last]** in highlight mode. When in highlight mode, **[**channel list**]** or **[Group]** [n] **[Enter] [Next]** will select the channel list or group and isolate the first channel.

- **[High] [Enter] [6] [Thru] [1][5] [Enter] [Next]** - specifies channels 6 through 15 with channel 6 the only channel selected. 6 is at the highlight level and 7 through 15 are at their lowlight levels. Pressing **[Next]** again will put channel 7 at the highlight level and 6 plus 8 through 15 at their lowlight levels. If there is no lowlight preset, these channels are not affected.

Temporary Highlight Level

The highlight preset can be overridden by setting a temporary highlight level. Using **[High] [At] [5][0] [Enter]** overrides the highlight preset and sets the highlight level to 50. Non-intensity parameters are not affected and will use the default highlight setting or the highlight preset.

The temporary highlight level will remain until **[High]** is pressed again or the channel is no longer selected.

Highlight/Lowlight Rem Dim

In addition to the highlight and lowlight presets, there is also a setting for **{Highlight Rem Dim}**. When enabled and highlight mode is active, the intensity for all **non-selected** channels are automatically set to the Rem Dim value established in setup, if that Rem Dim value is lower than the channel's current intensity. This can be used to help further isolate the channels you are working with in Highlight Mode

If you do not wish to enable Rem Dim globally in Setup, you can specify a rem dim on the command line for temporary use. Rem Dim will use the **{Live Rem Dim}**, as specified in setup.

- **[High_Low] [Rem Dim] [Enter]**

To temporarily override the **{Highlight Rem Dim}** option in Setup, you can use either of the following syntax examples:

- [Channel list] **[Highlight] [Rem Dim]** [n] **[Enter]**
- [Channel list] **[Highlight] [Rem Dim] [/]** [n] **[Enter]**

Sneak

The **[Sneak]** command (when a destination is not provided) removes manual changes from selected channels and allows the channels to **sneak** back to their background states (cue or submaster instruction, if any).Sneaking channels to their previous state is similar to the Expression release function, except sneak has the ability to release in time.

If there is no background state from the playbacks, the channel parameters will be set to their home position. The sneak command follows the sneak timing default established in Setup (see *Manual Control*), unless a timing value is provided as part of the sneak command.

The playback status display will show a red counter for sneak time. If multiple sneak times are being used, the most recently fired sneak time will be displayed. For an example of the sneak counter, see *Indicators in the Playback Status Display*.

The sneak command can also be used to send a channel parameter to a specific destination, either with or without timing. The following examples illustrate the various methods of using the sneak command:

- [channel list] **[Sneak] [Enter]** - releases manual control, setting parameters to their background state. If there are current values for those parameters from a playback, those are the values that will be restored. If there are no values from a playback, the parameters are set to home (or default) position.
- [channel list] **[Color] [Sneak] [Enter]** - sneaks color of the selected channels to the default or background state.
- **[5] [At] [5]<0> [Sneak] [8] [Enter]** - sneaks channel 5 to 50% in 8 seconds.

- **[Sneak] [Enter]** - when no channels are selected, restores all channels with manual values to their background state.
- **[Sneak] [Sneak]**- puts **{AllNPs} [Sneak]** on the command line, which sneaks out all non-intensity parameters. **[Sneak] [Sneak]** is a self-terminating command.
- **[Sneak] <Time> [3] [Enter]** - restores all channels with manual values to their background state in 3 seconds.
- **[Select Active] [Sneak] [Enter]** - selects all channels with intensity above zero and restores them to their background state, using default sneak times.
- **[Group] [5] <Color Palette> [9] [Sneak] [Enter]** - selects group 5 and sneaks it to color palette 9 using default sneak time.
- **[Group] [3] [At] <Color Palette> [1] [Sneak] <Time> [7] [Enter]** - selects group 3 and sneaks it to color palette 1 in 7 seconds.
- **[Sub] [4] [At] [5] [0] [Sneak] [2] [Enter]** - selects submaster 4 and sneaks it to 50% in 2 seconds.

Note: *When recalling a reference from the direct selects to use with the sneak command, the sneak command has to be entered before the reference.*

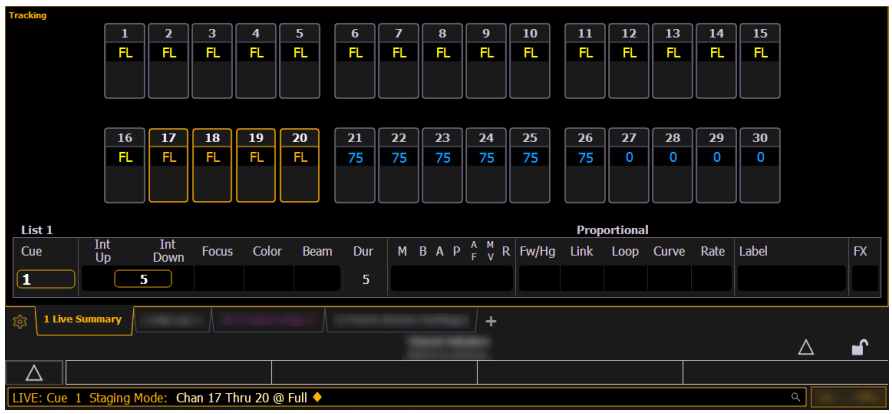
- **[Chan][1] [Sneak] {Preset 1}-** selects channel 1 and sneaks it to preset 1 using default sneak time.
- **[Chan][2][Sneak]<Time>[2]{Intensity Palette 3}**- selects channel 2 and sneaks it to intensity palette 3 in 2 seconds.
- **[Shift] & [Sneak]** - makes any manual data unmanual. The values will remain but they will no longer be available for **[Update]** or **[Record Only]** operations. When used with an empty command line, this will affect any and all manual data. When used with a channel selection, only those channels will be affected.
- **[1] [At] [5]<0> [Sneak] <Time> [8] [Delay] [5] [Enter]** - sneaks channel 5 to 50% in 8 seconds after a delay of 5 seconds.

Staging Mode

Staging mode allows you to preview changes temporarily, and then either commit them to Live or Blind, or revert them.

Using Staging Mode

In either Live or Blind, enter staging mode by pressing **[Staging Mode]** or **[Stage]**. The command line will append "Staging Mode." Make the desired changes. Staged data will display in orange.



If an *Augment3d* tab is open, staged data will also preview there. The physical **[Stage]** key LED will illuminate when in staging mode.

Committing Staging Mode Changes

Press **[Copy To] [Enter]** to commit changes to either Live or Blind. Additional modifiers can optionally be added to the syntax (for example, **[Copy To] <Sneak> <5> [Enter]**).

Pressing **[Staging Mode]** or **[Stage]** again will place "Clear Staging Mode" on the command line. Exiting staging mode will preserve the changes without committing them. Staging mode changes preserved without committing them are stored in a buffer for use when Staging Mode is reentered. If the buffer has content when exiting staging mode, the **[Stage]** key LED will blink.

Note: *Staging Mode changes committed to Live will display as manual data (red), and will still need to be recorded or updated into a cue.*

Staging Mode & Highlight

Highlight (see *Highlight and Lowlight*) can be used in staging mode in both Live and Blind. To enable, simply press **[Highlight]** while already in staging mode. To disable, select **[Highlight]** again, or exit staging mode.

Select Keys

A number of select functions are available.

Select Last

The **[Select Last]** key allows you to reselect whatever the previous channel selection was. This includes multiple channel selections, groups, etc. Using **[Select Last]** , Eos will recall your last selection and leave it unterminated for further operation. This will work for a loop of the last five selections.

Note: *On Ion Classic and Element Classic, **{Select Last}** is a softkey.*

Note: *If any manual control action is taken immediately after a **[Record]**, **[Record Only]**, or **[Update]** command, the previously selected channels will automatically be reselected.*

[Shift] & [At] and [Shift] & [Enter]

- **[Shift] & [At]** - recalls last channels and parameters without terminating; does a loop of last five commands.
- **[Shift] & [Enter]** - reselects the last command and leaves it unterminated; does a loop of last five commands.

Select All

Pressing **[Shift] & [Select Last]** will give the additional softkey option, **{Select All}**. **{Select All}** will select all channels.

Select Active

The **[Select Active]** key is used to select all channels that currently have intensity levels above zero. Pressing **[Select Active]** once will capture all active levels. Pressing **[Select Active]** twice will capture all active manual levels and those from playbacks except for submasters. Select NonSub Active will post to the command line.

The following examples illustrate the how to select channels using **[Select Active]**:

- **[Select Active] [Enter]** - selects all active channels with intensity levels above zero.
- **[Select Active] [Record] [Group] [x] [Enter]** - records active channels to the target group.
- **[Select Active] [Sneak] [Enter]** - selects all channels with intensity above zero and restores manual control to the background state, using default sneak time, if enabled.
- **[1] [Thru] [1] [0] [0] [Select Active] [Enter]** - selects channels between 1 and 100 with intensity levels above zero.

On a completed command line, using **[At]** or **[Select Last]** after **[Select Active]** or **[Select Manual]** will post the numeric channel list to the command line.

For example, cue 1 is active, and has channels 1 through 5 at full. Using the syntax, **[Select Active] [Enter] [At]** will post channels 1 through 5 onto the command line.

Another example, Channels 10 through 20 have a manual level of 75. Using **[Select Manual] [Enter] [Select Last]** will put channels 10 through 20 onto the command line.

Note: *On Ion Classic and Element Classic, **{Select Active}** is a softkey.*

Select Manual

The **[Select Manual]** key is used to select all channels that currently have manual data. You may use **[Select Manual]** combined with the parameter control keys to capture only certain parameters of a channel with manual data.

The following examples illustrate the various methods to select channels using **[Select Manual]**:

- **[Select Manual] [Enter]** - selects all channels with manual data.
- **[Select Manual] [Color Palette] [1] [Enter]** - selects all channels with manual levels and sets them to color palette 1.
- **[Color] [Select Manual] [Color Palette] [1] [Enter]** - selects only channels with manual color values and sets them to color palette 1.
- **[1] [Thru] [1] [0] [0] [Select Manual] [Enter]** - selects channels between 1 and 100 with manual data.
- **[Select Manual] [Record] [Group]** [n] **Enter]** - records channels with manual data to the target group.

Note: *On Ion Classic and Element Classic, **{Select Manual}** is a softkey.*

[-] Select Manual or Select Active

[-] [Select Manual] or **[-] [Select Active]** can be used to modify channel selections. Using **[-] [Select Manual]** will select all of the channels in the list except those that have manual data. Using **[-] [Select Active]** will select all of the channels in the list except those that are active.

- **[1] [Thru] [2] [0] [-] [Select Manual] [Enter]** - selects channels 1 through 20 except any channels that currently have manual data.
- **[1] [Thru] [2] [0] [-] [Select Active] [Enter]** - selects channels 1 through 20 except any channels that are currently active.

Channel Check

Channel check allows you to quickly step through all of your patched channels. This is useful for checking lamps or checking focus.

Note: *Parked addresses will not be affected by the channel check feature.*

The following examples illustrates how to use the channel check feature:

- **[1] [At] [7] <0> {Chan Check} [Enter]** - brings channel 1 to 70% intensity.
- **[Next]** - channel 1 returns to its background state and channel 2 is set to 70% intensity.
- **[Next]** - channel 2 returns to its background state and channel 3 is set to 70% intensity.

Use **[Next]** or **[Last]** to progress through the channel list to complete the channel check. Any other key press other than **[Next]** or **[Last]** will terminate channel check mode.

Address at Level

Note: *[Address/Patch] is used in the examples below. Ion Classic users will need to use {Address}, and Element Classic users [Dimmer/Address].*

The **[Address/Patch]** key in Live is used to send level information directly to an output address.

- **[Address/Patch] [5] [Full] [Enter]** - sets output address 5 to full. It will return to its previous level once the command line changes.
- **[Address/Patch] [2] [/] [1] [At] [/] [2][3][0] [Enter]** - sets universe 2, address 1 at DMX value 230.

With **[Address/Patch]** on the command line, you can use the level wheel to adjust the level.

After using the **[Address/Patch]** command, **[Next]** and **[Last]** may be used to increment the address number and set it to the same level.

Addresses return to their previous level once the command line is cleared, or **[Next]** / **[Last]** is used to increment to the next address.

Note: *This feature is useful when you want to perform an address or dimmer check.*

Address Check

Address check allows you to quickly step through all of your patched addresses.

Address check differs from *Address at Level* because it skips non-intensity parameters of patched addresses. Since address check follows the current flexichannel state, it can be used with all channels to identify unpatched channels, or with flexi-patched to only show the intensity addresses of patched channels.

For example, use the appropriate hard or softkey to select addresses based on your console: **[Address/Patch]**, **{Address}**, or **[Dimmer/Address]**.Then, add the syntax **[1] [At] [Full] {Check} [Enter]** to bring address 1 to full intensity.

Use **[Next]** or **[Last]** to progress through the address list to complete the address check. Any key press other than **[Next]** or **[Last]** will terminate address check mode.

Flash

Using the **{Flash}** softkey in Live will bring a channel or address to full, and then every other second the level will move to 15%. That will hold for 1 second, and then the level will return to full. The channel or address will keep flashing until either the command line is cleared, or **[Next]**/**[Last]** is used to increment to the next channel or address.

- **[1]{Flash}** - will bring channel 1 to full, then to 15%.
  - **[Next]** - channel 1 returns to its previous state and the intensity for channel 2 will flash.
- **[Address/Patch][1][0]{Flash}** - will bring address 10 to full, then to 15%.
  - Ion Classic users will need to use **{Address}**. Element Classic users will need to use **[Dimmer/Address]**.

Flash On & Flash Off

Pressing **[Shift] & [Full]** together will put all the selected channels at full and "Flash On" will be posted to the command line.

Pressing **[Shift] & [Out]** together will put all the selected channels to out and "Flash Off" will be posted to the command line.

Releasing the keys will return the channels to their previous state.

Advanced Manual Control

This section describes some advanced features for manual control functions. These features can save you valuable programming time.

[Copy To]

[Copy To] allows you to copy all data from one channel to another, either within the current working mode or to a different record target. **[Copy To]** works much like **[Recall From]**, but in the opposite direction, **[Copy To]** forces data **to** a channel from the selected channel, whereas **[Recall From]** pulls it **from** a channel to the selected channel. For information on using **[Recall From]**, see *[Recall From]*

By using the IFCB category buttons in the ML Controls display or the parameter buttons, you may copy subsets of channel data. Entire cues, cue ranges, and cue lists can be copied to other locations. To only copy over intensity and parameter levels, use the **{Only Levels}** softkey. This will exclude discrete timing information.

To copy over data from only active channels, use the **{Only Active}** softkey.

When referenced data is copied, if the copy target also has data in the reference that is being copied, the target will be placed in that reference (such as, color palette 1), at its stored values. If the copy target is not included in the reference, absolute data will be copied to the target, and not the reference.

Below are some examples of copy commands from record targets. This command is very versatile and the following list is far from exhaustive:

- **[2] [Copy To] [Cue] [5] [Enter]** - copies all information for channel 2 to cue 5.
- **[2] [-] {Focus} [Copy To] [Cue] [5] [Enter]** - copies all parameter data for channel 2, other than focus, to cue 5.
- **[Group] [3] [Copy To] [Preset] [6] [Enter]** - copies current information for group 3 to preset 6.
- **[3] [Copy to] [6] [Cue] [8] [Enter]** - copies the data from channel 3 to channel 6 in cue 8.

- [3] [Copy to] [4] [Thru] [9] [Enter] - copies the data from channel 3 to channels 4 through 9.
- [3] [Copy to] [8] [Cue] [2] [/] [1] [Q Only / Track] [Enter] - copies the data from channel 3 to channel 8 in cue 2/1 and takes exception to the track/ cue only settings in regard to subsequent cues in cue list 2.
- [Cue] [2] [/] [Copy to] [Cue] [7] [/] [Enter] - copies all of the contents of cue list 2 to cue list 7.
- [Cue] [1] [/] [1] [Thru] [1] [0] [Copy To] [Cue] [5] [/] [5] [Enter] - copies cues 1 through 10 from cue list 1 to cue list 5, starting with cue 5.
- [1] [Copy To] [2] [0] {Only Levels} [Enter] - copies only the intensity and parameter information from channel 1 to channel 20.
- [1] [Copy To] {DMX} [2] - copies the DMX value from channel 1 to channel 2.
- [1] [Copy To] [2] {From Absolute} [Enter] - sets channel 2 to channel 1's absolute level.
- [1] [Copy To] {Live} [Enter] - copies channel 1's level to the live output.

In Live, you can use [Sneak] with [Copy To] to fade in the change.

- [1][2] [Copy To] [2] [Sneak] <Time> 7 [Enter] - copies the recorded data from channel 12 to channel 2 and sneaks it in 7 seconds.

Using the {HTP} softkey with [Copy To] will cause any intensity levels to be ignored if they are less than or equal to the copied value.

For example, channels 1 and 2 are at 50% in cue 10, and in cue 11 channel 1 is at 10% and channel 2 is at full.

- [1] [Thru] [2] [Copy To] [Cue] [1][0] {HTP} [Enter] - when used from cue 11, channel 1 will remain at 50% and channel 2 will go to full.

Move To

While technically not a manual control instruction, Move To will be very useful when managing record target data stored from manual control.

When a Move To command is given, data is removed from its current location and moved to its new location. If the new location already contains data, a confirmation is required by Eos (unless disabled in Setup). See *Record Defaults*. Existing data in the new location will be completely overwritten if a Move To command is confirmed.

Press [Copy To] [Copy To] to access Move To.

The following are examples of using Move To:

- [Color Palette] [1] Move To <Color Palette> [5] [Enter]
- [Preset] [3] Move To <Preset> [8] [Enter]
- [Cue] [9] Move To <Cue> [2] [Enter]
- [Snapshot] [4] Move To <Snapshot> [7] [Enter]
- [Preset] [1] Move To [Color Palette] [3] [Enter]
  - Element Classic users will need to use [Shift] & [Int Palette] instead of [Preset]
- [Int Palette] [5] Move To [Preset] [1] [0] [Enter]

When using Move To to convert a preset into a palette, all information not relevant for that palette will be removed.

Labels, Scenes, and Notes

The [Copy To] and Move To commands can be used to copy or move labels between any target types that can have labels. A {Labels Only} softkey will display.

- [Sub] [1] [Copy To] [Sub] [3] {Labels Only} - copies submaster 1's label to submaster 3.

Labels, scenes, and notes can be copied or moved between cues. The **{Labels Only}**, **{Scene Only}**, and **{Notes Only}** softkeys will display.

- **[Cue] [3] Move To [Cue] [6] {Notes Only}** - moves the note from cue 3 to cue 6.

[Recall From]

[Recall From] is similar to *[Copy To]*, except that it retrieves data from other locations, and can be used only for a channel list recalling from the same channel list but in a different location (for example, a cue). **[Recall From]** is essentially a "copy from" command.

All parameter data for selected channels will be recalled, or by using the IFCB category buttons or parameter buttons, you may recall subsets of channel data. To recall only levels and not effect, timing, mark or other non-level data, use the **{Only Levels}** softkey.

To recall data from only the active channels, use the **{Only Active}** softkey.

In Live, you can use **[Sneak]** with **[Recall From]** to fade in the change.

Below are some examples of recall commands from record targets:

- **[2] [Recall From] [Cue] [5] [Enter]** - recalls all recorded data from cue 5 for channel 2.
- **[2] [-] {Focus} [Recall From] [Cue] [5] [Enter]** - recalls all data for channel 2 from cue 5, except focus (pan/tilt - XYZ) data.
- **[Group] [3] {Color} {Focus} [Recall From] [Preset] [6] [Enter]** - recalls the color and focus information from preset 6 for the channels in group 3. Could also be used with a channel selection set instead of a group.
- **[Group] [3] {Color} [Recall From] [Cue] [7] {Make Absolute} [Enter]** - recalls color data for group 3 from cue 7 and breaks any references to record targets.
- **[2] [Recall From] [Sub] [4] [Enter]** - recalls all recorded parameter data from sub 4 for channel 2.
- **[Recall From] [Intensity Palette] [1]**- recalls all of the values stored in intensity palette 1.
- **[1][0] [Recall From] [Cue] [2] [Sneak] <Time> 7 [Enter]** - would recall the recorded data that cue 2 has for channel 10 and sneak it in 7 seconds when used in live.
- **[Recall From] [Cue] [1][0] {Only Active} [Enter]** - recalls data from only the active channels, which are those channels with intensities above 0, if no channel selection had been previously made.
- **[Recall From] [Cue] [2] [Enter]** - would result in a selection of the channels used in that cue and their values. Any channels that are used in the cue list but do not currently have an intensity in the recalled from cue will be set to zero. Pressing **[At]** afterwards would post a numeric list of those channels to the command line.

In Live or Blind, hitting **[Recall From] [Recall From]** will put **[Recall From] [Cue]** on the command line.

Using the **{HTP}** softkey with **[Recall From]** will cause any intensity levels to be ignored if they are less than or equal to the recalled value. For example, in cue 10 channels 1 and 2 are at 50%, and in cue 11 channel 1 is at 10% and channel 2 is at full.

- **[Recall From] [Cue] [1][1] {HTP} [Enter]** - when used from cue 10, channel 1 will remain at 50% and channel 2 will go to full.

[Recall From] [Park]

You can use **[Recall From] [Park]** to set a channel or parameter to the same level as the current *Park* value. For example, channels 1 through 5 are parked at 55. To recall that level to channels in live or blind, use the following syntax:

- **[1] [Thru] [1][5] [Recall From] [Park] [Enter]** - channels 1 through 5 will be set to 55 and channels 6 through 15 will be unaffected.

This does not release the Park buffer.

{Make Null}

The **{Make Null}** softkey can be used to withhold parameter data from record or update actions in live, and remove parameter data from record targets in Blind. **{Make Null}** is applied using channel selection and can impact entire channels, individual parameters, or parameter categories.

{Make Null} in Live

When you apply a **{Make Null}** instruction to channels or parameters in Live, channel data is still visible onstage, but that data is essentially rendered invisible to record commands. Similar to *Record Filters*, **{Make Null}** acts as an "ignore" instruction in Live, not a remove instruction. When channel data is nulled, the values for that data in the live display turn grey and an "N" appears next to the data field.

{Make Null} differs from Park in that you can still manipulate data onstage (through manual control or through playback) but that data will be unavailable for record actions.

Some examples of using **{Make Null}** in Live are:

- **[1] [Thru] [5] {Make Null} [Enter]** - converts all parameters of channels 1 through 5 into null data.
- **[2] {Color} {Make Null} [Enter]** - changes only color data for channel 2 to null data.
- **[9] [Thru] [5] {Pan} {Make Null} [Enter]** - changes only the pan data for channels 5 through 9 to null.

Null instructions are lifted in two different ways. First, as **{Make Null}** is a toggle state, it is possible to reselect the channel and parameter followed by **{Make Null} [Enter]**. This lifts the null state.

Additionally, a **[Go To Cue]** instruction will remove the null state.

{Make Null} in Blind

When applied in Blind, **{Make Null}** can be used to mask instructions in a cue after it has already been stored. A **{Make Null}** instruction can also be applied to channels/ parameters in palettes, presets, and submasters, thereby removing the data from the target entirely, in the same way that **[At] [Enter]** does.

When applied to channels/ parameters in cues, **{Make Null}** doesn't remove the data from the cue, it simply makes it unavailable for playback. It has the same effect on move instructions that it has on tracked values.

Some examples of using **{Make Null}** in Blind are:

- **[Color Palette] [1] [Enter] [3] {Magenta} {Make Null} [Enter]** - removes all magenta parameter data for channel 3 from color palette 1.
  - Element Classic users will need to use **{Color Palette}**
- **[Preset] [5] [Thru] [9] [Enter] {Intensity} {Make Null} [Enter]** - removes all intensity data for all channels in presets 5 through 9.
- **[Cue] [8] [Enter] [2] [Thru] [7] {Make Null} [Enter]** - nulls all data for channels 2 through 7 in cue 8.
- **[Cue] [9] [Enter] {Intensity} {Make Null} [Enter]** - nulls all intensity data for all channels in cue 9.

In the cue scenarios above, **{Make Null}** differs from using **[At] [Enter]** in that instead of allowing values established in previous cues to track in, **{Make Null}** both restricts the recorded data from playing back and prevents other values from tracking in. Therefore, if the cue were executed as an out-of-sequence cue, no data would play back or track in for any nulled values.

Release

Release is an extension of the **{Make Null}** command in Blind. When Release is used, it behaves like Make Null, but it also releases the channel and parameter data to its background state, if one is available, or fades out the intensity instead.

Release can be used to mask instructions in a cue after it has already been stored. The data is not removed from the cue.

Release is applied in Blind via the **{Release}** softkey, or the **[Release]** hardkey if available.

- **[Cue] [3] [Enter] [2] {Release} [Enter]** - releases all data for channel 2 in cue 3.
- **[Cue] [2] [Enter] [3] {Color} [Release]** - releases the color data for channel 3 in cue 2.

Note: *Release tracks forward through a cue list until the Release command is removed or a move instruction happens.*

When release has been applied, the released content will display in gray with a R in Blind.

A Release flag will also appear in the Playback Status Display and the Cue List Index.

{Make Manual}

The **{Make Manual}** softkey can be used to convert cue or submaster data into manual values, allowing it to be included in **[Record]**, **[Record Only]**, and **[Update]** operations.

- **[5] {Make Manual} [Enter]** - selects channel 5 and makes all of its current parameter settings manual data.
- **[8] {Focus} {Make Manual} [Enter]** - selects channel 5 and makes all of its focus data manual.
- **[9] [Thru] [3] {Color} {Intensity} {Make Manual} [Enter]** - selects channels 3 through 9 and makes their color and intensity values manual.

{Make Absolute}

Referenced data is channel or parameter data that uses value stored in a palette or preset. This type of data can be converted into absolute numerical values using the **{Make Absolute}** softkey. This is primarily useful for recording updates to referenced data in cues without updating the references.

The **{Make Absolute}** command can be applied to the channels or parameters required before the update instruction, or they can be applied during the update.

- **[4] {Make Absolute} [Enter]** - selects channel 4 and makes any referenced data for that channel absolute data.
- **[7] {Color} {Make Absolute} [Enter]** - selects channel 7 and makes its color data absolute.
- **[3] [Thru] [9] {Color} {Intensity} {Make Absolute} [Enter]** - selects channels 3 through 9 and makes their color and intensity data absolute.

In each of these examples, the channel display will change from the previously-indicated reference (**IP**, **FP**, **CP**, **BP**, **Pr**) to show a numerical absolute value.

{Make Absolute} can also be used in conjunction with an **[Update]** command, allowing a cue to be updated while also breaking the reference to palettes or presets that were manually modified.

- **[Update] {Make Absolute} [Enter]** - updates the active record target, breaks the references for any parameters which have been changed and updates the cue with the changes. The referenced target will no longer be displayed in the channels which were made absolute. All of the data updated in cue 5 will now be shown as absolute data. . Any manual values that were modifications to a palette or preset stored in the cue will be updated as absolute data in the cue. The reference will be discarded.
- **[5] [Thru] [9] [Update] {Make Absolute} [Enter]** - this will break only the references for channels 5-9 and record their manual values to the cue. Other manual values will not be included in this update.

In Live, data that is changed to absolute is also made manual, thereby requiring a record or update instruction if the results are to be maintained.

[Capture]

Note: *Not available on Element Classic.*

Capture is a manual priority state. Any captured channel parameter data will be unaffected by playback, but will respond to manual control operations.

When channels are selected, **[Capture] [Enter]** captures all parameters of those channels. They will remain unavailable for playback or submaster override until they are released from the captured state. Capture is a toggle state, so to release parameters from a captured state, press **[Capture] [Enter]** again.

- **[1] [Thru] [9] [At] [Full] [Capture] [Enter]** - a "C" is displayed next to the captured parameters (intensity) in the channel display. The selected channels are now captured and are unavailable for playback or submaster instructions until they are released from capture.

You may also capture specific parameters of a channel using the parameter buttons in the CIA.

- **[7] {Focus} [Capture] [Enter]**

If a group of channels are selected, and some of those channels are captured and some are not, the first press of **[Capture] releases** all channels from the captured state and the second press captures all manual settings for the selected channels.

Uncaptured channels remain at their current values until restored to previous values or a new instruction is provided. You may restore channels to their background or default state using the **[Sneak] [Enter]** feature (see *Sneak*). Or you may leave them in a manual state until a new instruction is received.

It is also possible to latch capture on. This will automatically capture all manual changes as they are made. Pressing **[Capture] [Capture] [Enter]** automatically captures subsequent manual changes. The command line will read "Capture Enable " and the Capture hardkey will illuminate. To remove the capture latch, press **[Capture] [Capture] [Enter]** again. Capture latch works on a user by user basis.

[Query]

Note: *[Query] is used in the examples below. Ion Classic and Element Classic users will need to use {Query}.*

[Query] is used to select channels that meet criteria specified by you. These selections are conditional, based on what type of fixture a channel is or what that channel is doing, isn't doing, can do or cannot do. These criteria are established in the command line using the softkeys, the keypad, and the direct selects.

Query Softkey Options

When **[Query]** is used, the following softkey conditions are available:

- **Is In**
- **Isn't In**
- **Can Be**
- **Can't Be**
- **Or**
- **Moves Only**
- **Unpatched**
- **Mark** (cue where the intensity is active)*
- **Less Than** (includes equal to)
- **Greater Than** (includes equal to)
- **Broken Mark***
- **Marking** (future cue)*
- **Track**
- **Up Moves**
- **Down Moves**
- **Live Moves**
- **Dark Moves**
- **Autoblock**
- **Block**
- **Assert***
- **Part**
- **Park**
- **Time**
- **Delay**
- **Capture***

* Not available on Element Classic.

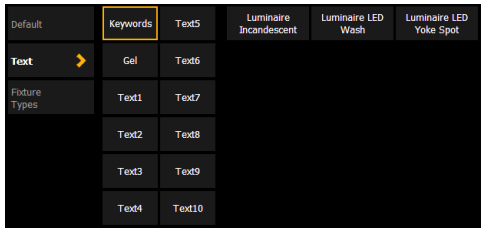
Note: *Unless otherwise specified, Eos assumes that a query will apply to current output. Therefore use of the **{Is In}** softkey is optional.*

The CIA also repaints to display all of the available softkeys by which you can search. These can be used in defining your query criteria.

Default

Includes the query softkeys along with additional query conditions.

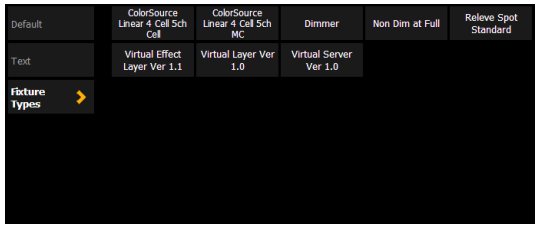
Text



- **{Keywords}** - displays buttons for all the text used in the text 1 through 10 fields and all of the default keywords in Patch.
- **{Gel}** - displays all of the gels used in the current show file.
- **{Text 1}** - **{Text 10}** - displays only the text used in that text field.

See also *Renaming Text Fields in Patch*.

Fixture Types



Displays buttons for all of the fixture types used in the current show file.

Using Query

As a query is defined in the command line, channels will be specified in the Live/ Blind display. When an **[Enter]** command is used to end the query, the remaining channels of the query will be selected. For example, you wish to find channels which are in color palette 2 and have an intensity of 50%:

- **[Query] <Is In> [Color Palette] [2] [At] [5] [0] [Enter]**

In the Live/ Blind display, any channels meeting this criteria will be selected. You may use **[Next]** and **[Last]** to cycle through the query selection, one channel at a time to control only a specific channel.

Other examples of using a query are:

- **[Query] {Isn't In} [Beam Palette] [2] [5] [Enter]**
- **[Query] {Accessory} {Can Be} [Color Palette] [8] [Enter]**
- **[Query] {Unpatched} [Delete] [Enter] [Enter]**(Only works while in Patch.)
- **[Query] {Fixture Type} {Revolution} {Can Be} [Focus Palette] [6] {Isn't In} [Cue] [4] [Thru]**

[9] [Enter]

- **[Next] [Next] [Enter]** - selects one channel from the query result

Additionally, in Patch you can define up to ten query keywords for each channel. These keywords can be used to create a query condition as well (See *Adding Keywords in Patch*).

Keywords defined in Patch will appear in the CIA when **[Query]** is pressed. They can then be used in a query like this:

- **[Query]** {your keyword} **{Can't Be} {Beam Palette 5} [Enter]**

Hardkeys on the face panel, such as **[Time]** can also be used to construct a query.

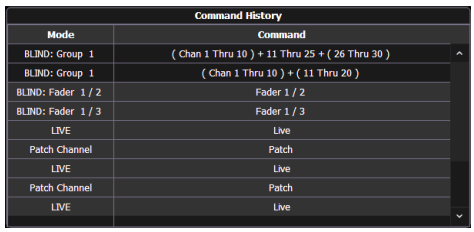
[Undo]

Undo is a method to revert certain operations performed in the software. You can use **[Undo]** to reverse any command that results in a change to data that would be saved to the show file or any command that changes manual levels in Live.

Command History [Tab 30]

Command histories are kept for each editing session, which begins when a new show file is created or when an existing show file is opened, merged, or imported.

The current command history can be accessed in its own tab using the *Workspace Layout Menu* or **[Tab] [3][0]**. When **[Undo]** is used, the command history opens in the *Central Information Area (CIA)*.



Commands that do not affect manual input or record targets, such as loading a cue, running a cue, or moving a submaster, are not included in the command history. Not all commands can be undone, including playback actions, manual attributes placed on channels, encoder actions, and Augment3d model edits.

In a multiple user environment, users can only see and undo the changes they made. Each user builds an individual command history, specific to the commands entered by their user number.

Using [Undo]

From Command History

When **[Undo]** is used, the command history opens in the *Central Information Area (CIA)*. It can also be opened with **[Displays] <More Sk> {Cmd History}**.

You can use a mouse, face panel arrow keys, or keyboard arrow keys to select one or more commands. When **[Enter]** is pressed, an advisory is posted. When **[Enter]** is pressed again, all highlighted commands will be undone and subsequently removed from the command history. When removing more than one command, a confirmation is required.

Pressing **[Undo] [Undo]** will scroll to the most recent undo-able command in the command history display. To undo the command, press **[Enter]**.

From the Command Line

If there are any commands in the command line, pressing **[Undo]** once clears the command line. Once the command line is empty, pressing **[Undo]** will start the undo process.

When **[Undo]** is pressed from an empty command line, the command history display will open in the CIA and the most recent completed command is highlighted in gold. If you press **[Enter]**, you will undo your last command. **[Shift] & [Clear]** can be used to clear the command line as well. If the most recent completed command is grayed out, it cannot be undone. Pressing **[Undo]** again will select the first command which can be undone.

{Redo}

After an undo has been performed, a **{Redo}** button will appear in the command history. **{Redo} [Enter]** will revert the last undo and reinstate the removed commands.

Chapter 8

Groups

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Recording Groups Live

Record groups of channels that you want to have available for fast recall later. Groups can be stored as whole numbers (such as Group 5) or as decimals of tenths, hundredths, or thousandths (such as Group 2.5, Group 7.65, Group 3.131). Only whole number groups can be stored using the direct selects; any decimal designations for groups must be stored using the keypad.

All groups may be labeled. These labels are then displayed on the direct selects as well as in the group list. Group numbers will not display in either until the groups have been created.

The following syntax examples illustrate the various methods and features available when recording groups:

Note: *[Record Only] is used in the examples below. Element Classic users will need to use [Record] [Record].*

- **[1] [Thru] [5] [Record] [Group] [7] [Enter]** - records only channels 1 through 5 to group 7.
- **[4] [Thru] [8] [.] [Record] [Group] [2] [Enter]** - records only the cells of the selected multicell fixtures, channel 4 through 8, to group 2.
- **[Record] [Group] [7] [Enter]** - records all channels with non-home values to group 7.
- **[5] [Thru] [9] [Record] {Group 7}** - records channels 5 through 9 to group 7 using the direct selects.
- **[3] [Thru] [8] [Record] [Group] [8] [.] [5] [2] [Enter]** - records channels 3 through 8 to group 8.52.
- **[-] [3] [Record] [Group] [7] [Enter]** - records all channels, except channel "3," to group 7.
- **[Group] [7] [+] [5] [Record] [Group] [9] [Enter]** - records groups 7 and 5 into group 9.
- **[Group] [8] [Group] [9] [Record] [Group] [1] [0] [Enter]** - records groups 8 and 9 into group 10.
- **[Record] [Group] [7] [Label]** [name] **[Enter]** - records as above and adds a label to the group.
- **[Record Only] [Group] [7] [Enter]** - records channels with manual data to group 7.
- **[Record Only] {Group 7}** - records channels with manual data to group 7 using the direct select.

[Thru] and [Thru] [Thru]

[Thru] can be used to select existing cues, presets, palettes, and groups between two numbers.

[Thru] [Thru] syntax will error instead of creating targets between two numbers.

Decimal targets will only be created with **[Thru] [Thru]** if the start and end target have the same number of decimal places. Zeroes at the end of decimal target numbers are ignored. As the target lists in the browser are limited to 10,000 items, **[Thru] [Thru]** syntax that would create more than 10,000 targets is ignored.

- **[Group] [1] [Thru] [Thru] [Enter]** - syntax error.
- **[Group] [1.001] [Thru] [Thru] [11.001] [Enter]** - 10,000 groups with 3 decimal places are created from 1.001 to 11.001.
- **[Group] [1.001] [Thru] [Thru] [11.002] [Enter]** - 10 whole-number groups are created from 2 to 11.
- **[Group] [1] [Thru] [Thru] [11.001] [Enter]** - 11 groups are created: 1.001, 11.001, and whole-number groups from 2 to 11.

Ordered Channels

When recording groups, channels are ordered in the group based on their selection order when the group is stored. This ordering is useful when combined with **[Next]** and **[Last]** functions, and when applying effects to groups.

For example, you record a group by selecting channels in the following order:

- **[1] [+] [3] [+] [5] [Thru] [9] [Record] [Group] [1] [Enter]**

Later you select Group 1 and press **[Next]**, the channels will be accessed, one at a time, in the same order in which they were initially selected.

If new channels are added to an ordered group using an update command, those channels are added to the end of the channel list from an ordering perspective.

When a group is previewed using the Group List, the display defaults to showing the ordered view. Channels can be reordered as needed from this list. Use the **[Format]** key to change to a numeric listing of channels.

- **[1] [0] [Thru] [2] [Record] [Group] [1] [Enter]** - records channels 10 through 2 to Group 1, and then if you select the group you can cycle through the channels using **[Next]** starting with 10, then 9, then 8, and so on.

The following softkeys are available:

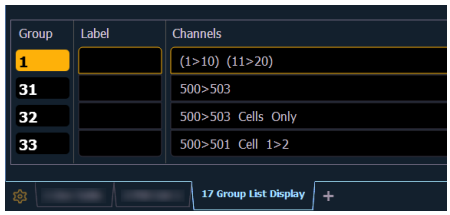
- **{Insert Before}** - inserts a new channel after the specified channel within a group.
- **{Insert After}** - inserts a new channel before the specified channel within a group.
- **{Reverse}** - places a group's channels in reverse order.
- **{Random}** - places a group's channels in a random order.
- **{Reorder}** - rearranges the channels to numeric order in a group.
- **{Offset}** - see *Offset*.

Subgroups

You can create subsets of channels within a group by using **[Shift] & [/]** to create parentheses. The subgroups will display within those parentheses.

These subsets of channels or subgroups are treated as a single channel in the following ways:

- When applying absolute or relative effects from live, the subgroups are treated as a single channel by the effect.
- When setting a range of step's channels on a step based effect, the subgroup will not be spread out amongst multiple steps.
- When the group is selected and next/last is pressed, each subgroup is traversed.
- When a group has subgroups, **{Reverse}**, **{Reorder}**, and **{Random}** in the group editor will affect the subgroups instead of the channels in each subgroup. **{Reorder}** will order the groups based on the first channel in each subgroup.



Subgroups can be created either in Live or in the group list.

- **[Shift] & [/] [1] [Thru] [4] [Shift] & [/] [Record] [Group] [2] [Enter]** - creates a subgroup in Live.

- **[Group] [2] [Enter] [Shift] & [/] [1] [Thru] [4] [Shift] & [/] [Enter]** - creates a subgroup in the group list index.

Editing and Updating Groups in Live

Existing groups can be updated or re-recorded in Live. If you re-record an existing group, a confirmation is required (unless disabled in Setup). By re-recording a group, you **replace** the contents of the group, you do not add to it. Updating a group does not require a confirmation and adds channels to the group, rather than replacing them.

Group updates containing manual data follow the same behavior as **[Record Only]**, and will store only the manual data. See *Using Record in Live*.

Other editing or updating examples are:

- **[Group] [x] [Label] [Label] [Enter]** - clears the label.
- **[Group] [x] [Label]** [name] **[Enter]** - stores a new label.
- **[1] [Thru] [5] [Update] [Group] [n] [Enter]** - adds channel 1-5 to existing Group n.

For record examples, see *Recording Groups Live*.

Multicell Fixtures in Groups

There are multiple different ways to create groups using multicell fixtures.

Note: *The following examples are created in the group list. Groups can also be recorded in Live. See Recording Groups Live.*

To create subgroups of the whole multicell fixtures:

- **[Group] [3] [1] [Enter] [5] [0] [0] [Thru] [5] [0] [3] [Enter]**

To create a group with only the cells of the selected multicell fixtures:

- **[Group] [3] [2] [Enter] [5] [0] [0] [Thru] [5] [0] [3] [.] [Enter]**

To create a group with only certain cells of multicell fixtures:

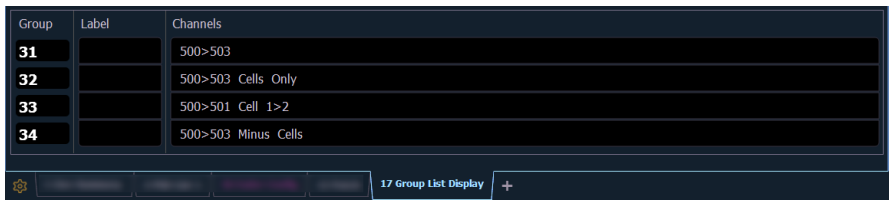
- **[Group] [3] [3] [Enter] [5] [0] [0] [Thru] [5] [0] [1] [.] [1] [Thru] [2] [Enter]**

To create a group with only the master cells:

- **[Group] [3] [4][Enter] [5] [0] [0] [Thru] [5] [0] [3] [Shift] & [.] [Enter]**

To create subgroups with only specific cells:

- **[Group] [3] [5] [Enter] [5] [0] [0] [.] [1] [Shift] & [/] [5] [0] [1] [.] [1] [Enter]**



You can also use the **{Offset}** softkeys to aid in create of groups and subgroups. See *Offset*.

Group Selection

Groups may be selected from the control keypad or the direct selects.

To select a group:

- **[Group] [1] [Enter]** - selects all channels in group 1.
- **[Group] [1] [At] [5] <0> [Enter]** - selects group 1 and places all channels within at 50%.
- **{Group 1}** - Selects all channels in group 1.

If **[Next]** is used after a group selection, it accesses the first ordered channel in that group. Pressing it again accesses the second ordered channel in that group, and so on. **[Next]** - used after the last channel in the group - accesses the first channel in the group again.

[Last] may be used with group selects similar to **[Next]**. Press **[Select Last]** to reselect the entire group.

Using Groups to Select Channels

[Group] can also be used as a quick way to collect channels from various targets.

- **[Group] [Cue] [#] [Enter]** - selects all the channels in the specified cue.
- **[Group] [Sub] [#] [Enter]** - selects all the channels in the specified submaster.
- **[Group] [Int Palette] [#] [Enter]** - selects all the channels in the specified intensity palette.
- **[Group] [Effect] [#] [Enter]** - selects all the channels currently using the specified effect. Channels are selected in the order they were used or stored in the effect.

Deleting Groups

When you delete a group, the group number and all contents from the Group List Index and Direct Selects are deleted. Delete commands require a confirmation by default. This can be altered in the default settings. If you disable confirmations, the second enter is not required in the following examples:

Group deletion features include:

- **[Delete] [Group] [5] [Enter] [Enter]** - deletes group 5.
- **[Delete] [Group] [3] [+] [Group] [5] [Enter] [Enter]** - deletes groups 3 and 5.
- **[Delete] [Group] [3] [Thru] [9] [Enter] [Enter]** - deletes groups 3 through 9.
- **[2] [Delete] [Group] [7] [Enter]** - deletes channel 2 from group 7.

Groups [Tab 17]

The group list allows viewing and editing of groups.

To open the group list you can:

- Press **[Group] [Group]**
- Press **[Tab] [1] [7]**

You can navigate within the group list using **[Next]** and **[Last]** or by selecting the group you want to work with.

Ordered View and Numeric View

By default, grouped channels will be displayed in ordered view. Therefore, grouped channels will appear in the order they were added to the group (see *Ordered Channels*). If you wish to view the channels in numeric view, press the **[Format]** key and the view will be switched (channels will appear in numeric order from lowest to highest).

This setting defines how channels are displayed in Group List. If left in numeric format, group selection channels will be displayed in chronological order. If left in ordered view, they will be displayed based on their order of being stored to the group.

Editing Groups from the Group List

An existing group can be modified without the need for recording or updating, as follows.

- Select the required group by pressing **[Group]** [n] **[Enter]**, or using **[Next]** and **[Last]** to navigate through the list.

The selected group is highlighted in gold.

The following actions are possible:

- **[Label]** [name] **[Enter]** - adds or modifies a group label.
- **[Copy To] [Group] [7] [Enter]** - copies the contents of the selected group to group 7.
- **[2] {Insert Before} [9] [Enter]** - inserts channel 2 into the group, placing it before channel 9 in the ordered view.
- **[2] {Insert After} [5] [Enter]** - inserts channel 2 into the group, placing it after channel 5 in the ordered view.
- **[2] [Delete] [Enter]** - removes channel 2 from, the group.
- **[+] <Chan> [1][0] [Enter]** - adds channel 10 to the selected group.
- **[-] <Chan> [5] [Enter]** - removes channel 5 from the selected group.
- **[+][Group] [1][0] [Enter]** - adds group 10 to the selected group.
- **[-] [Group] [5] [Enter]** - removes group 5 from the selected group.
- **{Random} [Enter]** - rearranges the channels in the group randomly.
- **{Reverse} [Enter]** - reverses the order of the channels within the group.
- **{Reorder} [Enter]** - reorders the channels to numeric order in the group selected.
- **{Offset}** - see *Offset*.

Groups can be assigned an icon, which can be configured to appear on the direct select button in Direct Selects (Tab 4) or Custom Direct Selects (Tab 39). See *Icons*.

Chapter 9

Palettes

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About Palettes

Palettes are referenced data. This means that when included in presets, cues, or effects, changes to the contents of the palette are propagated into all of the places the palette is stored.

Palettes are a critical component when using automated fixtures and can save considerable programming time when editing show data.

Four *Palette Types* are available. When recording palettes, three softkey *Palette Options* are available.

Eos supports up to 1,000 palettes of each of the four types, which can be recorded as decimal (up to three places, 0.001) or whole number (up to 9,999.999). Palettes are automatically filtered into IFCB categories. Color data cannot be placed in beam palettes, intensity cannot be included in focus palettes, and so forth. This makes the process of creating palettes easier, faster and less work. If you need to create a reference that will include a mix of IFCB information, *Presets* can be used.

Palettes can be mapped to faders. See *Preset and Palette Fader Properties*.

Palette Types

There are four types of palettes.

Intensity Palettes [Tab 22]

Intensity palettes can be created for use with all channels that have intensity parameter data.

Focus Palettes [Tab 23]

Focus palettes can be created for all channels that have focus parameter data.

Focus palettes store focus data including pan, tilt, and XYZ position. Use **{Enable/Disable XYZ Format}** to toggle the format of data stored.

Focus palettes can be assigned to track a specific *Scenic Element Movable (SEM)*. Focus will aim at the XYZ location of the SEM, offset by the pan and tilt values in the palette. For example, an actor is standing on an SEM with an assigned focus palette. Giving the palette a Z value of 5 feet will focus lights using the palette 5 feet above the SEM, hitting the upper body of the actor.

Color Palettes [Tab 24]

Color palettes can be created for all channels that have color parameter data. Color palettes store any combination of color data, including CMY, RGB, and HS settings, color scrollers, and color wheels.

[Record Only], filter settings, and selective store commands are very useful when storing color palettes. Element Classic users will need to use **[Record][Record]**.

Beam Palettes [Tab 25]

Beam palettes can be created for all channels that have any beam parameter data. It is rare when storing beam palettes that you will wish to include all of the beam parameters for channels. Therefore, **[Record Only]**, filters and selective store commands will be very useful when storing beam palettes. Element Classic users will need to use **[Record][Record]**.

Palette Options

When recording palettes, there are three softkey options.

{By Type} Palettes

By Type Palettes are created with 'default' channels which contain values that can be assigned to any other channel within the same fixture type. By Type palettes can also contain discrete channel values.

By Type palettes will display a 'T' in the lower corner of the direct selects and in the palette lists. A '+' will display after the 'T' if there are channels stored with discrete data.

{Absolute} Palettes

Absolute palettes are palettes that when recalled the data is displayed and treated like absolute data applied to a channel. The data is never referenced.

An absolute palette will display with an "A" in the lower corner of the direct selects and in the palette lists.

{Locked} Palettes

Locked palettes are palettes that are protected from being accidentally changed in Live.

A locked palette will display a "L" in the lower corner of the direct selects and in the palette lists.

Locked palettes can be updated by specifically calling the channels and the record target, **[**channel list**] [Update] [**record target**] [Enter]**. You cannot update a locked color palette directly in Live. However, locked palettes are not protected in Blind.

Storing Palettes Live

Palettes may be stored in live or blind. There are a variety of methods for determining what data is stored into a palette but **[Record]**, **[Record Only]** and using filters are the most common ways.

When **[Record]** is used, Eos will store the relevant parameter category data (intensity, focus, color or beam) for all channels that are not currently at their default value.

[Record Only] is a type of selective store that can be used to store only the relevant parameters that have manual data. Filters and selective storing provide additional methods to control what is stored into a palette.

On Element Classic, double pressing **[Record]** will post Record Only to the command line.

Storing Palettes with [Record]

Note: *[Focus Palette] and [Beam Palette] are used in the examples below. Element Classic users will need to use {Focus Palette} and {Beam Palette}. The easiest way to access palettes is via ML Controls [Tab 5].*

The most common method to create palettes is to store them from Live. Palettes can be numbered from 0.001 through 9999.999, and each can be given a label. **[Record]** will store the relevant current parameter data for all channels with non-default data for the appropriate palette type, as modified by the filter settings.

For example, assume you want to create a custom color using the color picker and store that data to a custom color palette. Select channels 1-11 using **[1] [Thru] [1] [1] [Enter]**. Using the color picker, adjust the hue and saturation levels to the desired look. When the color is selected, store the palette with **[Record] [Color Palette] [4] [Label]** <FOH Blue> **[Enter]**. Notice

that when you recorded the color palette, all of the color data for channels 1 through 11 is displayed in live with the reference "CP 4". Because **[Record]** was used, it stored all of the color parameters for those channels. Element Classic users will need to use **{Color Palette}**.

Note: *[Record] will store the entire parameter category into a palette. [Record Only] stores just the values you have adjusted manually to the target palette. See Storing Palettes with [Record Only].*

When a palette is created, the channels and the parameters involved in the record action are automatically set to the palette reference ("CP 4" in this instance). To view the absolute data for those channels, press and hold the **[Data]** key.

The following methods can be used to store palettes using **[Record]**:

- **[Record] {Color Palette 1}** - records all color parameter data to color palette 1 and shows it as the first color palette direct select. See *Storing Palettes to Direct Selects*.
- **[Record] [Focus Palette] [2] [Label] <**name**> [Enter]** - records focus parameter data for all channels not at their default state and adds a label to focus palette 2.
- **[Record] {Color Palette} [Next] [Enter]** - records data to the next sequential color palette number.

Selective Storing Palettes

Palettes can also be created using selective storing, which allows you to specify only the channels and or parameters that you want to store.

The following examples illustrate various methods of selectively storing palettes using **[Record]**:

- **[1] [Thru] [3] [Record] [Intensity Palette] [2] [Label]** <name> **[Enter]** - records the intensity data for selected channels 1 through 3 and adds a label to intensity palette 2.
- **[Group] [2] [Record] {Beam Palette} [Next] [Enter]** - records the beam parameter data for Group 2 to the next sequential beam palette number.
- **[-] [9] [Record] [Focus Palette] [5] [Enter]** - stores the focus data to focus palette 5, excluding the group or channels specified.
- **[1] [Thru] [9] {Iris} {Zoom} [Record] [Beam Palette] [5] [Enter]** - stores all zoom and iris data for channels 1 through 9 to beam palette 5.
- **[-] [5] [Record] [Beam Palette] [Next] [Label] <**name**> [Enter]** - stores to the next sequential beam palette, withholding the group or channels specified and adds a label.

Note: *When using a selective store, you must specify the channel list to be included or excluded, identified by the **[+] [-]** modifier, as part of the **[Record]** command. Otherwise all channels with appropriate non-default data will be stored in the new palette.*

Selective storing is useful when you are doing a "one-time" selective store action. If you are recording a series of palettes with only specific parameters, it will save you time to set a record filter. See Using Filters with Palettes.

Storing Palettes with [Record Only]

Note: *[Record Only] is used in the examples below. Element Classic users will need to use **[Record] [Record]**.*

[Record Only] is a selective record process that stores **only manual parameter data**. When used to record palettes, only the manual parameter data for channels will be stored in the palette. As with record, filters can further restrict stored data if they are enabled when using [Record Only]. See *Storing Palettes Live*.

Note: *If you use **[Record Only]** to record to an existing palette, the data will be added to that palette. The original palette will not be completely overwritten. Only manual changes will be stored to the palette.*

Note: *It is possible to **[Update]** to add specific changes to the record target. See Update.*

The following methods can be used to selectively store manual parameter data to palettes using [Record Only]:

- [Record Only] [Color Palette] [2] [Enter]- records only the manual color parameter data to color palette 2.
- [Record Only] [Beam Palette] [5] [Label] <name> [Enter] - records manual beam parameter data for all channels and adds a label to beam palette 5.
- [-] [9] [Record Only] [Color Palette] [Next] [Label] <name> [Enter] - stores manual data to the next sequential color palette, withholding the group or channels specified and adds a label.
- [select channels] [Record Only] [Focus Palette] [2] [Enter] - stores focus palette 2, but only includes the manual data for the specified channels and parameters.
- [1] [Thru] [9] {Iris} {Zoom} [Record Only] [Beam Palette] [5] - stores only manual zoom and iris data for channels 1 through 9 to beam palette 5.

Storing Palettes to Direct Selects

You can store palettes efficiently using the *Direct Selects [Tab 4]* by simply touching the desired direct select for that palette from the touchscreen. For example, if you want to store color data to color palette 4, select [Record] and then press the button in the bank of color palette direct selects that is labeled in the lower right corner with a light gray **4**. Color Palette **4** will appear in the direct select, indicating a successful store.

Using Filters with Palettes

Filters can be used to modify what data is stored to a palette by a record action. The parameters that are active or filtered allow those parameters to be stored to record targets.

To filter a parameter:

1. Press the {Filter} button in the CIA. The {Filter} button will flash.
2. Press the button for the parameter you wish to store.
3. Press the {Filter} button to release. "Filter On" appears next to the parameter category button.

To determine which parameter is filtered in the category:

1. Press the {Filter} button. All actively filtered parameters are highlighted in gray. You may need to press the arrow softkey for that parameter category to page additional parameters in the category.

Filters are a toggle state. To remove filters, press {Filter} and then press the highlighted parameter buttons in the CIA to deactivate the filters, or use {Clear Filters}.

Recalling Palettes

Note: *[Palette] and [Beam Palette] are used in the examples below. Element Classic users will need to use {Palette} and {Beam Palette}.*

Palettes may be recalled from the control keypad, from direct selects, or from ML Controls (see *ML Controls [Tab 5]*)

When palettes are recalled, all data is manual and will display in red. Recalled palettes are applied only to selected channels, therefore you must select channels before recalling a palette. If a selected channel or parameter has no stored value in the recalled palette, it remains in its current state. Palettes on direct selects will be highlighted if they are applicable for the current channel selection.

You can select all the channels included in a palette by pressing **[Group] [Palette]** [x] **[Enter]**. You can also recall an entire palette by pressing **[Recall From] [Palette]** [x] **[Enter]**.

Note: *If enabled in Setup, you can double click on a palette direct select button to quickly recall from the selected palette and put its content on stage. See Device > Displays for additional information.*

Recalled palettes will appear as manual data for the specified channels. That data will appear as abbreviations of the palette type (IP3 = Intensity Palette 3, FP8 = Focus Palette 8, and so on), or as the palette label if defined/enabled in the displays settings in Setup (see *{Show Ref Labels}*). To see the numeric values behind any palette (or other referenced value), press and hold the **[Data]** key. To see the palette number behind the label, press **[About] + [Label]**.

When palettes are recalled, channels with stored data in the palette will follow that data according to manual time settings. A manual time master fader can also affect the timing. See *Manual Time Master*.

Palettes may also be recalled using a time specified using **[Sneak] [Time]**. For examples on using **[Sneak] [Time]**, see *Sneak*

You may also use groups to recall palettes. For example:

- **[Group] [1] [1] [Beam Palette] [5] [Enter]**
- **[Group] [5] {Color Palette 6}**

Palettes may also be recalled from the direct selects which automatically terminates the command line. To recall only specific parameters of a palette, select channels and the required parameters (or those not required, using the **[-]** key) in the command line.

The following are methods that can be used to recall palettes.

- **[**selected channels**] {**direct select**}** - recalls the associated (IFCB) palette data for the selected channels.
- **[**selected channels**] [Palette]** [n] **[Enter]** - recalls the associated IFCB palette for selected channels.
- **[**Channel List**] {edge} [Beam Palette]** [n] **[Enter]** - recalls only the edge data from the specified beam palette for the selected channels.
- **[Group]** [n] **[Palette]** [z] **[Enter]** - recalls all of the data in the palette and applies it to the selected group.
- **[Intensity Palette]** [y] **[At]** [z] **[Enter]** - recalls the intensity palette for selected channels and sets all recalled intensity values to a proportioned level of their recorded states.

Note: *The above example breaks the referenced link to the intensity palette. To maintain the link, the palette must be recalled without a modified intensity value. Calling back the intensity palette at full will also break this link.*

When recalling palettes, only channels that are selected at the point of recall will be affected by the palette recall. The data recalled from a palette is referenced. To break the reference you may use **{Make Absolute}**.

- **[**Channel List**]{Edge} {Beam Palette} [n] {Make Abs} [Enter]** - recalls only the edge data from the specified beam palette for the selected channels and makes that absolute data.

Palettes On Faders

Palettes can be mapped to faders. See *Preset and Palette Fader Properties*.

Presets and palettes can be used to create a temporary list of content that can be played back on a fader. See *Temporary Fader Mapping*.

Editing Palettes Live

Note: *[Palette] and [Color Palette] are used in the examples below. Element Classic users will need to use {Palette} and {Color Palette}.*

If a palette is already recorded, **[Record]** replaces all existing data, unless channels have been excluded. **[Record Only]** is a selective store, therefore it adds data. Recording over a previously existing palette requires a confirmation, if confirmations are enabled in Setup. See *Record Defaults* It is also possible to **[Update]** to add manual changes to the record target.

Rerecord

Rerecording follows the conventions illustrated in the **[Record]** and **[Record Only]** sections detailed earlier in this chapter. The only exception is that a confirmation is required to record over an existing palette.

There are two different methods for rerecording:

- **[Record] [Palette] [5] [Enter] [Enter]** - overwrites the content completely.
- **[**Channel List**] [Record] [Palette] [5] [Enter] [Enter]**- merges the data.

Update

Live changes can be updated to both active and inactive palettes. When updating a parameter in an active palette, that parameter will no longer be absolute data, but will now be in the updated palette on stage.

The following illustrates how to update color palette 2 when no cues are active and you have recalled channels within that palette.

- **<**channel list**> [Update] [Color Palette] [2] [Enter]** - any manual changes for channels originally in the palette are updated in color palette 2.
- **[1] [Update] [Color Palette] [2] [Enter]** - adds channel 1's manual data to color palette 2.
- **[-] [3] [Update] {Color Palette 2}** - withholds manual changes for channel 3 from the update to Color Palette 2 using the direct selects.

If a channel or parameter does not have data in the palette being updated, it will not be added to that palette unless the user specifically requests it, by specifying the channel.

Editing Palettes in Blind

Note: *[Palette] is used in the examples below. Element Classic users will need to use {Palette}.*

All palettes can be viewed and edited in Blind. To open a palette in Blind, you can do any of the following:

- **[Blind] [Palette] [Enter]** - pressing this will display the first recorded palette of the selected type (Intensity, Focus, Color or Beam) in Blind or return to the last palette of this type viewed in blind.
- **[Blind] {Palette Select 3}** or **[Blind] [Palette] [3] [Enter]** - pressing this will display the specified palette in Blind.
- **[Palette] [Palette] {Edit}** - opens the list view of the palette type and then opens Blind palette. You can also use the tab number to open the list view. See *Editing Palettes in List View* for a list of tab numbers.

CAUTION: ***When editing palettes in Blind, changes to palettes are automatic, therefore no update or record command is required.***

Palettes can be viewed and edited in blind in the table and spreadsheet views. In Blind, the following softkeys are available when editing palettes:

- *{By Type} Palettes*
- *{Absolute} Palettes*
- *{Locked} Palettes*
- *Editing By Type Palettes in Blind*
- *Offset*
- *{Make Null}*
- *{Make Absolute}*
- *Replace With*
- *[Query]*

Entering Blind Palette from Live

Note: *[Palette] is used in the examples below. Element Classic users will need to use {Palette}.*

- **[Blind] [Palette] [Enter]** - pressing this will display the first recorded palette of the selected type (Intensity, Focus, Color or Beam) in blind or return to the last palette of this type viewed in blind.
- **[Blind] {Palette Select 3}** or **[Blind] [Palette] [3] [Enter]** - pressing this will display the specified palette in blind.
- **[Palette] [Palette] {Edit}** - opens the list view of the palette type and then opens blind palette.

Viewing Palettes From Blind

While in any blind mode, when no channels are selected, you can enter a palette from the command line or direct selects. This will take you into blind channel mode for that palette.

- **[Color Palette]** [n] **[Enter]**
  - Element Classic users will need to use **{Color Palette}** [n] **[Enter]**

You may also step through the available palettes using **[Next]** and **[Last]**.

Editing in Blind

The following are representative methods used for editing palettes in Blind:

- **[2] {Iris} [At] [Enter]** - removes the current parameter value from channel 2.
- **[1] {Iris} [5] [0] [Enter]** - selects channel 1 and sets iris value to 50.
- **[2] [Copy To] [5] [Enter]** - copies the information from channel 2 to channel 5.
- **[6] [Recall From] [Focus Palette] [1] [Enter]** - recalls the values for channel 6 from Focus Palette 1 but not the reference.
  - Element Classic users will need to use **{Focus Palette}**

You may set Blind levels with encoders, if available.

When editing in Blind, it is possible to remove an instruction from any palette by selecting the channel and parameter and pressing **[At] [Enter]** or **{Make Null} [Enter]**.

[Recall From], **[Copy To]**, **Move To** (accessed by pressing **[Copy To] [Copy To]**), and **{Replace With}** may be used to create and edit palette data. See *Advanced Manual Control*.

Note: *While editing palettes in blind, hitting **[Recall From] [Recall From]** will put **[Recall From] [Palette]** on the command line.*

Palettes can be assigned an icon, which can be configured to appear on the direct select button in Direct Selects (Tab 4) or Custom Direct Selects (Tab 39). See *Icons*.

Spreadsheet Editing Palettes

Note: *[Color Palette] and [Beam Palette] are used in the examples below. Element Classic users will need to use {Color Palette} and {Beam Palette}.*

Blind Spreadsheet view shows a range of palettes along the Y axis and channel parameters along the X axis. Viewing palettes in spreadsheet view is useful when you want to compare data between palettes. While in blind, press **[Format]** to access the spreadsheet. See *Spreadsheet (Blind Only)*.

After selecting a palette, you may use the **[Next]** or **[Last]** keys to move through the list or you may select the exact palette from the keypad. You may also select a range of palettes to edit at once. You can make changes to the palettes by selecting channels and altering parameter values. In addition to normal editing functions, you may also use the following commands in this view: **[Copy To]**, **{Make Absolute}**, **{Make Null}**, **Move To** (accessed by pressing **[Copy To] [Copy To]**), and **{Replace With}**.

The following are representative methods used for editing palettes in blind spreadsheet:

- **[Color Palette] [1] [Thru] [9] [Enter]** - selects color palettes 1 through 9.
- **[1] {Scroller} {Make Null} [Enter]** - sets channel 1 scroller value null in the selected color palettes.
- **[1] {Scroller} [4] [Enter]** - sets channel 1 scroller value to frame 4 in the selected color palettes.

Here are some examples of the additional palette editing features available in spreadsheet view:

- **[**palette type**] [1] [Thru] [5] {Move To} <**palette type**> [9] [Enter]** - this will move palettes 1 through 5 to palettes 9 through 14 respectively. You do not have to supply the end value for the console to perform the move.

- **[Beam Palette] [1] [Thru] [5] [Enter] {Iris} [5] [0] {Replace With} [2] [5] [Enter]** - for palettes 1 through 5, this command will replace any iris parameter values of 50 with values of 25.

Editing Palettes in List View

When you press the specific Intensity, Focus, Color or Beam palette button twice, a list view for the associated palette type is opened in a new tab (or brings the list view into focus if already open). You can also open the list views from the home screen. See *Workspace Layout Menu*.

You can also open the list views by using their tab numbers. Press and hold **[Tab]** and type the number to open.

- **Intensity Palette** - **[Tab] [2] [2]**
- **Focus Palette** - **[Tab] [2] [3]**
- **Color Palette** - **[Tab] [2] [4]**
- **Beam Palette** - **[Tab] [2] [5]**

Indicators for absolute (A), locked (L), and by type (T+) display to the right of the palette number.

Note: *In the by type channels column, any channel number with an asterisk indicates that the channel does not have any by type data stored to it.*

From the list view, you can select a palette for editing, which changes focus to blind channel view, with the specified palette ready for editing. In addition, you can add palettes to your list and edit the labels for each palette in the list. In list view, you can select palettes and relabel or move them:

- **[1] [5] [Label] <**name**> [Enter]**

While in the specific palette category list view, the **{Edit}** softkey is available for use. The **{Edit}** softkey opens a blind channel view of the selected palette and changes focus from the palette list. You can change the blind display to spreadsheet or table view by pressing the **[Format]** key.

You can copy palettes within the list to another location in the list using **[Copy To]**.

- **<Color Palette> [2] [Copy To] [9] [Enter] [Enter]** - copies the contents of color palette 2 to color palette 9. Color palette 2 will remain in the list. The second **[Enter]** is not required if you have disabled confirmations in setup.

You can also use **[Copy To]** from presets to palettes.

To move a specific palette to a different location:

- **[1] {Move To} [3] [Enter]** - moves the contents and label of the specific palette 1 to palette 3. If palette 3 is already used, you will be asked to confirm that you want to overwrite the existing recorded palette. You can hit **[Copy To] [Copy To]** to access **{Move To}**.

You can also move data from a preset to a palette and vice versa. It is important to remember that when using the **{Move To}** command that data is removed from its current location and moved to its new location.

To edit any palette data from list view:

- **[1] [5] {Edit} [Enter]** - selects palette number 15 and brings the blind display into focus, with palette 15 selected for editing. You can use the **[Next]** and **[Last]** buttons to access the other palettes, or select a new palette for editing from the keypad.

By Type Palettes

Storing a By Type Palette

If **{By Type}** is used when recording, the lowest number channel of each fixture type will be the default channel. Generally, when storing by type palettes, you will want only one channel of each fixture type in use. Any additional channels in that fixture type will be recorded with discrete data.

- **[1] [Thru] [5] [Record] [Int Palette] [1] {By Type} [Enter]** - Channels 1 through 5 are saved to Intensity Palette 1. Channels 1 through 5 are of the same fixture type. Channel 1 will be the default channel and channels 2 through 5 will be saved with discrete data.
- **[1] [Thru] [5] [Record] {Intensity Palette 1} [Enter]** - If a by type palette is recorded without using the **{By Type}** softkey and the default channel is included in the record, the default channel's level will change and all other changes will be discrete.
- **[1] [Thru] [5] [Record] {Intensity Palette 1} {Discrete} [Enter]** - If a default channel is included in a record where **{Discrete}** is used and another channel is tracking it, the default channel will be changed to having discrete data and the lowest numbered tracking channel will become the new default channel. All other channels in the record will also have discrete data.

Editing By Type Palettes in Blind

Note: *[Color Palette] and [Beam Palette] are used in the examples below. Element Classic users will need to use {Color Palette} and {Beam Palette}.*

In Blind, the default channel's levels will display in blue, discrete data for the other channels will display in white, and any channels that are using the default channel value will display in magenta.

- **[3] {By Type} [Enter]** - makes channel 3 the new default channel for that device type. If another channel for that type was the default channel, its data will now be discrete.
- **[1] [0] [Thru] [2] [0] {Discrete} [Enter]** - changes the levels for channels 10 through 20 to discrete. If any of those channels are default, the lowest numbered tracking channel will become the new default channel.
- **[5] [Thru] [8] [At] [Enter]** - removes the discrete data for channels 5 through 8. They will now use the default channel's values.
- **[Color Palette] [2] {Discrete} [Enter]** - changes all tracking and default channels to discrete.
- **[Intensity Palette] [5] {By Type} [Enter]** - makes the first channel of each device type a default channel.
- **[Beam Palette] [3] {Cleanup} [Enter]** - converts palettes created in earlier versions of Eos Family software to by type palettes. If by type channels exist in this palette, **{Cleanup}** will convert any discrete levels that match their by type channel's level to tracks.

{Make Null} can be used with by type palette when you wish to withhold a channel from responding to a by type palette recall. The data will still display but will be in gray with a "N". See *{Make Null}*.

Updating By Type Palettes

Pressing **{By Type}** after an **[Update]** command, with a channel tracking but no default channel included in the update, will cause the lowest numbered tracking channel's level to be updated

into the default channel. The tracking channel will remain tracking. This means that when updating a default value in a by type palette, you don't need to know the default channel number.

When a default channel is included in an **[Update]** command without using **{By Type}** and another channel is tracking it, the default channel's data will be changed to discrete. The lowest numbered tracking channel will then become the new default channel. Any other updated channels will be made discrete.

Other Palette Edits

Note: *[Color Palette] is used in the examples below. Element Classic users will need to use {Color Palette}.*

Removing Channels from a Palette

You can remove specific channels from a palette. This can be done from Blind.

- **[Blind] [Color Palette] [Enter]** - opens the palette in Blind.
- **[Color Palette] [5] [Enter]** - select the palettes you wish to edit.
- **[2] [+] [4] [+] [6] [Thru] [9] [At] [Enter]** - removes channels.
  - You may also remove a channel or parameter from a range of presets by pressing **[Beam Palette] [1] [Thru] [5] [Enter] [6] [At] [Enter]**.
  - You can remove channels from Live by pressing **[**channel list**] [Delete] [Color Palette] [2] [Enter]**.

Deleting Palettes

To delete color palette 1, press **[Delete] [Color Palette] [**1**] [Enter] [Enter]**. When palettes are deleted, any references in cues will be converted to absolute data.

Chapter 10

Presets

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About Presets

Presets are very similar to palettes in that they are collections of data for specific channels to facilitate cue creation. Presets, however, can collect all data for a given channel (intensity, focus, color, beam) rather than a single parameter category.

Eos supports up to 1,000 presets, which can be recorded as decimal (up to three places, 0.001) or whole number (up to 9,999.999). They can contain absolute data and/ or a mix of IFCB palettes. Presets cannot refer to other presets.

On most Eos Family consoles, presets can be mapped to faders. See *Preset and Palette Fader Properties*.

Effects can be stored in presets. See *Recording an Effect to a Preset*.

Preset Options

When recording presets, there are three softkey options.

{By Type} Presets

By Type presets are created with 'default' channels which contain values that can be assigned to any other channel within the same fixture type. By Type presets can also contain discrete channel values.

By Type presets will display a ‘T’ in the lower corner of the direct selects and in the presets list. A ‘+’ will display after the ‘T’ if there are channels stored with discrete data.

{Absolute} Presets

Absolute presets are presets that when recalled the data is displayed and treated like absolute data applied to a channel. The data is never referenced. An absolute preset will display with an ‘A’ in the lower corner of the direct selects and in the presets list.

{Locked} Presets

Locked presets are presets that are protected from being accidentally changed in Live.

A locked preset will display a “L” in the lower corner of the direct selects and in the presets list.

Locked presets can be updated by specifically calling the channels and the record target, **[**channel list**] [Update] [**record target**] [Enter]**. Using **[Update] [Preset] [1] [Enter]** would not work in Live for a locked preset. However locked presets are not protected in Blind.

Storing Presets Live

Presets can be recorded live using the keypad and/ or the direct selects. Both **[Record]** and **[Record Only]** can be used to record presets, with or without filters. See *Storing Data with Record Filters*.

[Record] will store all channels that are not at their home values, and it will record all information about those channels, including parameters that are still at default. Therefore presets can contain all of the same information as a cue, but they have no timing information or cue attributes (such as follow, delay, or cue overrides). When recorded or re-recorded, presets are automatically recalled on stage. Presets may be individually labeled.

Storing Presets Using [Record]

The **[Record]** key will store all parameter data for channels with one or more parameters not at their home values, as modified by the filter settings in the CIA. If filters are used, only the parameters enabled by the filters are stored.

When you record data to a preset live, the channels involved in that preset will then actually be in that preset.

Note: *[Preset] is used in the examples below. Element Classic users will need to press **[Shift] & [Intensity Palette]** or use the **{Preset}** button in ML Controls.*

The following methods can be used to store presets using **[Record]**:

- **[Record] [Preset] [5] [Label]** [name] **[Enter]** - records all parameter data for all channels not at default and adds a label to preset 5.
- **[Record] [Preset] [Next] [Enter]** - records data to the next sequential preset number.
- **[-] [2] [Record] [Preset] [n] [Enter]** - stores the preset, withholding the group or channels specified.
- [channel list] **[Record] [Preset] [6] [Enter]** - stores the preset, but only the data for the channel list supplied.
- **[Record] {Preset 1}**- records the preset and shows it as the first preset direct select.
- [channel list] **{AllNPs} [Record] [Preset] [8] [Enter]** - records all non-intensity parameters for the selected channels to the preset.

Note: *When using selective record, the user must specify the channel list to be included (or excluded as the case may be) as part of the **[Record]** command. Otherwise, all parameters of channels with non-home values will be stored in the preset.*

Note: *You may also use the filters and **{Make Null}** as additional tools to decide what data will be stored. For more information on these features see {Make Null} and Filters .*

When you re-record an existing Preset, a confirmation will be required, unless *Record Defaults* have been disabled in Setup.

Storing Presets Using [Record Only]

[Record Only] is a selective record process that stores **only manual parameter data**. Therefore, when used to record presets, only manual data for channels will be stored in the preset. As with **[Record],** filters and **{Make Null}** can be used to further modify what information is stored. See *Storing Data with Record Filters*.

On Element Classic, double pressing **[Record]** will post Record Only to the command line.

The following methods can be used to store presets using **[Record Only]**:

- **[Record Only] [Preset] [5] [Label]** [name] **[Enter]** - records **manual** parameter data for all channels and adds a label to preset 5.
- **[Record Only] [Preset] [Next] [Enter]** - records manual data to the next sequential preset number.
- **[-] [3] [Record Only] [Preset]** [n] **[Enter]** - stores the preset, withholding the group or channels specified.
- [Channel list] **[Record Only] [Preset] [6] [Enter]** - stores the preset, but only the manual data for the channel list supplied.

- [Channel list] {Color} [Record Only] [Preset] [7] [Enter] - stores only manual color data for the specified channels to the preset.

Recalling Presets

Channels must be selected when recalling a preset. If a selected channel or parameter has no value in the preset, it will stay in its current position. If you want to recall all channels in a preset, you can press [Recall From] [Preset] [x]. Presets on direct selects will be highlighted if they are applicable for the current channel selection.

Note: *If enabled in Setup, you can double click on a preset direct select button to quickly recall from the selected preset and put its content on stage. See Device > Displays for additional information.*

If you only want to recall certain parameters of the preset, select channels and enter the required parameters (or those not required, using the [-] key) in the command line (see command examples below).

When a preset is recalled, parameter changes will follow the manual timing defaults, if enabled. A manual time master fader can also affect the timing. See *Manual Time Master*.

Presets may also be recalled using a time specified using [Sneak] [Time]. For examples on using [Sneak] [Time], see *Sneak*

You may recall presets using any of the following methods:

- {Preset direct select} - recalls the associated preset data for selected channels.
- [Preset] [2] [Enter] - recalls preset 2 for selected channels.
- [Channel List] [Preset] [2] [Enter] - recalls the preset data for the channels in the selection list.
- [Channel List] [Preset] [Enter] - recalls the last selected preset's data for the channels in the selection list.
- [Channel List] {Color} [Preset] [5] [Enter] - recalls only the color data from the specified preset for the specified channels.
- {Color} {Preset direct select} - recalls just the color data from the specified preset for selected channels.
- [Recall From] [Preset] [3] [At] [5] <0> [Enter] - recalls all channels in preset 3, and sets all intensity values at 50%. The original intensity data is still linked to the preset. If the intensity change is desired, you must update the preset to maintain the change and the link. Storing the data to another record target would break the link and make the data absolute.
- [Channel List] [Preset] [7] [Enter] [At] [5] <0> [Enter] - recalls preset 7 for selected channels. Intensity values will be recalled at 50% of their recorded state. The intensity link is maintained. If the intensity change is desired the user either needs to update the preset to maintain the change and the link. Storing the data to another record target would break the link and make the data absolute.
- [Recall From] [Preset] [9] [Enter] - selects all channels with data stored in preset 9, and sets those channels to the values in preset 9.
- [1] [Recall From] [Preset] [1] [At] [5] <0> [Enter] - recalls the intensity of channel 1 from preset 1 at 50% of the stored value. If channel 1 was set to 50 in preset 1, it's recalled value would be 25.

Editing Presets Live

There are two ways to edit a preset in Live. You may rerecord the preset or you may use [Update].

Rerecording Presets

Rerecording follows the conventions of **[Record]** and **[Record Only]**. The only exception is that a confirmation is required to actually rerecord the preset.

Two different mode for rerecording:

- **[Record] [Preset] [5] [Enter] [Enter]** - overwrites the content completely.
- [Channel list] **[Record] [Preset] [5] [Enter] [Enter]** - merges the data.

Updating Presets

[Update] is used to record parameter modifications back to a preset. When updating, you must specify the preset to be updated. You may do this using the keypad or the direct selects.

For the purposes of the following descriptions, assume that there are no active cues on stage. Updating referenced values while cues are active is covered in *Modifying Cues Live*.

To update a preset, first recall the preset for any channels you wish to edit:

- **[1] [Thru] [5] [Preset] [1] [Enter]**
- **[Recall From] [Preset] [1] [Enter]**

Make required changes to the desired parameters using the keypad, encoders, or ML Controls. Once you have achieve the desired look, update the preset:

- **[Update] [Preset] [1] [Enter]**
- **[Update] {Preset 1}**

When updating a preset, only channels that are already in the preset will be updated. You need to select channels or parameters to force new data into a preset when using **[Update]**.

Presets [Tab 26]

The preset list displays all recorded presets. The Preset List only allows you to change attributes; no editing can be done directly in list view.

Press **[Preset]** twice to open the Preset list view. You can also open the list view from the home screen or by using **[Tab] + [2][6]**. Element Classic users will need to press **[Shift] & [Intensity Palette]** or use the **{Preset}** button in ML Controls. See *Workspace Layout Menu*.

Pressing the **{Edit}** softkey takes you to the blind view of the selected preset, in the last format you used in blind. This will allow you to edit the preset. You can change the blind display to spreadsheet or table view by pressing the **[Format]** key.

You can navigate the preset list using **[Next]** and **[Last]**.

Indicators for absolute (A), locked (L), and by type (T+) display to the right of the preset number.

In the by type channels column, any channel number with an asterisk indicates that the channel does not have any by type data stored to it.

Copy To

You can copy presets within the list to another location in the list using **[Copy To]**.

- **<Preset> [2] [Copy To] [9] [Enter] [Enter]** - copies the contents of preset 2 to preset 9. Preset 2 will remain in the list. The second **[Enter]** is not required if you have disabled confirmations in setup.

You can also use **[Copy To]** from palettes to presets.

Move To

You can move presets within the preset list using **Move To**, which is accessed by pressing the **[Copy To]** button twice.

- **<Preset> [3] [Copy To] [Copy To] [8] [Enter] [Enter]** - moves preset 3 to preset 8. Preset 3 will be removed from the list. The second **[Enter]** is not required if you have disabled confirmations in setup.
- **<Preset> [1] [Thru] [5] [Copy To] [Copy To] [6] [Enter] [Enter]** - moves presets 1 through 5 to presets 6 through 10.

You can also move data from a palette to a preset and vice versa. It is important to remember that when using the **Move To** command that data is removed from its current location and moved to its new location.

Editing Presets in Blind

All presets can be viewed and edited in blind. To open a preset in blind, you can do any of the following:

- Press **[Blind] {Preset** x**}** - opens to the specific preset
- Press **[Tab] & [2][6]** - opens the preset list
- Press **[Preset] [Preset]** and then **{Edit}** when a preset is selected in the list
  - Element Classic users will need to use **[Shift] & [Intensity Palette]** instead of **[Preset]**

CAUTION: ***When editing presets in Blind, changes to presets are automatically stored. Therefore no update or record command is required.***

You can change the blind display to spreadsheet or table view by pressing the **[Format]** key. In blind, the following softkeys are available when editing presets:

- *Preset Options*
- Cleanup (*By Type Presets*)
- Discrete (*By Type Presets*)
- *Offset*
- Make Null (*Editing in Table View*)
- Make Absolute (*Editing in Table View*)
- Replace With (*Editing in Table View*)
- Query (*[Query]*)

Presets can be assigned an icon, which can be configured to appear on the direct select button in Direct Selects (Tab 4) or Custom Direct Selects (Tab 39). See *Icons*.

Editing in Table View

Table view shows the data for one preset at a time in a table. Channels are displayed on the Y axis and parameters are shown along the X axis. Viewing presets in the table is useful if you want to see data for numerous channels in one specific preset.

To change which preset you are viewing you may use the **[Next]** or **[Last]** keys or you may select the exact preset from the keypad or direct selects. You can make changes to the preset by selecting channels and altering parameter values. In addition to normal editing functions, you may also use the following commands in this view: **[Copy To]**, **[Recall From]**, **{Make Absolute}**, **{Make Null}**, **{Move To}**, and **{Replace With}**.

Here are some examples of the additional preset editing features you have while editing in table view:

- [select channels or parameters] {Make Abs} - changes the data for any palette references within the preset into absolute data that no longer references another record target.
- [select channels or parameters] {Make Null} - removes the data for the specified channel or parameter from the preset.
- [select channels or parameters] [At] [Enter] - removes the data for the specified channel or parameter from the preset.
- [Preset] [5] {Move To} [Preset] [9] [Enter] - this will move the contents of preset 5 to preset 9. Preset 9 will be created and preset 5 will be deleted.
- [Preset] [1] [Copy To] <Preset> [5] [Enter] - this will copy the contents of preset 1 to preset 5. You may also copy ranges of presets to new locations.
- [1][Recall From][Preset][1][Enter] - will recall the contents for channel 1 in preset 1.

Note: *While editing presets in blind, hitting **[Recall From] [Recall From]** will put **[Recall From] [Preset]** on the command line.*

Spreadsheet Editing Presets

Spreadsheet view shows a range of presets along the Y axis and channels/channel parameters along the X axis. Viewing presets in spreadsheet view is useful when you want to compare data between presets.

You may select a preset from the spreadsheet using the [Next] or [Last] keys to move through the list or you may select the exact preset from the keypad. You may also select a range of presets to edit at once. You can make changes to the presets by selecting channels and altering parameter values.

In addition to the examples given in *Editing in Table View*, here are some examples of the additional preset editing features you have while editing in spreadsheet view:

- [Preset] [1] [Thru] [5] {Move To} <Preset> [9] [Enter] - this will move presets 1 through 5 to presets 9 through 14 respectively. You do not have to supply the end value for Eos to perform the move. If presets 9 through 14 already exist you will be asked to confirm this move.
- [Preset] [1] [Thru] [5] [Enter] {Iris} [5] [0] {Replace With} [2] [5] [Enter] - for presets 1 through 5, this command will replace any iris parameter values of 50 with values of 25. Range editing using {Replace With} is easiest done in spreadsheet view, but can be done in any Blind mode.

By Type Presets

Storing a By Type Preset

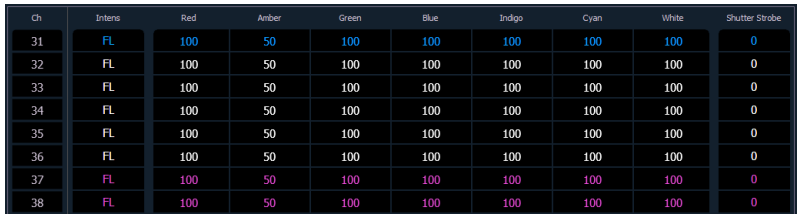
If {By Type} is used when recording, the lowest number channel of each fixture type will be the default channel. Generally, when storing by type presets, you will want only one channel of each fixture type in use. Any additional channels in that fixture type will be recorded with discrete data.

- [1] [Thru] [6] [Record] [Preset] [1] {By Type} [Enter] - Channels 1 through 6 are saved to Preset 1. Channels 1 through 6 are of the same fixture type. Channel 1 will be the default channel, and channels 2 through 6 will be saved with discrete data.
- [1] [Thru] [6] [Record] [Preset] [1] [Enter] - If a by type preset is rerecorded without using the {By Type} softkey and the default channel is included in the record, the default channel's level will change and all other changes will be discrete.

- **[1] [Thru] [5] [Record] {Preset 1} {Discrete} [Enter]** - If a default channel is included in a record where **{Discrete}** is used and another channel is tracking it, the default channel will be changed to having discrete data and the lowest numbered tracking channel will become the new default channel. All other channels in the record will also have discrete data.

Editing By Type Presets in Blind

In Blind, the default channel's levels will display in blue, discrete data for the other channels will display in white, and any channels that are using the default channel value will display in magenta.



Ch	Intens	Red	Amber	Green	Blue	Indigo	Cyan	White	Shutter Strobe
31	FL	100	50	100	100	100	100	100	0
32	FL	100	50	100	100	100	100	100	0
33	FL	100	50	100	100	100	100	100	0
34	FL	100	50	100	100	100	100	100	0
35	FL	100	50	100	100	100	100	100	0
36	FL	100	50	100	100	100	100	100	0
37	FL	100	50	100	100	100	100	100	0
38	FL	100	50	100	100	100	100	100	0

Softkeys available for editing presets in blind are **{By Type}**, **{Discrete}**, and **{Cleanup}**.

- **[3] {By Type} [Enter]** - makes channel 3 the new default channel for that device type. If another channel for that type was the default channel, its data will now be discrete.
- **[1] [0] [Thru] [2] [0] {Discrete} [Enter]** - changes the levels for channels 10 through 20 to discrete. If any of those channels are default, the lowest numbered tracking channel will become the new default channel.
- **[5] [Thru] [8] [At] [Enter]** - removes the discrete data for channels 5 through 8. They will now use the default channel's values.
- **[Preset] [2] {Discrete} [Enter]** - changes all tracking and default channels to discrete.
- **[Preset] [5] {By Type} [Enter]** - makes the first channel of each device type a default channel.
- **[Preset] [3] {Cleanup} [Enter]** - converts presets created in earlier versions of Eos Family software to by type presets. This command will use the first channel of each type as the default, and allow other channels of the same type to use that value upon recall.

{Make Null} can be used with by type preset when you wish to withhold a channel from responding to a by type preset recall. The data will still display but will be in gray with a "N".

Updating By Type Presets

Pressing **{By Type}** after an **[Update]** command, with a channel tracking but no default channel included in the update, will cause the lowest numbered tracking channel's level to be updated into the default channel. The tracking channel will remain tracking. This means that when updating a default value in a by type preset, you don't need to know the default channel number.

When a default channel is included in an **[Update]** command without using **{By Type}** and another channel is tracking it, the default channel's data will be changed to discrete. The lowest numbered tracking channel will then become the new default channel. Any other updated channels will be made discrete.

Removing Channels from a Preset

You can remove specific channels from a preset. This can be done from Blind:

- **[Blind] [Preset] [Enter]** - opens the preset in Blind.
- **[Preset] [5] [Enter]** - selects the preset you wish to edit.

- **[2] [+] [4] [+] [6] [Thru] [9] [At] [Enter]** - removes channels 2, 4, and 6.
  - **[5] [+] [7] {Color} [At] [Enter]** - removes the color parameters for channels 5 and 7.
  - **[Preset] [1] [Thru] [5] [Enter] [1] {Color} [At] [Enter]** - removes channel 1 color parameters from presets 1-5.

You can remove channels from Live with **[**channel list**] [Delete] [Preset] [2] [Enter]**.

Deleting Presets

You may delete presets in the following ways:

- **[Delete] [Preset] [1] [Enter]**
- **[Delete] [Preset] [1] [Thru] [5] [Enter]**

Presets can be deleted from any screen, at any time. A confirmation is required to delete, unless confirmations have been disabled in Setup. See *Record Defaults*

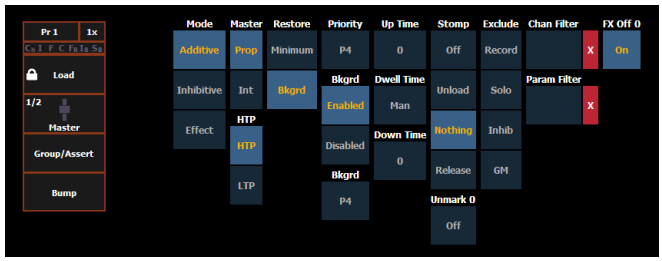
Preset and Palette Fader Properties

Presets and palettes can be mapped to faders by using the fader configuration display. For information on how to use the fader configuration display to map faders, see *Fader Configuration [Tab 36]*

The fader configuration display is found on Tab 36. The *Fader List [Tab 35]*, which shows all of the faders and their assignments, can be found in Tab 35.

Click or tap the second row of the fader page to access this properties display.

The following options are available when a fader is configured as a preset or palette fader:



Mode

You may define your fader as additive (contributes to the live output), inhibitive (limits live output) or an effect fader (presets only).

Master

A fader can be assigned as a Master. When it is a master, its behavior as a Proportional Master or Intensity Master (I-Master) is drawn from this setting.

HTP

Intensity playback behavior can be set to HTP (highest takes precedence) or LTP (latest takes precedence).

Restore

Faders can be placed into restore modes of minimum or background, which is the default. When a fader is in the restore to background mode, the restore column of the fader list display will be blank. When in minimum mode, 'Min' will display in the restore column.

The restore mode of background means that when the fader is returned to zero, control will be restored to the background value, such as another fader or a cue.

The restore mode of minimum means that when the fader is faded down, control does not go to the previous background state but to the parameters' minimum value.

Priority

The Independent setting for faders has been changed to priority. There are 10 levels of priority for faders. 1 is the lowest and 10 is the highest. Faders can still be shielded, which means that their content is automatically made exclusive and can't be controlled by anything other than that fader and park, including by manual control. Shielded has a higher priority than 10.

Background

Faders can have their background states disabled. Background states are enabled by default. When enabled, the content of the fader will act as a background or previous state for other cues and faders.

Background Priority

Background can have a priority assigned to it.

In previous software releases, when content was released, it always returned to the last fader that owned it. Background priority releases to the highest priority content that previously had ownership, provided that content has not be turned off or released.

There are 10 levels of background priority for faders. 1 is the lowest and 10 is the highest. When LTP content is released to background, it will go to the background state with the highest available priority.

Up Time

This is the time for the fader to fade from its home position to its target position (0 to Full if additive, Full to 0 if inhibitive). The default time is 0.

Dwell Time

This is the time the fader look will hold before starting the downfade. This can be set to a specified time, or to "Hold" or "Manual". "Hold" time maintains the fader values until the bump is pressed a second time. "Manual" time applies the fader values only as long as the bump is held. The default is "Manual".

Down Time

This is the time for the content on a fader to fade from its target position to its home position. The default time is 0.

Stomp Mode

Stomp happens when all the content owned by a fader is now being controlled by other targets. The fader is being removed from the background , and once that happens, it would not be eligible to fade back. You can assign behavior that will happen when a fader is stomped.

- Off When Stomped - puts the content into an off state, the same behavior encountered when pressing [Off] + [Load].
- Unload When Stomped - unloads the fader.

- **Nothing When Stomped** - no action happens to the fader.
- **Release When Stomped** -This function behaves the same as Off When Stomped.

Unmark at 0%

When this option is on, marked content controlled by the fader will automatically be released when the fader reaches 0%. When the bump button is next pressed, the fader will fire. If this option is off, you would need to first press the bump button to reset the fader before pressing the bump again to fire it.

Note: *This option is for faders that are set to Intensity Master.*

Exclusions

Those exclusions include:

- **Exclude From Record** - output is not recorded into any other record target.
- **Exclude From Grandmaster** - content cannot be mastered by a grandmaster.
- **Exclude From Inhibitive Sub** - content cannot be mastered by an inhibitive submaster
- **Exclude From Solo** - content will ignore solo. See *Fader and Button Configuration*.

Channel and Parameter Filters

Channel and Parameter Filters can be used to allow only specified data to be played back. These are playback filters, and do not impact how data is recorded.

Tap or click on **{Chan Filter}** to assign channels or groups. Tap or click on **{Param Filter}** to open a list of available parameters that you can filter.

When a filter has been applied, an indicator will display in the fader ribbon. C will display for channel filter, and F is for parameter filter.

Press the red **[X]** to clear the channel or parameter filters listed.

Fader and Button Configuration

Click or tap on the virtual buttons or fader to see a list of available configuration options.

Button Options

The following options are available for fader buttons:

- **Bump** - plays back the content at 100% of the recorded level. It will continue to do so until released, unless the fader has a time assigned or the **{Hold}** property set.
- **Group/ Assert** - selects all the channels associated with the fader, if the fader is inactive. If active, the contents of the fader will be asserted.
- **Assert** - regains control of all of the channels associated with the fader.
- **Group Select** - selects the channels stored in the fader. This is the same as **[Group] [Sub] [n]**.
- **Freeze** - halts all effect activity on the fader.
- **Off** - removes the content and if the fader is set to Master, the fader will remain where it currently is.
- **Release** - removes the content and if the fader is set to Master, the fader will reset to 0.
- **Start Stop Effect** -starts the effect while ignoring dwell times. Will stop effects if any are running.
- **Button Disabled** - no action is assigned to the button.

- **Solo** - suppresses any intensity values not provided by the associated content while the solo button is held down. When the button is released, intensity values are restored. Priority and HTP are ignored. Shielded, park and pixel mapping outputs are not affected by the solo button.
- **Back** - fades to the previous cue when fader is assigned to a cue list.
- **Macro** - allows you to assign a macro as a button action.

Fader Options

The following options are available for a fader:

- **Master** - fader will be a proportional master, a manual master, or an intensity master.
- **Effect Rate** - fader centers to home. It controls the rate of any running effects (same behavior as using rate via the Effect Status Display). The adjusted setting from this control cannot be stored.
- **Effect Size** - similar to Effect Rate but for effect size.
- **Rate Master** - homes to center. It adjusts the cue rate, just like rate and load.
- **Fader Disabled** - no action is assigned to the fade.
- **Master Only** - fader is used to set a level for content to fade to. The slider can be used to live adjust levels when the fader has been activated via the bump button. See *Master Only*.
- **Effect Master** - masters the entry/exit mode of the effects (size, rate or both).
- **Levels Only** - masters the levels without mastering the effect.

Temporary Fader Mapping

Presets and palettes can be used to create a temporary list of content that can be played back on a fader.

Note: *This list is not recorded. If the fader is unloaded, the list cannot be recalled.*

To create a list, press the **[Load]** button of an unmapped fader. You can then select presets or palettes to add to your list either by the command line or from the direct selects.

- **[Load] {DS 1} {DS 2} {DS 2} [Enter]**
- **{Fader} [1][0] [Preset] [1] [Preset] [2] [Preset [3] [Enter]**

Once mapped, the fader will default to Master Only mode. See *Master Only*.

The list will use the timing assigned to the fader.

A fader with temporary mapping will have the cue list options for Back From First and Go From Last. See *Cue List Properties*.

The list of targets will display in the Fader Configuration List (Tab 36), in the Fader List (Tab 35), and in the Fader Ribbon.

Chapter 11

Cues and Cue Lists

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About Cues and Cue Lists

A cue is a record target comprised of channels with associated parameter data, discrete (channel or parameter level) timing, cue timing, and cue attributes (such as preheat, follow or hang instructions).

When cues are created, they are stored in a single cue list by default, identified as cue list 1. Cues can also be recorded to *Multiple Cue Lists*.

Note: *Multiple cue lists are not available on Element 2 and Element Classic.*

Tracking vs Cue Only

In **Setup > User >** *Record Defaults*, you determine if Eos will operate in *Tracking vs. Cue Only* mode. By default, Eos is set to tracking, therefore this section primarily addresses working in tracking mode. The current mode is displayed in the upper left corner of the Live or Blind display. It is important to know which mode you are working in, as it impacts how cues are edited.

- If your console is set in Track mode (default), changes move forward through the cue list until a block or a move instruction is encountered.
- If your console is set in Cue Only mode, changes to cues have no impact on subsequent cue data.

Cue Numbering

Cues can be numbered from 0.001 - 9999.999. You can have up to 10,000 cues.

Eos provides you with multiple ways to number your cues. The most common methods are listed below:

- After pressing record, enter a cue number which can be a whole number (1) or a decimal number (1.1).
- After pressing record, rather than entering a cue number you may press **[Next]**, which will automatically number the cue with the next sequential number in the same cue list. For example, the current cue is numbered cue 1.1, pressing **[Record] [Next]** will automatically number the new cue 1.2.
- When recording decimal cues, it is not necessary to specify the leading cue number if a cue has already been recorded. For example, if the current cue is numbered 5, when you enter the next record command, you can just enter **[.] [5]** to record cue 5.5.
    - Whole numbered cue - **[Next]** increments the next whole numbered cue.
    - Tenths numbered cue (.1) - **[Next]** increments in tenths.
    - Hundredths (.01) numbered cue - **[Next]** increments in hundredths.
    - Thousandths (.001) numbered cue - **[Next]** increments in thousandths.

Recording Cues in Live

When using **[Record]**, all parameters of any fixtures that have non-home values, either from manual control, other cues, or submaster playback are stored in the target cue.

Channels that have all home values, meaning they have never been changed, are not included in the record action, unless you specifically select the channel and press **{Make Manual}**. See *{Make Manual}*.

Possible exclusions are parameters categories or individual channel parameters withheld by use of filters (see *Filters*). You can also select individual parameters of individual channels (such as Cyan and Iris) and place them in a null state using the **{Make Null}** button if the values are not needed in the cue you are recording. See *{Make Null}*.

You could also use **{Release}**. Release is an extension of the **{Make Null}** command in Blind. When Release is used, it behaves like Make Null, but it also releases the channel and parameter data to its background state, if one is available, or fades out the intensity instead.

Release can be used to mask instructions in a cue after it has already been stored. The data is not removed from the cue. See *Release*.

Eos consoles are tracking, meaning once something is recorded into the cue list, the cue list will always contain information about that channel/ parameter unless it is nulled, by using the **{Make Null}** command, released by using the **{Release}** command, or filtered using the parameter filters.

When cues are recorded they are automatically played back and manual values are released, unless auto playback on record has been disabled in setup. See *{Auto Playback}*. Upon playback, displayed parameter levels will be color coded for clarification of the record action:

- **Blue** - intensity has increased from the previous cue or a non-intensity parameter has changed.
- **Green** - intensity level has decreased from the previous cue or a non-intensity parameter has marked.
- **Magenta** - level has tracked from a previous cue.
- **White** - level has been blocked (see *Block*).

Using Record in Live

When the **[Record]** button is pressed the keypad defaults to cue mode; use of the **[Cue]** button is optional. The following are representative examples of recording cues in Live. Once the cue record has been specified, cue attributes such as timing can be combined and entered in any order you wish.

- **[Record] <Cue> [5] [Enter]** - records all parameters of any channels with non-default data into the specified cue number 5.
- **[Record] <Cue> [5] [Label]** [name] **[Enter]** - records the specified cue and provides an alphanumeric label.

When using the console in tracking mode or when using track editing, it is important to understand the concept of blocking. A cue containing a *Block* flag will stop edited levels from tracking through that cue. Blocks are often placed on the cue at the top of an act or scene, or anywhere you want to protect cues from levels that may track in from upstream cues. Block flags should also be set on cues that you want to have behave as blackouts.

Update [+] can be used with **[Record]** to specify a range of cues for recording.

Using Record Only in Live

Note: *[Record Only] is used in the examples below. Element Classic users will need to use [Record] [Record].*

[Record Only] is similar to **[Record]** except that it selectively stores only manually set values, preventing unwanted levels (such as from a submaster or another cue list), from being recorded into the cue. Therefore, when used to record a cue, only the manual data for channels will be stored in the cue. Any values in the previous cue that were unchanged will track into the new cue.

All of the same commands used for **[Record]** may also be used for **[Record Only]**.

- **[Record Only] <Cue> [Next] [Enter]** - stores only the manually set values into the next cue in the list.
- **[Record Only] [Cue] [3] [Enter]** - stores only the manually set data into cue 3.

As with **[Record]**, filters can further restrict stored data if deployed when using **[Record Only]**. See *Filters*

Record and Record Only [+]

[+] can be used to specify a range of cues when using **[Record]** and **[Record Only]**.

- **[Record] <Cue> [5] [+] [1][0] [+] [1][5] <CueOnly/Track> [Enter]** - records only cues 5, 10, and 15.
- **[Record Only] [+] <Cue>[7] <CueOnly/Track> [Enter]** - updates the current cue and cue 7

Note: *If no cue number is entered before the **[+]**, the current active cue will be used.*

Cue Only / Track

Note: *For a more detailed summary of Cue Only and Tracking modes, see Tracking vs. Cue Only.*

In Track Mode

When you create a new cue, any channel parameter data from the previous cue is tracked into the new specified cue. Any changes in this new cue will also track forward into subsequent cues until a move instruction is encountered. The **[Q Only/Track]** key is an exception to this behavior. When you record a cue in the middle of an existing cue list, using the **[Q Only]** button will prohibit new information from tracking into the subsequent cue. When you rerecord or update a cue, the modifications will not track forward.

Note: *In the following examples, the command **[Q Only]** indicates the same key hit of **[Q Only/Track]** which is a single button on the keypad. The system setting determines the actual context of the button depending on the mode in which the system is operating. For clarity, only the contextual function of the button is used in the examples.*

- **[Record] <Cue> [5] [Q Only] [Enter]** - records cue 5. New values or changes will not track into the subsequent cue.
- **[-] [Color] [Record] <Cue> [5] [Q Only] [Enter]** - as above the recorded data will not track forward and all color data is excluded from the record operation.
- **[Record Only] <Cue> [5] [Q Only] [Enter]** - records all manual data, but doesn't allow it to track into subsequent cues.
- **[-] [5] [Record] <Cue> [6] [Q Only] [Enter]** - records the specified cue, except the contributions from channel 5. The stored data will not track forward in the list.

On Element Classic, double pressing **[Record]** will post Record Only to the command line.

In Cue Only Mode

When you create a new cue, any channel parameter data from the previous cue is tracked into the new cue. The **[Q Only/Track]** key can be used as an applied exception to the cue only/ track system setting.

Note: *In the following examples, the command **[Track]** indicate the same key hit of **[Q Only/Track]** which is a single button on the keypad. The system setting determines the actual context of the button depending on the mode the system is operating. For clarity, only the contextual function of the button is used in the examples.*

- **[Record] <Cue> [5] [Track] [Enter]** - records cue 5. This data will track forward in the list until the next move instruction or block.
- **[-] [5] [Color] [Record] <Cue> [6] [Track] [Enter]** - records the specified cue, except the color data from channel 5. The data will track forward in the list until the next move instruction or block.
- **[Record Only] <Cue> [2] [Thru] [7] [Track] [Enter]** - stores all manual data. The stored data will be forced to track from cue 2 through 7 through any blocks or move instructions. After cue 7, values will continue to track until a move instruction or block is encountered.

Selective Storing Cues in Live

Cues can also be modified using selective storing, which allows you to specify only the channels and or parameters that you want to store. When using a selective store, you must specify the channel list to be included or excluded, identified by **[Thru]**, **[+]**, **[-]**, as part of the **[Record]** or **[Record Only]** command.

Using Selective Store

You may use the **[-]** button to withhold information from a cue or use the **[+]** button to specify a particular channel/ parameter to be included in the record action. These actions are both selective stores using *Partial Filters*.

Since Eos consoles are tracking, any channels not included in the selective store, but that do have values in the previous cue will track into the recorded cue. This is true even when the console is in Cue Only mode. To remove intensity values that would otherwise track when on a selective store, the *Remainder Dim* command can be used.

Using a Positive Selective Store

You may record only specified parameters into cues. If the cue has already been stored, this action adds the specified channel parameters to the existing cue data.

To record only specific channels into a new target cue:

- **[1] [Thru] [5] [Record] <Cue> [4] [Enter]** - records only channels 1 through 5 into cue 4.
- **[**channel list**] [Record] <Cue> [5] [Rem Dim] [Enter]** - stores the selected channels into the target cue. Any channels active in the previous cue that are not in the selected channel list will be set to zero in cue 5.
- **[2] [Thru] [8] [Record Only] <Cue> [9] [Enter]** - stores only the manually set data for channels 2 through 8 into the target cue 9.
- **[Group] [2] [Record Only] [Cue] [5] [Enter]** - stores only the manual data from group 2 into cue 5.

To record only specific parameters into a target cue:

- **[1] [Thru] [5] {Focus} {Color} [Record] <Cue> [4] [Enter]** - records the focus and color data for channels 1 through 5 into cue 4. Any other data on stage would not be stored in the target cue.
- **[**selected channels**] {Color} [Record Only] <Cue> [4] [Enter]** - stores only the color data for the selected channels into cue 4.

Using a selective store for a new record target will track in values from the previous cue that are not included in the record action.

Using a selective store for an already existing cue will modify the selected data only, leaving the rest of the cue untouched. This does not overwrite the whole cue.

Using a Negative Selective Store

It is possible to withhold data from a cue by using the **[-]** key as follows:

- **[-] [Group] [3] [Thru] <Group> [6] [Record] <Cue> [9] [Enter]** - records the specified cue, with the exception of any channels associated with groups 3 through 6.
- **[-] [3] [Thru] [6] [Record] <Cue> [9] [Enter]** - records the specified cue, with the exception of channels 3 through 6.
- **[-] [Sub] [7] [Record] [Enter]** - records the selected cue, without the input from submaster 7.
- **[-] [Sub] [Record] [Enter]** - as above, except withholds the contents of all submasters.
- **- {Color} [Record] <Cue> [8] [Enter]** - records cue 8 without any color data.

Filters

Filters are used to determine which parameters can be stored to cues, palettes, and presets. The filter selection tool in the CIA affects record operations as long as the filters are set.

Note: *Channel and parameter filters can be applied to faders and submasters. Those type of filters affect playback and not record functions.*

Record Filters

Record filters are used to select specific parameter data to store to record targets. When no filters are selected, all parameters can be stored, as appropriate to the **[Record]**, **[Record Only]**, and selective record action used.

When storing show data, applied filters are highlighted and allow the associated parameters to be stored in record targets. When filters are deselected (not highlighted), they **prohibit** storing the associated parameters.

Note: *There is no difference between having all filters selected and having no filters selected (default). In either state, all parameters are available for recording.*

Record filters are applied from the CIA using the following buttons: **{Filter}**, the parameter buttons in the CIA, and the parameter category buttons.

Parameter category buttons can be used to select filters. The following buttons are available below the command line:

- **{Intensity}** - enables recording intensity data.
- **{Focus}** - enables recording pan and tilt data.
- **{Color}** - enables recording color data.
- **{Form}** - enables recording beam form data.

- {Image} - enables recording beam image data.
- {Shutter} - enables recording beam shutter data.

{Beam}, which comprises form, image, and shutter information, is available above the command line with additional softkeys for individual beam parameters.

To apply record filters by category:

1. Press and hold {Filter}. The parameter buttons change to display filter selection.
2. Press the parameter category softkey for the category you want to include in the record target. All parameters in that category will be highlighted and "Filter On" will appear above the softkey.
3. Release {Filter}. The buttons return to their normal appearance.

In subsequent record functions, only the filtered categories will be recorded. You may apply multiple category filters at once. Remember that applying all filters and no filters yields the same effect.

Partial Filters

If you do not want an entire category to be recorded, you may apply parameter specific filters (partial filters) instead.

To apply partial filters:

1. Press and hold {Filter}. The parameter buttons change to display filter selection.
2. Press the parameter button (for example {Zoom}) for the parameter you want to include in the record target. That parameter will be highlighted and "Filter On" will appear above the softkey.
3. Release {Filter}. The buttons return to their normal appearance.

In subsequent record functions, only the filtered parameters will be recorded. You may apply as many partial filters at once, as you wish. Any unfiltered parameters will not be included in record actions. In Live, unfiltered parameter data is displayed in gray, with an "N" (indicating null data) in the upper right corner of the parameter's field.

Clearing Filters

Applying filters is a toggle state. To clear any filter, simply repeat the application process described above. When pressed again, any applied filter will be removed.

To clear all filters at once:

1. Press and hold {Filter}. The parameter buttons change to display filter selection. {Clear Filters} appears in the upper left corner of the parameter buttons.
2. Press {Clear Filters}. Any applied filters will be removed and the highlights will turn off.
3. Release {Filter}. The buttons return to their normal appearance. All parameters are now available to record functions.

Storing Data with Record Filters

If a record target is stored with filters in place, the filters allow only associated parameter data to be recorded in the target. Non-filtered data is not included when you record.

The various record targets are affected by filters in the following ways:

- Palettes - Palettes by definition are already filtered. The color and beam filters can be used to further modify what is stored in the color and beam palettes, however.
- Presets - Active filter settings impact what is stored in presets.
- Cues - Active filter settings impact what is stored in cues, even when using "record only"

commands.

- **[Recall From]** - Recall from instructions are not affected by the filters.

Timing

Cue timing can be applied in a variety of ways. At a cue level, timing categories are provided for intensity up, intensity down, focus, color and beam transitions. Each of these times can have an associated delay. Timing can also be applied directly to a channel or a specific parameter. This is called discrete timing.

Time can be entered in minutes and seconds (example 10:15) with valid fade times from zero to 99:59 (99 minutes and 59 seconds), or seconds and tenths of seconds (example 1.3), or 100ths of seconds (example 1.35) with valid fade times from zero to 99.99. When no time is applied at a cue level, the defaults established in **Setup** are used. See *Cue Settings*

- **[Cue] [1] [Time] [1][0][1][5] [Enter]** - sets the time for cue 1 to be 10 minutes and 15 seconds. The command line will show the time as Cue 1 Time 10:15.
- **[Cue] [1] [Time] [1][.][3] [Enter]** - sets the time for cue 1 to be 1.3 seconds. The command line will show the time as Cue 1 Time 0:01.3.

Setting Cue Level Timing

Unless you specify otherwise, Eos assigns default fade times to any cue you record. Default timing is designated in **Setup** (*Cue Settings*). Cue level timing can be applied when a cue is recorded or can be added or modified later.

Following are some examples of record commands with cue level timing:

- **[Record] <Cue> [5] [Time] [9] [Enter]** - puts a time of 9 seconds on all parameter timing categories.
- **[Record] <Cue> [6] [Time] [3] [Time] [9] [Enter]** -specifies the intensity up, focus, color, and beam times at 3 seconds and the down time at 9 seconds. The first instance of **[Time]** is used for intensity up fade (meaning intensity value is fading to a higher level than previously set) and the second instance of **[Time]** is used for intensity down fade time (intensity values fading to a lower level than previously set).
- **[Record] <Cue> [2] [Time] [Enter]** - resets time to default value defined in **Setup**.

Note: *Unless FCB timing is specifically set, it always defaults to the up fade time value.*

Manual Timing at a Cue Level

It is possible to assign a time of manual, for manual parameter transition through the associated fader. See *Manual Timing Control*. Manual times are assigned by using the **{Manual}** softkey that displays after **[Time]** is pressed when recording a cue.

- **[Record] <Cue> [4] [Time] {Manual} [Enter]** - applies a manual time. If the cue had previously been given split times, would apply a manual to the up fade, focus, color, and beam times. If the cue had a single time, all of the timing would be manual and controlled by the fader.
- **[Record] <Cue> [4] [Time] [Time] {Manual} [Enter]** - applies a manual intensity time to the down fade.
- **[Record] <Cue> [4] {Color} [Time] {Manual} [Enter]** - applies a manual time to any color data changes in cue 4.

Non-intensity Parameter Category Timing

Timing can be also applied for Focus, Color and Beam parameter categories at a cue level. By default, FCB timing is the same as intensity upfade time. Once FCB timing is different than intensity upfade time, those times are no longer affected by intensity upfade changes.

When you apply a time to an individual parameter category and that category has no movement, the time is displayed in gray. The specified timing will remain in gray until that category is provided with a move instruction, at which point it the timing will display in white.

- **[Record] <Cue> [2] {Color} [Time] [7] [Enter]** - records cue 2 with a cue level color time of 7.
- **[Record] <Cue> [2] {Color} [Time] [Enter]** - resets the color time of cue 2 back to the default value.
- **[Record] <Cue> [2] [Time] [Time] [Time] [7] [Enter]** - records cue 2 with a cue level focus time of 7. In this example, each press of the **[Time]** key steps through each timing value (up time, down time, focus time, color time and beam time).
- **[Record] <Cue> [2] [Time] [7] [Enter]**- records cue 2 and puts a time of 7 on all parameter categories. This only works if FCB timing was previously untouched. If FCB timing had been changed, this syntax example would change just the upfade time to 7.

Note: *It is not necessary to rerecord a cue to alter stored timing data. You can simply redefine the time by specifying the cue and re-entering the time values.*

- ***[Cue] [5] [Time] [8] [Enter]** -redefines the all category times to 8 seconds. This only works if FCB timing was previously untouched. If FCB timing had been changed, this syntax example would change just the upfade time to 8.*
- ***[Cue] [2] {Color} [Time] [5] [Enter]** - redefines color time to 5 seconds.*
- ***[Cue] [3] {Focus} [Time] [-] [2] [Enter]** - removes 2 seconds from the current time.*
- ***[Cue] [7] {Beam} [Time] [+] [3] [Enter]** - adds 3 seconds to the current time.*

[Time][/]

The **[/]** key can be used with **[Time]** to control the intensity upfade and downfade times, and delays.

- **[Cue] [1] [Time] [/] [5] [Enter]** - places a downfade time of 5 on the cue, while splitting the upfade, which preserves its current value.
- **[Cue] [2] [Time] [/] [Enter]** - removes the downfade time and makes the downfade match the upfade.
- **[Cue] [3] [Time] [4] [/] [Enter]** - sets the upfade time, and splits the downfade without splitting the FCB times.
- **[Cue] [5] [Time] [4] [/][3] [Enter]** - sets the upfade and the downfade times.
- **[Cue] [4] [Time] [2] [/] [/] [Enter]** - changes only the intensity upfade time and splits the downfade and FCB times preserving their current value.

Discrete Channel and Parameter Timing

Rather than using cue times, timing can be applied directly at a parameter or channel level. This is referred to as discrete time.

Discrete timing can be applied to a specific channel or parameter. You must select the channels that you want to apply the time to, otherwise the system assumes you are addressing the selected cue.

Following are some examples of use:

- [channel list] {Color} [Time] [3] [Enter] - adds a time of 3 seconds to all of the color parameters of the channel list that have a move instruction.
- {Focus} [Time] [7] [Enter] - assigns a time of 7 seconds for the focus attribute of all selected channels.
- [Select Manual] {Beam} [Time] [7] [Enter] - selects channels with manual data and applies a time of 7 to any manual beam values.
  - Ion Classic and Element Classic users will need to use {Select Manual}

Discrete delay times can also be placed on a channel parameter.

- [1] {Color} [Time] [4] [Delay] [3] [Enter] - places a time of 4 seconds and a delay of 3 seconds on all color parameters of channel 1.

The [+] and [-] hardkeys can be used to increase or decrease discrete timing values.

- [channel list] [Time] [+] [3] [Enter] - increases the discrete timing values by 3 seconds.
- [channel list] [Delay] [-] [1] [Enter] - decreases the discrete delay value by 1 second.

When timing has been applied to a channel parameter in live, a small red "t" will be displayed with the channel. This indicates the timing must be stored or updated to the required cue. When this is done, the "t" is displayed in blue. In the Playback Status Display, a "+" is displayed in the associated parameter category time field, indicating that not all of the parameters in the cue will use the cue timing.

[About] & [Time] can be held down to see the discrete delay /time information for channels in Live /Blind. Delay is displayed first, followed by the timing value.

Note: *Any conditions placed on channels or parameters in Live (discrete timing, asserts, blocks, etc) must be stored or updated to the cue.*

Discrete Time as a Percentage

Discrete times can be entered as a percentage of the cue time.

- [channel list] [Time] [/] [5] [Enter] sets the time to 50% of the cue time.
- [channel list] {Focus} [Time] [/] [7][5] [Enter] - sets the discrete focus timing to 75%.

Cue Attributes

You can record cues with specific attributes to affect how cues behave when executed. Cue attributes include *Follow/Hang*, *Link / Loop*, *Delay Time*, *Rate*, *Curve*, *Cue Notes*, *Cue Label*, and *Scenes*. Cue attributes can be entered when the cue is initially recorded, or they can be added or modified at a later date.

When [Cue] is pressed, the {Attributes} softkey will display. Press {Attributes} to access the following softkeys:

- {Rate}
- {Note}
- {Scene}
- {Curve}
- {Preheat}
- {AF/MF} (Allfade/ Move Fade)
- {Scene End}

Preheat and *Allfade* are flags.

Follow/Hang

A follow automatically activates the next cue in the sequence when the follow time of the associated cue has elapsed. The follow time begins counting from the moment the cue is executed.

The hang time is also an auto-follow, but rather than counting from the moment the cue is executed, it is calculated from the completion of the cue. You can assign a negative value to a hang time, allowing a subsequent cue to overlap an active cue.

You can assign either a follow time or a hang time, but not both. Both features are accessed using the **[Shift] & [Delay]** keys on the console or the softkey **{Fw/Hg}**. **[Shift] & [Delay]** or **{Fw/Hg}** will put Follow on the command line, and **[Shift] & [Delay] [Delay]** or double pressing **{Fw/Hg}** will put Hang.

In the Playback Status Display, any cue that will be triggered by a follow or hang will have an arrow before the cue number. See *Indicators in the Playback Status Display*. This indicator can be disabled in the *Playback Status Display Tab Configuration* menu.

Following are some examples of use:

- **[Record] <Cue> [5] [Shift] & [Delay] [8] [Enter]** - records cue 5 and provides a follow time of 8 seconds which impacts the start of the next cue in the list. The following cue will automatically initiate on the same fader when the follow time has elapsed. The follow time will begin counting down when the associated cue (Cue 5) is executed.
- **[Record] <Cue> [5] [Shift] & [Delay] [Delay] [8] [Enter]** - records cue 5 and provides a hang time of 8 seconds which impacts the start of the next cue in the cue list. The following cue will automatically initiate on the same fader when the hang time has elapsed. The hang time will begin counting down when the associated cue (Cue 5) is complete.
- **[Record] <Cue> [5] [Shift] & [Delay] [Delay] [-] [5] [Enter] -** records cue 5 and provides a hang time of negative 5 seconds.

To remove a Follow /Hang time:

- **[Cue]** [x] **[Shift] & [Delay] [Enter]**

Cues with follow / hang times cannot also have associated *Cue Alerts*.

Link / Loop

Link

Link allows cues to be run out-of-sequence, by causing a different cue number to be loaded into the pending file of the playback fader when the cue that carries the link instruction is activated. If a follow or hang time is included with the cue attributes, the activation of the linked cue will occur when the follow or hang time has elapsed.

The link can be within the cue list or to a cue in another cue list, if available.

Cues that link to other cues will display this information in a row under the cue in the Cue List Index and the Playback Status Display. This can be suppressed via the *Playback Status Display Tab Configuration*.

If a linked cue has a label, the label will be displayed in the link cue indicator.

- **[Record] <Cue> [2] {Link/Loop} <Cue> [8] [Enter]** - records the specified cue 2 and provides a link to cue 8 in the cue list. When cue 2 is played back, the linked cue is loaded into the pending queue of the associated fader.

Loop

Loop is provided as a method to link a series of cues and loop them a number of times in a sequence. Once the sequence of cues has played back the first time, the system recognizes the loop command and plays the sequence again, provided the target of the link is a previous cue.

If the first cue in the sequence is a cue with an assert attribute or has move instructions for channels, values from the last cue are not allowed to track through into the first cue when it is looped back. But without a move or assert in the first cue, values from the last cue will track into the first cue when it loops back.

A loop specified with "0" loops the sequence indefinitely.

- **[Cue] [2] {Link/Loop} <Cue> [1] {Link/Loop} [3] [Shift] & [Delay] [4] [Enter]** - records a link from cue 2 back to cue 1. Because there is a follow time, cue 1 will automatically trigger 4 seconds after cue 2. If cue 1 also has follow time, it will automatically trigger cue 2. This sequence will run 4 times (once plus 3 loops) and then stop in cue 2. The loop value specifies the number of times the loop instruction will be performed. Since the sequence has run once prior to the loop command, the total number of passes will be the specified number of loops +1.

You could apply **{Go After Loop}** on cue 2 to execute the next cue after a follow link/ loop sequence has ended using *Cue Triggers*.

All cues in a looping sequence must have Follow or Hang times in order for the loop to play uninterrupted.

Delay Time

Delay can be useful when you do not want a parameter to change (for example - intensity down) until other changes have begun or completed their transition.

Delay times can be added to any cue or to any specific parameter category within the cue, which will postpone the parameter transition until the delay time has elapsed.

Following are some examples of recording with a delay:

- **[Record] <Cue> [2] [Delay] [5] [Enter]** - stores cue 2 with a 5 second delay on intensity.
- **[Record] <Cue> [2] [Time] [9] [Delay] [3] [Enter]** - records cue 2 with a 9 second fade for all parameter categories, delayed from Go by 3 seconds.
- **[Record] <Cue> [2] [Time] [7] [Delay] [Enter]** - records cue 2 with a 7 second fade, and removes delay time.
- **[Record] <Cue> [2] [Delay] [/] [5] [Enter]** - records cue 2 with a 5 second delay on the downfade.

Delay can be used to affect only the parameters in the specified category.

- **[Record] <Cue> [2] {Color} [Delay] [8] [Enter]** - records cue 2 with a delay time of 8 seconds for the color category.
- **[Record] <Cue> [2] [Time] [Time] [Time] [Delay] [7] [Enter]** - records cue 2 with a cue level focus delay time of 7. In this example, each press of the **[Time]** key steps through each timing value (up time, down time, focus time, color time and beam time.

Rate

The **{Rate}** softkey can be used to apply a rate adjustment to all timing in the cue. The default rate is 100%, which is real time. To slow a cue down, set the rate below 100%. To speed the cue up, set the rate above 100%. The range rate for a cue is 0 - 2000%. A timing value of 5, with a rate of 50% will replay in 10 seconds. A timing value of 5, with a rate of 200% will replay in 2.5 seconds.

Following is an example of using rate:

- **[Record] <Cue> [4] {Attributes} {Rate} [1] [2] [5] [Enter]** - records the specified cue, and places a rate override instruction on all timing values. The cue would now be played back at 125% of recorded time values.

Note: *You can use the playback rate override function to determine the rate at which you want to play the cue back, and then apply that rate to the cue. This eliminates the need to adjust all of the timing in the cue if you only need to speed it up or slow it down. See Rate Override.*

Curve

{Curve} is used to affect the percent completion of a cue or part by applying the curve's output level as the percent completion for all fade calculations. When *Curves [Tab 21]* are applied to cues, they impact only the intensity transitions in that cue. When applied to a cue part, they impact any parameters moving in that part.

- **[Cue] [6] {Attributes} {Curve} [5] [Enter]** - applies curve 5 to cue 6.

Cue Label

[Label] is used to attach an alphanumeric label to a cue or cue part.

Following is an example of how to apply a label to a cue:

- **[Record] <Cue> [7] [Label] <**name**> [Enter]** - records cue 7 and applies the label as entered on the alphanumeric keyboard.
- **[Record] <Cue> [8] [Label] [Block] [Enter]** - records cue 7 and applies the name of the hardkey as the label

Pressing **[Label]**, when a label has already been applied to a cue, will display the label on the command line for editing. Pressing **[Label]** a second time will clear the label, or you can press **[Clear]** to remove the label one character at a time.

Cue Notes

Cues can have notes attached to them.

These notes can be viewed in the Playback Status Display and the Cue List Index by hovering a mouse over or tapping on the **+** in the Label column.

You can also select to view the notes or the notes for the pending cue in a horizontal bar at the bottom of the PSD. See *Playback Status Display Tab Configuration* for these additional display options.

To add a note to a cue:

- **[Cue]** [n] **{Attributes} {Notes}**

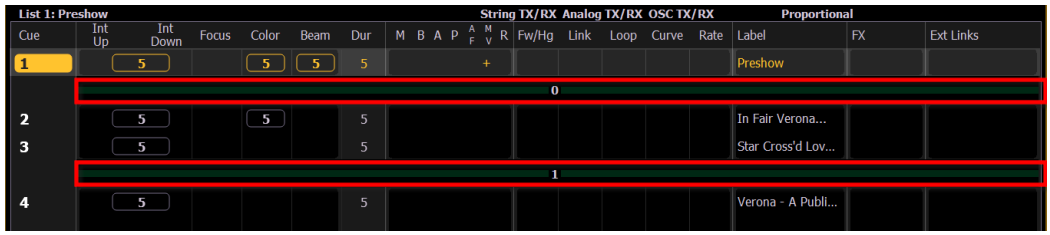
To add a note to the currently selected cue, you can use **[Shift] & [Label]**.

You can use the virtual alphanumeric keyboard or an external keyboard to enter the desired text.

See *Labels, Scenes, and Notes*.

Scenes

Scenes are a cue organization tool that provide a visual identifier for breaks in your show and allow for quick cue list navigation.



Scenes display in the cue list index and the playback status display as a green bar above the cue they are associated with in the list. An end of scene can also be created, and those display as a green bar under their associated cue.

You can recall a scene to quickly jump to a cue without needing to remember its number. To recall a scene, use the **[Go to Cue]** button and select the **{Scenes}** softkey.

This will open up the scene selection display in the CIA. The scene's label and cue will display. Press or click on the scene to select it.

Scenes can also be recalled by using the direct selects. See *Using Direct Selects*.

Creating a Scene Break

You can add a scene break by using the **{Scene}** softkey. For example, **[Cue] <1 > {Attribute} {Scene}** will add a scene to cue 1.

The virtual alphanumeric keyboard will open. You will need to label the scene before it is created.

See *Labels, Scenes, and Notes*.

Creating a Scene End

You can specify where a scene ends by using the **{Scene End}** softkey. For example, **[Cue] <5 > {Attribute} {Scene End}** will add a scene end to cue 5.

You can create a scene and a scene end at the same time by using **[Thru]**. For example, **[Cue] [1] [Thru] [5] {Scene}** will add a scene to cue 1 and a scene end to cue 5.

Update Using Scene End

The **{Scene End}** softkey can also be used when updating the cues in a scene. For example, **[Update] <Cue> [1] [Thru] {Scene End}** will put the last cue of that scene on the command line.

Note: *Tracking / cue only rules still apply. If your console is in tracking mode, and you want the update to stop at the scene end, you will need to use the **[Q Only]** command.*

Deleting Scenes

To delete a scene or scene end, you will need to use the following syntax:

- **[Cue]** [n] **{Attributes} {Scene} [Label] [Enter]** - deletes the scene.
- **[Cue]** [n] **{Attributes} {Scene End} [Enter]** - deletes the scene end.

If a cue with an attached scene break is deleted, the scene break will move to the subsequent cue.

Clearing Cue Attributes

To clear attributes from a cue:

- **[Cue]** [n] **[Shift] & [Delay] [Enter]** - removes the follow or hang time from the specified cue "n".
- **[Cue]** [n] **[Label] [Label] [Enter]** - removes the label from the specified cue "n".
- **[Cue]** [n] **{Link/Loop} [Enter]** - removes the link instruction from the specified cue "n".
- **[Cue]** [n] **[Thru]** [y] **{Attributes} {Rate} [Enter]** - removes the rate instruction in cues "n" through "y".

You may combine these to remove multiple attributes at once:

- **[Cue]** [n] **[Shift] & [Delay] {Link/Loop} [Enter]** - removes the follow time and link instruction.

Flags

Flags can be applied to cues to change specific behaviors. Flags can be set for *Block*, *Assert*, *Allfade*, *Mark*, and *Preheat*.

Element Classic Flags

On Element Classic, flags can be set for *Block (Element Classic)*, *Preheat*, and *Moves (Element Classic)*.

Block

You can apply a block to a cue, a cue part, to any channel (or group of channels), or parameter (or group of parameters) within a cue. Block is an editing function. It has no impact on how the data is played back.

Note: *Block functions differently on Element Classic consoles. See Block (Element Classic).*

At a Cue Level

A cue level block causes all tracked values in the cue to be treated as move instructions from an editing standpoint, which prohibits any data changes from tracking into the cue. Parameters that are not included in the cue are not impacted by the block instruction.

Blocks do not protect a cue, channel or parameter from being modified by a range edit, nor are they protected from a trace instruction (see *Update Using Trace*). It is assumed that if you use the trace instruction, then you really want the initial value to change. A block will stop the trace from moving any further backwards through the cue list.

- **[Cue] [5] [Block] [Enter]** - "B" is displayed in the flags field, indicating a cue level block. When this cue is recalled, all data that would otherwise appear as a tracked value, will be displayed in white. Any changes upstream in the cue list will not impact this blocked cue data.
- **[Cue] [6] {Intensity} [Block] [Enter]** - "I" is displayed in the flags field, indicating a cue level intensity block. You could also use **[Shift] & [Block]** to put Intensity Block on the command line.

At a Channel / Parameter level

Blocks can also be applied to a channel or a channel parameter. This can be done in live or blind. When applied in live, the block instruction must be stored or updated to the appropriate cue.

- **[9] [Block] [Enter]** - applies a block to channel 9. A red "B" appears near the channel in the live display, indicating a block has been applied but is not yet stored.
- **[Group] [5] {Color} [Block] [Enter]** - applies a block to all of the color parameters for group 5.

When the block instruction has been stored or updated, any tracked values the block was applied to will be displayed in white.

Channel level blocks are indicated in the cue list by a "b" and auto-blocks are indicated in the cue list by a "b", representing a partial block. To remove auto-blocks, see *Auto-Block Cleanup*.

Auto-Block

Note: *Not available on Element Classic.*

Eos also supports an auto-block function. Auto-block can protect your cue data from unwanted changes. For example, in cue 5 you set channel 1 to 50%. It is stored as a move instruction. Then, you later go back to an earlier cue and set channel 1 to 50% and it tracks forward to cue 5. Channel 1 will be auto-blocked in cue 5. Even though it is now at the same value as the previous cue, the original concept of a move instruction is maintained.

Auto-blocks are displayed in white, with a white underscore.

Block (Element Classic)

Block flags prevent edited levels from tracking into a cue, and force a move instruction on any tracked value in that cue. For example, if channel 1 is at full in scene 1 and scene 2, and you want to make sure it stays at full in scene 2 when you edit scene 1, place a block flag on the cue at the top of scene 2. A block also forces a move instruction on playback (blackout cues typically get blocked to ensure that they fade any moving levels from the previous cue to zero.)

You can apply a block to a cue, a cue part, to any channel (or group of channels), or parameter (or group of parameters) within a cue.

Note: *On other Eos Family consoles, the block command is split into block for editing and assert for playback. See Block and Assert.*

At a Cue Level

A cue level block causes all tracked values in the cue to be treated as move instructions for editing and playback purposes, which prohibits any data changes from tracking into the cue. Parameters that are not included in the cue are not impacted by the block instruction.

Blocks do not protect a cue, channel or parameter from being modified by a range edit, nor are they protected from a trace instruction (see *Update Using Trace*). It is assumed that if you use the trace instruction, then you really want the initial value to change. A block will stop the trace from moving any further backwards through the cue list.

Blocks that you have applied will display parameter data in white.

- **[Cue] [5] [Block] [Enter]** - "B" is displayed in the flags field, indicating a cue level block. When this cue is recalled, all data that would otherwise appear as a tracked value, will be displayed in white. Any changes upstream in the cue list will not impact this blocked cue data.

At a Channel or Parameter Level

Blocks can also be applied to a channel or a channel parameter. This can be done in live or blind. When applied in live, the block instruction must be stored or updated to the appropriate cue.

- **[9] [Block] [Enter]** - applies a block to channel 9. A red "B" appears near the channel in the live display, indicating a block has been applied but is not yet stored.
- **[Group] [5] {Color} [Block] [Enter]** - applies a block to all of the color parameters for group 5.
- **[1][0] {Intensity} [Block] [Enter]** - applies a block to the intensity of channel 10. You could also use **[Shift] & [Block]** to put Intensity Block on the command line.
- **[Cue]** [n] **{Intensity}** (from the ML controls) **[Block] [Enter]** - blocks all the intensities in the cue, but not the NPs. I is displayed in the Block field.

Auto-Block

Element also supports an auto-block function. Auto-block can protect your cue data from unwanted changes. For example, in cue 5 you set channel 1 to 50%. It is stored as a move instruction. Then, you later go back to an earlier cue and set channel 1 to 50% and it tracks forward to cue 5. Channel 1 will be auto-blocked in cue 5. Even though it is now at the same value as the previous cue, the original concept of a move instruction is maintained.

When the block instruction has been recorded, updated, or stored while in blind, any tracked values the block was applied to will be displayed in white. Auto-blocks are displayed in white, with a white underscore.

Channel level blocks are indicated in the cue list by a "b" and auto-blocks are indicated in the cue list by a "b", representing a partial block. To remove auto-blocks, see *Auto-Block Cleanup*.

Moves (Element Classic)

There are two types of moves, live and dark. A live move is a NPs move in a channel with an intensity that is zero in the previous cue, that moves above zero in the current cue. A dark move is a NPs move in a channel that is at an intensity of zero in the previous and current cue.

In the *Playback Status Display (PSD) [Tab 2]* and *Cues [Tab 16]*, there is a MV column for displaying live and dark move flags. A live move will be indicated with a "L" and a dark move is indicated with a "D". A "+" is used to show that both types of moves are in that cue.

Assert

Assert is a way to make a tracked or blocked value act as a move instruction on playback. It is often used in a multiple cue list environments, or to assure that a transition happens in the desired time. See *Using Assert* on asserts in multiple cue lists and *Assert (Fader Control)* on using assert for playback.

Assert can be useful in a single cue list. For example, cue 10 is a blackout with a zero count. It is common practice to block blackout cues. Imagine some of the lights were fading to zero in cue 9, and you select **[Go]** for cue 10 before cue 9 is finished. The lights that were fading to zero in cue 9 will continue their downfade in the timing for cue 9 since cue 10 doesn't provide them with a new move instruction. If you assert cue 10, the lights will bump to black as expected.

Allfade

Any cue can have an allfade flag applied. An allfade sends the intensity for all channels not included in the cue to zero. Submasters, any captured channels and the contribution from any faders that are set to priority are unaffected, unless the cue executing the allfade is also set to

priority. An allfade flag "*" is identified in the cue list index and the playback status display for the specified cue.

- **<Cue> [5] {Attributes} {AF/MF} [Enter]** - sends intensity for all channels not included in the allfade cue to zero.

The allfade instruction is useful as a quick cleanup, to get back to a known state on stage, without having to worry about what channels need to be set to zero.

Mark

Note: *This option is not available on Element 2 and Element Classic.*

The Mark flag is used to relay information about either automarks or reference marks. When using automarks, an "M" will display in the flags field for the specific cue that will execute an automark. A "D" is displayed when automark has been disabled for a cue or a cue part.

When using reference marks, an "M" will display in the flags field for any cue that will execute a referenced mark. An "R" displays when a cue is the source of a mark. See *Mark*.

Preheat

Preheat can be used to warm filaments in the cue immediately preceding an intensity upfade from 0. Preheat values can be assigned to channels individually in patch (see *Patch > Attributes*).

Preheat is assigned on a cue (or cue part) basis. If assigned, any channel in that cue with a preheat value assigned in patch will fade to that intensity in the cue immediately preceding the cue with the preheat flag. Cues with a preheat flag will display an "P" in the preheat flag column (indicated by a "P" at the top of the column) in the PSD and Cue List Index.

When a channel is in a preheat state, a "Ph" is displayed in the intensity field of that channel. When a preheat is executed, the preheat value is established using the upfade time of the associated cue. It is possible to hold the **[Data]** key to see the actual preheat values.

Mark

Mark is an instruction that automates the process of presetting automated fixtures to their required state in a cue, prior to fading intensity up. This allows your automated fixtures to unobtrusively perform non-intensity parameter transitions in an inactive (darkened) state.

Most Eos Family consoles provide two different methods to mark lights:

- *AutoMark*
- *Referenced Marks*

AutoMark

The AutoMark feature is a system default setting and can be turned on or off at a global level. The system default for this setting is off. To change the default settings see *Cue Settings*.

With AutoMark enabled, non-intensity parameter transitions occur in the cue immediately preceding the cue in which the changes are stored, if intensity in that cue is moved from zero to any active level. Therefore, the preceding cue executes the AutoMark.

AutoMark information only applies to cues or cue parts, and is not a channel instruction. AutoMarked cues are indicated by M *Indicators in the Playback Status Display*.

AutoMarks will execute using the time of the cue in which the moves occur. These cues will be indicated by M *Text Indicators* in Live and Blind. The exceptions to this are the mark time in Setup. If discrete timing is stored with the move instruction, in which case the discrete time will be used.

AutoMarks will display the same way in Live and in Blind.

AutoMark on Element 2 and Element Classic

AutoMark is the only mark option available for Element 2 and Element Classic consoles, and defaults to enabled.

Conditions Triggering an AutoMark

The following rules determine which channels AutoMark is applied to and how it is deployed:

- The marked cue must have a move instruction for intensity of automated fixtures above zero or null.
- The marked cue must have a move instruction for non-intensity parameters of those channels.
- AutoMark will not occur if the channel is receiving an intensity instruction from another source (such as a submaster or HTP fader).
- AutoMark must be enabled for an AutoMark to occur. AutoMark is based on the current setting of the default during playback. It does not matter what the setting is at the point of record.
- On a "per channel" basis, an AutoMark does not occur until:
    - Any parameter delay time has elapsed and
    - The intensity has reached zero and the parameter has completed any previous movement.

Allowing a Live Move

Note: *Not available on Element Classic.*

It is possible to override AutoMark on a per cue (or cue part) basis. The override is available through a softkey, {AutoMark Off}. This softkey is not visible when AutoMark is disabled in Setup.

When enabled, the cue that executes the mark will have an "M" in the flags field. If AutoMark is disabled, allowing a live move, a "D" is displayed in the flags field of the cue or cue part where the data is stored.

By using AutoMark with multipart cues, it is possible to have some parameters mark and others move live. See *Multipart Cues*.

AutoMark and Timing

Note: *Not available on Element Classic.*

An AutoMark will happen in the time of the cue in which is moving (the "M" cue), unless the channel has discrete timing or the mark time is disabled via the {Mark Time} setup option. Discrete timing would override the mark time option in setup. See *Mark Time*. In which case, the discrete timing will apply to the moves. Discrete timing is applied in the cue where the move instruction is stored.

Referenced Marks

Referenced marks are user-specified marks that are manually applied to specific channels or parameters.

AutoMark and referenced marks cannot be used simultaneously. Referenced marks are not available on Element 2 and Element Classic.

Note: *If you begin programming with AutoMark enabled, and then disable the feature, all of the AutoMarks in the show are converted to referenced marks.*

There are essentially two parts to a successful referenced mark. The first part is the cue with the mark flag (set by the user). This is the cue in which any non-intensity parameters will change. This cue is referred to as the **marked cue**.

The second part is the cue with intensity value for the channels in question. This is referred to as the **source cue**. This is also the cue where the non-intensity moves are stored.

In order to use mark properly, you **must specify** channels to be marked in the source cue. Eos will not assume all automated fixtures apply to any given mark.

There are two ways to apply a referenced mark. You can apply a mark flag at a cue level and then subsequently reference that flag in a later cue, **or** you can apply a mark in a cue and reference back to an earlier cue.

Referenced marks are useful because the non-intensity parameter data is stored in the cue that actually fades the lights up. Therefore, any changes to the non-intensity parameter data is modified in the source cue. You do not need to worry about changing it in the marked cue.

Note: *When bringing up the intensity of a fixture that is in a marked state, all the parameters of that fixture will be made manual and the current NPs settings will display. This is done so you won't need to use* ***{Make Manual}*** *when storing to a cue.*

Setting Referenced Mark Flags

You can apply a mark flag by pressing **[Cue]** [n] **[Mark] [Enter]**. This sets a flag (M) on a cue for later marking activity. In subsequent cues, when channels are marked, they will preset for movement in this cue (unless told to mark elsewhere).

When you are building a cue containing channels that you want to mark, use the syntax [channel list] **[Mark] [Enter]**. Store the cue, following normal procedures. Eos will automatically look backwards in the cue list for the first mark flag it encounters.

For example:

- **[Cue] [10] [Mark] [Enter]** - places a mark flag on cue 10. This becomes the marked cue.
- **[1] [Thru] [10] [Mark] [Enter]** - adds a mark instruction on channels 1-10. Note that channels 1-10 are displayed with a red "M" in the upper right corner.
- **[Record] <Cue> [1] [2] [Enter]** - stores cue 12. This becomes the source cue.

Since no specific mark instruction was given to the channels in cue 12, the channels will mark back to the first "M" encountered in the preceding cues of the cue list, provided that the intensity for those channels is "out" throughout the duration of the mark.

When cue 10 is played back, the non-intensity parameters of channels 1-10 will fade to the values stored in cue 12. Then in cue 12, the intensity will fade up on those channels.

Mark Display Indicators

In the previous example, indications that a mark had been placed are as follows. Cue 10 would be shown with a mark flag (M) in the cue list. In addition, when cue 10 is played back, channels 1-10 will show a green "MK" in the intensity field, while the non-intensity parameters would show the source cue number in green "Q12" (the MK in the intensity field is green if, in cue 10, the lights are fading to zero and then the NPs are marking. If, in cue 10, channels 1-10 were already at zero, a magenta "MK" will be displayed).

The source cue (cue 12) would include a green "M" next to the intensity level and any non-intensity parameter values would be displayed in green. Also, in the cue list, cue 12 would have an "R" in the mark flags field. If a mark has been placed on a cue, but that cue is not yet marking any lights, the "M" will be represented as "m". You will also see an "m" if the mark is no longer in tact.

Priority Mark

When setting mark cues, you assign a priority marking using the softkeys **{High Priority}** and **{Low Priority}** . When marking, channels will attempt to mark to high priority cues first. Cues that are flagged with just Mark are considered normal priority. Channels will attempt to mark to them second if a high priority cue can not be used. Low Priority cues will be used last if a high or normal priority cue could not be used.

Priority marked cues display indicators in the PSD. See *Mark Symbols*.

Applying Flags as Channels are Marked

You may also apply a mark flag to a previous cue by doing the following:

- [Channel list] **[Mark] [Cue] [5] [Enter]**
- **[Record] [Cue] [8] [Enter]**

This would mark cue 5 to perform any non-intensity moves stored in cue 8. The display indicators for this mark would be the same as shown in the previous example. As long as intensity is at zero within the cue range, if there are any non-intensity move instructions for these channels between these two cues, they will be removed.

It is also possible to mark only certain parameters for marked moves, while allowing live moves for other parameters.

- **[1] [Thru] [10] [Focus] [Mark] [Enter]** - mark only focus, and allow all other parameters to transition while the light is fading up.

Mark Earliest

The **{Earliest}** command can be used with **[Mark]** to mark the channel into the cue after the last intensity moved from a nonzero level to 0. The mark is stored and behaves exactly as if you had typed the cue number instead of **{Earliest}**. This works in blind, or in live if you record afterwards.

For example, cue 2 moves the intensity for channel 1 to 0, cues 3 thru 4 have no intensity for channel 1, and cue 5 has the intensity move to full. From cue 5:

- **[1] [Mark] {Earliest} [Enter]** - marks cue 3 to cue 5. This works the same as **[1] [Mark] [Cue] [3] [Enter]**.

Note: *[Mark] {Earliest} will mark through block cues or blocked intensity moves of 0, until it finds the earliest intensity move to 0. If the cue immediately before the cue being marked is the earliest intensity move to 0, it will mark in that cue.*

{Earliest M} will mark to the earliest cue that already has a mark flag. If a mark cue doesn't exist, **{Earliest M}** will behave like **{Earliest}** and will mark to the earliest possible cue.

Note: *{Emergency Mark} can be used to automatically set a mark flag if you had not previously done so. If using {Earliest M} and no cue with a mark flag has already been set, {Emergency Mark} will set a mark flag. See Record Defaults.*

Mark Symbols

A variety of symbols appear in the **Mark** flag columns of *Live and Blind [Tab 1]* and *Playback Status Display (PSD) [Tab 2]*.

Live / Blind Tab

- **MK** - the channel is marked for a later cue. The cue number is indicated in the other categories (see "Q" below).
- **Q** - found in the non-intensity categories of a marked channel. The "Q" is followed by a number indicating which cue the mark is in preparation for.
- **M** - a mark is placed, but manual, and must be stored. Is blue when stored. "m" indicates cue is not marking.
- **-** - a tracked intensity of 0, which could indicate a dark move, where non-intensity parameters move on channels whose intensity is at 0.

Playback Status Display

- **D** - AutoMark is disabled.
- **M** or **m** - Indicates a marked cue. "M" indicates an AutoMark or a reference mark that is used by a subsequent cue. "m" indicates a reference mark that is currently unused by any subsequent cue. Found in the "Flags" area.
- **R** - Indicates the source cue which refers back to an earlier mark. Found in the cue display "Flags" area.
- **+** - Indicates a cue is both a marking and reference cue when displayed in the mark flag.
- **x** - Indicates that a mark has been placed, but the mark has been broken. If possible, Eos will AutoMark the lights.
- **mh** - Indicates that a cue has been flagged as high priority mark, but nothing is marking to it yet.
- **Mh** - Cue has been flagged as high priority, and lights are marking to it.
- **ml** - Indicates that a cue has been flagged as low priority mark, but nothing is marking to it yet.
- **Ml** - Cue has been flagged as high priority, and lights are marking to it.

Reference Marks and Timing

Movement of non-intensity parameters in conjunction with a mark will adhere to the following timing rules.

If discrete timing is used for non-intensity parameters, when channels execute a mark, the moves will use the discrete times assigned to them **in the source cue**. For example:

- **[Cue] [5] [Mark] [Enter]** - a mark is applied to cue 5, making it the marked cue.
- **[1] [Thru] [1] [0] {Focus} [Time] [8] [Mark] [Enter]** - channels 1-10 are assigned discrete timing and a mark instruction.
- **[Record] <Cue> [1] [0] [Enter]** - records those channels into cue 10.

In this instance, when cue 5 is executed, channels 1-10 will perform their focus parameter moves in 8 seconds, as specified in cue 10 (the source cue, which is the source of their move instruction).

If no discrete timing is used for non-intensity parameters or mark time is disabled, when channels execute a mark, the moves will use the time recorded **in the marked cue**. For example:

- **[Record] <Cue> [5] [Time] [1] [0] [Enter]** - cue 5 is recorded with a time of 10 seconds.
- **[Cue] [5] [Mark] [Enter]** - a mark is applied to cue 5, making it the marked cue.

Later, channels 1-10 are assigned a mark instruction and then recorded into cue 10 with **no** discrete timing:

- **[1] [Thru] [1] [0] [Mark] [Enter]**
- **[Record] <Cue> [1] [0] [Enter]**

When cue 5 is executed, channels 1-10 will perform their non-intensity parameter changes in 10 seconds, as specified in cue 5 (the marked cue).

Marked cues that are played out of sequence will fade to their marks immediately. When firing a cue that has a linked cue, the cue will mark like the linked cue is the next cue. The marks will fade using the active cue's timing.

Mark Time

See *Mark Time*

Removing Referenced Marks

Mark is a toggle state. Therefore, the first mark command sets a mark. The second removes it.

- **[Cue]** [n] **[Mark] [Enter]** - removes a mark flag from a cue.
- [Channel] **[Mark] [Enter]** - removes a mark from a channel.

Note: *If a mark is removed from a channel in live, the corresponding cue must be updated.*

It is also possible to mark to a cue that doesn't exist, and when the mark is stored, Eos will automatically create the cue to mark to. For example, if cue 2 does not exist yet:

- **[**Channel list**] [Mark][2] [Enter]**

The command line will display, "Create Mark Cue?" Select **[Enter]**. When the cue is stored, the system will automatically create a cue 2 and mark the lights to it.

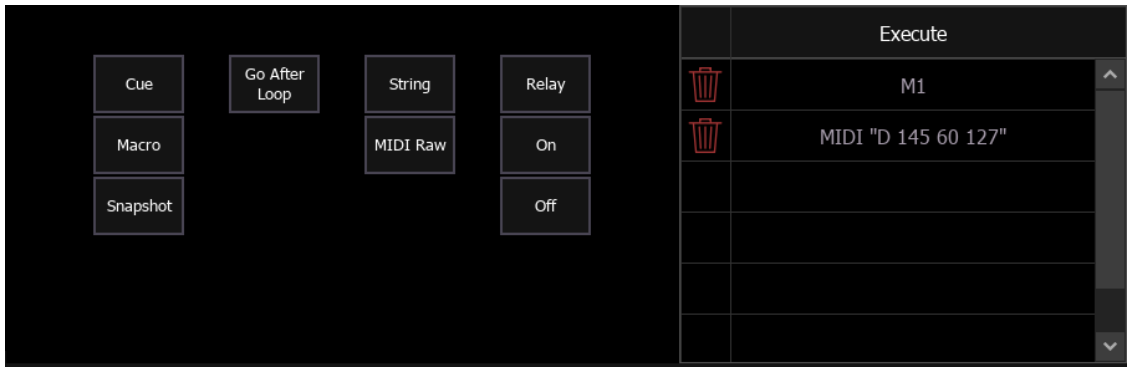
If a light is marked and that mark is later broken (for example being used by a move instruction stored in the mark range), Eos will attempt to repair the mark. This is done by automatically marking in the cue previous to intensity fading up, if possible. This will be indicated in the cue list by a "*" in the cue immediately preceding the "R" cue.

Cue Triggers

Triggers can be used to tie actions such as macros, show control, or snapshots to cue or cue list playback. You can also trigger the playback of additional cues or cue lists, if available.

{Execute}

When used after selecting a cue via the command line, **{Execute}** will open a trigger display in the CIA.



The table on the right lists all triggers associated with the selected cue, along with their reference labels. The delete icon will remove the trigger on that line. Buttons for common trigger targets are available on the left, or can be used via the softkeys below.

{Cue}

Enter a cue or cue list to be executed when the cue or cue list is played back. Cues can execute cues in any cue list. If the executed cue is in another cue list, it will play back simultaneously with the primary cue. If the executed cue is in the same cue list, the primary cue list will jump to that position.

Cue lists can only execute other cue lists. Playing back cues on the primary cue list will automatically play back cues of the same number on any executed cue lists. If a primary cue number does not exist in an executed list, only the primary cue will play. If a cue number in an executed list does not exist in the primary, those cues are skipped.

If a cue in the primary list is played back out of sequence, only cues with the same number on executed cue lists will play back. **{OOS Sync}** can be enabled to make sure executed lists advance at the same rate as the primary list, regardless of whether the cue numbers match.

{String}

Enter an RS232, UDP, or ACN string to be sent when the cue or cue list is played back. See *Sending String Commands*.

{Macro}

Run one or more specified *Macros* when the cue or cue list is played back. Each macro must be entered separately as an individual trigger.

{Relay}

{On} and {Off}

{Snapshot}

Recall a specified snapshot when the cue or cue list is played back. See *Snapshots*.

{OOS Sync}

Note: *Not available on Element Classic.*

Disabled by default. When enabled on an executed cue list, the playback of any out of sequence primary list cue will trigger the earliest cue that exists on the executed list if the correct cue does not. When disabled, cues in executed cue lists will only be triggered by primary cues of the same number.

For example, cue list 1, which contains cues 1 through 10, is executing cue list 2, which contains cues 4 through 8, and has **{OOS Sync}** enabled. When cue 1/3 is fired, cue 2/4 will play back, since cue 2/3 does not exist. If cue list 2 did not have **{OOS Sync}** enabled, cue 1/3 would fire, and cue list 2 would do nothing.

{OSC Cue Recv String}

Enter an incoming OSC string format to associate with a specified cue list. Overrides the *OSC Cue Receive String* setting in **Setup > System > Show Control**. This trigger cannot be used for individual cues.

{OSC Cue Send String}

Enter an outgoing OSC string format to associate with a specified cue list. Overrides the *OSC Cue Send String* setting in **Setup > System > Show Control**. This trigger cannot be used for individual cues.

{Go After Loop}

Executes the next cue after a follow link/loop sequence has ended. By default, the loop will end with the last cue in the sequence. **{Go After Loop}** will use the follow time assigned to the last cue in the sequence.

- **[Cue] [5] {Execute} {Go After Loop} [Enter]** - assigns the **{Go After Loop}** command to cue 5. Go After Loop will display in the Ext Links Column of the Cue List index and the PSD. After Cue 5 has completed all loops, it will execute the next cue.

{MIDI Raw}

Execute an entered MIDI Raw string when the cue is played back. See *Sending MIDI Raw with Cues or Submasters*.

Syntax

A variety of command line syntax is available when working with triggers:

Action	Syntax	Example	*Notes*
Add the first trigger of a target type.	**[Cue] [#] {Execute} {Target} [#] [Enter]**		
Replace existing triggers of a target type with the one specified.			*Confirmation required.*
Add the first or additional triggers of a target type.	**[Cue] [#] {Execute} [+] {Target} [#] [Enter]**		
Remove the specified trigger.	**[Cue] [#] {Execute} [-] {Target} [#] [Enter]**		
Remove all triggers of the specified target type.	**[Cue] [#] {Execute} {Target} [Enter]**		*Confirmation required.*
	[Cue] [#] {Execute} [-] {Target} [Enter]		
Remove all triggers.	**[Cue] [#] {Execute} [Enter]**		*Confirmation required.*

Modifying Cues Live

Recorded cues can be modified live. *Cue Attributes* (such as link, loop, label and so on) may be edited as well. The cue does not need to be active (played back) to change cue attributes. You may also change cue attributes for a range of cues if you wish.

[Recall From], *[Copy To]*, and *Move To* may be used to create and edit cue data.

Using [At] [Enter]

[At] [Enter] allows you to select any channel or parameter, or several of them, and remove their move instructions, allowing the value from the previous cue to be manually recalled.

[At] [Enter] is essentially a "recall from the previous cue" command. For example, if cue 5 is active in Live:

- **[Group] [1] [Focus] [At] [Enter]** - lifts the current move instructions for Group 1 focus, and recalls the focus data for those lights from the immediately preceding cue. It is now manual, and can be stored or updated as required.

You may use **[At] [Enter]** to affect only certain channels or parameters by selecting them specifically:

- **[2] [At] [Enter]** - this will remove the changes for channel 2 only.
- **[2] {Color} [At] [Enter]** - this will remove only the color data changes for channel 2.
- **[2] [Thru] [5] [+] [9] [+] [1] [1] [Thru] [1] [5] [-] [1] [2] [-] {Zoom} [At] [Enter]** - removes the changes for only the selected channels for all parameters except zoom.

Modifying Using Record

You may modify a cue by re-recording it entirely. After making changes to channels/ parameters:

- **[Record] [Enter] [Enter]** - will replace any data in the active cue with the current stage settings.
- **[Record] [Cue]** [x] **[Enter] [Enter]** - will replace the any data in cue "x" with the current stage values.

Selective Storing Cues in Live will modify the existing cue without overwriting it.

- **[1] [Record] [Cue] [2] [Enter] [Enter]** - will only record the changes to channel 1.

Note: *Using **[Record]** will store all parameters of all non-default channels onstage. This means that all other cue data and submaster data will be included in the record action. This is a common method when working with a single cue list. When working with multiple cue lists and/ or submasters, **[Record Only]** is a useful tool.*

Modifying Using Record Only

Note: *[Record Only] is used in the examples below. Element Classic users will need to use **[Record] [Record]**.*

Modifying existing cues using **[Record Only]** is considered a "selective store" function. As such, it adds or modifies only manual data to the target cue, but leaves any other data that was already in the cue intact and does **not** include playback values from other cue lists or submasters. **[Record Only]** is a good way to modify existing cues without including contributions from other playbacks in the cue. In that way, it is very similar to *[Update]*.

All of the same commands used for Record may also be used for Record Only.

- **[Record Only] [Enter] [Enter]**- adds the current manual data to the selected cue.
- **[Record Only] [Cue]** [x] **[Enter] [Enter]** - adds the current manual data to cue "x".

[Update]

Update is a powerful feature, and also very versatile. Using a combination of **[Q Only]**, **[Track]**, **[Trace]**, and **{Make Absolute}**, the number of ways you can update specific information and manual data is virtually endless. Data can be updated to various record targets either at once, or individually.

Update Dialogue Box

When you press **[Update]**, a dialogue box will open in the CIA. Update styles and modifiers for those styles will be divided in the Update Dialogue Box.

Default Update Modes are set in **Setup > User >** *Record Defaults*.

Note: *If Updating By Type Presets, **{By Type}** is available as a softkey.*

Update Styles

- **{All}** - this button will update the target cue and all references stored to that cue (nested and otherwise).
- **{Make Absolute}** - this button will update the target cue and convert all levels to absolute values, thereby removing any references.
- **{Ref Only}** - this button will only update the palettes or presets used in the cue, but will not update the cue itself. If a manual reference was used before using **{Ref Only}**, the last manual reference will be updated.

Update Modifiers

- **{Last Ref}** - updates using the last reference that was applied via the command line, rather than the original reference for the values present in the cue.
- **{Break Nested}** - updates the target cue and any presets used, but breaks the reference to any palettes nested in a preset. For example, if cue 1 channel 1 references preset 3, and preset 3 was built using color palette 5. When updated with this option, preset 3 would be updated, color palette 5 would not, and the reference to CP5 would be broken in preset 3.
- **{Reset Update}** - clears any commands after the **[Update]** command to quickly undo pending changes before **[Enter]** is pressed.

The dialogue box also provides you with a listing (by record target) of what channels/parameters will be impacted by the update instruction. If the channel contains a reference in the cue, it is indicated. Channels that have been manually added to the stage output, but are not overrides of an active cue will update to the selected cue list.

Once you have made a selection from the available options, press **[Enter]** and the target will be updated.

Targets may be deselected from the dialogue box, excluding them from the update without specifying the target number, for example, **[Update] [Color Palette] [Enter]**. Selecting a line by clicking or pressing it can also be used to deselect a target. Element Classic users will need to use **{Color Palette}**.

On Eos Family devices that do not have a **[Snapshot]** hardkey, there is a **{Snapshot}** softkey available in the Update display.

Updating to References

When a cue is active, it is possible that various record targets (palettes or presets) will be played back within that cue. As changes are made to the data in that cue, as well as to the individual palettes or presets, updating both the cue and references within that cue is simple. When you have overridden a reference in a cue, the data is displayed in red with a red "R" in superscript next to the channel's intensity.

By default, Eos updates any referenced data that was included in the cue.

For example, cue 5 is recalled Live. It contains references to color palette 1 and preset 2. You make changes to channels included in these record targets. To update both the cue **and** the palettes and presets, use **[Update] [Enter]**.

This will automatically take the manual changes and update them to color palette 1 and preset 2. Therefore cue 5 now references these new values, and the modifications to color palette 1 and preset 2 have propagated through all of the show data.

If you had made changes to other channels that were not included in the palettes and presets used in cue 5, those values would also be updated to the cue as absolute data.

Updating Without References

Referenced data is channel or parameter data that uses value stored in a palette or preset. This type of data can be converted into absolute numerical values using the **{Make Absolute}** softkey. This is primarily useful for recording updates to referenced data in cues without updating the references.

The **{Make Absolute}** command can be applied to the channels or parameters required before the update instruction, or they can be applied during the update.

- **[4] {Make Absolute} [Enter]** - selects channel 4 and makes any referenced data for that channel absolute data.
- **[7] {Color} {Make Absolute} [Enter]** - selects channel 7 and makes its color data absolute.
- **[3] [Thru] [9] {Color} {Intensity} {Make Absolute} [Enter]** - selects channels 3 through 9 and makes their color and intensity data absolute.

In each of these examples, the channel display will change from the previously-indicated reference (**IP**, **FP**, **CP**, **BP**, **Pr**) to show a numerical absolute value.

{Make Absolute} can also be used in conjunction with an **[Update]** command, allowing a cue to be updated while also breaking the reference to palettes or presets that were manually modified.

- **[Update] {Make Absolute} [Enter]** - updates the active record target, breaks the references for any parameters which have been changed and updates the cue with the changes. The referenced target will no longer be displayed in the channels which were made absolute. All of the data updated in cue 5 will now be shown as absolute data. . Any manual values that were modifications to a palette or preset stored in the cue will be updated as absolute data in the cue. The reference will be discarded.
- **[5] [Thru] [9] [Update] {Make Absolute} [Enter]** - this will break only the references for channels 5-9 and record their manual values to the cue. Other manual values will not be included in this update.

In Live, data that is changed to absolute is also made manual, thereby requiring a record or update instruction if the results are to be maintained.

Using [Record Only]

You may also use **[Record Only]** to break references. For example, cue 5 is active and onstage. Channels 5 through 20 are currently referencing preset 1. You make changes to channels 5 through 9. The data for these changes is now manual. Select **[Record Only] [Enter] [Enter]**. If there were other changes on stage, you could use **[5] [Thru] [9] [Record Only] [Enter] [Enter]**.Only the manual data will be recorded as an update to cue 5. The reference to preset 1 for channels 5 through 9 is broken and now the cue will display the absolute data rather than the reference indicator.

Update Using Cue Only/Track

The **[Q Only/Track]** key can be used as an applied exception to the cue only/track system setting. Therefore if the system is set to Cue Only, the key behaves as a **[Track]** command. Alternatively, if the system is set to Track, the key behaves as a **[Q Only]** button.

For a more detailed summary of Cue Only and Tracking modes, see *Tracking vs. Cue Only*.

[Q Only/Track] can be used in conjunction with record or update functions. Following are some examples of use:

Note: *In the following examples, the commands **[Q Only]** and **[Track]** indicate the same key hit of **[Q Only/Track]** - a single button on the keypad. The system setting determines the actual context of the button. For clarity, only the contextual function of the button is used in the examples.*

With system set to Track

- **[Record] <Cue> [5] [Q Only] [Enter] [Enter]** - rerecords cue 5. This will make the changes to cue 5 **only**. The changes will not track forward through the list.
- **[-] [Color] [Record] <Cue> [5] [Q Only] [Enter] [Enter]** - as above, but changes to color parameters will not be included in the record and all data that was included will not track forward. Color data in the cue remains unchanged.
- **[Update] <Cue> [5] [Q Only] [Enter]** - updates cue 5 with only those manual parameters that were receiving their instructions from that cue. The changes will not track forward in the list. Note that if the data being updated were referenced, this action updates the referenced target as well.
- **[-] [5] [Record] <Cue> [7] [Q Only] [Enter] [Enter]** - rerecords the specified cue, except the contributions from channel 5. The changes will not track forward in the list.

With system set to Cue Only

- **[Record] <Cue> [5] [Track] [Enter] [Enter]** - rerecords cue 5. This will force the changes to track forward in the list until the next move instruction or block.

- **[-] [5] [Color] [Record] <Cue> [7] [Track] [Enter] [Enter]** - rerecords the specified cue, except the color data from channel 5. The recorded changes will track forward in the list.
- **[Update] <Cue> [3] [Thru] [7] [Track] [Enter]** - updates cues 3 through 7. Range updates are subject to the normal rules of track/cue only in determining impact on subsequent cues.

Update Using Trace

Note: *[Trace] is used in the examples below. Ion Classic and Element Classic users will need to use {Trace}.*

[Trace] works just as Track does, except it allows changes to be tracked backwards through the cue list, until it sees a move instruction. A trace will track into, but not beyond, a blocked instruction.

For a more detailed summary of Trace, see *Using Trace*

Following are some examples:

- **[Update] <Cue> [5] [Trace] [Enter]** - updates cue 5, and tracks changes backward until a move instruction is encountered. If the system is in tracking mode, the change will track forward in the cue list until the next move instruction or block. If in cue only mode, this has no impact on subsequent cues.
- **[Update] [Trace] [Q Only / Track] [Enter]** - updates the selected cue and tracks changes backward until a move instruction is encountered. If the system is in tracking mode, the change is prohibited from tracking forward in the list. If in cue only mode, the change is allowed to track forward.

  When a channel that is inactive (at zero or null) in the cue list receives an active level, if update trace is used, that channel will not trace the current setting into previous cues. To force that channel's new value to go backward in the cue list, **[Trace] [Trace]** can be entered.

Updating the Current Cue

The current cue is updated by simply pressing **[Update] [Enter]**.

When only one cue list is active, this update will include any changes to all channels.

Updating a Source Cue

Note: *[Trace] is used in the examples below. Ion Classic and Element Classic users will need to use {Trace}.*

To update the source of a level in the current cue (therefore, a move instruction in a prior cue) you must specify a trace for the desired channels. See *Update Using Trace*.

- **[5] [Update] [Trace] [Enter]** - Updates any manual changes for channel 5 in the current cue. Any tracked values for channel 5 are traced back to the source of the value (the original move instruction) and changed to the new value. The value for traced changes in the current cue will be magenta indicating it is a tracked value.
- **[Trace] [Trace]** - If a channel was inactive in the cue (either because it had not previously been used in the cue list, or it was a tracked zero) and is set to a new level, by default the new level will not track back. You can force it by pressing **[Trace]** twice.

Updating a Non-Active Cue

It is possible to use the same update commands as current (*Updating the Current Cue*) and source cues (*Updating a Source Cue*) to update inactive cues (cues not live onstage). In these situations, if the updated cue is not the source of a channel's live value, manual data will remain manual. If the updated cue **is** the source of the current value, the values will change to magenta (indicating tracked) when the update is completed.

Update [Thru]

Using **[Update] [Thru]** allows you to update from a current cue to a destination cue without first entering the current cue's number.

- **[Update] [Thru] <Cue> [10] <CueOnly/Track> [Enter]** - updates cues 5-10 when currently in cue 5.

Update [+]

[+] can be used to specify a range of cues for updating. **[+]** can also be used with **[Record]** and **[Record Only]**.

- **[Update] <Cue> [5] [+] <Cue> [1][0] [+] <Cue> [1][5] <CueOnly/Track> [Enter]** - updates only cues 5, 10, and 15.
- **[Update] [+] <Cue>[7] <CueOnly/Track> [Enter]** - updates the current cue and cue 7.

If no cue number is entered before the **[+]**, the current active cue will be used.

Update Intensity Cue Only

This option allows you to update intensity cue only, and all other parameters according to your console's current tracking settings in **Setup > User >** *Record Defaults* or manual use of CueOnly / Track.

Recording and Editing Cues from Blind

When you press **[Blind]**, the selected cue will be displayed. You can make changes to cues in the blind display using either the summary, table, or spreadsheet views.

CAUTION: ***Edits in blind take effect immediately. [Record] or [Update] commands are not required in blind.***

Note: *To force blind to the selected cue, press **[Blind] [Blind]**.*

If changes are made in the blind display to an active cue, these changes will not impact the current stage state. To make blind changes active you can press **[Assert] & {Load}** button for the fader associated with the cue, or you can use **[Go To Cue] [Enter]**.

Move instructions can be removed from a cue by selecting the channel and pressing **[At] [Enter]**. This allows all values from the previous cue to track into the current cue. You can also use this command for specific parameters as well.

For example, you are in blind cue 5 and make changes to channels 1 through 5:

- **[1] [Thru] [5] [At] [5] <0> {Iris} [3] [5] [Enter]** - sets Intensity to 50% and Iris to 35%.
- **{Iris} [At] [Enter]** - removes the Iris instruction. The Iris value from the previous cue tracks in.

- {Intensity} [At] [Enter] - removes the Intensity change. All values from the previous cue track in.
- [1] [Thru] [5] [At] [Enter] - returns the channels to their values from the previous cue.

The impact of blind edits on subsequent cues is determined by the default setting of Track/ Cue Only mode. In track mode any changes will track forward until the next move instruction, unless [Q Only] is pressed. In cue only mode any changes will apply only to the selected cue. If you want values to track forward, the [Track] button will allow it. The track/cue only instruction must be applied when a value is entered. [Trace] can also be used to have changes trace back to the initial move instruction.

- [1] [Thru] [5] [At] [5] <0> [Q Only/Track] [Enter]
- {Intensity} [At] [Q Only/Track] [Enter]
- [1] [Thru] [5] [At] [5] <0> [Q Only/Track] [Trace] [Enter]

To Live From Blind

From blind, a softkey {Live} is posted when you press [Recall From] or [Copy To] to allow you to copy to or recall information from live. The following examples only work with the {Live} softkey, not the [Live] hard key.

- [1] [Recall From] {Live} [Enter]
- [2] [Copy To] {Live} [Enter]

Editing From Summary or Table Views

Use the [Format] key to cycle through the available views.

Summary view allows you to see the greatest number of channels at once, though parameter data is somewhat truncated. Channels with focus, color, or beam data are indicated with + symbols beneath the level data. This view is useful for viewing lots of channel data at once or for editing primarily intensity values.

Table view grants you greater visibility of parameter data and a reduced number of visible channels. This view displays channels along the y axis and parameters along the x axis. Parameter categories are always visible (I, F, C, and B).

You can also view specific parameters by pressing and holding the [Params] button and then pressing the category softkeys for the parameters you wish to view. Ion Classic and Element Classic users will need to use [Data]. This will expand the category to show any parameters used in the show. You can also deselect the parameters you do not wish to see. This is remembered the next time you go to table view.

Both summary and table views allow you to make changes to channels and parameters.

Editing from the Blind Spreadsheet

The Blind spreadsheet is another useful blind view of cue data. While in Blind, press [Format] to access the spreadsheet. See *Spreadsheet (Blind Only)*.

In spreadsheet view, cues are listed on the y axis and channels/ parameters are displayed on the x axis. This view is useful for showing a limited number of channels over a span of numerous cues. This is the only view where channel data of multiple cues can be viewed at once. This makes spreadsheet view useful for viewing overall trends in channel and parameter data.

Pressing [Params] & {parameter tiles} will expand or collapse information shown. Ion Classic and Element Classic users will need to use [Data] to access the parameter tiles.

Editing cue ranges is possible in spreadsheet view. To select all of the cues, you can press [Cue] [Home] [Thru] [Enter].

Replace With

{Replace With} is used to select channels that have certain specified values and then provide new instructions for those values.

- [Cue] [1] [Thru] [9] [Enter] - selects a range of cues.
- [1] [Thru] [7] <At> [Color Palette] [5] {Replace With} <Color Palette> [3] [Enter] - selects a range of channels that are used throughout these cues and enters a change instruction. This instruction finds all instances of channels 1 through 7 in cues 1 through 9 that are in color palette 5 and replace Color Palette 5 with Color Palette 3.

Be aware of the track and cue only settings when using this command.

Note: *[Cue] [Home] [Thru] [Enter] will select all stored cues within the selected cue list. [Thru] [Enter] can be used with all record targets. See Home.*

The range of possibilities of potential {Replace With} commands is virtually endless and can be applied to single cues or channels, ranges of cues or channels, parameters of any type, or timing data.

Move To

Move To is used to move cues from one location in a cue list to another location in the same or a different cue list. To put Move To on the command line, press [Copy To] twice.

Note: *On Element 2 and Element Classic, Move To is used to move cues from one location in a cue list to another location in the list.*

When cues are moved, values that were tracks or move instructions and now match the previous cue will be auto-blocked by the system. The impact on subsequent cues is based on track/cue only settings as described above. Below is an example of Move To:

- [Cue] [2] Move To <Cue> [9] [Enter] - the contents of cue 2 moves to cue 9. Cue 2 is deleted. If cue 9 already existed, a confirmation will be required (unless confirmations have been disabled in setup). Any contents of cue 9 will be replaced entirely.

In the above example, if running in cue only mode, any tracked values in cue 2 become blocks (see *Block*) or moves in cue 9, as well as any move instructions which now match the previous cue. Cues after cue 9 are affected based on the default setting of track/cue only. Any values in the cue after cue 2 that tracked from moves in cue 2 are changed to move instructions.

Ranges of cues can be moved as well. You can also move cues to other cue lists. In either of these situations if any cue is to be overwritten, a confirmation is required. See *Move To*.

Using Encoders in Blind

If your console has encoders, they are disabled by default in blind. Press an [encoder paging key] prior to moving the encoders, and they will function while you remain in Blind.

When a cue is specified, you can select channels and alter parameters using the encoders. [Q Only/Track] can be placed on the command line after a selection to determine how these changes will impact subsequent cues.

Deleting Cues

Cues, ranges of cues, or lists of cues (if available) can be deleted. When deleting cues, the track/ cue only setting of the console will determine how subsequent cues are affected. The [Q Only /Track] button can be used to modify the default behavior as needed.

Some examples of cue deletion are:

- [Delete] <Cue> [5] [Enter] [Enter] - deletes cue 5. Subsequent cues in the list are affected depending on the console default setting.
- [Delete] <Cue> [6] [Q Only/Track] [Enter] [Enter] - deletes cue 6, making exception to the default setting.
- [Delete] <Cue> [7] [Part] [1] [Enter] [Enter] - deletes part 1 of cue 7. Deleting a part does not delete any move instructions. Those will be moved to the main cue. See *Deleting Parts from Multipart Cues*
- [Group] [1] [Delete] <Cue> [2] [Enter] - deletes any channels in group 1 from cue 2. Cue 2 remains in the cue list and any channels not in group 1 are unaffected.
- [Delete] <Cue> [2] [Thru] [8] [Q Only/Track] [Enter] [Enter] - deletes cues 2 through 8, making exception to the default setting.

Deleting In Track Mode

When the console is in track mode, deleting a cue also removes any move instructions provided by the cue. For example, assume you have stored cues 1 through 10 and cue 5 contains move instructions for channels 1 through 5. If cue 5 is deleted, the move instructions are deleted as well and the values from cue 4 will track directly into cue 6 and beyond.

In this instance, if you used the [Q Only] button in the delete instruction, cue 5 would be deleted, but the tracked values in cue 6 that originated in cue 5 would remain and be converted to move instructions.

Deleting In Cue Only Mode

When the console is in cue only mode, any subsequent tracked values are not eliminated, but are converted to move instructions instead.

In the example above, deleting cue 5 (in cue only mode) would result in any tracked values in cue 6, that originated in cue 5, being converted to move instructions.

If you apply the [Track] button to the delete instruction, the move instructions from cue 5 are deleted and the values from cue 4 would then track into cue 6 and beyond.

Cues [Tab 16]

The cue list index is a Blind display list which shows the cue list you are working with, the cue status, cue list properties, and, if available, any other stored cue lists, and what (if any) faders the lists are loaded onto.

Opening the Cue List Index

You can access the cue list index by pressing [Cue] [Cue],[Tab] [1][6], or you can navigate within the browser to Record Target Lists > Cue List Index and press [Select].

Cue list properties determine how the cue list will interact. Assigned properties will display at the top of the cue list as well as any currently active show control triggers.

The top half of the cue list index displays all stored cues, including cue list properties, for the selected cue list. The bottom half of the cue list index displays one or more stored cue lists and their properties. The selected cue list is highlighted.

Using the mouse, you can move the barrier between the stored cue display (top) and the stored list display (bottom). Hover the mouse arrow over the list boundary until it changes to the move boundary icon. Then click and drag the boundary up or down to the desired height.

Command Line Behavior for Cue List Index

The command line while in the Cue List Index defaults to cue list selection. The softkeys that display will default to cue list control.

[Next] and **[Last]** will select the next or last cue list if no cue list or a cue list but no cue is on the command line.

When a specific cue is selected, **[Next]** and **[Last]** will move through the cues in that same list, and the softkeys will change to be for a single cue control.

Solo Mode

Note: *This option is not available on Element 2 and Element Classic.*

The **{Solo Mode}** softkey is useful in multiple programmer situations. **{Solo Mode}** is used to pull a cue list out for editing purposes after it has been synced with other cuelists.

For example, cue list 1 is being used by one programmer and cue list 2 was programmed by a second programmer. For the run of the show, the lists are synced so they run together. But if changes need to be made to cue list 2 and not be affected by the playback of cue list 1, **{Solo Mode}** can be used.

- **[Cue] [2] [/] {Solo Mode} [Enter]** - places cue list 2 into solo mode.

{Solo Mode} is a toggle state. If cue list 2 is already in solo mode, and **[Cue] [2] [/] {Solo Mode} [Enter]** is used again, that list will no longer be in solo mode.

Auto-Block Cleanup

{Autoblock Clean} is used to remove all *Auto-Block* instructions from a single cue, cue range or entire cue list. **{Autoblock Clean}** is a softkey that will be posted when a cue list and / or cue number are on the command line in the Cue List Index, Live, and Blind. A range of cues or a cue list can be specified with this command.

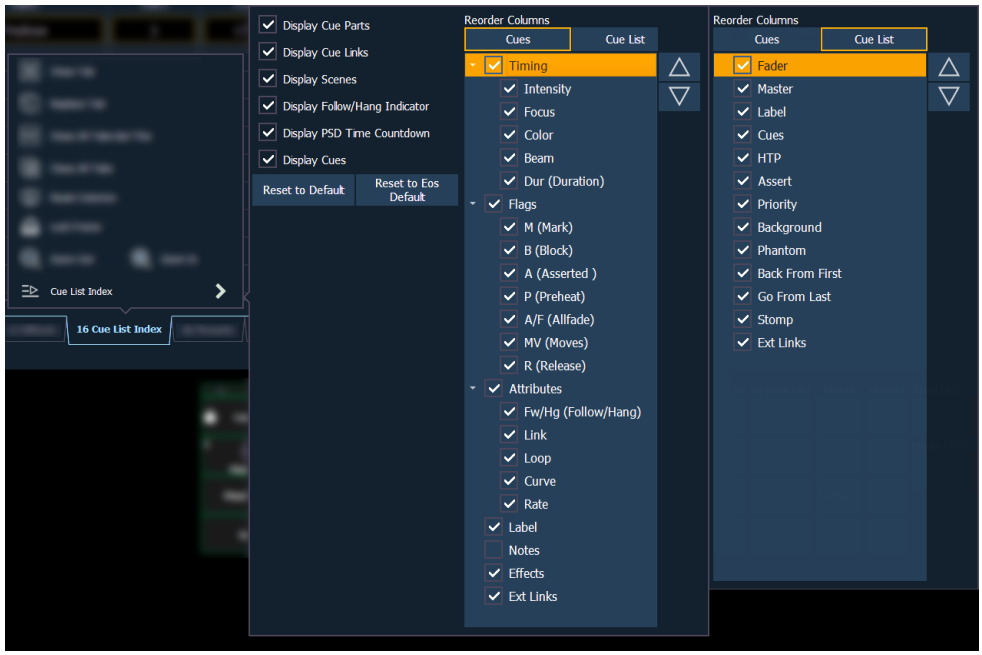
- **[Cue] [1] [/] {Autoblock Clean} [Enter]** - clears all auto-blocks from cue list 1. Only blocks displayed with the white underscore are removed. If the **[Block]** key was previously used, this command will not unblock it.
- **[Cue][1] [/] [1][0] [Thru] [1][0][0] {Autoblock Clean} [Enter]** - clears the auto-blocks just from cues 10 through 100 of cuelist 1.

Edit

The **{Edit}** softkey opens a blind channel view of the selected cue and changes focus from the cue list index. You can change the blind display to spreadsheet or table view by pressing the **[Format]** key. You can edit any of the cue attributes for the cue selected in the index, but the cue contents must be edited in the blind display. See *Recording and Editing Cues from Blind*.

Cue List Index Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



The following options are available:

- **Display Cue Parts** - displays the individual parts of a part cue. When not enabled, the number of parts for that cue will display as a superscript number beside the cue's number.
- **Display Cue Links** - displays the *Link / Loop* information.
- **Display Scenes** - displays cue *Scenes*
- **Display PSD Time Countdown** - displays the cue category times countdown in the PSD as a cue is fading.
- **Display Cues** - displays the top half of the cue list index, which shows all the stored cues.
  - Not available on Element 2 or Element Classic

Reorder Columns

Reorder columns allows you choose what data displays in the top and bottom halves of the Cue List Index and what order it displays in. To make changes to the top half, select **{Cues}**. To make changes to the bottom half, select **{Cue List}**.

By default, all columns except notes will be displayed. The arrow keys on the right can be used to move columns around. Columns with multiple options are moved in groups. To select a column header to move, click or tap the name. The check boxes suppress or enable. When an item is enabled to display, a check mark will be in the corresponding box.

Default

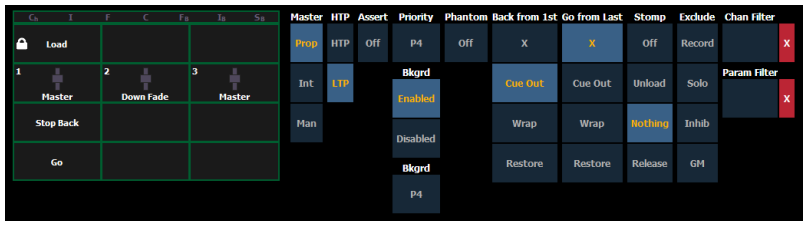
The Cue List Index takes its default settings from the Playback Status Display. The default is identified with parentheses. See *Playback Status Display Tab Configuration*.

- **Reset to Default** - returns the settings to the default state that you created.
- **Reset to Eos Default** - returns all settings to the Eos defaults.

Cue List Properties

Note: *The examples below mention multiple cue lists and mapping them to faders. Element 2 and Element Classic consoles have a single cue list which can only be loaded to the main fader pair.*

When the cue list index is open, the cue list properties dialogue box will display in the CIA. The cue list properties determine how the cue list will interact.



Cue list properties include:

- **Master type** (Proportional, Manual Master, or Intensity Master)
- **Intensity HTP or LTP** (default is LTP)
- **Assert**
  - Not available on Element Classic
- **Priority**
- **Background**
- **Background Priority**
- **Phantom**
- **Back from 1st**
- **Go from Last**
- **Stomp**
- **Exclude**
- **Channel Filters**
- **Parameter Filters**

A cue list can be mapped to any fader via the fader configuration display or by using **[Load]** (see *Selected Cue*). If a *Fader Configuration [Tab 36]* has been set for default mapping, the fader will receive its configuration from the Cue List Index. Changes made to a cue list in the cue list index will be shared with any default mapping faders loaded with that cue list. If changes are made to a fader set to default mapping in the fader configuration display, those changes will also happen in the Cue List Index. If set to Local, any changes made in the fader configuration display will impact only that instance of the content.

Master

When a fader is assigned as a master, its behavior as a Proportional Master, Manual Master or Intensity Master (I-Master) is drawn from this setting.

Proportional Faders

Proportional faders, when the slider is set to zero prior to the execution of a cue, will withhold playback of intensity data until the fader is raised. Intensity data will then be played back proportionally according to the level of the fader. Once the fader reaches full, the cue is considered complete and the cue is released from the manual fader. If the fader is at any value other than zero when the cue is executed, intensity values will play back normally. If the slider is returned toward zero, intensity in the cue will fade to the previous level.

Manual Masters

In Manual Master mode, cues are triggered manually by faders without using the **[Go]** button. With a cue list on a fader set to manual master, a cue will fire in manual time when the fader is moved from 0% or from Full. Timing is scaled. So, if color has a 5 count delay, and the duration of the cue is 10, the color transition will not begin until the faders manually reach 50%. Follow and hang times will be ignored when firing a cue with a manual master fader.

Intensity Masters

Intensity Masters will master the intensity level for cues during playback. Therefore, intensity masters set below 100% will proportionally limit playback of intensity data relative to the level that the fader is set. All non-intensity parameters are unaffected by the fader. Once the fader has reached full, control of intensity is retained. If the fader is moved toward zero, intensity will proportionally fade toward zero (not the previous state as per proportional faders).

HTP

Intensity playback behavior can be set to HTP (highest takes precedence) or LTP (latest takes precedence). For cues, it defaults to LTP.

HTP vs. LTP on Element Classic

The **{HTP/LTP}** softkey is a toggle state between LTP (latest takes precedence) and HTP (highest takes precedence). All parameters other than intensity are LTP.

Intensity, by default, is also LTP. The cue list can be set with an HTP intensity override. When the cue list is set to HTP, intensity values provided will override the LTP value (of which there can be only one), provided the HTP instruction is higher than the LTP value. When a cue from an HTP cue list is executed, the console determines if the intensity value when the cue is complete will be higher than the current setting. If so, the intensity will begin to fade from its current value to the required value in the incoming cue using the cue's upfade time.

Note: *This behavior is relevant only to cues. If a submaster is going to provide a higher level, Element Classic will wait until the value is matched before assuming control of the intensity.*

The following example illustrates the use of the **{HTP/LTP}** softkey in the cue list index:

- **[Cue] [1] [/] {LTP/HTP} [Enter]** - toggles the selected cue list between HTP/LTP behavior.

Assert

Note: *Not available on Element Classic.*

Assert can be turned on or off at the fader level. This property sets the entire cue list to be asserted on playback (even track instructions are replayed).

Priority

Note: *Priority was previously called Independent.*

Priority is used to protect values from being affected by submasters or playback faders that have a lower priority level. They will, however, still be impacted by manual control, grandmaster, blackout, park instructions, or other playback faders and submasters at the same or higher priority.

There are 10 levels of Priority that cue lists can have. 1 is the lowest level and 10 is the highest. The default priority level is 4.

- [Cue] [1] [/] {Priority} [5] [Enter] - sets the priority of the cue list to 5.

Background

Background can be enabled or disabled at the fader level. When enabled, the content of the cue list will act as a background or previous state for other cues and submasters. When a cue list has its background state disabled, a "D" will display in the Cue List Index background column.

Background on Element Classic

The {Background} softkey is a toggle state for enabling and disabling the background state of a cue list. When a cue list has its background state disabled, "Background Disabled" will display at the top of the cue list.

Background Priority

Background can have a priority assigned to it.

In previous software releases, when content was released, it always returned to the last fader that owned it. Background priority releases to the highest priority content that previously had ownership, provided that content has not be turned off or released.

There are 10 levels of background priority. 1 is the lowest level and 10 is the highest. The default background priority level is 4.

Phantom

When a cue list is set to Phantom, pressing [Go] will not change the selected cue on the command line, or an unlocked playback status display.

Back From First

Back From First controls the behavior that happens when you press the [Back] button while in the first cue.

The following are Back From First options:

- Do Nothing - keeps the first cue active
- Cue Out - default setting. Only fades out channels in that cue list. Other channels will remain. Intensity and non-intensity parameters will be homed. This setting uses the Back time for fading.
- Wrap - puts the last cue in the list in pending, and fires said cue
- Restore Background - any background cue, submaster, and effect levels are restored following background priority. Manual levels will not be restored. This setting uses the Release time set in Setup. See *Manual Control*.

Go From Last

Go From Last controls the behavior that happens when you press the [Go] button while in the last cue.

The following are Go From Last options:

- Do Nothing (Default Setting) - keeps the last cue in the list active.
- Cue Out - only fades out channels in that cue list. Other channels will remain. Intensity levels will go out. Non-intensity parameters will remain. This setting uses the Go to Cue timing for fading.
- Wrap - puts the first cue into pending, and fires it.

- **Restore Background** - any background cue, submaster, and effect levels are restore following background priority. Manual levels will not be restored. This setting uses the Release time. The pending cue will be set to the first cue in the list. If there is no background state, the non-intensity parameters will not fade.

Stomp Mode

Stomp refers to when all the content owned by a cue is now being controlled by other targets. The cue is being removed from the background, and once that happens, it would not be eligible to fade back. You can assign behavior that will happen when a cue is stomped.

The following are Stomp Mode options:

- **Off When Stomped** - puts the content into an off state, the same behavior encountered when pressing **[Off] + [Load]**.
- **Unload When Stomped** - unloads the fader.
- **Nothing When Stomped** (Default Setting) - nothing happens.
- **Release When Stomped** - resets a cue list to the top of the list.

Exclusions

Those exclusions include:

- **Exclude From Record** - output is not recorded into any other record target.
- **Exclude From Grandmaster** - content cannot be mastered by a grandmaster.
- **Exclude From Inhibitive Sub** - content cannot be mastered by an inhibitive submaster
- **Exclude From Solo** - content will ignore solo button mode. See *Fader and Button Configuration* on solo.

Channel and Parameter Filters

Channel and Parameter Filters can be used to allow only specified data to be played back. These are playback filters, and do not impact how data is recorded.

For cue lists, channel and parameter filters can be set in the following areas:

- Cue List Index using the **{Properties}** softkey
- In Fader Configuration (Tab 36)
- In Live using the **{Properties}** softkey

Tap or click on **{Chan Filter}** to assign channels or groups. Tap or click on **{Param Filter}** to open a list of available parameters that you can filter.

Note: *Filters will travel with their assigned cue lists wherever they are mapped.*

When a filter has been applied, an indicator will display in the fader ribbon. C will display for channel filter, and F is for parameter filter.

Press the red **[X]** to clear the channel or parameter filters listed.

Fader and Button Configuration

Click or tap on the virtual buttons or fader to see a list of available configuration options.

Button Options

The following options are available for playback buttons:

- Go - executes the cue currently in the pending file of the associated fader.
- Stop Back - instantly stops all fader activity. Pressing twice will fade to the previous cue on that fader.
- Assert - can be used to re-run the active cue on that fader, to regain control of all cue contents, to apply a newly set higher priority state to the associated fader, or make any changes in Blind to an active cue on stage.
  - Not available on Element Classic
- Group Select - selects the channels stored in the cue.
- Freeze - halts all effect activity on the fader. Press Freeze again to resume effect activity.
- Off - removes the content and if the fader is set to Master, the fader will remain where it currently is.
- Release - removes the content and if the fader is set to Master, the fader will reset to 0.
- Start Stop Effect - starts the effects while ignoring dwell times. Will stop effects if any are running.
- Button Disabled - no action is assigned to the button.
- Solo - plays back the content and suppresses any intensity values not provided by the associated content while the solo button is held down. When the button is released, intensity values are restored. Priority and HTP are ignored. Shielded, park and pixel mapping outputs are not affected by the solo button. This is unrelated to *Solo Mode*.
- Back - fades to the previous cue.

Fader Options

The following options are available for a playback fader:

- Master - fader will be a proportional master, a manual master, or an intensity master, depending on the cue list property.
- Effect Rate - fader centers to home. It controls the rate of any running effects (same behavior as using rate via the Effect Status Display). The adjusted setting from this control cannot be stored.
- Effect Size - similar to Effect Rate but for effect size.
- Rate Master - homes to center. It adjusts the cue rate, just like rate and load.
- Down Fade - same as the default behavior of the master option.
- Fader Disabled - no action is assigned to the fader.
- Master Only - fader is used to set a level for content to fade to. The slider can be used to live adjust levels when the fader has been activated via the bump button. See *Master Only*.
- Effect Master - masters the entry/exit mode of the effects (size, rate or both).
- Levels Only - masters the levels without mastering the effect.

Multipart Cues

Cues can be divided into up to 20 parts. Each part can have its own channels or parameters, levels, and timing information. Multipart cues can be stored in Live or Blind using the same conventions to record a standard cue.

There are three basic ways to create a multipart cue:

- Building a multipart cue part-by-part in Live
- Breaking an existing cue into multipart cues in Live
- Breaking an existing cue apart in Blind.

Multipart cues can be used to organize automated fixture data so that you can apply different times to different moves (focus moves slowly, but color snaps after a short delay). You can also use multipart cues instead of many individual cues triggered by wait times to create a series of fades.

A channel or parameter can only be provided an instruction once in a multipart cue. For example, it isn't possible to adjust color for channel 1 in cue 1 part 1 and then also provide a different instruction for channel 1 color in cue 1 part 8.

Default part timing is drawn from the cue level timing defaults established in **Setup** (see *Cue Settings*); you may also assign discrete timing to channels in each part as you would for a single part cue.

Recording a Multipart Cue in Live

Storing a multipart cue in Live is accomplished in similar fashion to storing a single part cue. However, rather than storing the entire cue, you select and store just the channels that you want in each part.

Note: *There are a variety of different ways and different orders to go about creating a multipart cue. These examples represent some, but not all, of those ways.*

Creating a New Multipart Cue in Live

There are two ways to create a multipart cue in Live. You can either build it part-by-part, or by building parts from the cue end state.

Build Part-By-Part

Make desired changes to the stage state. If all of the changes that you have made are to go into a part, press:

- **[Record Only] [Cue] [2] [Part] [1] [Enter]**

Continue making changes and storing parts as you go.

Build Parts From Cue End State

In most instances, you will create the end state of the cue and then break it into parts. To do this, you use selective storing commands, as follows:

- [channel/parameter selection] **[Record]** (or **[Record Only]**) [n] **[Part]** [a] **[Enter]**
- [channel/parameter selection] **[Record]** (or **[Record Only]**) **[Part]** [b] **[Enter]**

Note: *Element Classic users will need to press **[Record]** twice to post Record Only to the command line.*

Each part can contain its own cue level timing and other attributes. Follow/Hang, Link and Loop, and Allfade commands can only be placed at the cue level, not on a part. Via channel selection, you can put channel parameters into different parts.

Also, you can put channel parameters into different parts by including them after the channel selection but before the **[Record]** command.

- **[1] [Thru] [1] [0] {Focus} [Record] [Part] [3] [Enter]** - places pan and tilt parameters for channels 1 through 10 into part 3.

Part 1 of any multipart cue is where all unassigned move instructions will reside. Therefore, if the body of the cue (which is the normal behavior) is to be in part 1, you can simply select the channel/parameter list that you wish to place in parts 2 and higher.

Setting Multipart Attributes and Flags

Cue Attributes include *Follow/Hang*, *Link / Loop*, *Delay Time*, *Rate*, *Curve*, *Cue Notes*, *Cue Label*, and *Scenes*. They are stored and function exactly as they do in single part cues.

Flags can be set for *Block*, *Assert*, *Allfade*, *Mark*, and *Preheat*. On Element Classic, flags can be set for *Block (Element Classic)*, Preheat, and *Moves (Element Classic)*.

Cue part attributes can be defined as the parts are recorded, or they can be added after the part has been created.

- **[Record] [Cue] [2] [Part] [1] [Delay] [8] [Enter]**
- **[Cue] [4] [Part] [3] {Color} [Time] [6] [Enter]**
- **[Cue] [8] [Part] [9] {AutoMark Off} [Enter]**
- **[Record Only] [Cue] [5] [Part] [2] [Assert] [Enter]**

Using Update in Live for Multipart Cues

Updating a multipart cue is generally the same process as updating a single part cue, except you will provide a specific part cue number in the update command.

Various referenced data, such as palettes or presets, can be assigned to build a multipart cue. If you have made changes to referenced data within a multipart cue, thereby creating manual data, pressing **[Update] [Enter]** updates both the multipart cue and any referenced data with the new levels, as it does with single part cues.

You can update a part of a multipart cue with only selected parameters as well. For example, you have written cue 1, which is a multipart cue and is active. Part 2 includes channels 1 through 5 referencing intensity palette 2 which is set at 25%. Select channels 1 through 5 and change the intensity value to 21%. The data in Live will indicate the new levels in red, and an "R" is displayed to indicate the reference has been broken.

To update cue 1 part 2, including the new intensity levels, breaking the reference to the intensity palette, press:

- **[1] [Thru] [5] {Make Absolute} [Enter]**
- **[Update] <Cue> <1> [Part] [2] [Enter]**

To update cue 1 part 2 **and** the referenced palette with the new levels:

- **[1] [Thru] [5] {Intensity} [Update] <Cue> <1> [Part] [2] [Enter]**

For example, when cue 2 is active, select channels 1 through 5 and set new levels for the color scrollers. Update only part 4 of the multipart cue 2 with the new scroller levels.

- **[1] [Thru] [5] [Scroller] [Update] [Part] [4] [Enter]**

Element Classic users will need to use **{Scroller}**.

Storing Multipart Cues in Blind

CAUTION: ***Edits in Blind take effect immediately and do not require a [Record] or [Update] command.***

Changing a Standard Cue to a Multipart Cue

When working in Blind, often you will be breaking a single part cue into a multipart cue.

It is quite possible to create a new cue in Blind and follow the exact same process, except in addition to pulling channel parameters into parts, you will also be providing them with move instructions or block commands. It is worth noting that tracked instructions do not belong to any specific part of a multipart cue.

Select the cue you wish to break apart and specify the first part you wish to create. Part 1 is generally where the body of the cue resides. Therefore, if you specify any part other than part 1, all of the move instructions in the cue are placed in part 1.

Begin by selecting any channels that you wish to move into some part other than part 1.

- [1] [Thru] [5] [Part] [2] [Enter]
- [6] [Thru] [1] [0] {Intensity} [Part] [3] [Enter]
- [6] [Thru] [1] [0] {Color} [Part] [4] [Enter]

As you create each part, that part is now selected. It is possible to select the channel parameter you want and press [Part] [Enter] to pull that data into the selected part.

Note: *When breaking a cue into a multipart cue in blind, the [Part] button is a required instruction. Channel selection will not automatically assign a channel into a part. Use of the [Part] key allows you to add only specific channel parameters to the part. For example: [5] [Thru] [9] {Color} [Part] [Enter].*

Changing a Multipart Cue to a Standard Cue

To change a multipart cue to a standard cue, delete all of the parts of the cue. For example, cue 4 is a 3 part cue that include channels 1 through 20.

- [Delete] [Part] [1] [Thru] [3] [Enter] - changes cue 4 back to a standard single cue.

Creating Multiple Cue Parts in a Range

[Thru] [Thru] can be used in blind to create multiple cue parts in a range.

- [Cue] [1] [Part] [1] [Thru] [Thru] [4] [Enter] will create parts 1 through 4.

If you were to use just [Thru] instead of [Thru] [Thru], you would create parts 1 and 4.

Deleting Parts from Multipart Cues

When you delete parts of a multipart cue, any move instructions in the deleted part are moved to the first available part. If you want to delete move instructions out of a cue part, you have to select the channels and [At] [Enter] or null them.

- [Delete] <Cue> [1] [Part] [1] [Enter] [Enter]
- [Delete] <Cue> [6] [Part] [1] [Q Only / Track] [Enter] [Enter]
- [Delete] [Part] [1] [+] [2] [Enter] [Enter]
- [Delete] [Part] [1] [Thru] [3] [Enter] [Enter]

Multiple Cue Lists

Note: *This option is not available on Element 2 and Element Classic.*

Eos provides many useful tools to allow you to work efficiently and simultaneously with multiple cue lists.

Solo Mode and *Cue List Properties* are topics that can also be useful when working with multiple cue lists. Additional information about working with a cue list can be found in *About Cues and Cue Lists*.

Partitions can be especially useful when working with multiple cue lists.

Recording to a New Cue List

When recording cues, cue list 1 is initially used as the default cue list. Cue list 1 is displayed with only the cue number. It does not have a lead cue list number or a "/". To record to another cue list, that list must be specified. Cues will then be recorded to that cue list until another list is specified, or until the selected cue is changed in Live.

You may record up to 999 cue lists in an Eos show file.

The cue list that you are storing to is always determined by the selected cue, unless you specify a different cue list. The selected cue is displayed in the command line, in the PSD, and at the bottom of the Live/ Blind screen.

The selected cue is the last cue that you affected in Live. This includes a record, an update, a playback action such as **[Go]**, **[Back]**, a **[Go To Cue]** instruction, or simply changing a cue attribute.

Note: *It is very useful to keep an eye on the selected cue.*

Pressing **[Live]** will resync to the active cue.

Using Record

[Record] will record all parameters of any channels that have non-home values to a specified cue.

To record to a new cue list press:

- **[Record] <Cue> [2] [/] [5] [Enter]** - this will create cue list 2 and will record the data to cue 5 in that cue list.

Any cues recorded after this will automatically record to cue list 2 until another cue list is specified or the selected cue changes the cue list number.

Record Via Load

You can record a cue 1 to the next unused cue list by using the **[Load]** button for an unmapped fader. **[Record] [Cue] [Load]** will create a cue 1 in a new cue list and will map that cue list to the fader. Subsequent cues can also be recorded with **[Record] [Load]**, which will record to the next available cue within that cue list

Using Record Only

[Record Only] can be used to create a new cue list instead of [Record]. [Record Only] stores only manual data to the specified cue.

To record to a new cue list press:

- [Record Only] <Cue> [2] [/] [5] [Enter] - this will create cue list 2 and will record all manual data to cue 5 in that cue list.

The cue list display will change to show only data from cue list 2. Any cues recorded after this will automatically record to cue list 2 until another cue list is specified or the selected cue changes the cue list.

{Make Manual}

This softkey can be used to convert live cue or submaster data into manual values, allowing them to be included in the [Record Only] operation. Therefore data from other cues or lists can be selectively converted to manual data and then stored to another cue/list using [Record Only].

Using Assert

Note: *There are two [Assert] buttons. The [Assert] button in the main keypad area is used in the examples below. Ion Classic users will need to use {Assert}.*

By default, channel parameters only respond to move instructions during playback . The [Assert] function allows tracked or blocked data from a cue to be replayed, even when another cue list has taken control of that channel/ parameter (see *Cue List Ownership*).

Assert can be applied to cues, cue parts, channels, channel parameters, or to entire cue lists. Asserted channels will play back their tracked and blocked values, regardless of cue list ownership, when the associated cue is replayed.

At a Cue Level

When applied at a cue level, [Assert] ensures that all data in the cue, both moves and tracks, will be played back at their stored values.

To place an assert on a cue:

- [Cue] [x] [/] [y] [Assert] [Enter] - the cue will assert all of its channels upon playback. An "A" will be displayed in the "A" column of the cue attributes (cue index, playback status, and so on); indicating the cue has been asserted.

Assert can also be used from the command line to manually replay portions of a cue without having to replay the entire cue. Assert in this mode can only be used with cues that are currently active.

To place an assert on a portion of a cue:

- [Group] [6] [Assert] [Enter] - asserts the instructions for the channels in group 6 in cue 4.

This would then need to be stored using either [Record] or [Update].

At a Cue List Level

When applied at the cue list level, [Assert] ensures that all values in all cues in that list are asserted on playback. When a cue list has been asserted, the playback status display will show an "A" in the assert column for every cue in that list.

To place an assert on a cue list:

- [Cue] [x] [/] [Assert] [Enter]

At a Channel Level

When applied at a channel or parameter level, assert ensures that the entire channel or the specified parameter will be played back at its stored value.

To place an assert on a channel or group of channels:

1. [select channels] [Assert] [Enter] - a red "A" will appear next to all of the channels' parameters in the Live/ Blind display. This indicates the assert is placed, but not yet recorded to a cue.
2. [Record] <Cue> [x] [Enter] - the red "A" turns to blue in the Live/ Blind display, indicating the assert has been recorded. In the cue x row of the playback status display or the cue list index, a lower case 'a' appears in the "A" column, indicating that a partial assert is included in cue x.

You may also store this assert using [Update] or you can apply it in Blind.

To place an assert on specific parameters:

1. [select channels] {Intensity / Focus / Color / Beam} or {parameter buttons} [Assert] [Enter] - places an assert on the specific parameters of the selected channels.
2. [Record] <Cue> [x] [Enter] - the assert is recorded to cue x. In the cue x row of the Playback Status Display or Cue List Index, a lower case "a" appears in the "A" column, indicating that a partial assert is included in cue x.

Assert is a very useful tool allowing channels that have been seized by other cue lists to be repossessed by the associated cue list, while still allowing the asserted channel data to be treated as tracked instructions.

Using Allfade

Allfade is a cue attribute (see *Cue Attributes*) that commands any intensity values on stage that are not provided by the associated cue to fade to zero intensity when the cue is played. The allfade will adhere to the downfade time of the associated cue.

This is useful when *Using Assert*, so you can regain control of channels from other cue lists **and** fade other channels from that cue list out.

Note: *Channels with tracked values in the associated cue will not fade out in response to an allfade. These tracked values are part of the associated cue and therefore will be played back.*

To assign an allfade to a cue:

- [Record] <Cue> [2][/][5] {Attributes} {AF/MF} [Enter] - records cue 2/5 as an allfade cue, thereby forcing any channels not in the cue to fade to zero on playback.

Like many other cue attributes, allfade is a toggle state. To remove the allfade flag, specify the cue and press {Attributes} {AF/MF} [Enter].

See *Allfade*

Changing the Active Cue List

The active cue list will be displayed in detail in the *Playback Status Display (PSD) [Tab 2]* and *Cues [Tab 16]* tabs.

This view is changed by the following actions:

- Recalling another cue list in the command line - **[Cue] [3] [/] [Enter]**
- Recording a cue to another cue list - **[Record] <Cue> [3] [/] [8] [Enter]**
- Playing back a cue from the fader of another cue list - press **[Go]** for the associated fader.

The split PSD allows detail for two cue lists. Both or either of these can be locked.

For information on using **{OOS Sync}** (out of sequence sync), see **Cue Triggers >** *{OOS Sync}*.

Most Recently Activated Cue

Use **[Cue]** [n] **[/] [Enter]** to select the most recently activated cue from that cuelist. If there is no active cue from that list, the first cue in the cuelist will be used.

[Go To Cue] with Multiple Cue Lists

[Go To Cue] defaults to the currently selected cue list. **[Go to Cue]** is a live function. It can not be used to change cues in blind. **[Go to Cue]** instructions can be executed from any operating mode, without returning to live.

By default, cues played using *[Go To Cue]* instructions are out of sequence.

Go To Cue 0

[Go To Cue] [0] is a command line instruction that resets all intensity values not owned by another fader to default, including any manual values that are not an override to another active fader value. **[Go To Cue] [0] [Enter]** also resets the selected cue list to the top of the list, with the first cue pending.

To **[Go To Cue] [0]** on another cue list, press:

- **[Go To Cue] [2] [/] [0] [Enter]**

Captured channels, priority values and values from other faders running a different cue list are not affected by a **[Go To Cue] [0]** command.

When **[Go To Cue] [0]** is executed, any intensity values owned by the associated cue will fade out, while all non-intensity parameters remain in the current state. A **[Go To Cue] [0]** instruction does not impact the input from other programmers using partitioned control, unless the channels/parameters are shared.

[Go To Cue 0] & [Load]

The **[Go To Cue 0]** , located with the playback controls, in conjunction with a fader load button to send a specific cue list to cue 0. This action does not use the command line. On the desired fader, simply press **[Go To Cue 0] & [Load]**. Ion Classic users will need to use **[Fader Control] {Go To Cue 0}**.

Go To Cue Out

To reset all parameters to their default state (unless they are controlled by a submaster) and reset all cue lists that are loaded to faders so that the first cue of each list is pending, press:

- **[Go To Cue] [Out] [Enter]**

The **[Go to Cue] [Out]** command will not affect a cue list that is in *Solo Mode*.

Chapter 12

Cue Playback

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About Cue Playback

All Eos Family consoles have a single master fader pair, along with a varying number of motorized or non-motorized faders with multiple pages for configurable cue lists, submasters, grandmasters, IFCB palette and preset lists, or individual instances.

The master playback fader pair is located to the right of the motorized fader array, near the control keypad. The master is a split crossfader pair. The left fader controls the intensity upfade, while the right fader controls all intensity downfade actions. The two buttons beneath the master fader pair are **[Go]** and **[Stop/ Back]**. The **[Load]** button is located directly above the fader pair. You cannot page the master fader as it is permanently paired and always available for use.

You can define how each of the faders will function. There is no default setting for faders, which allows you the freedom to define each fader's function in *Fader Configuration [Tab 36]* or you can configure them while programming, as the contents of those targets are stored.

The two buttons beneath the master fader pair are **[Go]** and **[Stop/ Back]**. The **[Load]** button and playback display are located just above the faders.

Note: *On some consoles, the **[Load]** button for the master playback fader pair is actually labeled as **[Master]**.*

You can page the motorized faders using the **[Fader Page]** button alone, combined with the numeric keypad, or with the wheel directly below the **[Fader Page]** button. As pages are changed, the faders will reset to the last position they were in on the associated page. Also, each individual fader is provided with a **[Load]**, **[Go]**, and a **[Stop/Back]** button for operation and playback. These buttons behave differently when the fader is a submaster or grandmaster, and can be changed in the fader configuration display.

Cue Playback on Element 2 and Element Classic

The single cue list on Element 2 and Element Classic consoles cannot be assigned to a fader. It can only be loaded to the master playback fader pair.

Cue Playback on Ion Classic

Cues may be played back using the master playback fader pair or by using a playback fader. While any cue list can be loaded to these faders, the first cue list you record to will automatically load to the master fader pair.

To use playback faders, you can either use a fader wing or virtual faders. See *Fader Configuration [Tab 36]* and *Faders [Tab 28]*.

Fader Display and Ribbon

Note: *On Element 2 and Element Classic, this information is displayed in the fader status display. See Element 2 & Element Classic Fader Status Display.*

The fader display is located on the bottom of the PSD, and the fader ribbon is located directly above the faders. Both areas provide information about each fader including the fader designation (S = submaster with the designation of the submaster number, L = playback with designation of the cue list and cue number that is loaded, GM = grandmaster, PR = preset with designation of the preset number, and IP, FP, BP, CP = palettes with designation of the palette number).

Each area uses the fader color coding that is used in the fader configuration tools.

Grandmasters and inhibitive submasters are in red, additive submasters are yellow, playback faders display in green, and presets and palettes are orange.

Selected Cue

When in Live or Blind, if you press **[Live]** or **[Blind]** respectively, the last executed cue will be selected and appear on the command line.

When working in Live, the selected cue is always the last cue you recorded, edited, updated or played back. When entering Blind for cues, the selected cue will be selected and displayed.

Changing the selected cue in Blind will cause the playback status display to change as well, unless **{Preserve Blind Cue}** has been enabled in **Setup >** *User > Displays*, which will not synchronize the Blind display to the currently selected cue but rather shows the last cue selected in Blind. When you return to Live, the selected cue is synchronized to the currently active cue.

The *Cue Attributes* of the selected cue (such as timing, attributes, label and external links) are shown at the bottom of the Live or Blind display.

In Live

To load a new cue to a fader, place the cue on the command line and press **[Load]** for the desired playback. When the **[Go]** button is pressed, the activated cue is the selected cue. For example, assume you have cue list 1 already loaded to the master playback faders. Now you want to load cue 2/1 to a fader.

- **[Cue] [2] [/] [1] [Load]** - loads cue 2/1 to a fader.

If you press the **[Load]** button above the master playback fader, it will load cue 2/1 into the pending file. You could also press the **[Load]** button above any other playback fader to load the cue into that fader's pending file.

In this example, the last cue executed from cue list 1 is still the active cue, while cue 2/1 is pending. When **[Go]** is pressed, 2/1 will be executed.

You can also load cue list 2 by pressing **[Cue] [2] [/] [Load]**. This will load the first cue of list 2 into pending.

The selected cue is changed by go, record, or update instructions as well as cue modification and selecting a cue on the command line. When you execute a cue that has a follow or hang time, the next cue will become the selected cue when activated.

In Blind

While in Blind, changing the selected cue will change the playback status display to show information surrounding that cue.

CAUTION: ***When editing in Blind, changes to cues are automatically stored, therefore no update or record command is required.***

While working in Blind mode, cues can be executed in Live using **[Go]**, **[Back]**, **[Stop/Back]**, and **[Go to Cue]**, but this does not change the cue you are working with in Blind.

Loading a Cue With Temporary Time

A cue can be loaded with a temporary time.

- **[Cue] [3] [Time] [6] [Load]** - loads cue 3 with the manual time of 6.

For multipart cues, the temporary time will be applied to the entire cue, not just the part on the command line. For cues with discrete timing, its parameters will use the temporary time instead of the assigned discrete timing.

[Go To Cue]

Go To Cue commands allow you to play cues out of sequence.

- Generally, when an out-of-sequence cue is executed, the entire contents of the cue (move instructions **and** tracked values) will be played back.
  - For example, cue 1 sets channel 1 to full. That value is tracked forward until cue 10. You play back cue 1 and set channel 1's intensity to 50% manually. If you execute cue 2, channel 1 remains at 50%, as it is not receiving a move instruction from the incoming cue. However, if you select **[Go to Cue] [5] [Enter]**, even though the value for channel 1 in cue 5 is a tracked value, channel 1 will fade from the manual value of 50% to full.

Cues can also be played out of sequence in the following ways:

- Executed by a *Link / Loop* instruction.
- Manually loaded to a fader *In Live*.
- Re-executed using **[***Assert (Fader Control)***] & [Load]** or asserted from the command line.

Go To Cue

[Go to Cue] instructions can be executed from any operating mode.

- **[Go To Cue] [5] [Enter]** - all parameters with values in cue 5 are faded to those values, even if they are tracked.
- **[Go to Cue] [6] [At] [5] [Enter]** - takes you to cue 6 at 50% of its fade completion. Selecting **[Go]** would finish the cue.
- **[Go To Cue] [Next] [Enter]** - takes you to the next cue in the active list.
- **[Go To Cue] [Last] [Enter]** - takes you to the previous cue in the active list.

When a **[Go To Cue]** instruction is executed, any null states applied with *{Make Null}* are removed. To maintain the make null setting, you should use *[Capture]* for the required channels.

Go To Cue Timing

[Go To Cue] uses timing established in **Setup >** *Manual Timing*. You can use a **Go To Cue** instruction with different timing options as follows:

- **[Go To Cue] [2] [Time] [1] [Enter]** - takes you to cue 2 in one second.
- **[Go To Cue] [3] [Time] [4] [/] [3] [Enter]** - takes you to cue 3 and all up fades and NP moves would have a time of four seconds and down fades of 3.
- **[Go to Cue] [Next] [Time] [3] [Enter]** - takes you to the next cue in the selected list in three seconds.
- **[Go to Cue] [Last] [Time] [2] [Enter]** - takes you to the previous cue in the selected list in two seconds.
- **[Go To Cue] [8] [Time] [Enter]** - takes you to cue 8 using all timing values stored in cue 8.
- **[Go to Cue] [5] [Time] [Enter]** - will go to cue 5 using cue times, and also uses any associated follow/hang times to automatically trigger the subsequent cue.

Loading a Cue With Temporary Time allows you to bypass the time established in **Setup**.

Go To Cue Modifiers

When **[Go to Cue]** is pressed, the softkeys in the CIA will display a variety of modifiers that can enhance **Go To Cue** commands, such as by only playing back specific elements of a cue.

Go To Cue Complete

{Complete} allows you to play back a specified cue and any subsequent follows as a single fade.

[Go To Cue] [Go To Cue] will post **Complete** to the command line. You can then select the appropriate cue number and level of completion.

- **[Go To Cue] [4] {Complete} [Enter]** - will go to cue 4 and if that cue has a follow/ hang, any following cues in the sequence will also fire. This may look like you are going straight to the last cue in the sequence but each cue will fire to make sure that any external links are fired.
- **[Go To Cue] [2] [At] [5][0] {Complete} [Enter]** - will go to cue 2 at 50% of its completion.
- **[Go to Cue] [5] [Time] [Go to Cue]** - will go to cue 5 using cue times, and append **Complete** to the command line.

Go To Cue Timecode

{Timecode} allows you to jump to the nearest cue that would be playing back at a time specified by incoming *Timecode*.

- **[Go to Cue] {Timecode} [Enter]** - plays the cue associated with the current time.
- **[Go to Cue] {Timecode} [**xx:xx:xx:xx**] [Enter]** - plays the cue associated with the specified time.

If the current cue list is not associated with a timecode list, the first show control timecode list will be used.

Other Go To Cue Modifiers

When specifying a time while using modifiers, the **[Time]** command must always be entered after any other commands, other than **{Manual}**.

- **[Go to Cue] [6] {Manual} [Enter]** - manual control using a fader.
- **[Go To Cue] {Scenes}** - opens the *Scenes* selection display. Press or select a scene to go to that cue.
- **[GoTo Cue] [3] {MovesOnly} [Enter]** - move instructions only.
- **[GoTo Cue] [4] {MinusLinks} [Enter]** - withhold any links (follow/hang, execute instructions).
- **[Go to Cue] [5] {Minus Links} [Time] [Enter]** - goes to cue 5 in cue time without triggering any associated follow/hang times.
- **[GoTo Cue] [5] {Use Marks} [Enter]** - delays channels from marking until their intensities have reached zero.
    - Not available on Element Classic
- **[GoTo Cue] [1] {SingleParam} [Enter]** - single parameter channels only.
- **[GoTo Cue] [2] {MultiParam} [Enter]** - multi-parameter channels only.
- **[Go To Cue] [1] {MultiParam} {MovesOnly} [Enter]** - move instructions of multi-parameter channels only.
- **[Go to Cue] [Home] [Enter]** - homes the currently selected cue list to its first cue. **[Go to Cue] [x] [/] [Home] [Enter]** homes a cue list to its first cue.

- **[Go to Cue] [Shift] [Home] [Enter]** - homes the currently selected cue list to its last cue. **[Go to Cue] [x] [/] [Shift] [Home] [Enter]** will take you to the last cue in a cue list.
- **[Go to Cue] [x] [/] [Out] [Enter]** - allows you to use the **[Go to Cue] [Out]** command on a list specific basis. **[Go to Cue] [Out]** continues to affect all active cue lists.

[Go to Cue] [x] [/] [Out] is similar to **[Go to Cue] [x] [/] [0]** except that any NPs on the fader will fade to their home level.

Assigning Faders

Note: *Additional virtual faders are available on **[Tab] [2][8]**. See Faders [Tab 28].*

Cue playbacks, submasters, grandmasters, palettes, and presets are targets that can be assigned to faders.

Faders can be assigned in a number of different ways.

- The *Fader Configuration [Tab 36]* display
- The *Fader List [Tab 35]*
- The *Cue List Properties* index
- The *Submaster Properties* display
- Manually using the **[Load]** button

The single cue list on Element 2 and Element Classic consoles can only be loaded to the master playback fader pair, and cannot be assigned to a fader.

With Auto Playback Enabled

Note: *Not available on Element Classic.*

Auto Playback is a record function enabled in **Setup > User** > *Record Defaults*, that automatically executes cues recorded in live on playback faders. When the cue is executed on the playback fader, any manual parameters involved in the record operation are automatically released to the cue and all other values stored in the cue are owned by that cue.

When the first cue is stored on Eos, the cue list of that cue automatically loads on the master fader. Any subsequent cue lists stored will load to the next available fader.

Assigning Faders Manually

The location of playbacks, submasters, palettes, and presets on faders can also be defined as the contents of those targets are stored.

Note: *Grandmasters must be defined in fader configuration display or the fader list. See Grandmaster.*

If a fader is unmapped, a target can be loaded to that location by selecting the target from the command line and pressing the associated **[Load]** key. The fader will then be automatically assigned that target.

Once a cue list is loaded to a fader, storing to that cue list automatically plays the cue back on the appropriate fader, when auto playback on record is enabled in **Setup > User** > *Record Defaults*.

If a fader has been configured for default mapping (see *Fader Configuration [Tab 36]*), the fader will receive its configuration from the Cue List Index. Changes made to a cue list in the cue list index will be shared with any default mapping faders loaded with that cue list. If changes are made to a fader set to default mapping in the fader configuration display, those changes will also happen in the Cue List Index. If set to Local, any changes made in the fader configuration display will impact only that instance of the content.

To load a new cue into the pending file of a playback fader, when auto playback is disabled in setup, or when you want to move a cue list to a different fader, first place that cue or list number on the command line then press the associated **[Load]** button for the destination playback fader.

- **[Cue] [4] [Load]** - changes the selected cue and loads it to the associated fader. This action assumes cue 4 is from the same cue list as is currently selected.
- **[Cue] [3] [/] [Load]** - changes the selected cue list and loads it to the associated fader.
- **[Cue] [5] [/] [6] [Load]** - changes the selected cue list and loads it to the associated fader with cue 6 as the pending cue.

Changing Fader Pages

Navigation changes to fader banks and wings in the same paging group will advance all the fader pages in the group. See *Wing Paging Groups*.

When fader pages are changed, motorized faders assume the last position the faders were in on that page. This includes homing submasters to their required home position if needed.

Paging Forwards

Pressing **[Fader Page]**, or **[+]** on an external wing, will advance through the available pages of faders.

If pressed on a fader page with content, the pages will advance through subsequent pages with content until a blank page is reached. After that blank page, the remaining blank pages will be skipped, and the next page with content will be displayed. Pages will loop infinitely. For example, pages 1, 2, and 5 are populated on a 1x10 fader wing. From page 1, pages will be advanced in the order 1, 2, 3, 5, 6, back to 1, and so on.

Paging Backwards

Pressing **[Shift] & [Fader Page]**, or **[-]** on an external wing, will decrement through fader pages using the same logic as above. The first blank page chronologically after a page with content will still be used in reverse order. Pages will loop infinitely. For example, pages 1, 5, 6, and 8 are populated on a 1x10 fader wing. From page 1 , pages will decrement in the order 1, 9, 8, 7, 6, 5, 2, back to 1, and so on.

Accessing Specific Pages

You can access a specific fader page at any time, by holding **[Fader Page]** and pressing the number of the page you wish to access.

Specific pages can also be accessed by holding **[Fader Page]** and using the bump buttons on an external wing.

Apex Fader Wheel Paging

Apex fader wheels are paged independently from the faders in the slots below them. Press and hold either **[Page +]** or **[Page -]** and move the wheel you wish to page.

Element 2, Element Classic, & Ion Classic Paging

On Element 2 and Element Classic, you can page the faders by holding down the **{Page Subs}** softkey in the Live display. The bump buttons will light up in green, and the bump buttons that correspond to the currently selected pages will flash. Press the corresponding bump button to go to that page. The fader status display will change to show the fader pages. See *Paging Submasters on Element 2 and Element Classic*.

On Ion Classic, holding down **[Fader Control]** to use the bump buttons on an external wing.

Playback Fader Controls

A variety of buttons are found in the Master Fader controls or in the Fader Page controls area of your console.

On Ion Classic and Element Classic, many of these buttons exist as softkeys. In order to access these keys, press **[Fader Control]** (Ion Classic) or **[Live] {Fader Control}** (Element Classic). The softkeys will change to display the fader control keys. You may press **[More SK]** if the green LED is illuminated, to view additional fader control buttons.

Go

The **[Go]** button is used to execute the cue currently in the pending file of the associated fader. When **[Go]** is pressed, all parameters assume their required positions in the recorded times, unless they have been recorded with manual timing. When a cue has manual timing values stored with it, the fader will set itself to zero when **[Go]** is pressed, or you may set the fader to zero before you press **[Go]**.

If a channel parameter is in a transition state when a new cue is activated on the same playback fader, that parameter will continue its initial instruction in its remaining time unless it receives a new move instruction in the incoming cue. If a new instruction is provided, the parameter will calculate its new target and the time to get there for a seamless course adjustment. If a parameter in transition has no new instruction in the incoming cue, it will continue its fade, using the original timing provided.

If a channel parameter is in a transition state when a new cue is activated on a different playback fader, and that parameter receives a move instruction, even if it is exactly the same instruction the parameter currently has, it will recalculate the destination and arrival time according to the information from the new cue.

For information on manual timing, see *Manual Timing Control* and for manual master, see *Master*

[Go] on Element Classic

The **[Go]** button is used to execute the pending cue. When **[Go]** is pressed, all parameters assume their required positions in the recorded times, unless they have been recorded with manual timing.

Stop / Back

All fader activity can be instantly stopped mid-transition by pressing the **[Stop/Back]** button for the required fader. To resume the cue, press the **[Go]** button. To fade to the previous cue on that fader, using default "back" timing, press the **[Stop/Back]** button again from this state.

When you have gone to the previous cue using the **[Stop/Back]** button, the cue should look just like it did before you hit the **[Go]** button, if the cue still has ownership of all of its

channels. If a different cue list has taken ownership of some of the channel parameters within that cue in the interim, those specific channel parameters will not respond to the **[Stop/Back]** command.

If a cue is recorded or rerecorded when a fade is stopped, the contents of that fader will be recorded as absolute data in the new record target. If a cue is updated with the fader in a stopped state, all references in the cue will be updated accordingly.

When a cue on the playback fader is complete, pressing **[Stop/Back]** will step backwards sequentially through the cue list from that point. **[Stop/Back]** uses default back time as established in **Setup**, see *Manual Control*. Or you can back into the previous cue using specific timing with **[Go to Cue] [Last] [Time]** [n] **[Enter]**.

[Stop /Back] on Element Classic

When a cue is complete, pressing **[Stop/Back]** will step backwards sequentially through the cue list from that point. **[Stop/Back]** uses default back time as established in **Setup**, see *Manual Control*. Or you can back into the previous cue using specific timing by pressing:

- **[Go to Cue] [Last] [Time] [n] [Enter]**

Blackout and Grandmaster

Blackout is a console function allowing you to immediately set all lighting levels to zero.

A grandmaster is type of fader that inhibits all live intensity values. Any fader on an Eos Family console or connected wing can be configured as a grandmaster. See *Grandmaster*.

Note: *Ion Classic and Element Classic have physical grandmasters.*

If a grandmaster is set to a value other than 100%, a grandmaster button with the set value will be shown at the top of each display. If blackout is currently on, a blackout button will be shown at the top of the displays.

Clicking on either button will open a new display which will allow you to turn off blackout and set the grandmaster to a different level.

Go To Cue 0

Note: *[Go To Cue 0] is used in the examples below. Ion Classic users will need to use [Fader Control] {Go To Cue 0}.*

You can use **[Go To Cue 0]**, located with the playback controls, in conjunction with a fader load button to send a specific cue list to cue 0. This action does not use the command line. Simply press **[Go To Cue 0] & [Load]** for the desired fader.

On Element 2 and Element Classic, you can use the **[Go To Cue] [0] [Enter]** command to send the cue list to cue 0. This drives all cue intensities to zero, while leaving non-intensity parameters as currently set but no longer under cue control.

See *Go To Cue 0*.

Assert (Fader Control)

Note: *There are two **[Assert]** buttons. The **[Assert]** button in the fader controls area is used in the examples below. Element 2 and Element Classic users will need to use **{Fader Control} {Assert}**. Ion Classic users will need to use **[Fader Control] {Assert}.***

Use **[Assert] & [Load]** for the associated fader to re-run the active cue in that fader, following the same rules as **[Go To Cue]**. Assert can be used to regain control of all cue contents, apply a newly set priority state to the associated fader, or make any changes in blind to an active cue on stage.

When **[Assert] & [Load]** are used together, the entire contents of the cue are replayed. You can assert just certain elements of a cue by using the command line. See *Using Assert*.

Timing Disable

Note: *[Timing Disable] is used in the examples below. Element 2 and Element Classic users will need to use **{Fader Control} {Timing Disable}**. Ion Classic users will need to use **[Fader Control] {Time Disable}.***

[Timing Disable] used with **[Load]** causes timing data to be ignored for any cues that are activated on the associated playback fader. When a playback fader is in timing disable mode, you will notice "TD" in the associated fader display, and the **[Timing Disable]** button will be red.

To release the playback fader from time disable mode, press **[Timing Disable] & [Load]** again. You can also cut the next cue in by pressing **[Timing Disable] & [Go]** or the last cue by pressing **[Timing Disable] & [Back]**.

On Element 2, **{Timing Disable}** is a softkey accessed via **[Live] {Fader Control}**.

Note: *[Shift] & [Go] and [Shift] & [Back] can be used to cut to the next cue in the same way as [Timing Disable] & [Go] and [Timing Disable] & [Back].*

Cues will snap from move instruction to the next move instruction in a time of zero, which is the default time. To set a different time for Timing Disable, go to **Setup > User >** *Manual Timing*. See *Manual Control*.

Freeze

Note: *[Freeze] is used below. Consoles without this hardkey use the following key combinations:*

- *[Fader Control] {Freeze} - Ion Classic*
- *{Fader Control} {Freeze} - Element 2 / Element Classic*

***Freeze** can also be accessed via a connected keyboard with CONTROL+ALT+F.*

[Freeze] can be used to halt all effect activity on any active faders. To activate a freeze for only a specific fader, press **[Freeze] & [Load]**.

There are two ways to remove the freeze command:

- Press **[Freeze] & [Load]** again for the specific faders to unfreeze the activity.
- Press **[Assert] & [Load]** or **[Go]** or **[Stop/Back]** for the specific faders to resume the activity.

You may freeze and unfreeze effects from the command line.

- **[Effect] [2] [Freeze] [Enter]** - to freeze effect 2. Freezing a specific effect is different from stopping an effect. Freeze will stop the effect exactly where it is.
- **[Effect] [6] [Thru] [9] [Freeze] [Enter]** - to freeze a specified range of effects.
- When an effect is in freeze mode, you can use the same command to unfreeze:
- **[Effect] [2] [Freeze] [Enter]**
- **[Effect] [6] [Thru] [9] [Freeze] [Enter]**

Stop Effect

Note: *[Stop Effect] is used below. Consoles without this hardkey use the following key combinations:*

- *[Shift] & [Effect] - Apex 5 / 10 / 20 / FP*
- *[Fader Control] {Stop Effect} - Ion Classic*
- *{Fader Control} {Stop Effect} - Element 2 / Element Classic*

StopEffect can also be accessed via a connected keyboard with CONTROL+ALT+E and SHIFT+ALT+E.

The **[Stop Effect]** button can be used to stop all effects from operating on any or all faders, or it may be used with the control keypad to stop a specific effect.

- To stop all effects on a fader, press **[Stop Effect] & [Load]** of the associated fader.
- To stop a specific effect regardless of the fader it is operating on, press **[Stop Effect] [2] [Enter]**.
- To stop an effect on a specific channel, press **[5] [Stop Effect] [Enter]**.

When an effect is stopped, all impact of the effect is removed and the stage output is as though the effect has never been activated. This behavior is influenced by the *Exit* behavior of the effect.

Rate Override

Note: *[Rate] is used in the examples below. Element 2 and Element Classic users will need to use {Fader Control} {Rate}. Ion Classic users will need to use [Fader Control] {Rate}.*

To collect a playback fader for rate control, press **[Rate] & [Load]** for the required fader. When **[Rate]** is pressed without **[Load]**, it always collects the master fader for rate control. A subset of faders can be collected by pressing and holding **[Rate]** while pressing the **[Load]** button for the associated faders you would like to add.

On Element 2 and Element Classic, rate control only applies to the master fader pair.

If a cue is complete, any rate adjustment applied affects the cue in the pending file. When that cue is subsequently activated, the adjusted rate is used to direct timing. Pressing **[Rate]** again will turn rate control off and reset to 100%.

Manual Control

There are four types of manual control for playbacks:

- Cues can be stored with manual timing. When cues have stored manual timing, the default behavior of the fader is to control those manual values.
- Cues can be captured for manual intensity control only. This is possible only when the associated cue has no manual timing values.
- Cues can be manually overridden using the **[Man Override] & [Load]** feature which captures all parameter transitions.
  - Element 2, Ion Classic, and Element Classic users will need to use **[Live] {Fader Control} {Man Override}**
- The fader can be set to manual master mode. See *Master*.

In each of these cases, follow time counts down from **[Go]**. The hang time will be kicked off when the fader reaches full or when the last parameter reaches its end state from timing, whichever comes last.

Note: *The Fader Ribbon and the Fader Display Format of the Playback Status Display are useful displays when using manual control. These displays are not available on Element 2 and Element Classic.*

Manual Timing Control

Manual timing can be set for any parameter or group of parameters. A fader is then used to control the progress of a transition.

For example, assume the active cue contains an instruction to set red at 40 for channel 1. The pending cue contains an instruction to set color for channel 1 to blue and the color parameter has a manual time. Press **[Go]** to activate the cue. Channel 1 color does nothing. As you move the fader up manually, channel 1 color moves proportionally from red to blue. Any parameters with timing will start their moves at the press of **[Go]** and be unaffected by the manual control.

To program a channel manual time:

- **[1] {Color} [Time] {Manual} [Enter]** - assigns a manual time to channel 1. This must be recorded or updated to a cue, when in Live.
- **[Record] [Cue] [5] [Time] {Manual} [Enter]** - sets manual timing for a specific cue.
- **[Record] [Cue] [6] {Color} [Time] {Manual} [Enter]** - sets manual timing for a specific cue and parameter.

Manual Intensity Override

An intensity transition may be taken over manually and the transition captured by dropping the fader down until it reaches the percentage of cue completion (i.e. if the cue is 50% complete, when the fader is manually dropped to 50%, the intensity transitions will be captured and the intensity portion of the cue completed by moving the fader manually between 50% and full or anywhere in between). If the fader is dropped below 50%, the fader will fade all intensity values proportionally from their captured values to their previous values.

If a fade is captured and the faders are not reset to 100% prior to the next press of the **[Go]** button, the fader will automatically reset to 100% upon cue execution. Alternatively, you can set the fader to 0% before executing the next cue to capture the cue for manual intensity control when the **[Go]** button is pressed if the fader is set to proportional control. Intensity

control is released from the fader when the cue is considered complete (when the fader is brought back to 100%). If the fader is set as an Intensity Master, the intensity control is maintained, even when the cue has completed.

If a pending cue has any manual control properties, you may either preset the fader to zero or the console will automatically set the fader to zero when the [Go] button is pressed.

Manual intensity override is not possible if there is any manual timing in the cue, as the fader is already occupied with that control.

Manual Override

Note: *[Man Override] is used in the examples below. Ion Classic users will need to use [Fader Control] {Man Override}. Element Classic users will need to use {Fader Control} {Man Override}.*

Manual override allows the associated fader to control all parameters in a transition state on that fader. When [Man Override] & [Load] are pressed, all activity on that fader is frozen and the motorized faders move to match the current fade progression.

The fader is used to manually complete the cue transition for all parameters. If the fader is operating in a paired mode, the left fader controls the intensity upfade and all non-intensity parameters, while the right fader controls all intensity downfade actions. Manual control override automatically releases when the cue is complete.

A group of faders can be collected for manual override by pressing [Man Override] & [Load] (continue adding faders by pressing the associated [Load] buttons).

Releasing Content From a Fader

Note: *[Off] and [Release] are used in the examples below. Element 2 and Element Classic users will need to use {Fader Control} {Off} and {Fader Control} {Release}. Ion Classic users will need to use [Fader Control] {Off} and [Fader Control] {Release}.*

There are a few ways to release content from a playback fader:

- [Off] & [Load] - returns control to the background fader, either a cue or a submaster, and stops any effects that are running on that fader. If there is no background value, the intensities will just fade out.

Note: *Associated pending and current cues will remain when using [Off] & [Load].*

Note: *Pressing [Go] will run the cues in their current sequence.*

- [Release] & [Load] - behaves like [Off] & [Load] except that it sets the pending cue to the first cue in the list and removes the active cue. On Element 2, press {Fader Control} to see {Release}.
- [Shift] & [Load] - behaves like Release & [Load] except that it additionally removes the content entirely from the fader. Pressing [Shift] & [Load] on an empty playback fader will unmap the fader.
- [Escape] & [Load] - unmaps all instances of the target (cue list, submaster, palette, or preset) on a selected fader.

The **[Go To Cue] [Out] [Enter]**command can be used to fade out all intensities, reset all cue lists to the top, and to clear out all background LTP fader values.

Cue Alerts

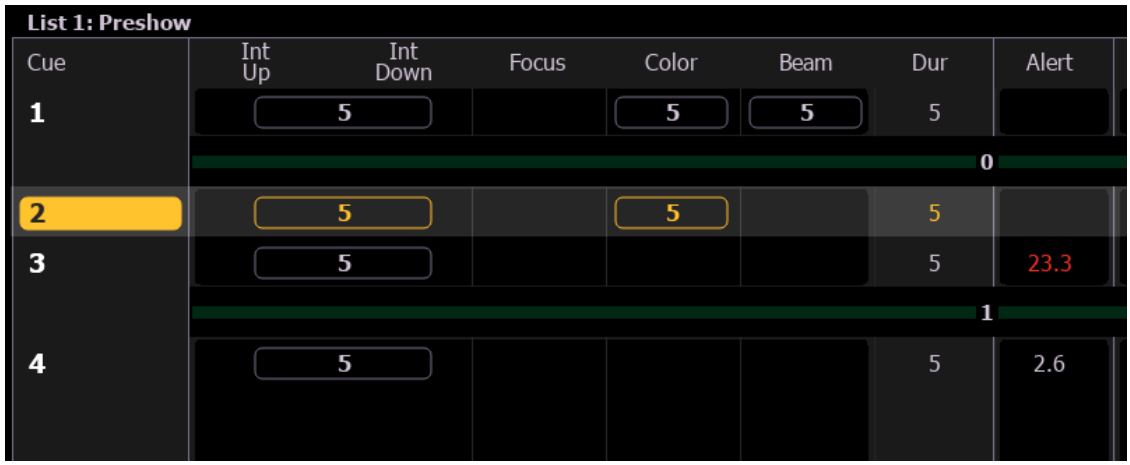
Eos can learn the time between manual **[Go]** commands in the same cue list and, in future runs, display a cue alert timer counting down to the next expected **[Go]**. The cue alert timer is informational only and is not a follow time (see *Follow/Hang*).

Learning Alerts

From Live, use **[Learn] {Learn Alert Time}** to start learning alert timings. **[Learn]** will flash and "Learning Alerts After GO" will display above the command line. Use **[Learn]** again to stop learning alert timings.

Alerts in the Playback Status Display

The Alert column can be enabled in the PSD via the *Playback Status Display Tab Configuration* menu.



When alerts are being learned, a count-up timer appears in red in the Alert column after each manual **[Go]** command. After the next **[Go]**, the time is stored and the process repeats.

Once alerts have been learned, after a manual **[Go]**, the recorded time in the Alert column will begin counting down.

When the countdown is below 5 seconds, the time will change to gold, and the alert advisory sound will play.

When the countdown reaches 0, the time will change to green and display until the next manual **[Go]**.

Alert Sounds

The alert advisory sound can be enabled and adjusted in volume, or disabled via **Setup > Device > Face Panel >** *Sounds*.

Editing Alerts

{Alert Time} appears as a softkey option when one or more [Cue] is on the command line in Live or Blind. Times can be entered directly or adjusted with [+] and [-].

Chapter 13

Effects

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About Effects

Effects are manual control functions that can be applied to a channel parameter and then included in presets, cues, or submasters. Cues can contain both standard transitions for some channels or parameters and effects for the same or other channels or parameters.

Intensities can have different effects running at the same time but they must be from different sources. You can have an intensity effect running on a cue and those same channels can be impacted by an intensity effect on a submaster. See *Multiple Intensity HTP Effects*.

Effects have user defined properties and attributes which are applied to the effects whenever they are used in cues. Effects also have cue level overrides, which allow you to use an effect in multiple locations, and modify its size, shape and / or rate in individual cues. See *Effect Channels [Tab 8]*.

Effects are broken up into three fundamental behavior types:

- Step Effects - are chases for one or more parameters. Intensity is the default. Step effects are On/ Off behavior. The ON value determines what the associated channel should do when the step is active, while the OFF value determines what the channel should do when the step is not active. See *Step Effects*.
- Absolute Effects - are progressive behavior, rather than on/ off states of step effects. However, unlike relative effects, which are also progressive, you are determining exactly the behavior that you want to have for each transition in the effect. See *Absolute Effects*.
- Relative Effects - are math based effects that provide a continuous offset from the current parameter value. There are three different types of relative effects: Focus, Linear and Color. See *Relative Effects*.

There are four different displays for viewing and editing effects:

- Effect List - displays all of the recorded effects. See *Effects [Tab 13]*.
- Effect Editor - displays in the CIA when the Effect List is open. The editor will display the attributes and properties of a selected effect for editing. See *Effects Editor*.
- Effect Status - displays information in the CIA about the currently running effects. See *Effect Status [Tab 6]*.
- Effect Channels - displays all of the channels in the currently running effects so you can override certain effect properties. The effect status display will also open while in the effect channel display. See *Effect Channels [Tab 8]*.

Effects [Tab 13]

At any time you may press **[Effect] [Effect]** or **[Tab] [1][3]** to view the effect list. Any recorded effects will be displayed here. The effect list is a blind view and any changes made in this view are automatically stored; a record command is not required.

You can also use the *Command Line Search* to see a list of effect names while in Live or Blind.

Notice that there are effects existing in this list prior to any being recorded. Effects 901-918 are pre-programmed *Relative Effects* that are automatically available.

To navigate this list use the navigation keys as described in *Display Control and Navigation* or select the effect number you wish to work with. Notice that when you select the effect list, the CIA changes to display the information for the currently selected effect.

Effects can be assigned *Icons*, which can be configured to appear on the direct select button in *Direct Selects [Tab 4]* or *Custom Direct Selects [Tab 39]*.

Effect	Label	Direct Select Icon	Type	Entry	Exit	Dur/Cyc	Scale
5	Now That's What I Call Music! 73	icon.jpg	Absolute	Immediate	Immediate	Infinite	
899	Circle		Focus	Immediate	Immediate	Infinite	25
900	Clover		Focus	Immediate	Immediate	Infinite	25
901	Circle		Focus	Immediate	Immediate	Infinite	25
902	Square		Focus	Immediate	Immediate	Infinite	25
903	Figure 8		Focus	Immediate	Immediate	Infinite	25
904	Can Can		Linear	Immediate	Immediate	Infinite	25
905	Triangle		Focus	Immediate	Immediate	Infinite	25
906	Spiral		Focus	Immediate	Immediate	Infinite	25
907	Reverse Sqr		Focus	Immediate	Immediate	Infinite	25
908	Reverse Circle		Focus	Immediate	Immediate	Infinite	25
909	Ballyhoo		Linear	Immediate	Immediate	Infinite	25
910	Color Smooth		Linear	Immediate	Immediate	Infinite	25
911	Color Fade Linear		Linear	Immediate	Immediate	Infinite	25
912	Color Step		Linear	Immediate	Immediate	Infinite	25
913	Bump Color		Linear	Immediate	Immediate	Infinite	25
914	Hue-Sat Fade		Color	Immediate	Immediate	Infinite	25
915	Ramp		Linear	Immediate	Immediate	Infinite	25
916	Inverted Ramp		Linear	Immediate	Immediate	Infinite	25
917	Rainbow RGB		Linear	Immediate	Immediate	Infinite	100
918	Rainbow CMY		Linear	Immediate	Immediate	Infinite	100
919	PAN WAVE		Linear	Immediate	Immediate	Infinite	25

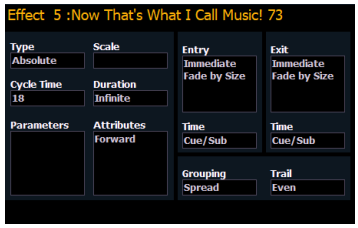
Effect List Navigation

Using the **[Next]**/ **[Last]** keys will only move between effects in the effect list display. To navigate the effect editor, you will need to use the page arrow keys.

You can use **[Page ◀]** or **[Page ▶]** when in the effect list display to begin navigating in the effect editor. This only works for step or absolute effects. You can press **[Escape]** to return focus to the effect list display.

Effects Editor

When viewing the effect list, the selected effect is displayed in the CIA. The effect properties and attributes are shown in categorized buttons in the CIA. To change a property or attribute, press the corresponding button and enter data as required. Some effect properties, such as rate and size, can only be modified in the *Effect Status [Tab 6]* and *Effect Channels [Tab 8]*.

The properties display of the effects editor is shown below and definitions of properties follow:

Type

Defines the effect type: step-based, absolute, or relative (linear, focus, or color). To change the type, press **{Type}** and then press the desired effect type in the buttons to the left.

- **<Effect> [1] {Type} {Step based} [Enter]**

Scale

Applies only to relative effects. This modifies the amount the pattern is offset from the current parameter values. The scale is expressed as a percentage increase or decrease (25 = 25% of the programmed value).

- {Scale} [3] [0] [Enter] or you may adjust this using the scale encoder, if available.

Cycle Time

Provides a cumulative time to complete one full iteration of an effect. In relative effects, the cycle time determines the length of time required for one channel to complete the cycle.

In absolute and step-based effects, the cycle time determines the time required to complete one full iteration of the effect. In these effect types, modifying the cycle time changes the timing values proportionally within the effect itself.

To change the cycle time, press {Cycle Time} and then enter the desired time (in minutes and seconds) from the keypad, followed by [Enter]. This can also be adjusted from the encoder, if available.

Duration/Cycle

This determines the length of time an effect will run. To specify, press {Duration/Cycle} and then choose the desired method from the buttons that appear to the left. The options are:

- {Infinite} - for step and absolute effects, the effect will run until the channel is provided a new instruction or the effect is stopped,. Relative effects with an infinite duration will run until a stop flag is applied.
- {Duration} - the effect will run for a set amount of time given in minutes and seconds. Enter the time from the keypad.
- {Num cycles} - the effect will run for a set number of iterations. Enter the number using the keypad.
    - {Duration/Cycles} {Num Cycles} [1] [0] [Enter]

When an effect with duration is running in a cue, the effect will display in light blue while it is running and dark blue when it has finished. This is only displayed in the Live Summary View.

Parameters

This allows you to select which parameters will be involved in the selected effect, by default. By entering a value here, you do not need to specify the required parameter when placing an effect on a channel group.

To add/ remove parameters to the effect, press {Parameters} and then select the desired parameters from the buttons that appear to the left.

- {Parameters} {Iris} [Enter]

Attributes

These determine the basic behavior of the effect. Attributes include behaviors such as forward, reverse, bounce, positive, negative, and random grouping/ random rate. The attributes are slightly different between step, absolute, and relative effects.

- Bounce - effect will run first in forward, then in reverse. Subsequent passes alternate between forward and reverse.
- Forward - the effect will run in the programmed direction (the arrow on the pattern editor indicates "forward" for pattern effects, and step/ absolute effects will follow numerical order).

- Reverse - effect will run in the opposite direction of forward or reverse numerical direction. Forward and Reverse are mutually exclusive settings.
- Random Group- channel distribution or step order (depending on the type of effect) is applied in a continuously random fashion. Enables *Random Modifier*.
- Random Rate - This overrides the cycle time of the effect. Random Rate is applied in a range (for example 5 through 150). Enables *Random Modifier*.
- Continuous Run - the effect will keep running until there is a stop effect command. By default, {Continuous Run} is disabled for all step, absolute, and relative effects. See *Stopping Effects*.
- Repeat on Go - the effect will not restart unless {Repeat on Go} is used.
- Build - keeps values at their on-state, even when the step is no longer active.
- Positive - effect will run the steps (on state and off state) as programmed. Step effects only.
- Negative - inverts the on state and off state for the effect. Step effects only.
- Break Mode - mimics a scroll across a static background. All but the last action scroll one channel at a time across the selection. The final action appears on all channels not affected by the other actions. Absolute effects only.
- Bounce Channels - runs the effect on the channels first in forward, then in reverse.

Play with these behaviors to see how they alter your effect.

Random Modifier

Random Modifier is an optional parameter that offers additional control over the behavior of effects that have Random Group or Random Rate attributes applied.

- Continuously Random - a "true random" option, which selects a different random modifier value each time the effect plays back.
- 1 - 9999 - each value provides a unique random behavior that is preserved between effects. This value can also be modified in Live to audition different random behaviors.

Entry

Establishes at what time and how channels will enter the effect. To change the entry method press {Entry} and then choose a method from the buttons to the left. Entry modes vary by effect type. The options are:

- {Cascade} - channels enter the effect according to the trail and cycle time values (if applicable).
- {Immediate} - all channels enter the effect instantaneously.
- {Fade by Size} - The effect will achieve its full value as allowed by the pattern or step/absolute values using the In Time.
- {Fade by Rate} - increases the rate of the effect as it enters. If an effect submaster has an entry mode of {Fade by Rate}, the submaster will control the rate between 0 to 100.
- {Fade by Size and Rate} - the effect will achieve its full value as allowed by the pattern or step/absolute values and ramp up to full speed using the In Time.

Exit

Establishes at what time and how channels will exit the effect. To change the exit method press {Exit} and then choose a method from the buttons to the left. Exit modes vary by effect type and how the effect is stopped. The options are:

- {Fade by Size} - when the effect is exited, values will return to their background state while still running using the exit time.
- {Fade by Rate} - decreases the rate of the effect as it exits.

- {Fade by Size and Rate} - when the effected is exited, channels will stop running the effect and return to their background state using the exit time.
- {Stop and Fade} - when the effected is exited, channels will stop running the effect and return to their background state using the exit time.
- {Stop and Hold} - when the effect is exited, channels will halt exactly where the effect left them.

Time (Entry or Exit)

These fields establish the length of time for channels to enter/exit the effect. It can be entered in minutes and seconds from the keypad. These timing values are applied to the entry and exit modes. Cue level timing is the default for these. Press {EnterTime} [Enter] or {Exit Time} [Enter]. To reset to defaults, press [Time] [Enter].

Grouping

Grouping is used only in relative and absolute effects. This determines how channels currently running the effect will be grouped throughout the pattern. To change this press {Grouping} and then enter the number of lights you want grouped together.

Grouping defaults to {Spread}. This means that every light the effect is applied to will act as an individual element, moving through the effect sequentially based on the channel selection order, cycle time, and trail times. You can enter any number from 1 through 2000. A grouping of 2 means that every other light in the selection list when the effect is applied will move together through the effect. Grouping of three means every third light, and so on.

Your options are 1 through 84 or {Spread} which will distribute each channel in the effect evenly and treat it as a separate group.

- {Grouping} [2] - every other channel (in a range of channels) will be grouped when running the effect.

When an effect is applied to a group in live, that group is distributed by order, using this grouping function. If a group list is created and an effect applied, each group is considered an individual element within the effect.

Trail

Trail is applicable to relative and absolute effects. Trail determines how channels are to follow each other through the effect; it is a percentage of the cycle time. Trail can be any value from 0-200%, even, or solo. The default is even. For example:

- {Even} - The groups will be distributed evenly throughout the pattern. This is calculated by dividing the cycle time of the effect by the number of groups of channels.
- {10%}-{200%} - When the first group is 10% through the effect, the second group will start the effect, and so on through the remaining groups. Therefore, the groups will trail n% behind each other, as a percentage of the cycle time.
- {Solo} - The first group will execute the entire pattern. When done, the second group will execute the entire pattern, and so on.

Effect Editor Navigation

To navigate the effect editor, you will need to use the page arrow keys.

You can use [Page ◀]or [Page ▶] when in the effect list display to begin navigating in the effect editor. This only works for step or absolute effects. You can press [Escape] to return focus to the effect list display.

Confirming Effect Changes

When using **[Page ▼]** to create a new effect step/ action in the Effects Editor display, you will first be asked to confirm the new step/ action number before continuing. This is to prevent new step/ action from being created by mistake.

Using Encoders With the Effect Editor

Note: *This option is not available on Element 2 and Element Classic.*

When any effect is specified in the command line, the encoder display automatically repaints to display the following properties:

- Cycle Time - default is 5 seconds for relative effects.
- Scale
- Shape - vertical or horizontal as defined by the **{Mode}** button.
- Axis

At any time, you may use the encoders to adjust these properties within the effects editor for the specified effect.

Effect Status [Tab 6]

To view the effects currently running, you may press **[Displays] > {Effect Status}** to open the effect status display in the CIA.

This display shows you any currently running effects and gives you the ability to edit the effect while running.

If your console has encoders, when an effect is selected, the encoders and encoder screen change to allow you to manipulate the effect according to rate, size, horizontal form, vertical form, and axis.

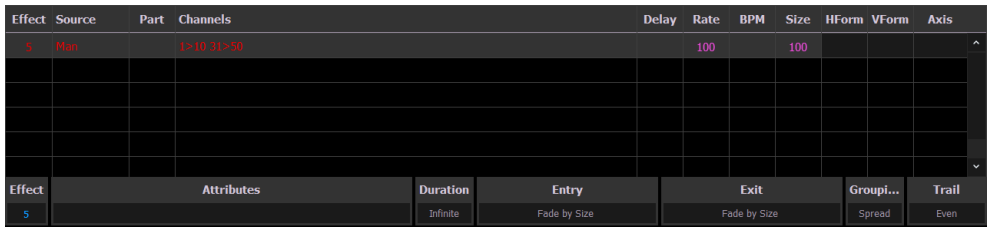
To edit an effect, select the effect using the command line or select it directly from the CIA.

- **[Effect] [9] [0] [2] [Enter]**

The encoder screen and softkeys will repaint so that they now control the five attributes in the columns of the effect status display:

- Rate - modifies cycle time. Default is 100% and can be modified from 0%-2000%.
- Size - modifies scale. Default is 100% and can be modified from 0%-2000%.
- Shape - vertical or horizontal as defined by the **{Mode}** button. Default is 100% and can be modified from 0%-2000%.
- Axis - default is 0° and can be modified by +/- 180°.

Use the encoders or softkeys to adjust the effects while watching the effect on stage. For example, effect 1 is a step effect with the on state set to 50 and the off state set to 10. If Size is set to 50, the on state will be set to 50% of 50 (25) and the off state will be 50% of 10 (5).



The effect itself can be accessed for editing from this display by pressing **{Edit}** - any changes made directly in the effect status display are made to the effect itself and must be stored. Cue level overrides also must be stored or updated to the required cue, but do not impact the basic effect itself.

Effect attributes modified in the effect status display can be reset to their previous values using the softkeys:

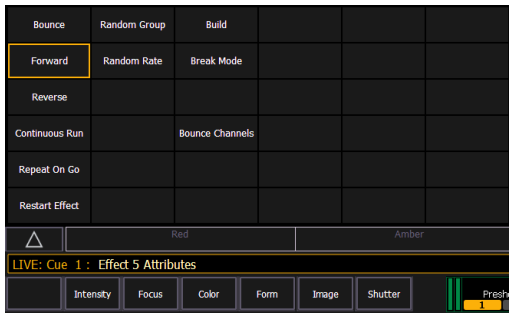
- **{Rate} [Enter]** - resets the rate to the previous value.

The properties of an effect that can be modified at a cue or sub level will display at the bottom of the effect status display and in the *Effect Channels [Tab 8]* (which is access by pressing **[Shift] & [Effect]**). Select a column to make changes from a list of available options.

Several color indicators are used in the effect status display:

- **Grey** - property is drawn directly from the effect.
- **Red** - property has been manually modified but not stored.
- **Blue** - property is an override to the saved effect.
- **Magenta** - property is tracking from a previous cue.

Selecting the **Attributes** column will open the effect attribute override display. From that display, you can access most of the same properties as those found in the effects editor. This display allows you to make modifications to properties, and store those modifications in a cue or submaster.

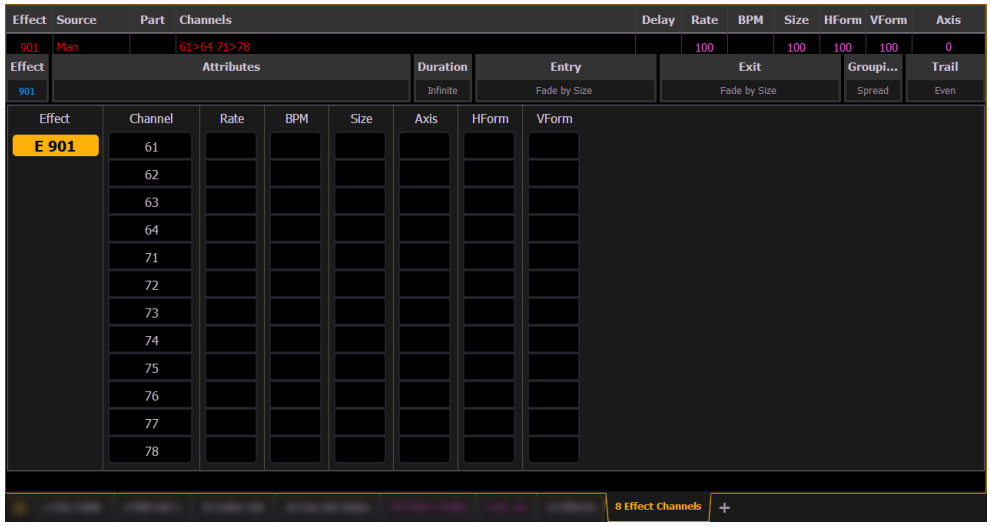


{Restart Effect} is an atrribute that can only be accessed from this display. When enabled, **{Restart Effect}** will cause an effect to restart whenever the cue is fired. This attribute is applied to the cue that the effect is stored in and not in the effect itself.

Note: *{Repeat on Go} is similar to {Restart Effect} but it is applied to the effect. See Effects Editor.*

Effect Channels [Tab 8]

In the Effect Channels display, you can override certain effect properties per channel at the cue level. To open this display, press **[Expand] [Effect]**, **[Tab] [8]**, or select the effect channel icon from the display management home screen.



The following properties can be overridden:

- Rate
- BPM
- Size

The following properties can be overridden for focus effects only:

- Axis
- H Form
- V Form

To add a channel level override, first you will need to be in the Effect Channel display with the effect running.

[2][6]<Effect><1>{Rate}[6][Enter] - to change the rate for just channel 26. With the effect running, the console will default to the running effect number. You may need to select the effect first (**[Effect] [n] [Enter]**). This will open the effect status display, and you will have access to the effect softkeys.

In the effect status display, an "+" will display by any effect property that has a channel level override.

You can then store these channel overrides in a cue by using **[Record]** or **[Update]**.

Step Effects

In step effects, each step contains an on-state and an off-state. The on-state is the action the channels in the step should take when the step is active. The off -state is the action the channels in the step should take when the step is not active. Step effects are a quick and easy way to build simple chases.

When building step effects, channels must be defined for each step. This is different from absolute and relative effects.

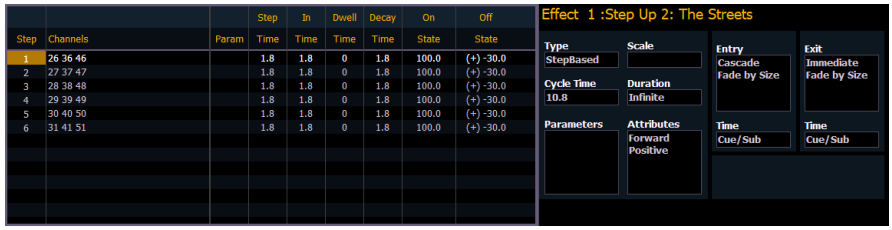
Once complete, you may play back the effect on all channels embedded in it by pressing **[Recall From] [Effect] [x] [Enter]**. Or you may specify only certain channels to play back from the embedded channel list.

A step effect is displayed in a chart with the following columns:

- **Step** - indicates the step numbers.
- **Channels** - displays the channels in the step.

- **Param** - displays the parameter (if other than intensity) controlled by the step.
- **Step Time** - time from triggering the associated step to triggering the next step.
- **In Time** - the length of time for the channels to fade to the "on-state".
- **Dwell Time** - the length of time the step remains in an "on-state".
- **Decay Time** - the length of time it takes for the channels to fade to the "off-state".
- **On State** - the parameter level (in%), or referenced data to be used for the on-state.
- **Off State** - the parameter level (in%) or referenced data to be used for the steps off-state. If you want the "off-state" to be the background state from playback, select the column and press **[At] [Enter]**.

All times are entered from the keypad in minutes and seconds, tenths and hundredths.



If an effect step is on the command line or indicated in the blue text to the left of the command line, entering a number on the command line will default to selecting a step for the current selected effect.

If no step is displayed, the command line will default to an effect number.

Programming Step Effects

Use **[Effect] [Effect]** to open the effects list. Use **<Effect> [1] [Enter]** to establish the number of the effect. The CIA will repaint with unpopulated fields for the new effect.

- **<Type> {StepBased}** - assigns the effect as a step effect. The effect will appear in the list and the CIA will repaint with the default entries for the effect and a step chart for the effect.
- **{Step} [1] [Thru] [6]** - defines the number of steps. The steps will populate the chart and will remain selected.

To make identical changes to all steps at once, you may now use the page arrow keys to navigate the chart. To make changes to only a single step, specify only one step in the command line. Default values are drawn from the previous step.

Select the **Channels** column.

- **[1] [Thru] [1] [2] [Enter]** - specifies the channels for the effect. Channels 1 through 12 will be broken up and distributed through the steps in the chart. Choose the parameter you would like in the effect by pressing:
- **{Parameters} <Intensity>** - chooses the parameters you would like in the effect. Intensity is assumed unless another parameter is specified. All steps are now intensity based.

Select the **Step Time** column.

- **[1]** - enters a step time of 1 second.

Select the **Dwell Time** column.

- **[1]** - enters a dwell time of 1 second.

Select the **Decay Time** column.

- **[.] [2] [5]** - enters a decay time of 0.25 seconds.

Select the **On State** column.

- **[1] [0] [0]** - sets an on state of 100%.

Select the **Off State** column.

- **[5]** - sets an off state of 5%.

Adjust any of the effect details on the right side of the CIA by pressing the appropriate detail button and making changes (see *Effects Editor*).

Note: *The cycle time is an aggregate of all of the timing in the effect and indicates how long it will take to make one full pass through the effect. If the cycle time is modified by the keypad or encoders, it proportionally adjusts all of the timing within the effect.*

Range for On State and Off State

You can apply a range of levels to the on state and off state for the steps. You can either apply a range using the percentage or by using a palette. For example:

- **{Steps} [1] [Thru] [6] [Enter]** - selects steps 1 through 6.

Select the **On State** column.

- **[1][0] [Thru] [1][0][0]** - assigns an on state range starting at 10 and ending at 100 to steps 1 through 6. The range between 10 and 100 will be evenly divided between the available steps.
- **[Intensity Palette] [1] [Thru] [5]** - assigns intensity palettes 1 through 5 to the steps 1 through 6. Steps 1 through 5 will be assigned to palettes 1 through 5. Step 6 will be assigned to intensity palette 1. The range will wrap to fill any available steps.

Inserting a Step

To insert a step anywhere in the effect, specify the step you wish the new step to be inserted before.

- **[Effect] [1] {Step} [4] {Insert} [Enter]** - inserts a new step before step 4. If step four does not exist, it also creates the steps necessary to have “step 4” and then places a step ahead of it as well.

Inserted steps result in all succeeding steps to be bumped one place lower in the effect. In the above example, by inserting before step 4, step 4 would become step 5, step 5 would become 6 and so on. The inserted step would become the new step 4.

Deleting Steps

To delete a step from a step-based effect, specify the effect in the command line and press delete:

- **[Effect] [1] {Step} [4] [Delete] [Enter] [Enter]**
- **[Effect] [1] {Step} [4] [Thru] [8] [Delete] [Enter] [Enter]**

Absolute Effects

Absolute effects are a listing of sequential actions that channels are to take. They differ from step effects in that there is no on/ off state, rather they define progressive behavior from one action, to the next, to the next, and so on. The best example of this is that palettes and presets can be used as actions in absolute effects.

Absolute effects differ from relative effects (which are also progressive) in that you are specifying exactly what actions you want the lights to take, rather than mathematical offsets from the current state (relative effects).

Absolute effects also do not contain an embedded channel list. Therefore, the effect must be applied to channels in order to be played back.

Absolute effects are displayed in a chart with the following columns:

- **Action** - displays the action number.
- **Param** - displays the parameter (if other than intensity) controlled by the action.
- **Step Time** -time from triggering the associated action to triggering the next action.
- **Time** - the time for the action to fade in.
- **Dwell** - the duration of the action before moving to the next action.
- **Level** - indicates either the level of the parameter specified in the effect, or the referenced value for the channels to perform (palette or preset as defined in the command line).

In the above image, actions 1 through 7 indicate referenced values in the “Level” column (palettes or presets), though these values can be absolute data as well.

If an effect action is on the command line or indicated in the blue text to the left of the command line, entering a number on the command line will default to selecting a action for the previous selected effect. If no action is displayed, the command line will default to an effect number.

Default step times will display in gray and in parentheses, and assigned step times will display in white without parentheses. The default step time is the time value plus the dwell value. If no step time has been assigned, the action will begin once the fade and dwell times for the previous action have completed. If a step time has been assigned, the next action will begin after that set amount of time has elapsed.

You can also define specific parameters for absolute effect actions. To apply a parameter to a specific action, select the **Param** column, then the desired parameter.

Programming Absolute Effects

Use **[Effect] [Effect]** to open the effects list.

- **[Effect] [8] [Enter]** - establishes the number of the effect. The CIA will repaint with unpopulated fields for the new effect.
- **<Type> {Absolute}** - assigns the effect as absolute. The effect will appear in the list and the CIA will repaint with the default entries for the effect and an action chart for the effect.
- **{Action} [1] [Enter]** - defines the first action. The action will populate the chart and will remain selected. You can also create a range of actions at once, using the **[Thru]** button, if desired.

Select the **Time** column.

- **[5] [Enter]** - specifies the fade-in time for the actions.

Select the **Dwell** column.

- **[5] [Enter]** - enters a dwell time.

Select the **Level** column.

- **[Color Palette] [5]** - enters the desired referenced target.

Page arrow down to create a new action. All fields default to the values in the previous action. Page to subsequent actions in the **Level** column and enter new referenced targets. Adjust any of the effect details on the right side of the CIA by pressing the appropriate detail button and making changes; see *Effects Editor*.

Range for Level

You can apply a range of levels to the actions. You can either apply a range using the percentage or by using a palette. For example:

- **{Actions} [1] [Thru] [6] [Enter]** - selects actions 1 through 6.

Select the **Level** column.

- **[1][0] [Thru] [1][0][0]** - assigns the range starting at 10 and ending at 100 to actions 1 through 6. The range between 10 and 100 will be evenly divided between the available actions.
- **[Color Palette] [1] [Thru] [3]** - assigns color palettes 1 through 3 to the actions 1 through 6. Actions 1 through 3 will be assigned to palettes 1 through 3. Action 4 will be assigned to color palette 1. The range will wrap to fill any available actions.

Modifying Effect Background Values

For Step and Absolute effects, you can use **[+]**, **[-]**, and **[/]** to adjust the background value.

When using **[-]**, you will need to preface the command with **[+]** if you want to remove from the current value. **[/]** is used to scale the value by a percentage.

For example:

- Effect 1 is a step effect with the on state set to 100 and the off state set to - 50% for all steps. To set the step off state to -50%, you would use the following syntax **[Effect][1] [Step] [1]**, click on the Off State column in the Effects editor, then type **[+] [-] [/] [5] <0> [Enter]**. If the channels in the effect have a background value of 50, the off state for each step would be 25.
- Effect 2 is an absolute effect. To set a level at + 20 of the background, you would use the following syntax, **[Effect][2] {Action} [1]**, click the Level column in the Effects editor, then type **[+] [2]<0> [Enter]**. If the channels in the effect have a background value of 50, the level 1 in the effect would be at 70.

Beats Per Minute

For step-based and absolute effects, you can set a beats per minute (BPM). For step-based effects, BPM affects the Step, In, Dwell, and Decay times, and for absolute effects, this affects the time/ dwell. Note that BPM impacts the effect directly.

There are two different ways for assigning BPM to effects:

Setting BPM

If you know the BPM, you can assign that directly to the effect by using the **{BPM}** softkey, which is available when in the effect editor display.

- **[Effect] [1] {BPM} [1][9][0] [Enter]** - sets the BPM of effect 1 to 190. The step times will be adjusted for step-based effects, or the time/ dwell will be adjusted for absolute effects.

The BPM will display on the right side of the effect editor beside the effect number/ label. Editing the cycle time, the step time for a step-based effect, or the time/ dwell for an absolute effect will remove the BPM.

Learning BPM

If you don't know the desired BPM, you can learn the BPM.

From Live, with the effect running:

- **[Effect] [1] [Learn] [Time]** - posts Effect 1 Learn Time Sample BPM to the command line, and opens the effect editor display.

While in this mode, press **[Enter]** to establish the BPM. The console will use an average of the last three times you press **[Enter]** in this mode to calculate the BPM. Pressing **[Learn]** again will stop this mode.

In this mode, every time the BPM changes, a live running effect will be modified accordingly without stopping.

Learning Discrete Step Time

In learning discrete step time mode, every time you press **[Enter]**, the time since the last press of **[Enter]** is used to set the next step's step time for a step-based effect, or the next step's fade/ dwell time of an absolute effect.

- **[Effect] [1] [Learn] [Time] [Time]** - posts Effect 1 Learn Time Discrete Steps to the command line, and opens the effect editor display.

Pressing **[Learn]** again will stop this mode.

Instead of pressing **[Enter]**, you can press **[At]** while in this mode to add new steps to the end of the effect. Pressing **[Enter]** will send you back to the first step in the effect.

BPM as a Cue Level Override

BPM can be applied to an effect or individual channels as only a cue level override in Live and Blind. As a cue level override, the effect step/ action times will not be affected.

Note: *The effect editor cannot be open when applying a cue level override. The effect status display does need to be open though. You can open the effect status display from the home screen or by pressing **[Effect]** while in live.*

With an effect recorded into a cue and playing back in live, **[Effect] [1] {BPM} [3][0] [Enter]** will change the BPM of the effect running. This change will happen immediately but the step or action times will not change. You can see the BPM value, which will be in red, in the Effect Status display.

When the cue is updated or recorded with the new BPM, an "*" will appear next to the effect number in the Ext Links column of the PSD and the cue list. The BPM value in the effect status display will now be displayed in blue.

[1] [Effect] [1] {BPM} [3][0] [Enter] will only change the BPM for channel 1. A "+" will display in the BPM column of the effect status display, and the BPM will display in red in the effect channel display.

Once the cue is updated or recorded, the BPM will display in blue in the effect channel display. The "+" will still be displayed in the effect status display, and an "*" will appear next to the effect number in the Ext Links column of the PSD and the cue list.

Multiple Intensity HTP Effects

Multiple intensity HTP effects are either step or absolute effects running on HTP submasters or cue lists. For multiple intensity HTP effects to run correctly, they must be recorded and played back from different sources.

For example, you create three separate step effects. Each effect impacts the same channels. For the three separate effects to run correctly you need to record them to three separate effect submasters or cues in separate cue lists. Either method will allow for each effect to run together according to the rules of HTP. But, for example, if you were to have three separate effects running on three separate effects submasters and you try to record that into one cue, the cue will only run the effects that were currently at the highest level at the moment of the record.

Relative Effects

A relative effect is an offset from the current state of a channel parameter. Relative effects have many of the same properties and attributes as step-based and absolute effects. Each of the three relative effect types below have a graphic editor designed specifically for the parameters involved.

To create a new relative effect, use **[Effect] [Effect]** to open the effects list. Establish the number of the effect with **[Effect] [4] {Type} {Linear/Focus/Color} [Enter]**. The effect will appear in the effect list and the CIA will repaint with the effect details visible. Manipulate the effect using the encoders, effect graph, and / or property fields so that the effect meets your needs (see *Effects Editor* for details on effect properties and encoders).

Eos includes default relative effects which represent some of the most commonly used patterns and parameters. These are automatically visible in the effects list and can be manipulated using the encoders to conform to your needs. You may also custom build relative effects.

Note: *As you learn to use the effects editor with relative effects, it is recommended that you experiment with the preprogrammed effects until you understand the fundamentals and how effects can be altered.*

Focus Effects

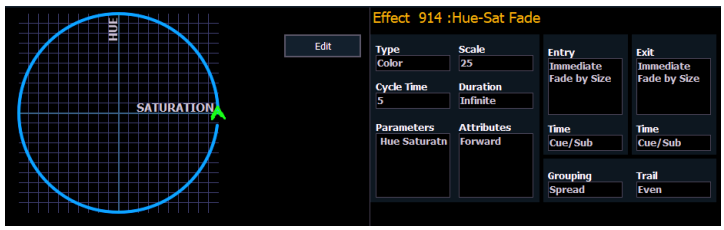
Focus effects are designed to impact a channel's pan and tilt parameters. These are represented in the horizontal and vertical axes of the graph in the effects editor. They can be created from live or blind and the properties can be set in the effects editor as any other effect.

New focus effects default to a circle. You can clear this and draw your own shape by pressing **{Edit}>{Clear}** and drawing on the graph with your finger or the mouse. Press **{Apply}** when you are done. Other pre-made focus effects can be modified in the same manner. The green arrow indicates default direction of motion, which can be modified in attributes.

You can adjust the vertical form of a focus effect by holding hold down **[Shift]** while using the horizontal encoder, if available.

Color Effects

Color effects impact only color parameters. Hue and saturation offsets can be used which are represented in the horizontal and vertical axes of the graph in the effects editor. The **{Parameters}** key within a color effect displays the various color mechanisms used in any patched channels.



New color effects default to a circle. You can clear this and draw your own shape by pressing **{Edit}>{Clear}** and drawing on the graph with your finger or the mouse. Press **{Apply}** when you are done. Other pre-made color effects can be modified in the same manner. The green arrow indicates default direction of color shift, which can be modified in attributes.

Linear Effects

A linear effect does not have to be parameter specific. Rather it can simply be a reference to a linear diagram which can be applied to any parameter. You can redraw the linear diagram for an existing linear effect by pressing **{Edit}>{Clear}** and then tracing the diagram on the graph with the mouse or your finger. Press **{Apply}** when you are done.

Relative Effect Pattern Shapes

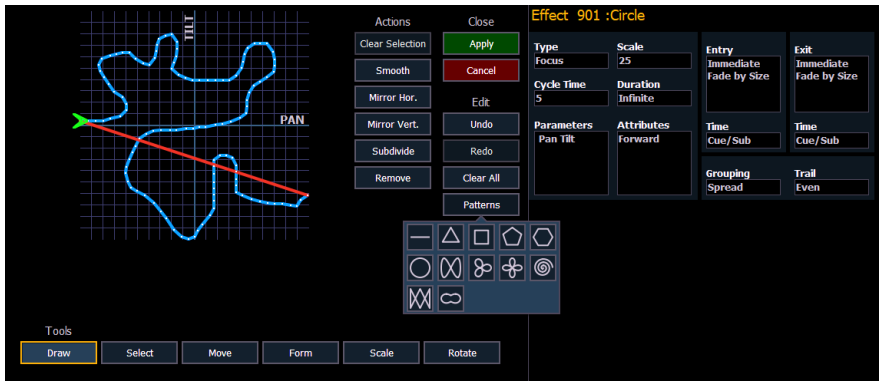
Shapes can be defined for any relative effect (focus, color, or linear). You can either draw a pattern from scratch or use one of preexisting patterns as a starting point.

To define a shape, press the **{Edit}** softkey beneath the pattern editor. The softkeys will change to **{Apply}**, **{Restore}**, **{Clear}**.

1. Press **{Clear}** to clear the pattern.
2. Draw a new pattern using your finger (or the mouse), or select a preexisting pattern. If you want to return to the original pattern, press **{Restore}** before pressing apply.
3. When you have the proper pattern drawn, press **{Apply}**. The pattern will be applied to the effect.

Note: *If you delete a preprogrammed effect (for example, after making changes to it) the effect will return to its default value. You can also copy effects to another effect location and modify them from there. This will leave the original effect untouched.*

- *[Effect] [904] [Copy To] [8] [Enter]*



The following tools are also available to edit the curve with the mouse or touchscreen:

- **Draw** - draw a new line for linear effects or append points to focus effects
- **Select** - select points of the curve (if no points are selected, all are changed)
- **Move** - move selected points, can also phase-shift the curve of linear effects in steps of 30 degree (only if no partial selection was made)
- **Form** - freehand scale the curve horizontally and / or vertically
- **Scale** - proportionally scale the curve (focus effects only)
- **Gamma** - apply a log function to the curve (linear effects only)
- **Size** - scale focus effects on both axis
- **Rotate** - rotate focus effects around the center of the selected points

The following actions are available when editing the curve:

- **Clear Selection** - selects all points at once
- **Smooth** - smooths the selected points
- **Mirror Hor. / Vert.** - mirrors the curve
- **Subdivide** - adds one point on each selected segment (useful to move that point or change the behavior of smooth)
- **Remove** - removes the selected points
- **Undo** - undoes the last operation
- **Redo** - redoes the last operation

Preprogrammed Rainbow Effects

Two preprogrammed rainbow linear effects are available in the effect list. Effect 917 is a Rainbow RGB effect, and effect 918 is a Rainbow CMY effect. These effects are for a rainbow on native color parameters that will fade hue from 0 to 360 with saturation at full, when the parameters are at their default levels. 0 is the default for CMY, and Full is the default for RGB.

Apply an Existing Effect

Once an effect has been created, it will appear in the effects list. To apply an existing effect, press:

- [Select Channels] **[Effect]** [x] **[Enter]**

or using the direct selects

- [Select Channels] **{Effect** x**}**

The selected channels will begin their changes as programmed in the effect.

Note: *Since step based effects have an embedded channel list, those effects can be recalled by* ***[Recall From] [Effect]*** *[n]* ***[Enter]*** *without selecting channels.*

Editing Effects Live

To edit an effect while it is running, press:

- **[Displays] {Effect Status}**

The effect status display will open in the CIA and any currently running effects will be visible in the display. Selecting the effect number in the status display will select the effect for editing. Select the effect you want to edit live by pressing:

- **[Effect]** [x] **[Enter]**

Adjust the attributes as described in *Effect Status [Tab 6]*. Adjustments are cue overrides and don't impact the core effect. Changes made to effects in the effect status display impact only that instance of the effect. The changes will then need to be recorded or updated.

To edit other properties of the effect in live, press **{Edit}** and the effects editor will open (See *Effects Editor*. Changes made in the editor will impact the effect itself and all instances in which the effect is used.

Stopping Effects

Note: ***[Stop Effect]*** *is used below. Consoles without this hardkey use the following key combinations:*

- ***[Shift] & [Effect]*** *- Apex 5 / 10 / 20 / FP*
- ***[Fader Control] {Stop Effect}*** *- Ion Classic*
- ***{Fader Control} {Stop Effect}*** *- Element 2 / Element Classic*

StopEffect *can also be accessed via a connected keyboard with CONTROL+ALT+E and SHIFT+ALT+E.*

Using Stop Effect

Use **[Stop Effect]** to post **StopEffect** to the command line. Confirm with **[Enter]** to stop all running effects.

- **[Stop Effect]** [#] **[Enter]** - stops the specified effect. You can also use **[Effect]** [x] **[At]** **[Enter]**.
- [#] **[Thru]** [#] **[Effect]** **[Enter]** - stops effects on the channels in the specified range.
- [#] **[Thru]** [#] **[Effect]** **[At]** **[Enter]** - removes effect instructions on the channels in the specified range. Works from Live or Blind.

Assigning a Stop Effect Command

A **[Stop Effect]** command can be assigned to a list of channels in a cue to prevent effects from tracking into it. *Freeze and Stop Effect on Submasters* can be used to affect lists of channels in submasters.

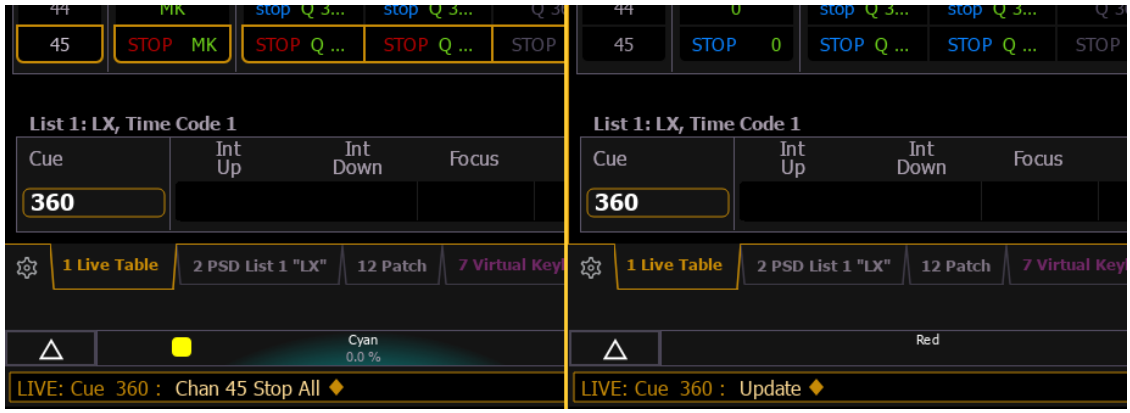
- **<Chan> [1] [Stop Effect] [Enter]** - creates a stop effect instruction for all selected parameters, if there isn't an effect running on any of the parameters.
- **<Chan> [1] [Effect] [Enter]** - stops the effect currently running effect.

Stop All

A **Stop All** command can be used with cues or subs to place stop flags on channels and parameters that are not currently running effects, allowing the cues and subs to stop effects from other sources even if *Attributes* > **{Continuous Run}** is enabled.

Use **[Stop Effect] [Stop Effect]** to post **Stop All** to the command line.

- **<Chan> [1] [Stop Effect] [Stop Effect] [Enter]** - stops any effects that might be running when a cue containing channel 1 plays back.



Stop All commands appear in the cue list as STOP.

Query and Group Effect

Note: *[Query] is used in the examples below. Element 2, Ion Classic, and Element Classic users will need to use {Query}.*

You can use **[Query] [Effect]** [n], **[Query] [Effect]**, and **[Group] [Effect]** [n] to select the channels currently running in the selected effect.

Using **[Query]** will select the channels in numeric order. **[Group]** will select the channels in the order that they were originally selected.

[Query] [Effect] will select all channels currently running effects. For example:

- **[3][1] [+] [2][6] [+] [3][0] [+] [2][7] [+] [2][9] [+] [2][8] [Effect] [1] [Enter]**

Using **[Query] [Effect] [1]** will select the channels currently running effect 1. Using **[Next]**, the channels will be selected in numeric order starting with channel 26. Using **[Group] [Effect] [1]** will select the channels currently running effect 1. However, pressing **[Next]**, the channels will be selected in the order they were originally selected. In this example, channel 31 would be first, then channel 26.

Replace With

{Replace With} allows you to replace an effect with another one. All overrides will be preserved.

- **[Effect] [1] {Replace With} <Effect> [2]** - all channels that were running effect 1 will now be running effect 2.

Deleting Effects

To delete an effect, press **[Delete] [Effect]** [n] **[Enter] [Enter]**. If you delete one of the default effects (901 through 918), that effect will return to its default values.

Recording an Effect to a Preset

Note: *[Preset] is used in the examples below. Element Classic users will need to press [Shift] & [Intensity Palette] or use the {Preset} button in ML Controls.*

Effects can be stored in a preset, and those presets can be used to create submasters and cues. However, the effect's data is only copied to the submaster or cue, and is no longer referenced through the preset. If changes are made to the effect in the preset, the effect saved to the submasters and cues will remain unchanged.

To apply an existing effect, press:

- [Select Channels] **[Effect]** [x] **[Enter]**

Recording to a preset, press:

- **[Record] [Preset]** [x] **{Plus FX} [Enter]**

Pressing [Effect] after [Record] [Preset] [x] will append {Plus FX} to the command line.

- **[Record] [Preset]** [x] **[Effects] [Enter]**

Effects are also included in Blind preset **[Copy To]** and **[Recall From]** commands.

Recording an Effect in a Cue

To apply an existing effect, press:

- [Select Channels] **[Effect]** [x] **[Enter]**

Recording to a cue, press:

- **[Record] [Cue]** [x] **[Enter]**

Recording to a cue part, press:

- **[Record] [Cue]** [x] **[Part] [x] [Enter]**

Effects on Faders

Channels running effects can be loaded onto a submaster. By default pressing the bump button of the submaster starts or stops the effect.

For the submaster to control the rate and/ or size of the effect, it can be configured as an effects submaster. To configure an effects submaster, see *Submaster Properties*.

CAUTION: ***When a submaster is defined as effect, only the effect information is stored.***

There are several submaster button and fader configuration options that affect how effects run. See *Submaster Fader and Button Configuration* about those options.

Configuring an Effect Submaster

To configure an effect submaster, press:

- **[Sub]** [x] **{Properties} [Enter]**

Note: *The {Properties} softkey will open the Submaster Properties display in the CIA.*

Recording an Effect to a Submaster

To apply an existing effect, press:

- [Channel List] **[Effect]** [x] **[Enter]**

To record to a submaster, press:

- **[Record] [Sub]** [x] **[Enter]**

A submaster can be configured to be an effect submaster. You can configure at the same time as you record the submaster. Before you hit **[Enter]**, hit the softkey for **{Properties}** to open the *Submaster Properties* display in the CIA. Select **Effect** as the mode.

Running an Effect from a Submaster

The way effects are played back from a submaster depends on its mode, and whether the submaster is set to be a proportional fader or an intensity master.

Below is an example of four different submasters, in different modes, with the same effect stored to them.

Effect on an Additive/ Proportional Submaster

The submaster contains the intensity, pan/tilt data, along with the effect. Pressing the bump button starts the effect. The fader controls values not affected by the effect. Pressing the bump button again stops the effect.

Effect on an Additive/ Intensity Master Submaster

Pressing the bump button marks the lights, and starts the effect. The fader brings up any intensities stored in the submaster. Pressing the bump button again stops the effect.

Effect on an Effect/ Proportional Submaster

Pressing the bump button starts the effect. The fader controls the rate and/ or size based on the effect's entry behavior. Pressing the bump button again stops the effect.

Effect on an Effect/ Intensity Master Submaster

Pressing the bump button starts the effect. The fader controls the rate and/ or size based on the effect's entry behavior. Pressing the bump button again stops the effect.

In other words, there is no difference between a proportional fader and an intensity master when the submaster is configured to be an effect submaster.

Global Effects Fader

A fader can be mapped as global effects in *Fader Configuration [Tab 36]*, **[Tab] [3][6]**. This fader type is used to master all effects or specific effects based off of the current filtering applied to the fader.

The following filters can be applied to effects running on:

- **Cue Lists** - you can specify certain cue lists or select **{All}** or **{None}**.
  - Not available on Element 2 or Element Classic.
- **Submasters** - you can specify certain submasters or select **{All}** or **{None}**.
- **Channels** - you can specify certain channels that will be affected by the global effects fader. See *Channel and Parameter Filters on Faders*.
- **Parameters** - you can specify certain parameters that will be affected by the global effects fader. See *Channel and Parameter Filters on Faders*.
- **Effects** - you can specify certain effects or select **{All}** or **{None}**.

- **Manual** - when on, the global effects fader will only affect manually run effects. By default, this is off.

If no filters have been applied, the fader will master all effects.

Fader Options

The following fader options are available for a global effects fader:

- **Effect Rate** - fader centers to home. It controls the rate of any running effects (same behavior as using rate via the Effect Status Display). Min is 0, and Max is 200.
- **Effect Size** - similar to Effect Rate but for effect size. Min is 0, and Max is 200.
- **Fader Disabled** - no action is assigned to the fader.
- **Effect Master** - masters the entry/ exit mode of the effects (size, rate or both).

If multiple global effects faders are used at the same time, their contributions are multiplied together. ETC recommends using one global effects fader at a time.

Button Options

The following options are available for global effect buttons:

- **Bump** - plays back the effect at 100% of the recorded level. It will continue to do so until released.
- **Freeze** - halts all effect activity on the fader.
- **Start Stop Effect** -starts the effect while ignoring dwell times. Will stop effects if any are running.
- **Button Disabled** - no action is assigned to the button.
- **Macro** - allows you to assign a macro as a button action.

Delaying Effects

A delay can be placed on an effect in a cue or submaster by using the syntax **[Effect]** [n] **[Delay]** [n] **[Enter]**. **[Effect]** [n] **[Delay]** **[Enter]** removes the delay.

Note: *If an effect delay is set in live, the cue or submaster must be recorded to include the delay.*

The Effect Status display has a delay column to show when a delay has been applied to an effect. When an effect is in delay mode, the column will display the countdown for the delay.

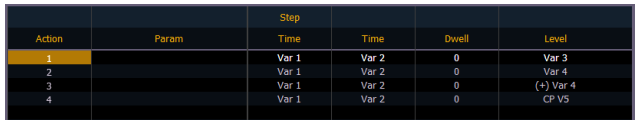
When an effect is delayed, a "*" will display by the effect number in the playback status display FX column.

Effects Variables

Variables give additional options for altering StepBased and Absolute effects on the fly.

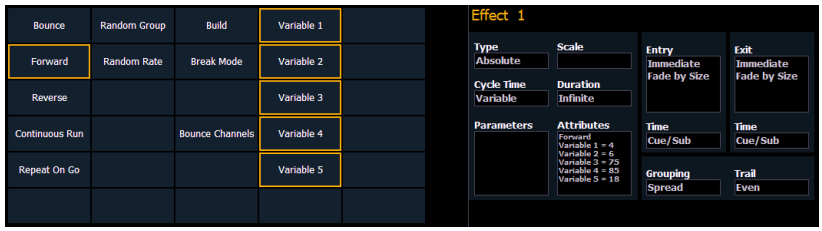
Using Variables in Effects

First, insert one or more variables into a StepBased or Absolute effect using the **{Variable}** softkey. Available fields are Timing, On State, and Off State for StepBased effects, and Level and Timing for Absolute. A maximum of ten variables can be used.



Variables can be substituted for any number in an effect, including for relative timing, and to define the number of a target, such as a Color Palette. Variables can also be used more than once in the same effect, or applied across multiple steps.

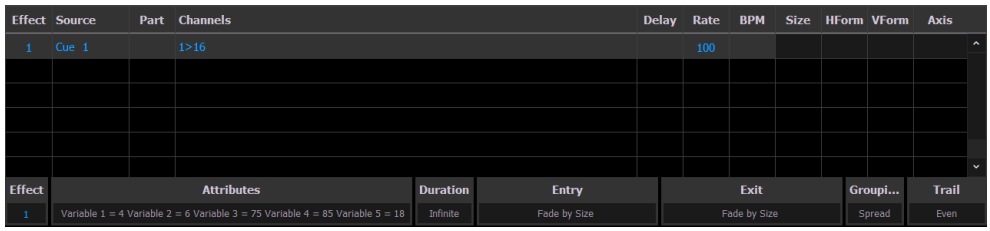
Variables need to be defined before the effect can be run. This can be done in the Effects editor by selecting the **Attributes** field.



Define your variables by selecting each one and giving them a value.

Altering Effects in Progress

Variables can also be defined in the Effects Status Display (ESD) before an effect is run, or redefined after an effect is already running.



Select **{Attributes}** to define or redefine variables. If variables are redefined in an already-running effect, the ESD will show the effect in red, with an asterisk (*) next to the effect number to indicate that it was modified. Store any manual changes using **[Record]** or **[Update]** as normal.

Chapter 14

Park

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Parked Values in Live 631

Scaled Parked Values in Live 632

Parked Addresses in Live 632

Park Values from the Park Display 632

Park [Tab 20]

You can access the park display by pressing **[Park] [Park]** or **[Tab] [2][0]**. Element Classic users will need to use **{Park}**.

The park display shows all parked channels and parameter values on the top half of the screen and all parked addresses (dimmers) on the bottom half of the screen. Parked channels displayed on the top of the screen can be displayed in the summary and table views seen in Live or Blind by using the **[Format]** key.

When a channel intensity is parked, the parked value will be indicated in white text. When a channel has a non-intensity parameter that is parked, that parameter will also be indicated with white text. The display also provides detail of which user parked the channel and /or parameter (when multiple users are on the system).

When an address is parked, it will appear in the bottom half of the park display. The address, parked value, affected channels and parameters are indicated.

About Park Instructions

The park instruction allows you to set a channel or parameter to a specific value and have it remain at that level on stage (live mode), prohibiting manual control override, cue or submaster playback modification. Park may also be used to place a scaling instruction on the intensity output of a channel.

A parked channel intensity is not impacted by grandmaster or blackout operations.

Parked values are withheld from all record targets, but you can manually set levels for parked channels and parameters and store those values into record targets. Keep in mind that the values set and stored in live do not actually output to the system if the parameter is parked.

When channels or parameters are parked, the LED on the **[Park]** button illuminates and the live display will indicate “Parked Channels” or “Parked Dimmers” in the top right corner. In addition, any parked channel or parameter will be indicated with a white channel number and a “P” will be visible in the channel. When the parked channel or parameter is unparked, it reverts to the level the console is currently providing, or its default value if there is no current instruction.

Park instructions are not subject to partition control. Any user may park and unpark channels or parameters as needed. Parked parameters set by radio focus remotes (RFR) will automatically unpark when the associated device goes offline.

Channels, parameters and outputs can be parked and unparked from live and from the park display.

Output from parked channels or parameters is not displayed in *Augment3d*.

Parked Values in Live

Channels and parameters may be parked and unparked from the live display. Parked values will be displayed in the park display and in **[About] & [Park]**.

To park a channel to a specific dimmer intensity level must be accomplished from the Parked Channel display. Access the Parked Channel display by pressing **[Tab] [2][0]** or **{Park}[Park] [Park]** twice.

To park a channel, parameter, or group from Live:

- **[2] [At] [5] [0] [Park] [Enter]** - parks channel 2 intensity at 50%.
- **[2] {Intensity} [Park] [Enter]** - parks the intensity of channel 2 at its current value.
- **[2] [Park] [Enter]** - parks all parameters of channel 2 at their current settings.

If a channel list is constructed in which some channels are parked and some are unparked, **[Park] [Enter]** will unpark them all. A confirmation will be required.

- **[2] [At] [Park] [Enter]** - if channel 2 is unparked, this command parks intensity at the current value. If the intensity for channel 2 is parked, this command unparks intensity.
- **[2] [Color Palette] [8] [Park] [Enter]** - parks the color for channel 2 in color palette 8.
- **[Group] [Cue] [6] [Park] [Enter]** - parks all the channels stored in cue 6 at their current levels.
- **[Park] [Enter]** - clears all parked channels and scaled park instructions (see *Scaled Parked Values in Live*). A confirm is required. When a channel is unparked, it reverts to the level the console is currently providing, or its default value if there is no current instruction. A confirmation will be required.

You can use *[Recall From] [Park]* to set a channel or parameter to the same level as the current park value.

Scaled Parked Values in Live

A scaled parked value allows the intensity output (only) to be modified proportionally in live. Scaled park values are ignored when storing a record target. The setting on the display indicates what should be stored, not the actual scaled value. An example of how to set a scaled parked value in live includes:

- **[3] [At] [/] [1] [2] [5] [Park] [Enter]** - sets a scaled value of 125% on channel 3 intensity. In other words, whenever channel 3 is active, it will be active 25% higher than its current setting.
- **[3] [At] [/] [8] [5] [Park] [Enter]** - sets a scaled value for channel 3. Whenever channel 3 is active, it will playback 15% lower than its current setting.

Remove the scaled parked value:

- **[3] [Park] [Enter]** - unparks a scaled intensity for channel 3.
- **[Park] [Enter]** - unparks all parked channels.

A channel can have both a scaled parked value and a parked intensity value. Keep in mind that the parked intensity has priority over (and overrides) scaled park values.

Parked Addresses in Live

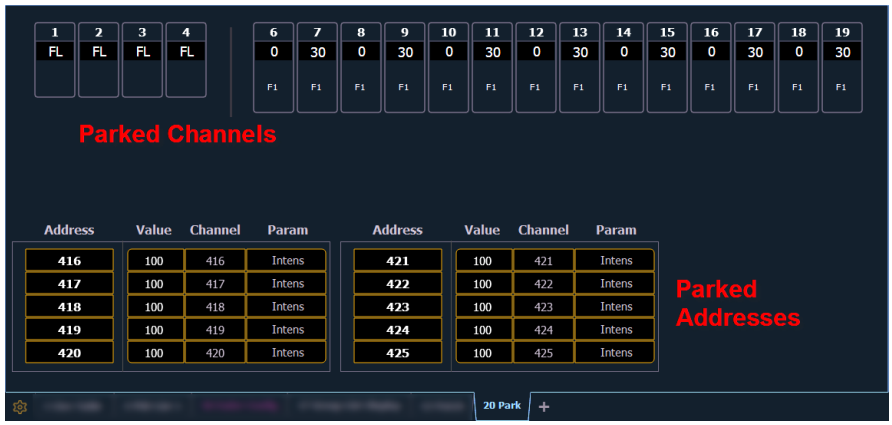
DMX addresses can be parked in Live. Below are some examples of parking an address in Live.

Note: *[Address/Patch] is used in the examples below. Ion Classic users will need to use {Address}. Element Classic users will need to use [Dimmer/Address].*

- **[Address/Patch] [5] [At] [5] [0] [Park] [Enter]** - parks output 5 at 50% intensity.
- **[Address/Patch] [5] [Park] [Enter]** - unparks output 5.
- **[Address/Patch] [Park] [Enter]** - unparks all parked outputs.

Park Values from the Park Display

You can park and unpark channel parameters or addresses from the park display. Open the display by pressing **[Park] [Park]** or **[Tab] [2] [0]**. While in this display, it is assumed that you want to park channels or parameters, therefore the use of the **[Park]** key is not necessary when parking, but is used for unparking. You can also use **[At] [Enter]** to unpark.



Note: *[Color Palette] is used in the examples below. Element Classic users will need to use {Color Palette}.*

Following are examples for parking channel parameters from the park display:

- **[3] [At] [4] [5] [Enter]** - parks channel 3 at 45%.
- **[3] [Color Palette] [4] [Enter]** - parks color for channel 3 at color palette 4.

You can use the **{Offset}** softkey to aid in channel selection. For a list of the **{Offset}** options, see *Offset*.

Following are examples for clearing parked values while in the park display:

- **[Select Active] [Park] [Enter]** - clears all parked channel parameter values.
- **[**channel list**] [Park] [Enter]** - unparks channels in the list.
- **[**channel list**] [At] [Enter]** - unparks channels in the list.

Below are examples for parking addresses in the park display:

- **[Address/Patch] [5] [At] [5] [0] [Enter]** - parks address 5 at 50% intensity.
- **[Address/Patch] [5] [At] [Enter]** - unparks address 5.

Note: *When parking a range of addresses in Park, using **[Thru]** will only park the intensities. If you want to park all of the addresses and parameters within the selected range, you will need to use **[Thru] [Thru]**.*

Chapter 15

Submasters

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About Submasters

Submasters can store any parameter data for channels. When storing from Live, Record Only and Record can both be used to determine what contents are stored. You can copy cues, presets, or palettes to a submaster as well. Channels running effects can be loaded onto a submaster. See *Effects on Faders*

Submasters can be controlled by faders or by the keypad. Faders can be configured as submasters (see *Submaster Properties*) or they can be defined while programming.

Note: *You can record up to 1000 submasters.*

In Blind, submasters can be created by using the **[Thru] [Thru]** syntax.

- **[Sub] [1] [Thru] [Thru] [1] [0] [Enter]** - will create subs 1 through 10.

When set as a submaster, the bottom buttons beneath the fader can be configured for different functions. See *Submaster Fader and Button Configuration*.

It is possible to program upfade, dwell, and downfade times in association with the submaster bumps. See *Submaster Properties*.

Blinking LEDs

When a submaster bump LED is blinking, it means that the submaster must be homed due to either changes to its content or to its mode. In either case, reset the submaster by dropping it to zero and the moving it back to the desired position. The LED will also blink when the submaster is in a "Hold" state via bump button timing.

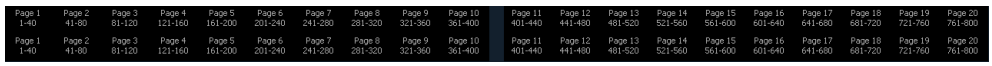
Paging Submasters on Element 2 and Element Classic

Element 2

Element 2 has a total of 1000 submasters. The fader position switch can be placed in faders 1-40 or 41-80 modes. Element 2 will default to the first 80 faders. To page through the available submasters, hold down the **{Page Subs}** softkey in the Live display. The bump buttons will light up in green, and the bump buttons that correspond to the currently selected pages will flash. Press the corresponding bump button to go to that page. The fader ribbon will change to show the submaster pages.

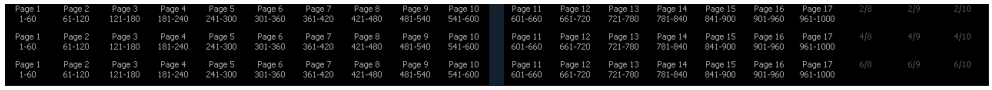
Element Classic

Element has a total of 1000 submasters. With the fader position switch in submaster mode, an Element 60 will display 60 submasters, and an Element 40 will display 40 submasters at a time. Element will default to the first 40 or 60 submasters. To page through the available submasters, hold down the **{Page Subs}** softkey in the Live display. The bump buttons will light up in green, and the bump buttons that correspond to the currently selected pages will flash. Press the corresponding bump button to go to that page. The fader ribbon will change to show the submaster pages.



There are 20 pages available on Element 40 for a total of 800 submasters

Note: *Submasters 801-1000 can only be controlled by the keypad on Element 40.*



There are 17 pages available on Element 60 for a total of 1000 submasters.

Recording a Submaster

You can record current stage contents directly to a submaster. To do this, set levels in Live as needed then record them to the submaster. See the following examples:

- **[Record] [Sub] [5] [Enter]** - records all current values to submaster 5.
- **[Record Only] [Sub] [5] [Enter]** - records the manual values of the current stage state to submaster 5.
- **[Record Only] [Sub] [5] [Label]** [Label Text] **[Enter]** - as above, with a label.
- **[Record] [Sub] [5] {Properties}** - opens the *Submaster Properties* window so you can select properties while recording your submaster.
- **[Record] [Load]** - for devices with a single load button per fader. Records all current values to the fader associated with the load button. Submaster will be stored with the number associated with the chosen fader.
- **[Record] [Both Bump Buttons]** - for devices with two bump buttons per fader. Records all current values to the fader associated with the bump buttons. Submaster will be stored with the number associated with the chosen fader.
- **[Record] [Bump]** - for devices with a single bump button per fader. Records all current values to the fader associated with the bump button. Submaster will be stored with the number associated with the chosen fader.

You can also record selected channel data to submasters as well.

- [Channel List] **[Record] [Sub] [5] [Enter]** - records all data for the channel list to submaster 5.
- [Channel List] **[Record Only] [Sub] [5] [Enter]** - records manual data for the channel list to submaster 5.

Submasters can also be recorded using selective storing, which allows you to specify only the channels that you want stored.

- **[6] [Thru] [1][0] [Record] [Sub] [3] [Enter]** - records only channels 6 through 10 to submaster 3.
- **[1] [Thru] [5] {Blue} [Record] [Sub] [6] [Enter]** - records only the blue color for channels 1 through 5.
- **[1] [Thru] [1][0] {Offset} {Odd} [Record] [Sub] [4] [Enter]** - records channels 1, 3, 5, 7, 9 into submaster 4. See *Offset*.

If a submaster already has data stored to it, selective store will act as a merge function. Using the above example of channels 6 through 10 stored to submaster 3, if you were to then store channel 5 to submaster 3, that would be added to the current content so that channels 5 through 10 are now stored.

If you don't want the data to merge, you can either first delete the submaster to remove the original content (see *Deleting a Submaster*), or you can selective store while using **[Rem Dim]**.

- **[5] Record] [Sub] [3] [Rem Dim] [Enter]** - records channel 5 to submaster 3 and removes any previous data from the submaster.

Submasters [Tab 15]

You can access the submaster list by pressing **[Sub] [Sub]**, **[Tab] [1][5]** or through the browser (**Record Target Lists>Submaster List>[Select]**). Either of these commands will open a new tab for the submaster list or if it is already open on a tab, will bring focus to the list.

The list view includes a list of all submasters including their labels and all properties. You can navigate within the list by using the **[Next]** and **[Last]** buttons or by selecting the desired submaster from the command line.

Editing Submasters

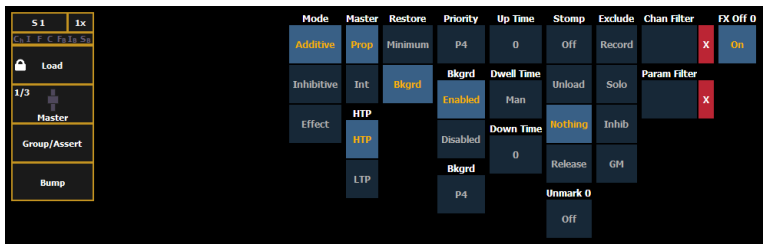
While in the Submaster list, if you want to edit the contents of the submaster, you can select the submaster and press **{Edit}**. This changes focus to the Live/ Blind tab and places you into the Blind edit mode for the specified submaster. You may also press **[Blind]** and select the required submaster from the command line.

Any changes made in this screen are automatically stored. A **[Record]** or **[Update]** command is not required.

Submaster Properties

Faders can be mapped to a submaster in the fader configuration display, or by recording or loading a submaster. See *Fader Configuration [Tab 36]*, *Recording a Submaster*, and *Loading Faders*.

If a fader has been configured for default mapping in the fader configuration display, the fader will receive its configuration from the *Submasters [Tab 15]*. Changes made to a submaster in the submaster list will be shared with any default mapping faders loaded with that submaster. If changes are made to a fader set to default mapping in the fader configuration display, those changes will also happen in the Submaster List. If set to Local, any changes made in the fader configuration display will impact only that instance of the content.



The following options are available for submaster faders:

Mode

You may define your submaster as additive (contributes to the live output), inhibitive (limits live output) or an effect submaster (see *Effects on Faders*). Eos defaults to submasters being additive.

Additive submasters are indicated by a green LED and a yellow fader icon in the fader ribbon.

Inhibitive submasters display these indicators in red. Channels mastered by an inhibitive submaster are indicated with an “I” next to the intensity value in the channel display in Live. Inhibitive submasters do not provide levels to the stage picture, they limit them (similar to a grandmaster). It is possible to put non-intensity parameters onto an inhibitive submaster, but it must be done from Blind.

Master

A fader can be assigned as a Master. When it is a master, its behavior as a Proportional Master or Intensity Master (I-Master) is drawn from this setting.

Proportional Master

When a submaster is proportional, the slider will control all contents of the submaster (intensity and non-intensity parameters) when moved from zero. When a proportional sub is returned toward zero, channel will be returned to their previous level.

The bump button can be used to bump all values to their recorded levels in the submaster, or, by assigning timing values, fade the contents of the submaster up or out. Eos defaults to submasters as proportional.

Intensity Master

When set to intensity master, the slider will control intensity only. The bump button can be used to preset (mark) non-intensity parameters stored to the submaster. If the bump is not pressed before the slider is moved, the slider will snap the non-intensity-parameters to their target values. Once the non-intensity-parameters are at their end state, the slider only controls intensity. When dropped toward zero, controlled intensities will be faded toward zero.

When non-intensity parameters on a intensity master submaster have been marked using the bump button, the LED on its bump button will blink to tell you that the non-intensity parameters have been marked.

Pressing the bump button for an intensity master submaster that is currently bumped will release the non-intensity parameters using the bump button timing. Its bump button LED will also be turned off.

Note: *For channels that have been set to GM Exempt in Patch > Attributes, Intensity Master control will not impact the intensity of those channels.*

HTP vs. LTP

Intensity playback behavior can be set to HTP (highest takes precedence) or LTP (latest takes precedence). Non-intensity parameters are always LTP. Eos defaults all submasters to HTP.

Restore

Submasters can be placed into restore modes of minimum or background, which is the default. When a submaster is in the restore to background mode, the restore column of the submaster list display will be blank. When in minimum mode, 'Min' will display in the restore column.

The restore mode of background means that when the submaster is returned to zero, control will be restored to the background value, such as another submaster or a cue.

The restore mode of minimum means that when the submaster is faded down, control does not go to the previous background state but to the parameters' minimum value.

Priority

There are 10 levels of priority for submasters. 1 is the lowest and 10 is the highest. The default priority level is 4.

Shielded

Submasters can be shielded, which means that their content is automatically made exclusive and can't be controlled by anything other than that submaster and park, including by manual control. Shielded has a higher priority than 10.

Channels stored to shielded submasters will display in yellow with a superscript ‘s’ beside it.

If channel parameters stored to shielded submasters were previously stored to cues or other submasters, those instructions will be ignored on playback.

If the same channels are assigned to more than one shielded submaster, control of those channels will be shared on either a LTP or HTP basis depending on the settings for the submasters.

Background

Submasters can have their background states disabled. Background states are enabled by default. When enabled, the content of the submaster will act as a background or previous state for other cues and submasters.

When a submaster has its background state disabled, a “D” will be displayed in the Submaster List background column.

For example, cue 1 has channel 10 at 25%. Submaster 1 is raised and has channel 10 at 50%. Submaster 2 is then brought up and has channel 10 at Full. When submaster 2 is lowered to zero, control will be returned to submaster 1. If submaster 1 is lowered to zero, control will return to cue 1. If submaster 1 has its background state disabled, which makes its content unavailable as a background state, then when submaster 2 is lowered to zero, control would return to cue 1 and not to submaster 1.

Background Priority

Background can have a priority assigned to it. Background priority releases to the highest priority content that previously had ownership, provided that content has not be turned off or released.

There are 10 levels of background priority for submasters. 1 is the lowest and 10 is the highest.

Up Time

This is the time for the submaster to fade from its home position to its target position (0 to Full if additive, Full to 0 if inhibitive). The default time is 0.

Dwell Time

This is the time the submaster look will hold before starting the downfade. This can be set to a specified time, or to “Hold” or “Manual”. “Hold” time maintains the submaster values until the bump is pressed a second time. “Manual” time applies the submaster values only as long as the bump is held. The default is “Manual”.

Down Time

This is the time for the submaster to fade from its target position to its home position. The default time is 0.

Stomp Mode

Stomp happens when all the content owned by a submaster is now being controlled by other targets. The submaster is being removed from the background , and once that happens, it would not be eligible to fade back. You can assign behavior that will happen when a submaster is stomped.

The following are Stomp Mode options:

- **Off When Stomped** - puts the content into an off state, the same behavior encountered when pressing **[Off] & [Load]**.
  - Ion Classic and Element Classic users will need to use **{Off}**
- **Unload When Stomped** - unloads the fader.
- **Nothing When Stomped** - no action happens to the submaster.
- **Release When Stomped** -This function behaves the same as Off When Stomped.

Unmark at 0%

When this option is on, marked content controlled by the submaster will automatically be released when the fader reaches 0%. When the bump button is next pressed, the submaster will fire. If this option is off, you would need to first press the bump button to reset the submaster before pressing the bump again to fire it.

Note: *This option is for submasters that are set to Intensity Master.*

Exclude

Those exclusions include:

- **Exclude From Record** - output is not recorded into any other record target.
- **Exclude From Grandmaster** - content cannot be mastered by a grandmaster.
- **Exclude From Inhibitive Sub** - content cannot be mastered by an inhibitive submaster
- **Exclude From Solo** - content will ignore solo. See *Submaster Fader and Button Configuration*.

Channel and Parameter Filters

Channel and Parameter Filters can be used to allow only specified data to be played back. These are playback filters, and do not impact how data is recorded.

For submasters, channel and parameter filters can be set in the following areas:

- Submaster List
- In Live using the **{Properties}** softkey

Tap or click on **{Chan Filter}** to assign channels or groups. Tap or click on **{Param Filter}** to open a list of available parameters that you can filter.

Note: *Filters will travel with their assigned submasters wherever they are mapped.*

When a filter has been applied, an indicator will display in the fader ribbon. C will display for channel filter, and F is for parameter filter.

Press the red **[X]** to clear the channel or parameter filters listed.

FX Off 0

Starts the effect when master fader is moved from 0, stops the effect when it is moved to 0. This is enabled by default.

Submaster Fader and Button Configuration

Click or tap on the virtual buttons or fader to see a list of available configuration options.

Button Options

The following options are available for submaster buttons:

- Bump - plays back the submaster at 100% of the recorded level. It will continue to do so until released, unless the submaster has a time assigned or the {Hold} property set.
- Group/ Assert - selects all the channels associated with the submaster, if the submaster is inactive. If the submaster is active, the contents of the submaster will be asserted.
- Assert - regains control of all of the channels associated with the submaster.
- Group Select - selects the channels stored in the submaster. This is the same as [Group] [Sub] [n].
- Freeze - halts all effect activity on the fader.
- Off - removes the content and if the fader is set to Master, the fader will remain where it currently is.
- Release - removes the content and if the fader is set to Master, the fader will reset to 0.
- Start Stop Effect -starts the effect while ignoring dwell times. Will stop effects if any are running.
- Button Disabled - no action is assigned to the button.
- Mark NPs - If no non-intensity parameters are owned by the submaster, it will fade the parameters on any dark channels in bump up time. If any non-intensity parameters are owned by the submaster, it releases the non-intensity parameters in bump down time. Dwell time and mode are ignored.
- Solo - suppresses any intensity values not provided by the associated content while the solo button is held down. When the button is released, intensity values are restored. Priority and HTP are ignored. Shielded, park and pixel mapping outputs are not affected by the solo button.
- Back - fades to the previous cue when fader is assigned to a cue list.
- Macro - allows you to assign a macro as a button action.

Fader Options

The following options are available for a submaster fader:

- Master - fader will be a proportional master, a manual master, or an intensity master.
- Effect Rate - fader centers to home. It controls the rate of any running effects (same behavior as using rate via the Effect Status Display). The adjusted setting from this control cannot be stored.
- Effect Size - similar to Effect Rate but for effect size.
- Rate Master - homes to center. It adjusts the cue rate, just like rate and load.

- **Fader Disabled** - no action is assigned to the fader.
- **Master Only** - fader is used to set a level for content to fade to. The slider can be used to live adjust levels when the fader has been activated via the bump button. See *Master Only*.
- **Effect Master** - masters the entry/exit mode of the effects (size, rate or both).
- **Levels Only** - masters the levels without mastering the effect.

Submaster Information

In the display for any programmed submaster, you will see the following:

On Element 2 and Element Classic, you will see this information in the fader status display. See *Element 2 & Element Classic Fader Status Display*

Note: *Inhibitive submasters display in red and additive submasters in yellow.*

- Submaster number
- Submaster label (if any)
- Priority flag (if any)
- I-Master flag (if any)
- Current submaster value

Labeling Submasters

Submasters can be labeled using the **[Label]** key.

- **[Sub] [6] [Label]** [xxxx] **[Enter]** - labels submaster 6.
- **[Sub] [6] [Label] [Label [Enter]** - removes the label.

If you would like your label to wrap, use CTRL+J or type || to create a line break between words.

Loading Faders

Note: *Consoles a single cue list cannot map cues to faders.*

Faders can also be loaded with cues, presets, or palettes. You can convert an empty fader to a submaster without configuring it in fader configuration display. Any fader can be configured and loaded with a submaster if the fader is not configured, the fader is configured as a playback but has no cue list loaded to it, or the fader is configured as a submaster, but that submaster is empty.

Regardless of the fader configuration, if the above conditions are met, the fader can be loaded with the submaster or target specified on the command line.

If data already occupies the fader, that fader must be unloaded before another target can be loaded. See *Releasing Content From a Submaster*

- **[Sub] [5] [Load]** - loads submaster 5 to the fader associated with the load button.
- **[Int Palette] [1] [Load]** - loads intensity palette 1 to the fader associated with the chosen load button.
- **[Cue] [5] [Load]** - loads cue 5 to the fader associated with the chosen load button.

Bump Button Timing With Submasters

Each submaster bump can have three different timing values: Up fade, Dwell, and Down fade (see *Submaster Properties*). The default timing is set so that the bump functions as an "on" flash key for additive submasters and an "off" flash key for inhibitive submasters. Effects on submasters will follow submaster timing, unless timing has been placed in the effect itself.

Note: *At any time, the fader can be used to manually override fade progression or a submaster triggered with time.*

To add bump button timing live:

- **[Sub] [8] [Time] [3] [Time] [4] [Time] [3] [Enter]** - adds a 3 second up fade, 4 second dwell and 3 second down fade to submaster 8.
- **[Sub] [2] [Time] [Time] {Manual} [Time] [3] [Enter]** - adds a manual dwell time and a 3 second down fade time to submaster 2. When the bump is pressed and held, it will flash on and stay on until the button is released. It will then begin the down fade.
- **[Sub] [4] [Time] [3] [Time] {Hold} [Enter]** - adds a 3 second up fade time, and a hold dwell time. When the bump is pressed, the up fade starts. Once at the target value it will remain there until the button is pressed again. The down fade will bump to zero.
- **[Sub] [3] [Time] [Enter]** - resets all time for submaster 3 to default (Up = 0, Dwell = Manual, Down = 0).

Controlling Subfades Manually

It is possible to take control of submasters even if they have recorded time. To capture the fade, you must push the fader past the current fade level. Once this is done, control is transferred to the fader for full manual control.

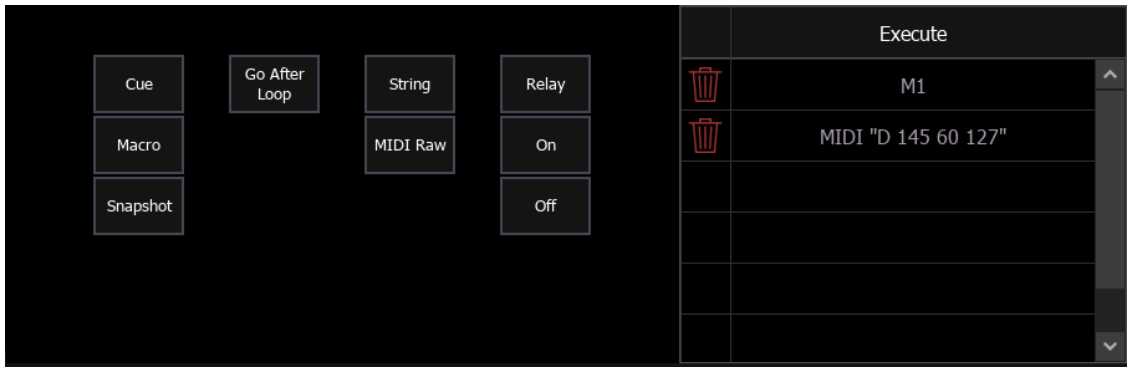
You may then use the fader to increase or decrease the submaster level as needed.

Submaster Triggers

Triggers can be used to tie actions such as macros, show control, or snapshots to submaster playback.

{Execute}

When used after selecting a sub via the command line, **{Execute}** will open a trigger display in the CIA.



The table on the right lists all triggers associated with the selected sub, along with their reference labels. The delete icon will remove the trigger on that line. Buttons for common trigger targets are available on the left, or can be used via the softkeys below.

{Cue}

Enter a cue or cue list to be executed when the sub is played back.

{String}

Enter an RS232, UDP, or ACN string to be sent when the sub is played back. See *Sending String Commands*.

{Macro}

Run one or more specified *Macros* when the sub is played back. Each macro must be entered separately as an individual trigger.

{Relay}

{On} and {Off}

{Snapshot}

Recall a specified snapshot when the sub is played back. See *Snapshots*.

{MIDI Raw}

Execute an entered MIDI Raw string when the sub is played back. See *Sending MIDI Raw with Cues or Submasters*.

Syntax

A variety of command line syntax is available when working with triggers:

Action	Syntax	Example	*Notes*
Add the first trigger of a target type.	**[Sub] [#] {Execute}** {Target} **[#] [Enter]**		
Replace existing triggers of a target type with the one specified.			*Confirmation required.*
Add the first or additional triggers of a target type.	**[Sub] [#] {Execute} [+]** {Target} **[#] [Enter]**		
Remove the specified trigger.	**[Sub] [#] {Execute} [-]** {Target} **[#] [Enter]**		
Remove all triggers of the specified target type.	**[Sub] [#] {Execute}** {Target} **[Enter]**		*Confirmation required.*
	[Sub] [#] {Execute} [-] {Target} **[Enter]**		
Remove all triggers.	**[Sub] [#] {Execute} [Enter]**		*Confirmation required.*

Freeze and Stop Effect on Submasters

[Freeze]

Note: *[Freeze] is used below. Consoles without this hardkey use the following key combinations:*

- *[Fader Control] {Freeze} - Ion Classic*
- *{Fader Control} {Freeze} - Element 2 / Element Classic*

***Freeze** can also be accessed via a connected keyboard with CONTROL+ALT+F.*

[Freeze] can be used to halt all effect activity on any active submaster. To activate a freeze for only a specific submaster, press **[Freeze] & [Load]**.

There are two ways to remove the freeze command:

- Press **[Freeze] & [Load]** again for the specific faders to unfreeze the activity.
- Press **[Assert] & [Load]** or **[Go]** or **[Stop/Back]** for the specific faders to resume the activity.

[Stop Effect]

Note: *[Stop Effect] is used below. Consoles without this hardkey use the following key combinations:*

- *[Shift] & [Effect] - Apex 5 / 10 / 20 / FP*
- *[Fader Control] {Stop Effect} - Ion Classic*
- *{Fader Control} {Stop Effect} - Element 2 / Element Classic*

StopEffect can also be accessed via a connected keyboard with CONTROL+ALT+E and SHIFT+ALT+E.

[Stop Effect] can be used to stop all effects from operating on any or all faders, or it may be used with the control keypad to stop a specific effect.

To stop all effects on a fader, press **[Stop Effect] & [Load]** of the associated fader. To stop a specific effect regardless of the fader it is operating on, press **[Effect] [2] [Stop Effect] [Enter]**.

When an effect is stopped, all impact of the effect is removed and the stage output is as though the effect had never been activated.

Moving and Copying Submasters

You can move a submaster using **Move To**. Press **[Copy To]** twice to put **Move To** on the command line.

- **[Sub] [2] Move To [Sub 9] [Enter][Enter]** - moves the contents, label, and timing data from submaster 2 and places it in submaster 9. Submaster 2 is removed.

You can copy the contents of a submaster by using the **[Copy To]** button.

- **[Sub] [2] [Copy To] [Sub 9] [Enter][Enter]** - copies the contents, label, and timing data from submaster 2 and places it in submaster 9.
- **[Sub] [2] [Copy To] [Sub 9] {Attrs Only} [Enter][Enter]** - copies all of the submaster properties from submaster 2 and places it in submaster 9. Levels, effects, and labels are not copied when using the **{Attrs Only}** softkey.
- **[Sub] [2] [Copy To] [Sub 9] {Labels Only} [Enter][Enter]** - copies only the label from submaster 2 and places it in submaster 9.

Releasing Content From a Submaster

Note: *[Off] and [Release] are used in the examples below. Element 2 and Element Classic users will need to use {Fader Control} {Off} and {Fader Control} {Release}. Ion Classic users will need to use [Fader Control] {Off} and [Fader Control] {Release}.*

To release content from a submaster, use one of the following methods.

- **[Off] & [Load]**- stops any running effects and fades out according to the **{Restore}** mode of the submaster.

- **[Release] & [Load]** - behaves in the same way as **[Off]**. **[Release]** no longer unmaps the fader.
- **[Shift] & [Load]** - behaves like **[Off]** and **[Release]** except that it will also unmap the fader.

Note: *When a submaster on a motorized fader is released or turned off, the fader will home.*

Updating a Submaster

It is possible to make changes to a submaster in Live mode. **[Update]** is used to store changes to a submaster.

- **[Update] [Sub] [5] [Enter]** - updates submaster 5 to include changes in live output only for channels already in submaster 5. You can also press the bump button for submaster 5 to select it.
- [Channel list] **[Update] [Sub] [5] [Enter]** - adds only the specified channels to submaster 5.

Deleting a Submaster

You can delete a submaster using the **[Delete]** key. When a submaster is deleted, the fader remains configured as a submaster, but it will be empty, unless the **{Unmap Faders}** softkey is used.

- **[Delete] [Sub] [5] [Enter] [Enter]** - deletes the contents of submaster 5.
- **[Delete] [Sub] [5] {Unmap Faders} [Enter] [Enter]** - deletes the contents of submaster 5 and unmaps any faders that are currently mapped to submaster 5.

Chapter 16

Using [About]

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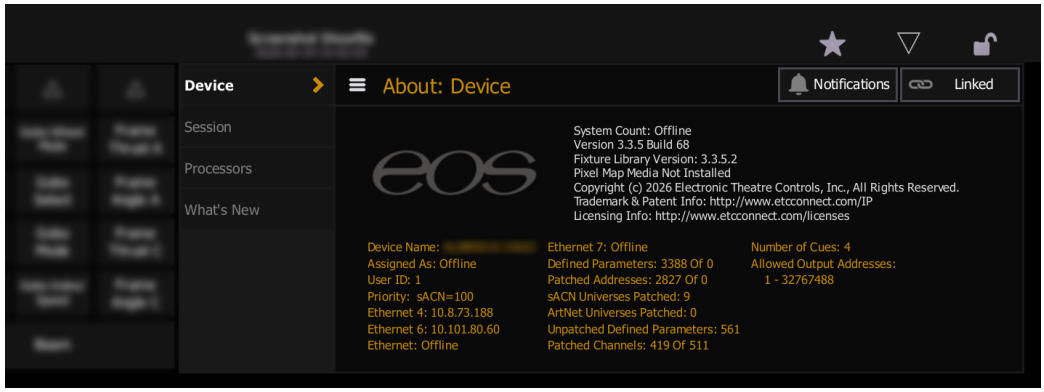
[About] [Tab 29]

The **About** display provides detailed information about selected elements of your show file.

About can be opened in a standalone tab from the *Workspace Layout Menu*, by using **[Tab] [2] [9]**, or by using **[About][About]**.

Pressing **[About]** opens **About** in the *Central Information Area (CIA)* below the *The Command Line*. In this mode, **About** will live update as show file elements are selected or changed, allowing you to examine information indefinitely while **About** remains open.



[About] and Display Toggles can be used to display additional information in **Live** and **Blind**.

About Tabs

The information in an **About** display is divided into tabs, which change based on the current **Command Line** selection.

About tabs can be hidden and shown at any time using the menu button in the top left of the display.

Default Tabs

When nothing is selected, **About** shows the following four tabs.

{Device}

This default display shows the following information:

- **System Count** - the number of available outputs.
- **Software Version**

- Fixture Library Version
- Pixel Map Media Installation
- Copyright Information
- Device Name
- Assigned As: Primary / Backup / Client / Offline - see *Eos Device Roles*.
- User ID
- Priority (sACN)
  - Not available on Element Classic.
- IP Address(es)
- Defined Parameters - the number of parameters that have been defined in *Patch [Tab 12]*, regardless of the output address patch.
- Patched Addresses - the number of addresses that have been used in **Patch**, which counts toward the available outputs.
- sACN Universes Patched
- ArtNet Universes Patched
- System Count - the number of available outputs.
- Unpatched Defined Parameters - defined parameters must be displayed and calculated in the fade engine, even when unpatched. If you are running a large show, it is helpful to locate unpatched information for deletion with **[Query] {Unpatched}**.
- Pixel Mapping Addresses
- Patched Channels
- Number of Cues - includes all cues from all cue lists. *Multipart Cues* are only counted once.
- Allowed Output Addresses - see *Allowed Outputs*.

{Session}

This tab provides a list of all devices detected in the network. The following information is available:

- Device Type - this can include other Eos Family devices, show control gateways, apps, and other sACN devices.
- Name/Component - the name of the device or software.
- Status - whether the device is currently online or offline.
- Connected - whether the device is connected to any active *Multi-Console Sessions*.
- Address - *IP Addresses* of the detected devices. Offline devices will display 0.0.0.0.

{Processors}

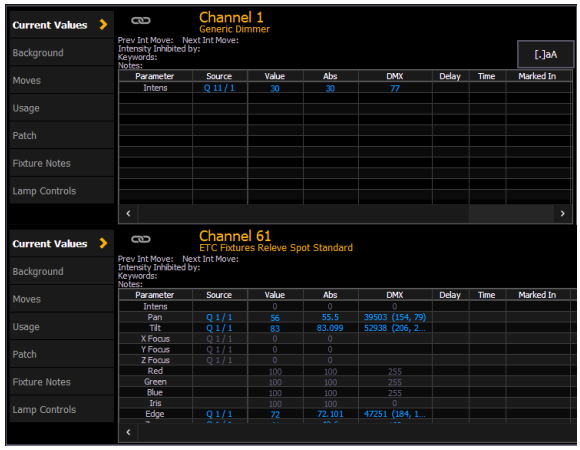
This tab provides access to the *Expansion Processing User Interface* for an overview of any connected devices providing *Eos Expansion Processing* for the session.

What's New

This tab provides links to *Eos [Home]* and a button to open the *Manual [Tab 100]*.

Contextual Tabs

When targets are selected, **About** shows tabs of information relevant to the selection.



For details on the information shown when a particular target is selected, see the individual target topics in this chapter.

Selecting a range of targets will display any common information shared between them.

About Options

The following **About** options are also available.

{Notifications}

Opens the **Setup >** *Console Status* display where you can view informational, advisory, or warning messages about your device.

{Notifications} is only available from the default **About** display when nothing is selected.

{Font Size}

Toggles the text size between small (default), medium, and large.

{Font Size} is only available when **About** is displaying information about a selected target.

Links

Toggles a link between this instance of **About** and the **Command Line**. When **About** is **{Linked}**, the display will update with the target selection. When **About** is **{Unlinked}**, the display will continue showing the information currently being displayed, even if the target selection changes. **About** displays are **{Linked}** by default.

If the selection is changed before **About** is set to **{Linked}**, the display will not live update until the next selection.

1. You want information about Channel 1. **About** is open, showing information about Preset 3.

2. You select Channel 1 but **About** doesn't change. You notice the display is set to **{Unlinked}**.
3. You toggle the display to **{Linked}** but **About** still shows information about Preset 3.
4. You must reselect Channel 1 to update the **About** display. The display will follow all subsequent selections until closed or toggled back to **{Unlinked}**.

[About] Channel

Press **[About]** or open *[About] [Tab 29]* and select a channel. The following contextual tabs of information about the selected channel will be displayed.

{Current Values}

This tab shows a table of the selected channel's current parameter values, organized into the following columns:

- **Parameter** - one of the selected channel's parameters, as defined by its fixture profile in *Patch [Tab 12]*.
- **Source** - the data source of the value.
- **Value** - the parameter value.
- **Abs** - the value in absolute terms.
- **DMX** - the DMX level from 0–255 that corresponds with the value. For example, a value of 20% is equivalent to a DMX value of 51.
- **Delay** - any delay applied to the parameter.
- **Time** - any timing applied to the parameter.
- **Curve** - any curve applied to the parameter.

The following information about the selected channel is also available:

- **Prev Int Move** - the cue number containing the most recent intensity move for the selection.
- **Next Int Move** - the next intensity move.
- **Intensity Inhibited by** - what is inhibiting the intensity of the selection, if anything.
- **Keywords**
- **Notes**

{Background}

This tab shows a table of the selected channel's parameter background values and sources, organized into the following columns:

Parameter	Source	Background
One of the selected channel's parameters, as defined by its fixture profile in *Patch [Tab 12]*.	The data source of the value.	The parameter background value. If the current control source is removed, the parameter will go to this value.

- **Parameter** - one of the selected channel's parameters, as defined by its fixture profile in *Patch [Tab 12]*.
- **Source** - the data source of the value.
- **Background** - the parameter background value. If the current control source is removed, the parameter will go to this value.

Background data follows the standard Eos color-coding scheme.

{Moves}

This tab shows a table of the selected channel's parameter move values, organized into the following columns:

- **Parameter** - one of the selected channel's parameters, as defined by its fixture profile in *Patch [Tab 12]*.
- **Prev Move** - the most recent move instruction for the parameter.
- **Value** - the value of the most recent move instruction.
- **Next Move** - the next move instruction for the parameter.
- **Value** - the value of the next move instruction.
- **Background** - the parameter background value. If the current control source is removed, the parameter will go to this value.

{Usage}

This tab shows a table of places the selected channel is used, organized into the following columns:

- **Submasters** - any *Submasters* containing the selected channel.
- **Cue Moves** - any cues containing moves for the selected channel.
- **Cue Dark Moves** - any cues containing dark moves for the selected channel.
- **Active in Cue** - any cues containing activity from the selected channel, based on intensity level.
- **Groups** - any *Groups* containing the selected channel.

{Refresh Usage}

If you select another channel while on this tab, you can use this button to see the information for the new channel.

{Patch}

This tab shows a table of the selected channel's **Patch** information, organized into the following columns:

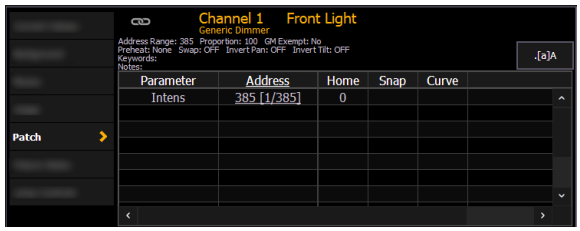
- **Parameter** - one of the selected channel's parameters, as defined by its fixture profile in *Patch [Tab 12]*.
- **Address** - the patched address of the parameter.
- **Home** - the *Home* value of the parameter.
- **Snap** - *Snap Parameters* display as **Enabled** in this column. Non-snap parameters are blank.
- **Curve** - any curve applied to the parameter.
- **DMX** - the DMX level from 0–255 that corresponds with the parameter.

The following information about the selected channel is also available:

- **Address Range** - the range of addresses used by the selected channel.
- **Proportion** - the p
- **GM Exempt** - wha
- **Preheat** - the .
- **Swap** - the
- **Invert Pan** - the
- **Invert Tilt** - the
- **Keywords**
- **Notes**

This information is also available on the *Patch > Attributes* tab.

- Address range
- Proportional patch level
- Curve (if any)
- GM exempt
- Preheat information (if any)
- Swap / invert the pan / tilt status
- Keywords
- Notes
- List of all parameter values with their address, home value, snap parameter, DMX value, and parked value (if any)



{Fixture Notes}

This tab shows information found in the fixture library such as:

- Revision Number
- Release Date
- Alternate Names
- Usage Notes

{Lamp Controls}

This tab shows any lamp controls for the selected channel, which can also be opened in *Lamp Controls [Tab 31]* as a separate display.

{Device Errors}

[About] Address

Press **[About]** or open *[About] [Tab 29]*, then select an address. The following contextual tabs of information about the selected address will be displayed.

{Address}

{Address} displays the following information:

- Address number (displayed as straight address and port/ offset)
- Dimmer label (if any)
- Associated channel number, which is a hyperlink to the **[About]** channel display.
- Part number (if any)
- Notes
- Output value (sACN, Art-Net, or DMX)
- Current output value and source of output
- Parameter controlled by the address
- Home Value
- Basic patch information
- Extended patch information (if available)
- If it is a scroller, color/ gobo wheel, the assigned scroll or wheel is indicated
- Information stored in the Text 1 through10 and the Notes fields in **Patch > Database**

{Next Part} and {Last Part} will advance to the next part or go back to the previous part. This only displays for addresses with parts.

{Go To Patch} is a shortcut to edit the patch for the address selected. This will open up the patch display.

{Fixture Notes}

{Fixture Notes} displays the following information:

- Revision number
- Release date
- Open issues list (if available)
- Usage notes including switch settings and configuration (if available)
- Alternate fixture names (if any)

{Lamp Controls}

{Lamp Controls} displays controls for the lamp or other parameters of the device (if it is an automated fixture).

{Next / Last Unpatched}

{Next/ Last Unpatched} will allow you to see what addresses closest to the current address are currently unpatched.

{Dimmer Feedback}

{Dimmer Feedback} - appears when the current address is patched to a dimmer in an ETC Sensor rack with a CEM+ or CEM3. Sensor feedback must be enabled and the CEM+ must be running software version 3.0 or later. See *Interface Protocols*.

{Dimmer Feedback} displays the following information:

- Name (dimmer name)
- Module type
- Rack/Position
- Rack dimmer level (displayed as a percentage)
- Rack dimmer source
- Recorded load
- Actual load

{Dimmer Feedback} also allows you to modify the following information about the selected address:

- Firing Mode
- Control Mode
- Curve
- Threshold
- Scale Minimum
- Scale Maximum
- Preheat Enable
- Preheat Timing
- Advanced Features (AF) Enable

Select any value to modify it and enter a new one.

The following softkey commands are supported from this display:

- {Ignore Errors}
- {Clear Errors}

Clearing CEM+ or CEM3 errors will be temporary unless the errors have been fixed at the CEM+ or CEM3. Errors displayed will clear on their own once they have been cleared from the CEM+ or CEM3. Some CEM+ or CEM3 errors can only be cleared at the Sensor rack.

{Device Details}

This option appears when the current address is patched to a *Network RDM* device. RDM devices must be enabled through the *Eos Configuration Utility (ECU)* and discovered through *Patch [Tab 12]*.

{Device Details} displays the information that it receives from the device; etails displayed will vary based on the device. Changes can be made to:

- Device Label (displayed at the top by the address number)
- DMX Address (can be changed in this display by clicking on the property or value)
- DMX Label (same as the device label, but the label can be changed here by clicking on the property or value)
- Type
- Manufacturer
- Device ID
- Footprint
- Versiond
- Lamp State
- Lamp Hours
- Head DC Voltage
- Lamp On/Off
- Gel Distance Traveled
- Gel2 Distance Traveled
- Fan RPM
- Ambient Temperature
- Gel Temperature

Changes may take a few seconds to make, as they need to propagate to the RDM device and then back to Eos.

{Device Errors}

A red exclamation mark (!) or a yellow question mark (?) is used in Patch, Live (see *Indicators in Live and Blind*), Patch, *[About] Channel*, and *[About] Address* to indicate Eos has detected *Errors and Warnings* from connected RDM, CEM+, CEM3, or ACN devices.

Errors and warnings are indicated based on severity using the following colors:

- Gray - unknown or not an error.
- White - an advisory: something that might be worth knowing about but likely won't affect system operation.
- Yellow - a warning: something you should know about that may affect system operation. Warning messages could include:
    - Multiple device addresses overlap.
    - A mismatch between the patched fixture type and the real fixture.
    - A mismatch between the patched address and the fixture address.
    - A device is offline.

- **Red** - an error: something definitively wrong that is likely or certain to affect system operation. Error messages could include:
  - A circuit is over temperature (overtemp).
  - A breaker has tripped.
  - A lamp is out.

The relative severity of an error in any given device is determined by the device manufacturer.

Use **{Clear Errors}** to remove displayed errors from the list.

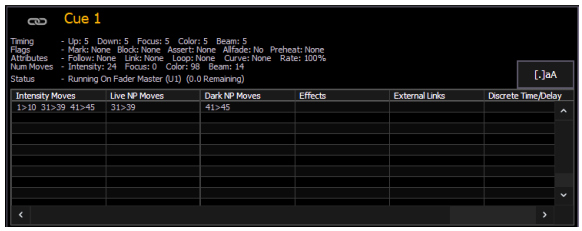
[About] Cuelist

Note: *Not available on Element Classic.*

The following information will be displayed when a cue list is selected:

- Cue List Attributes
- Active Cue
- The number of cues in the list (Multipart cues are only counted once)
- First cue in the list
- Last cue in the list
- Partition
- Playback number and physical fader location of the cue list
- Channels currently controlled in live by the cue list
- Channels with any intensities above 0 in the cue list
- Channels with Parameters stored in the cue list but no intensities

[About] Cue



The following information will be displayed when a cue is selected:

- The cue number
- Timing data for the cue (including discrete timing)
- Flags
- Attributes
- Number of moves per IFCB provided by the cue
- Current status of the cue
- Intensity moves
- Live NPs moves
- Dark NPs moves.
- Effects running
- External links
- All channels in that cue that have discrete or delay times

[About] Curves

When a curve is selected, the following information will be displayed:

- Curve number
- Curve label (if any)
- Channels that use the curve in patch
- Channels that use the curve as a fan curve
- Cues or cue parts that use the curve

[About] Effects

When an effect is selected, the following information will be displayed:

Note: *To view About Effect in live, the effect must be running.*

- Effect number
- Effect label (if any)
- List of submasters that use the effect
- List of cues that use the effect

Note: *Any cues or submasters that have overrides, such as rate, for the effect will display an *.*

[About] Groups

When a group is selected, the following information will be displayed:

- Group number
- Group label (if any)
- Channels in the group

The {Ordered} and {Numerical} softkeys can be used to change the display view in About Groups.

[About] Submaster

The following information will be displayed when a submaster is selected:

- Submaster number
- Label (if any)
- Current value
- Mode (additive, inhibitive, or effectsub)
- Fader (proportional or intensity master)
- HTP or LTP
- Exclusive
- Priority
- Timing
- Fader Pages
- Channels in submaster
- Effects assigned

[About] Macro

[About] Macro display shows a list of cues that will execute a selected macro. To view this display, you must be in the Macro Editor Display. While in that display, press [About] and then select the macro by using a mouse or touchscreen.

[About] IFCB Palettes

The following information will be displayed when an intensity, focus, color, or beam palette is selected:

- Number of cues the palette is used in
- Number of presets the palette is used in
- Number of channels
- First cue the palette is used in
- Last cue the palette is used in
- Number of cue lists the palette is used in

  {Usage} displays the following information about palettes:

  - Number of cues that move
  - List of channels that use the palette in a cue
  - List of channels stored in the palette that are not used in a cue
  - List of cues in which the palette have a move instruction
  - List of effects that use the palette
  - List of presets that the palette is stored in

[About] Presets

When a preset is selected, the following information will be displayed:

- Number of channels
- First cue the preset is used in
- Last cue the preset is used in
- Number of cue lists the preset is used in

  {Usage} displays the following information about presets:

  - Number of cues that move
  - List of channels that use the preset in a cue
  - List of channels stored in the preset that are not used in a cue
  - List of cues in which the preset have a move instruction
  - List of effects that use the preset

[About] Color Path

The following information will be displayed when a color path is selected:

- Color path number
- Label (if any)
- Channels that use the color path
- Cues that have moves that use the color path
- Number of cue lists the color path is used in

See *Color Path [Tab 33]*.

[About] Live

Pressing **[Live]** while holding **[About]** will display currently active DMX values, instead of a percentage value.

Double-tapping **[Live]** while holding **[About]** will latch this view. Press **[About]** to disable it again.

Chapter 17

Macros

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About Macros

Macros are comprised of any series of button presses (both hard and softkeys), screen commands and events. Eos provides you with the macro feature to simplify complex or repetitive console programming and operating tasks that you perform often.

When you record the series of button presses to a new macro, you can later play it back by simply pressing the macro direct select button, running it from a linked cue, accessing it from a connected show control system, remotely triggering the macro, or running it from another recorded macro.

You may create up to 99,999 macros either from live, using the macro **[Learn]** mode to record a sequence of keystrokes as you perform the operation, or you can create a macro from within the macro editor display, entering and editing keystrokes into the macro content editor without actually executing the instructions.

The macro editor display contains a listing of all recorded macros including labels and the contents of the macros stored. All macro editing is accomplished from the macro editor display.

Store a Macro from Live

The most effective way to store a macro is from live mode using the macro **[Learn]** mode to record a sequence of button presses as you enter them. You can include any button press on the console (hard key or soft key), except **[Macro]**, the arrow keys, **[Escape]**, **[Select]**, and **[Learn]**.

Using the [Learn] Key

Pressing the **[Learn]** key while in live mode places the console in macro learn mode. The **[Learn]** key flashes and the CIA displays "Learning" above the command line. Assign a number identifier (from 1 to 99,999) to the Macro using the control keypad and press **[Enter].** The CIA flashes "Learning Macro ####" above the command line. This indicates that the console is ready to record the macro.

Note: *It is helpful if you plan your macro content in advance of the macro record process. While in learn mode, each button press is recorded as content, even the **[Clear]** button if you have mistaken a keystroke. There is no way to fix a content error in live mode, but you can rerecord the macro as needed, or you can edit the recorded macro in the macro editor, removing any unneeded commands. See* *Editing Macros*

Begin writing the sequence of button presses and events for the macro record. When you have finished with the series of events and button presses, press the **[Learn]** key again to exit macro learn mode.

Examples of a macro record function include:

- **[Learn] [1] [Enter] [Go To Cue] [Out] [Time] [0] [Enter] [Learn]** - records macro 1 with the go to cue out command.
- **[Learn] [5] [Enter] [1] [Full] {Chan Check} [Enter] [Learn]** - records macro 5 with channel 1 at full in channel check mode. To check the next channel in the list, press **[Next]**.
- **[Learn] [4] [Enter] [-] [Sub] [Record] [Learn] -** records macro 4 with instructions to record a target excluding all submaster data.
- **[Learn] [2] [Enter] [-] [Group] [6] {Color} [Record] [Learn]** - records macro 2 with instructions to record a target excluding the color data from group 6.

You can also create a macro in live that bumps submasters across fader pages but first you must have content assigned to the submasters. For example, write submasters 1 through 5 and 15 through 17, each with its own channel selections at 100%. Then select:

- **[Learn] [1] [Enter] [Bump1] [Bump2] [Bump3] [Bump4] [Bump5]**
- **[Fader Page]**
- **[Bump15] [Bump16] [Bump17] [Learn]**

Once you have created the macro from Live in **[Learn]** mode, you can easily edit the sequence from the macro editor display. See *Macro Editor [Tab 18]*.

Macro Editor [Tab 18]

Macro editing is accomplished from the macro editor display. As an alternative to recording your macro in live, you may create it from this display instead. Open the macro editor display by pressing **[Macro] [Marco]**, from the browser by navigating to **Record Target Lists > Macro Editor**, or press **[Tab] [1] [8]**.

The display is divided horizontally, the top portion displays the macro contents in detail while the bottom portion lists all macros, including the label and contents.

While in the macro editor display, any numeric entry on the command line is assumed to be a macro number. If the macro number entered already exists and **[Enter]** is pressed, the macro list will page to the selected macro and the macro content detail section will display all of the contents of the selected macro. If the macro number entered does not exist in the list and **[Enter]** is pressed, an empty macro will be created with the specified macro number.

While in the macro editor display, the following functions may be performed using the control keypad and softkeys:

- **[Label]** - when a macro is selected and **[Label]** is pressed, the alphanumeric keypad will display on the CIA. Label the macro and press **[Enter]**.
    - **[1] [Label] <**name**> [Enter]** - labels macro 1
- **{Icon}** - macros can be assigned *Icons*, which can be configured to appear on the direct select button in Direct Selects (Tab 4) or Custom Direct Selects (Tab 39).
- **{Color}** - assign colors (**{Red}**, **{Green}**, or **{White}**) or **{Dark}** to a macro. **{Dark}** assigns no color to the macro. The colors will display beside the macro name in a direct select, and/or if that macro has been assigned to one of the customizable hardkeys on Eos Ti, Gio, Gio @5, and RPU.
    - There is also a **{Toggle Blink}** softkey. By default a customizable hardkey will blink when the macro assigned to it is running. This softkey will turn off the blinking if it is enabled and a BD will display in the color column when blinking is disabled.
    - Not available on Element Classic
- **[Delete]** - when a macro is selected and **[Delete] [Enter]** is pressed, you will be prompted to confirm the deletion of the selected macro. To confirm press **[Enter]**, to abort press **[Clear]**.

- **[1] [Delete] [Enter] [Enter]** - deletes macro 1 from the list.

- **[Copy To]** - when a macro is selected and **[Copy To]** is pressed, you will be prompted to enter the macro number that you want to copy the contents of the selected macro to. You will be prompted to confirm the copy process, press **[Enter]** to confirm or **[Clear]** to abort the copy to process.
  - **[1] [Copy To] [6] [Enter] [Enter]** - copies the entire contents of macro 1 to macro 6.
- **{Edit}** - when a macro is selected and **{Edit}** is pressed, you will have entered edit mode for the selected macro. See *Editing Macros*. Three notable changes to your macro editor display include:
  - a blinking cursor in the macro content detail portion (top) of the display.
  - "Press **[Select]** to save or **[Escape]** to cancel changes" displays above the command line.
- **{Move To}** - allows you to move and reorganize your macros anywhere in the macro list numerically. You can access **{Move To}** by pressing **[Copy To]** twice.
  - For instance, if you have macros 1 through 5 in the list, and you want to move/ change macro 1 to macro 6 so that your most commonly used macros are first in the list, you would press **[1] {Move To} [6] [Enter]**. This leaves only macros 2 through 6 in the list.
- **{Mode}** - allows you to assign different modes for the macro to run in. There are three modes: **background**, **foreground**, and **default**.
- **{Default}**
  - When a macro in default mode is run manually, it runs in the foreground (i.e., the command line) on the device that fired it. When a macro in default mode is executed by a cue or via show control, it runs in the background on the master device.
  - Running a macro on a master device only matters when the macro changes the displays of the device it runs on such as snapshot and flexichannel macros.
- **{Background}**
  - When a macro in background mode is run manually, it runs on the device that fired it but will not affect its command line.
  - A macro in background mode that is run from a cue or via show control will run on the master device but will not affect the master's command line.
  - When a background macro is running and includes a link to another macro, or is currently waiting, pressing the **[Macro]** button will stop it.
- **{Foreground}**
  - When a macro in foreground mode is run manually, it runs on the device that fired it and affects its command line.
  - If a foreground mode macro is fired via show control, it runs on the master device and will affect its command line.
  - If a cue fires the macro, it will run on the device whose user last pressed **[Go]** on that playback. If a foreground macro is fired from a cue that is executed from another cue list, the macro will run on the device that last pressed **[Go]** on the cue's playback but not the playback that triggered the executed cue.
- **{Target Device}** - A macro can have a Target Device assigned to it. This allows a cue to execute a macro only on a certain console.

- The Target Device can be a device name or User ID. These are assigned to a macro in the Macro Display by using the **{Target}** softkey and either selecting **{Device}** and **{User}**. Pressing **{Target}** will also display a list of connected devices and additional target options.

{SC Learn} - enables or disables excluding specific macros from being learned as show control events. See **Adding Timecode Events >** *Using Learn*.

Editing Macros

Once a macro is created, you can edit the content by removing or adding commands from the macro editor display.

Select an existing macro number and press **[Enter]**. The selected macro's contents will display in detail. Press **{Edit}** to make changes to the content.

The cursor in the macro content detail section of the display can be moved through the existing content list using the arrow keys. Arrow keys are not stored as macro content. To add content, place the cursor in the section that you want to insert, then add the command. To delete a command, place the cursor ahead of the content to be deleted, then press the **{Delete}** softkey.

Press **[Select]** when you have completed all editing. Press **[Escape]** to exit the editor.

Note: *Macros for options with a toggle action between enable and disable, such as AutoMark in setup, can use the {**Enable**} and {**Disable**} softkeys for creating absolute actions instead of toggles.*

Macro Softkeys

In edit mode, the CIA displays all softkeys available for the system that would otherwise be difficult to find when recording a macro. You can also choose from a list of the most common macro commands, or any lamp commands. The paging buttons allow you to scroll through the available softkeys in any of these selections. Paging buttons are not stored as macro content.

The search button allows you to search a scrollable list of all macro commands. Typing will filter the list. Pressing **[Enter]** on a command will place it into the macro and return to the search field. **[Learn]** or **{Done}** will exit edit mode.

Macro-Specific Softkeys

A new set of macro editor softkeys are displayed while in edit mode including:

- **{Loop Begin}** - inserts a start command for a loop with a limited number of iterations. An infinite loop is assigned when you use “0” for the iterations.
- **{Loop End}** - inserts a loop end command.
- **{Wait}** - inserts a pause for a period of time. This needs to be followed with a whole number of seconds.
- **{Delete}** - removes commands from the macro.

- {Wait for Entr} - inserts a pause in the macro that waits for the [Enter] key. Pressing [Enter]will resume the macro.
- {Wait for Input} - inserts a pause in the macro to allow you to enter data. The pause lasts until you press the [Macro] key again. Then the remainder of the macro will be completed.
- {Done} - exits macro edit mode. You may also use the [Learn] key to enter and exit edit mode.

Creating Macros

Macros can also be created in the macro editor display. Enter any unrecorded macro number from 1 to 99,999 and press [Enter]. Your new macro number will display in the macro list in numerical order but without a label or any contents. To store the macro contents, select the macro and press {Edit}. For example, to create macro 3, write the instruction to set all active channels to 50%, sneak them to their original levels over 10 seconds, and link to macro 5:

- <Macro> [3] [Enter]
- {Edit}
- [Select Active] [At] [5] [Enter]
- [Sneak] [Time] [1] [0] [Enter]
- [Macro] [5] [Enter]
- [Select]

Play a Macro

You can play a macro from the command line, from the direct selects, run it from a linked cue, or from another macro.

To play macro 5 from the command line press [Macro] [5] [Enter]. "Running Macro 5" displays above the command line in live while the macro is running.

To run macro 5 from the macro direct selects simply press {Macro 5}. "Running Macro 5" displays above the command line in live while the macro is running.

Macros can be run from a cue or submaster using *Cue Triggers* and *Submaster Triggers*.

To run macro 5 from cue 1 press:

- [Cue] [1] {Execute} [Macro] [5] [Enter]

If you would like to run multiple macros from cue 1, press:

- [Cue] [1] {Execute} [Macro] [6] [Enter]
- [Cue] [1] {Execute} [Macro] [7] [Enter]

Each macro has to be entered individually. The previous example would result in macros 5 through 7 being executed from cue 1.

Stop a Macro

If you need to stop a Macro while running (for example, during an infinite loop) you may press [Escape] and the macro will stop.

Deleting Macros

You can delete a macro from the Macro Editor display by selecting the macro and pressing [Delete] [Enter]. You will be prompted to confirm the deletion. Confirm by pressing [Enter] again, or abort by pressing [Clear].

- [5] [Enter] [Delete] [Enter] [Enter] - deletes macro 5 from the macro list.
- [Delete] [Macro] [5] [Enter] - deletes macro 5 from any display.

Chapter 18

Magic Sheets

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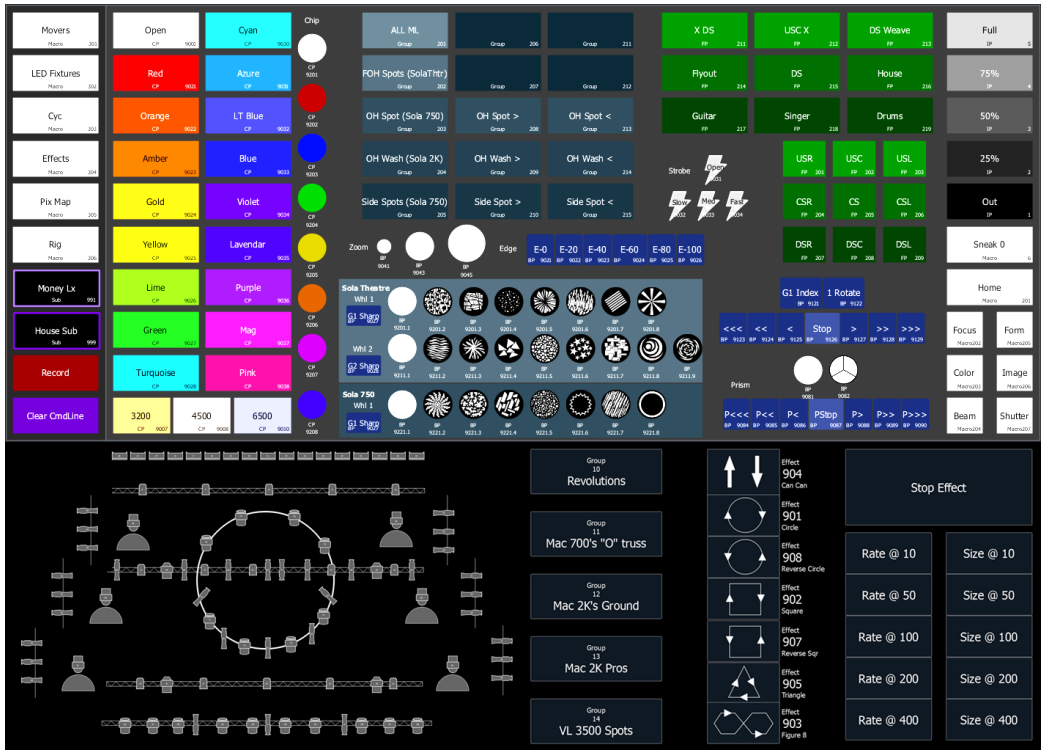
About Magic Sheets

Magic sheets are user-created interactive displays that allow you to customize how you interact with and view your show data and lighting system. A variety of objects can be tied to show data, such as channels, palettes, and other record targets, and added to a custom layout with additional graphics and icons.

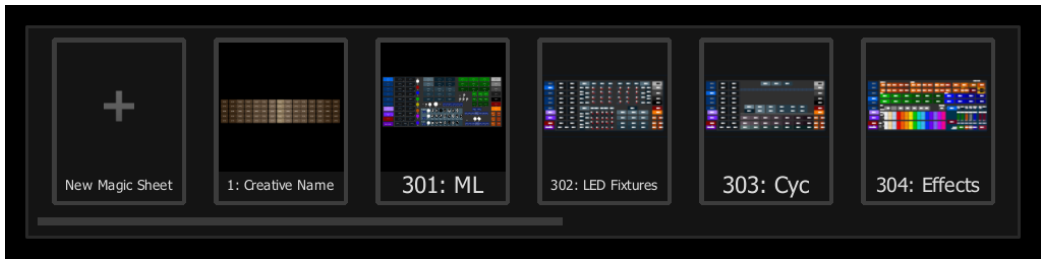


Accessing Magic Sheets

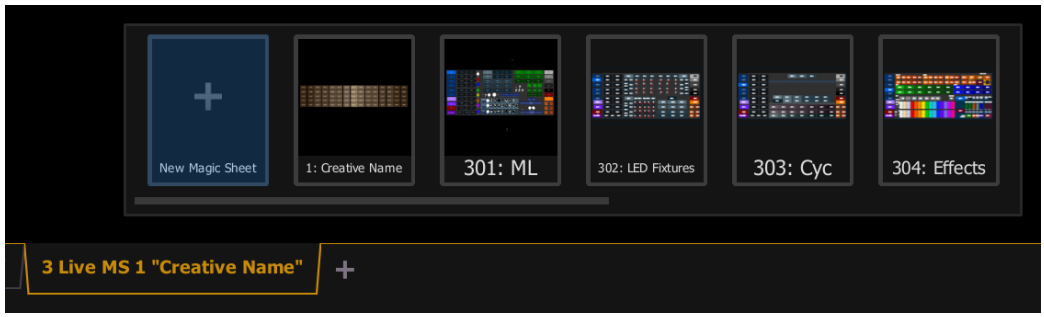
Magic Sheet [Tab 3]

The magic sheet tab can be opened by selecting **{Magic Sheet}** in the *Workspace Layout Menu* **> Displays** or using **[Tab] [3]**.

By default, the tab opens to the magic sheet browser. If no magic sheets exist in the show file, the browser will be empty. Use the **{New Magic Sheet}** option to create the lowest new magic sheet number available. Created magic sheets are available via the browser alongside all other magic sheets in the show file.



When a magic sheet is open, a pop-up magic sheet browser can be accessed from the *Magic Sheet Tab Configuration* menu, or using *Multi-Touch Gestures*.



Use **[Displays] {Magic Sheet} [#] [Enter]** to recall a specific magic sheet by number.

Magic Sheet List [Tab 14]

The magic sheet list displays a list of all created magic sheets, their labels, and how many links to views have been saved for each magic sheet. Views can be saved via the *Magic Sheet Tab Configuration* menu.

The magic sheet list can be opened by double pressing **{Magic Sheet}**, pressing **[Tab] [1] [4]**, navigating within the browser to **Displays > Record Targets > Magic Sheet** and pressing **[Select]** , or using ALT+MM on an external keyboard.

To label a magic sheet, use the syntax **{Magic Sheet} [#] [Label] <**name**> [Enter]**.

Pressing **[Label]**, when a label has already been applied to a magic sheet, will display the label on the command line for editing. Pressing **[Label]** a second time will clear the label, or you can press **[Clear]** to remove the label one character at a time.

Magic Sheet Direct Selects

Magic sheets can also be accessed using *Direct Selects [Tab 4]*. Using a direct select assigned to a magic sheet will open the magic sheet tab and display the selected magic sheet. Pressing a different magic sheet direct select will change the sheet open in the tab.

Magic sheets can be assigned *Icons*, which can be configured to appear on the direct select button in Direct Selects (**[Tab] [4]**) or Custom Direct Selects (**[Tab] [3][9]**).

Navigating Magic Sheets

Magic sheets can be navigated using a mouse, a keyboard, or a touchscreen. Many navigation options are also available via tools in the *Magic Sheet Layout Toolbar*, available in the *Magic Sheet Editor*.

Hold **[Shift]** or SHIFT while scrolling for fine control, allowing you to zoom in or out more precisely.

The following options are available:

Mouse

- **Scroll Up** - zooms in, making the magic sheet bigger.
- **Scroll Down** - zooms out, making the magic sheet smaller.
- **Right or Middle Click & Mouse** - pans the magic sheet directly with the mouse.

Keyboard

- ARROW KEYS - pans the view, moving the magic sheet in the opposite direction.
- ALT + M - double tap to open the magic sheet list.
- ESC - close the open magic sheet tab and return to Live.

Multi-Touch Gestures

Multi-touch gestures can be used with both internal and external multi-touch touchscreens.

Two Fingers

- Touch & Drag - pans the magic sheet directly.
- Pinch Outwards - zooms in, making the magic sheet bigger.
- Pinch Inwards - zooms out, making the magic sheet smaller.
- Double-Tap - zooms to all, showing all objects in the magic sheet.

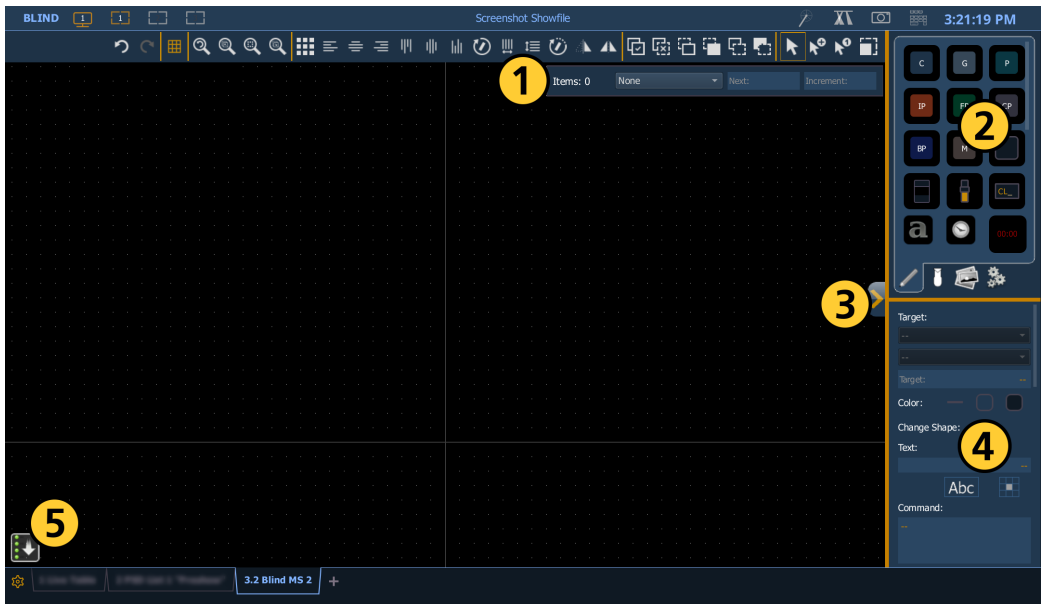
Three Fingers

Your touchscreen must support three or more simultaneous touches.

- Swipe Up or Right - opens the previous view of the open magic sheet.
- Swipe Down or Left - opens the next view of the open magic sheet.
- Tap - opens the pop-up magic sheet browser.

Magic Sheet Editor

The magic sheet editor is where magic sheets are laid out, built, and edited using a variety of tools. Use the **{Editor}** arrow button on the right side of the magic sheet display to toggle the editor open and closed.



The magic sheet editor offers the following tools arranged around the magic sheet:

1	*Magic Sheet Layout Toolbar*
2	*Magic Sheet Object Library*
3	{Editor}
4	*Magic Sheet Object Inspector*
5	{Quick Save}

Hover a mouse cursor over a tool to see a tooltip with a description.

The sizes of the object library and object inspector can be adjusted by dragging the border between them up or down.

Magic sheets are oriented around an X and a Y axis, which are only visible in the editor. The intersection of these axes is considered the center of the magic sheet.

The maximum outer boundary of a magic sheet is marked by a red border, which can be seen when fully zoomed out. Objects cannot be placed outside the boundary.

{Quick Save}

An *[Undo]* restore point is saved whenever you exit the editor.

{Quick Save} allows you to create an undo restore point for the open magic sheet at any time. A green checkmark will temporarily appear next to the button when the magic sheet is successfully saved.

It is recommended that you **{Quick Save}** before making any major changes to the magic sheet that you think you might want to undo. **[Undo] [Enter]** will return the magic sheet to the last undo restore point.

Once the magic sheet editor is closed, saved changes will automatically propagate to all other Eos devices in *Multi-Console Sessions*.

Editing Magic Sheets

Objects can be added to a magic sheet, arranged, and edited using a mouse or touchscreen, along with the tools in the *Magic Sheet Layout Toolbar*.

Adding Objects

There are a variety of ways to add objects to a magic sheet, some of which can make it quicker and easier to arrange large or complex layouts. You can drag and drop objects onto the magic sheet, or you can use the *Layout* tools to create arrays of objects.

An actual size preview of the object will be overlaid on the magic sheet to assist with positioning.

The following options are available:

Single Objects

- **Select and Place** - select an object in the *Magic Sheet Object Library*, then click or tap on the magic sheet to place it.
- **Drag** - select an object in the library and hold down to drag it onto the magic sheet.

Multiple Objects

- **Quick Layout Mode** - one of the layout *Modes* available in the toolbar, for quickly placing multiple instances of an object. Press **{Quick Layout}**, select the desired object in the library, and place the desired quantity of that object on the magic sheet.
  - The **Next** and **Increment** fields in the target bar can be used to adjust the numbering of the new objects.
  - Use the **{Done}** button or choose another layout option to exit quick layout mode.
- **ALT** - press ALT to load an instance of the most recently used object to the cursor for quick placement. Click or tap on the magic sheet to place the object, incremented based on the settings in the *Target Bar*. To place another of the same object, press ALT again to load another instance to the cursor.
  - To place a different object type, select an object of that type in the library or on the magic sheet, then press ALT to load an incremented instance of that object.

Grid and Snapping

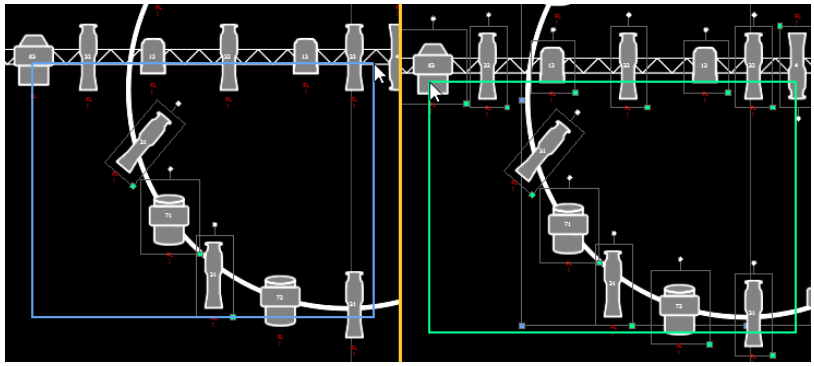
The **{Grid Toggle}***(CTRL+I)* button on the *Magic Sheet Layout Toolbar* turns the default background grid off and back on.

When the grid is disabled, objects can be freely placed anywhere on the magic sheet.

When the grid is enabled, objects will snap to the grid. Hold down **[Shift]** or SHIFT while placing an object to bypass the snapping behavior.

Selecting Objects

There are two object selection modes based on the direction you move a mouse or tap and drag on a touchscreen.



The following options are available:

- **Blue Selection (Left to Right)** - selects objects that are completely inside the selection outline.
- **Green Selection (Right to Left)** - selects any objects within or touching the selection outline.

Selection Modifiers

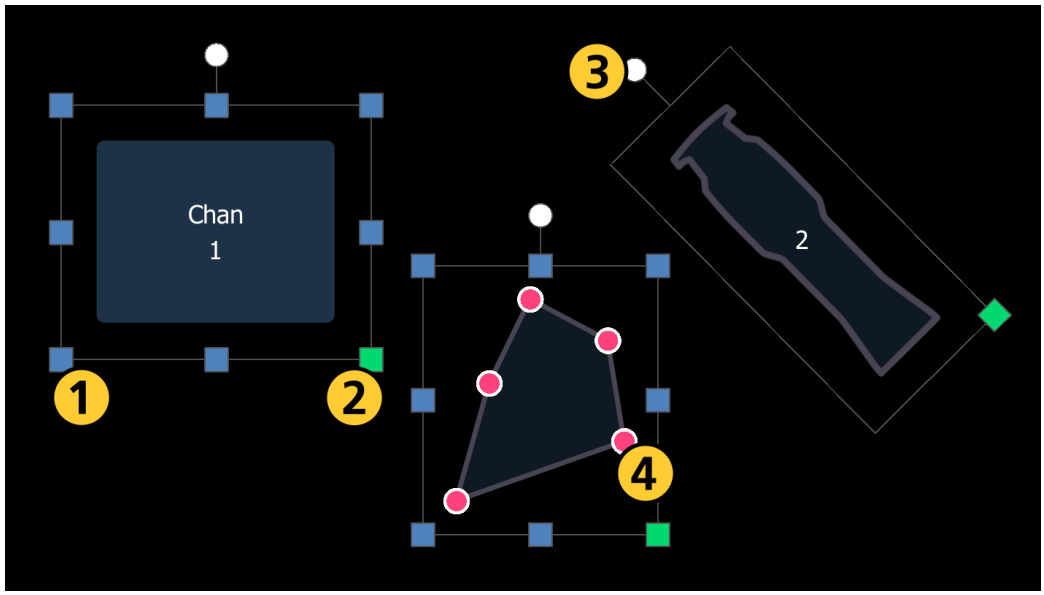
The following modifiers can be used when objects are selected with a mouse:

- **SHIFT + RIGHT MOUSE** - adds an object to the existing selection.
- **CTRL + RIGHT MOUSE** - toggles selection of an object on and off.
- **ALT + RIGHT MOUSE** - cycles through any stack of objects that partially or completely cover each other.

Object Handles

The handles around selected objects can be used to alter their appearance.

The following options are available:

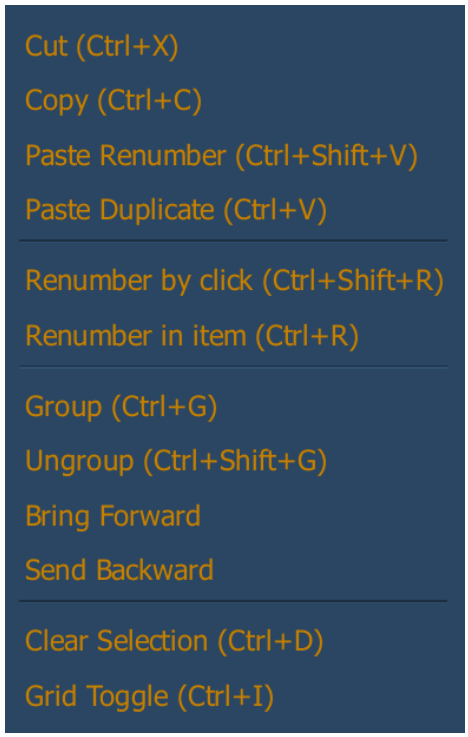


1	**Freeform Resize**	Blue square handles around the selection. Ignores the original aspect ratio, allowing you to resize object dimensions individually.
2	**Proportional Resize**	Green handle in the bottom right of the selection. Scales objects up or down, preserving the original aspect ratio.
3	**Rotate**	White circle above the selection. Turns objects in a circle.
4	**Reshape**	Pink circles around the object. Shapes only. Alters the perimeter of shapes, allowing you to change the length and angle of each side individually.

Adjusting the resize and rotate handles of one of the objects in a selection will resize and rotate all selected objects in unison. Only one object can be reshaped at a time.

Context Menu

The context menu offers quick access to standard object functions and tools from the *Magic Sheet Layout Toolbar*, and can be accessed by right-clicking, two-finger-tapping, or pressing and holding outside of any objects in the editor.



The following options are available:

- **Cut** *(CTRL+X)* - removes selected objects for pasting.
- **Copy** *(CTRL+C)* - copies selected objects for pasting.

These options are related to the *Layout* tools on the toolbar.

- **Paste Renumber** *(CTRL+SHIFT+V)* - pastes cut or copied objects, incrementing their target numbers as defined by the *Target Bar*. The offset between any cut or copied objects is also maintained when pasted.
- **Paste Duplicate** *(CTRL+V)* - pastes cut or copied objects with the same target numbers as the originals.
- **Renumber by click** *(CTRL+SHIFT+R)* - floats a preview of the next incremented target number as defined by the *Target Bar*. Click on an object to change its target number. The floating preview will increment, allowing you to continue renumbering.
  - Use the target bar to select the desired target type from the dropdown menu, editing the **Next** and **Increment** fields if necessary.
  - Select any object on the magic sheet with the cursor to change it to the target type and number defined by the target bar. Selecting objects with no target type selected will remove their target.
  - Use the **{Done}** button or choose another layout option to exit renumber mode.
- **Renumber in item** *(CTRL+R)* - opens a field on the object where you can enter a new target number. Press **[Enter]** or ENTER to confirm.
  - Multiple objects can be renumbered at once by selecting them in order and pressing CTRL+R. Enter the starting number, press **[Enter]** or ENTER, and object numbers will be distributed in the order the objects were selected.
  - Multiple channel objects can be given a starting number and an increment, separated by a forward slash (/). For example, five objects renumbered starting at 101/10 will receive the channel numbers 101, 111, 121, 131, and 141.

These options are related to the *Group and Order* tools on the toolbar:

- **Group** *(CTRL+G)* - associates multiple selected objects so that they can be moved and rotated like a single object.
- **Ungroup** *(CTRL+SHIFT+G)* - removes the association from any selected grouped objects.
- **Bring Forward** - moves the selection above the next object up.
- **Send Backward** - moves the selection below the next object down.

These options are also available:

- **Clear Selection** *(CTRL+D)* - deselects any selected objects.
- **Grid Toggle** *(CTRL+I)* - toggles the background grid off and back on. Also available on the toolbar.

Magic Sheet Object Library

The object library is located on the right side of the *Magic Sheet Editor*, above the *Magic Sheet Object Inspector* , and contains the buttons, shapes, fixtures, images, and other objects that can be added to a magic sheet. It also provides access to the *Magic Sheet Settings*.

The library is organized into the following tabs:

1	Objects	2	*Fixtures*	3	*Images*	4	*Magic Sheet Settings*

Objects

The **Objects** tab contains the majority of the object types that can be added to magic sheets.

Many objects are buttons that behave like *Direct Selects [Tab 4]* for a default target type, which can usually be changed once the object is added to a magic sheet. Exceptions are noted below.

Object settings can be adjusted in the *Magic Sheet Object Inspector* area below the object library.

Channel

Channel objects by default act as direct select buttons for an assigned *Channel*.

This object type can be assigned a different target type once added to a magic sheet.

Group

Group objects by default act as direct select buttons for assigned *Groups*.

This object type can be assigned a different target type once added to a magic sheet.

Preset

Preset objects by default act as direct select buttons for assigned *Presets*.

This object type can be assigned a different target type once added to a magic sheet.

Palettes

Palette objects by default act as direct select buttons for assigned *Palettes*. Objects are available for the following targets:

- *Intensity Palettes [Tab 22]*
- *Focus Palettes [Tab 23]*
- *Color Palettes [Tab 24]*
- *Beam Palettes [Tab 25]*

This object type can be assigned a different target type once added to a magic sheet.

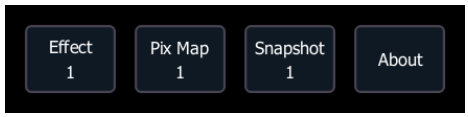
Macro

Macro objects by default act as direct select buttons for assigned *Macros*.

This object type can be assigned a different target type once added to a magic sheet.

Button

Button objects by default have no associated target, and can be assigned to act as direct select buttons for any target type once added to a magic sheet.



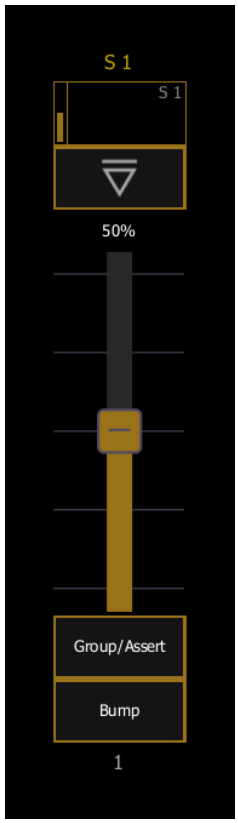
Tombstone

Tombstone objects mirror the channel indicators from the *Live and Blind [Tab 1]* for an assigned channel.

This object type cannot be assigned a different target type once added to a magic sheet.

Fader

Fader objects act as virtual fader controls similar to those available via *Fader List [Tab 35]* (**[Tab] [3][5]**) and *Fader Configuration [Tab 36]* (**[Tab] [3][6]**). Fader objects assigned to existing faders will mirror their settings.



Virtual faders can also be controlled using a mouse scroll wheel with the pointer over the fader.

A number of unique *Fader Properties* affecting their appearance and behavior on magic sheets are available via *Magic Sheet Object Inspector*.

This object type cannot be assigned a different target type once added to a magic sheet.

Command Line

Command line objects mirror *The Command Line*. They can be assigned to mirror the command line for any user number, and multiple command lines for different users can be used on the same magic sheet.

The command line is not mirrored when using the *Magic Sheet Editor*.

This object type cannot be assigned a different target type once added to a magic sheet.

Label

Label objects add descriptive text to magic sheets.

This object type can be assigned a different target type once added to a magic sheet.

Clock

Clock objects add a digital clock to magic sheets, displaying hours, minutes, and seconds in 12-hour time, mirroring the device time. The clock format cannot be changed.

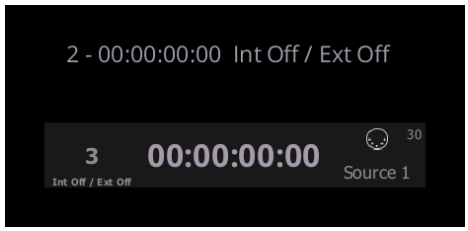
The clock does not display time when using the *Magic Sheet Editor*.

This object type cannot be assigned a different target type once added to a magic sheet.

Timecode

Timecode objects display the *Timecode* status of specified show control *Event Lists*.

The following options are available:



- **Timecode Status** - displays only the timecode status of the assigned event list.
- **Timecode Widget** - displays the timecode status of the assigned event list, along with additional information and control options for the timecode source.

This object type cannot be assigned a different target type once added to a magic sheet.

sACN Input

sACN objects display the current sACN input values for a specified *Address*.

This object type cannot be assigned a different target type once added to a magic sheet.

Foundation Motor

Foundation motor objects display the status of a networked ETC Foundation rigging system controller. For more information, see etcconnect.com/Foundation. This object type, other objects, and Eos in general cannot be used for rigging control.

This object type cannot be assigned a different target type once added to a magic sheet.

Response Analog IO

Response objects display the status of a networked ETC Response Analog IO gateway.

This object type can be assigned a different target type once added to a magic sheet.

Device Health

Device health objects display the status of the *Host* console or a networked device in *Expansion Processor (EEP)* mode.

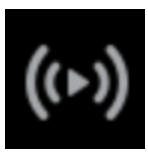
The live graph shows an ongoing 30-second window of the following health metrics:

- **DMX Output** - elapsed time since the last DMX output packet was sent in milliseconds (ms). Values above 24 for extended periods may result in dropped packets.
- **Fade Engine Tick** - elapsed time between fade engine ticks (refreshes) in milliseconds (ms).
- **Network Queue** - the number of queued commands from the multi-console *Host* waiting to be executed.
- **Packet Errors** - the number of packets received with ACN NAK errors. Higher values may indicate network issues.

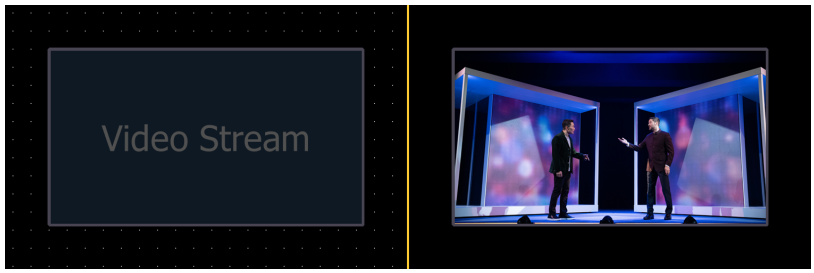
The solid line indicates the peak observed value for a metric. The darker line indicates the average of all observed values.

This object type cannot be assigned a different target type once added to a magic sheet.

Video Stream



Video stream objects display a networked video input. Video streams can be configured in *Setup* under **System Settings >** *Video Streams*, and viewed in the *Video Stream [Tab 41]* display.



This object type cannot be assigned a different target type once added to a magic sheet.

Pipe and Truss

Pipe and truss objects can be used to represent your system's physical lighting infrastructure, draw a line between objects, subdivide buttons, decorate your magic sheet, and so on.

This object type can be assigned a different target type once added to a magic sheet.

Shape

Shape objects by default have no associated target, and can be assigned to act as displays or controls for any target type once added to a magic sheet.

Unlike button objects, shape objects assigned to controls do not show a visual indication when they are pressed or used.

Freeform

Freeform objects can be used to create custom shapes, lines, and arrows, which can then optionally be assigned to a target.

The following options are available:

- **Freeform** - create a custom polygon shape.
- **Line** - draw a line with multiple segments.
- **Arrow Line** - draw a multiple-segment line with an arrow at the end.
- **Double Arrow Line** - draw a multiple-segment line with an arrow at both ends.

Click to create a starting point and drag to draw a line. Continue clicking to create vertices (corners) until the shape or line is complete.

Double click to finalize the shape or line. If necessary, reshape it with the pink *Object Handles*.

Fixtures

Objects specifically designed to represent common lighting fixtures are available in the **Fixtures** tab.

The following fixture icons are available:

Other than their shapes, fixtures are no different from other magic sheet objects, and are configured via *Magic Sheet Object Inspector*.

For example, this fixture has been assigned a number of *Fields* to display useful information about its current intensity level, channel number, fixture type, and color.

1	Intensity	2	Target Id	3	Fixture Type	4	Color Swatch

Fixture objects will automatically be assigned to a channel using the numbering defined in the *Target Bar*, but can also be reassigned to different target types.

Importing Fixtures

Additional fixture images in SVG format can be imported and linked to a target channel's color, intensity, or both.

SVGs are vector-based images which can be scaled to any size without losing resolution. Each image layer can be given an internal ID tag, which can be viewed and edited in an SVG editor, such as Inkscape, or directly in the code by opening the SVG file in a text or code editor, such as Notepad++.

1	Fill color (etc_symbol_base)
2	Outline (etc_symbol_outline)

Fixture SVG tags must meet the following criteria:

At least one element, typically the fixture fill color, must have one of the following IDs:

- **etc_symbol_base0** - links the fixture fill opacity to the target channel's intensity level.
- **etc_symbol_base** - links the fixture fill color to the target channel's color and the fixture fill opacity to the target channel's intensity level.
- **etc_symbol_base2** - links the fixture fill opacity to the target channel's intensity level.

At least one element, typically the fixture outline, must have one of the following IDs:

- **etc_symbol_outline0** - links the fixture outline opacity to the target channel's intensity level.
- **etc_symbol_outline** - links the fixture outline color to the target channel's color and the fixture outline opacity to the target channel's intensity level.
- **etc_symbol_outline2** - links the fixture outline opacity to the target channel's intensity level.

Any additional elements in the SVG that are given one of the ID tags above will also follow the target channel's color, intensity, or both.

Layers with tags not matching those above, or without tags, will be removed on import and not displayed.

Once properly tagged, the custom fixture image can be imported using the **{Import}** button in either the object library's **Images** tab or the library of *Icons* that opens in the *Central Information Area (CIA)*.

Images

Images can be added from the library of *Icons* in the third tab and used as objects or backgrounds.

The following options are available:

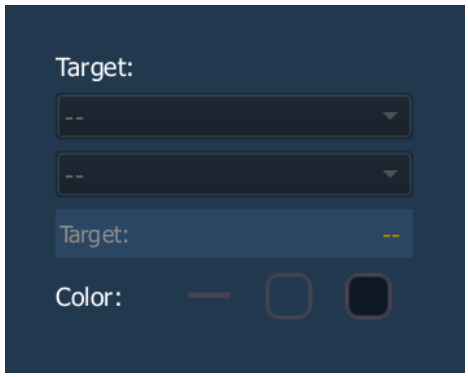
1	{Directory}	Identifies the folder of images currently being viewed. In subfolders, such as **Gobos (Imported)**, the button can be used to go back up one level in the hierarchy. At the top level (**All**), the button does nothing.
2	{Import}	Adds new images to the library, using the pop-up to navigate to the file's location. Use **{OK}** to import the image or **{Cancel}** to close the pop-up.
3	{Edit}	Opens the *Icons* display in the CIA, which provides additional options for organizing images and folders in the library.

Drag images from the library onto the magic sheet to use them as objects. Once placed, they can be configured and edited like any other object via the *Magic Sheet Object Inspector*.

Images can be assigned as backgrounds for an entire magic sheet in the *Magic Sheet Settings* tab under *Live and Blind Backgrounds*.

Magic Sheet Object Inspector

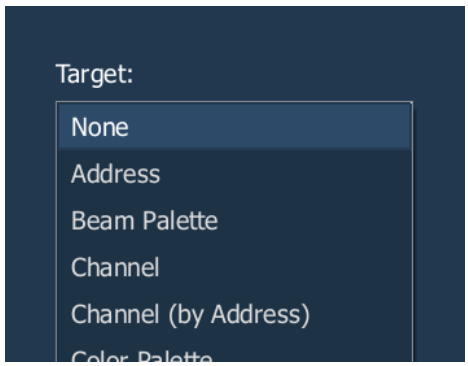
The object inspector is located on the right side of the *Magic Sheet Editor*, under the *Magic Sheet Object Library*, and contains all of the configuration settings for magic sheet objects. *Selecting Objects* allows you to modify their properties.



The sizes of the object library and object inspector can be adjusted by dragging the border between them up or down.

{Target}

Assigns *Record Targets* to the selected object. Most objects default to a target type, which can usually be changed once the object is added to a magic sheet.

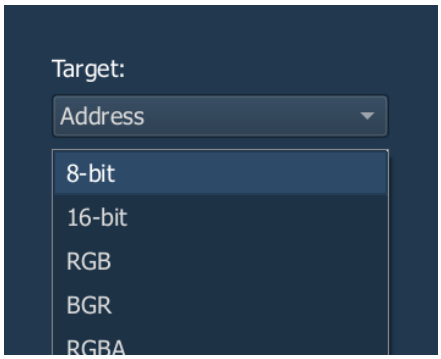


Only applicable targets for the specified object type will display in the target selection dropdown menu.

The second dropdown menu is only used with the specific targets and objects noted below.

The following options are available:

- **None** - no target.
- **Address** - any *Address*. When an *sACN Input* object is assigned an address target, use the second dropdown menu to specify the type of sACN data to monitor. For IRGB-type addresses, assign **Color** to the first color address, and **Intensity** to the intensity control address.

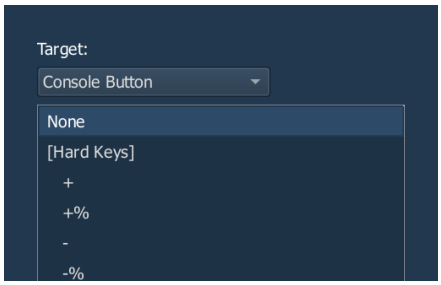
  

- **Channel** - any patched *Channel*, specified by its channel number.
- **Channel (by Address)** - any patched channel, specified by its address number.
- **Cue** - any recorded *Cues*.
- **Cue - Active** - the current cue.
- **Cue - Pending** - the next cue in the current cue list.
- **Effect** - any default or user-created *Effects*.
- **Fader** - any assigned *Faders*.
- **Group** - any recorded *Groups*.
- **Intensity, Focus, Color, and Beam Palettes** - any recorded *Palettes*.
- **Macro** - any recorded *Macros*.
- **Magic Sheet** - any created magic sheets.
- **Pixel Map** - any created *Virtual Media Server* pixel maps.
- **Preset** - any recorded *Presets*.

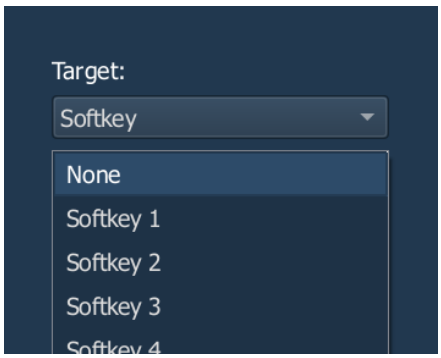
- **Response IO Relay** - any *Relay Outputs* of a network-connected ETC Response Analog IO Gateway.
- **Scene** - any created *Scenes*.
- **Snapshot** - any recorded *Snapshots*.
- **Submaster** - any recorded *Submasters*.
- **User** - any defined *User ID*.

A subset of targets can be used to access console controls from a magic sheet.

- **Console Button** - the hardkeys on your console. Use the second dropdown to choose from a list of all hardkeys.



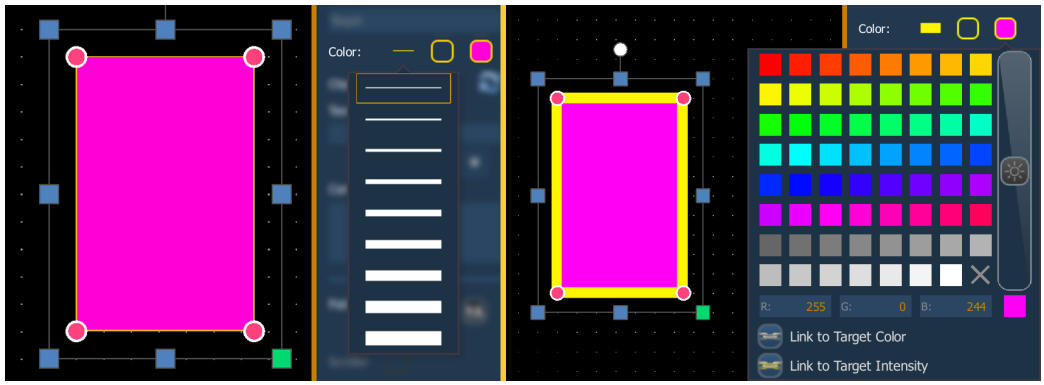
- **Softkey** - the virtual buttons in the Eos software. Use the second dropdown to choose from a list of all softkeys.



- *Command* - see below.
- **Zoom** - changes the magic sheet view to show any objects grouped with the object assigned to this target.
- **Selection** - selects any objects grouped with the object assigned to this target.

Color

The color section allows you to adjust object outline width, outline color, and fill color. The chosen colors will update the properties area as well as the object.



The following options are available:

1	{Outline Width}	Changes the thickness of the border around the object. Choose from the range of outline widths.
2	{Outline Color}	Changes the color of the object border. Choose from the available color swatches, or manually enter RGB values. Use the {X} swatch to remove the outline, which also disables {Outline Width}.
3	{Fill Color}	Changes the color of the object. Choose from the available color swatches, or manually enter RGB values. Use the {X} swatch to make the object transparent.

Use the slider on the right of the color picker to make color options brighter or darker. You can also type in RGB values. The swatch in the lower right corner under the slider indicates the most recently chosen color.

Linking Color

The color picker offers the following additional options:

- {Link to Target Color} - if the target has associated color parameters (such as a channel controlling an LED fixture), this option associates the object's outline color or fill color with the live color of the target. If the target has no color parameters, the object color will appear as selected.
- {Link to Target Intensity} - if the target has associated level parameters (such as a channel controlling an incandescent fixture), this option associates the object's outline opacity or fill opacity with the live intensity of the target. If the target has no intensity parameters, the object opacity will appear as selected.

If the target has no color or intensity parameters, the object color will appear as selected.

Target color and intensity values are affected by the object's fill color, and darker fill colors will limit the extent of the intensity values that can be displayed via opacity. To ensure an object can display the full range of target intensity values, set the object fill color to white.

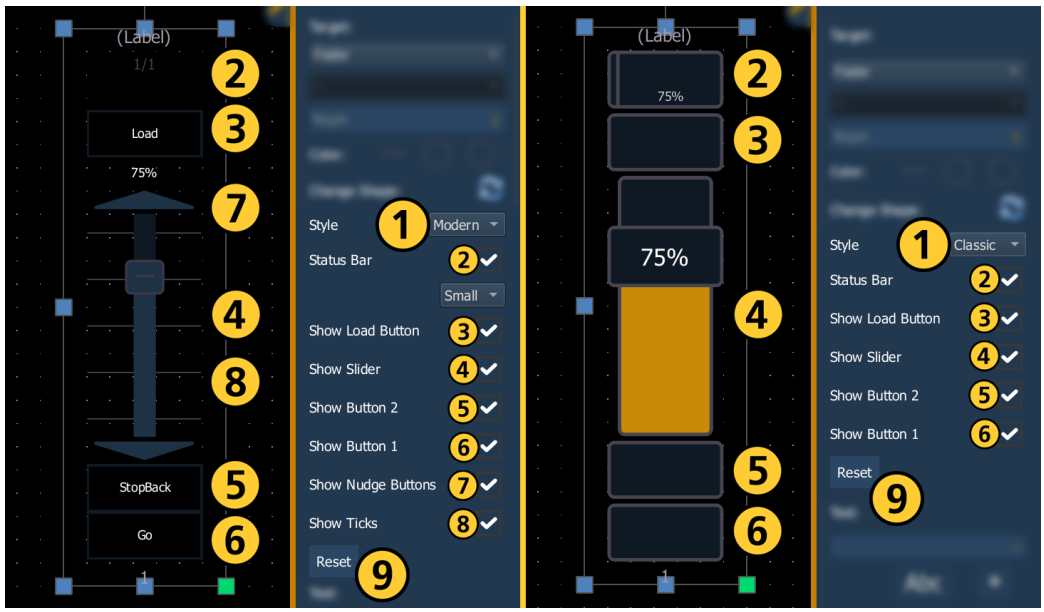
{Change Shape}

Allows you to quickly change the shape of one or more selected objects using the options in the *Magic Sheet Object Library*. Choose an option from the pop-up object library.

Fader Properties

These properties are unique to *Fader* objects and don't appear for other object types.

The following options are available:



1	{Style}	Toggles the visual style of the fader between **Modern** and **Classic**. Choose an option from the dropdown.
2	Status Bar	Toggles the status bar above the fader. Enabled by default. The dropdown menu below can be used to toggle the size of the status bar between **Large** and **Small** (default).
3	Show Load Button	Toggles the load button above the fader. Enabled by default.
4	Show Slider	Toggles the virtual fader control. Enabled by default.
5	Show Button 2	Toggles the top button below the fader. Enabled by default.
6	Show Button 1	Toggles the bottom button below the fader. Enabled by default.
7	Show Nudge Buttons	Modern style faders only. Toggles the triangular nudge buttons at the top and bottom of the virtual fader. Disabled by default.
8	Show Ticks	Modern style faders only. Toggles the horizontal lines behind the virtual fader. Enabled by default.
9	{Reset}	Returns the above fader properties to their default settings.

{User Label}

This property is unique to *Command Line* objects and does not appear for other object types. Choose an option from the dropdown menu to display the user ID, user label, or both.

The following options are available:

- None
- User ID (Left)
- User Label (Left)
- User ID & Label (Left)
- User ID (Right)
- User Label (Right)
- User ID & Label (Right)

{Quality}

This property is unique to *Video Stream* objects and does not appear for other object types.

The **Quality** dropdown allows you to choose how the selected object renders the video from the selected stream:

- **High Quality** - the video is rendered with the most fidelity, using the most system resources.
- **Medium Quality** - default. Fewer resources are used to render the video.
- **Low Quality** - the video is rendered using the fewest resources possible.

Lowering the quality of video stream displays may help free up system resources and improve speed or responsiveness.

Text

Changes an object's text. Although primarily for use with *Label* objects, most object types can be given text.

Enter your desired text in the field. Object text appears within the object's interior, and cannot be positioned on the exterior bounds or shape of the object as *Fields* can.

The following options are available:

- {Font} - adjusts the appearance of the text. Use the pop-up menu to adjust the following properties:
  - {Font} - changes the typeface. Choose an option from the dropdown.
  - Size - adjusts the size of the text. Enter a font size in the field.
    - Font size also adjusts the scaling of magic sheet icons.
    - Size also adjusts any selected intensity bar and color swatch fields.
  - {Color} - changes the color of the text. Choose from the available color swatches, or manually enter RGB values.
    - Use the {X} swatch to make the object transparent.
    - Use the slider on the right of the color picker to make color options brighter or darker.
    - The text of channel objects on magic sheets will assume any colors assigned to that channel in Live/Blind, regardless of the color assigned in the magic sheet editor.
  - {Bold} - toggles the text **bold**. Disabled by default. Can be combined with {Italic} and {Underline}.
  - {Italic} - makes the text *italic*. Disabled by default. Can be combined with {Bold} and {Underline}.
  - {Underline} - adds an underline to the text. Disabled by default. Can be combined with {Bold} and {Italic}.
- {Justification} - adjusts the position of the text relative to the object. Choose between {Top Left}, {Top Center}, {Top Right}, {Center Left}, {Center}, {Center Right}, {Bottom Left}, {Bottom Center}, and {Bottom Right}.

Command

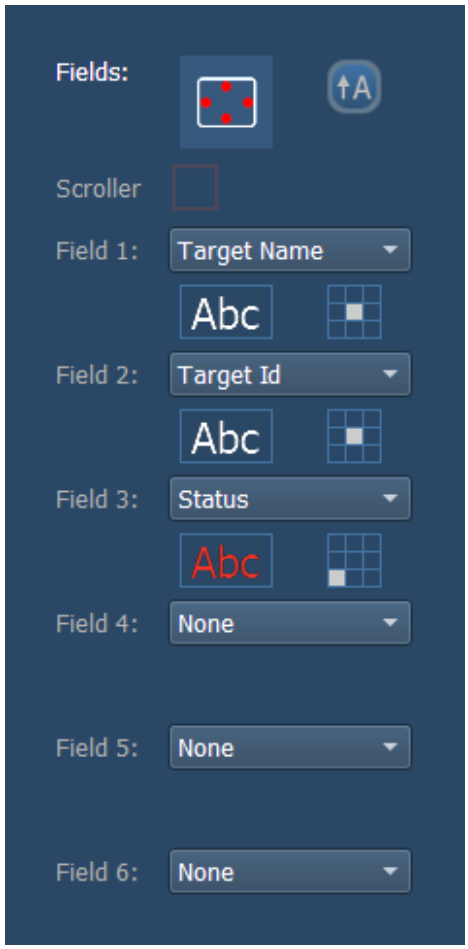
Assigns a command to be executed when the object is interacted with. The target type needs to allow command options. Multiple commands can be entered.

Mousing over the command box will display a tooltip of the following command examples:

- Chan 1
- event: Go 0
- <U2>Chan 1
- macro:Tab_Down 2 7 Tab_Up
- udp:$Chan 1#
- /device/slider (button edges auto-inserted)
- /device/slider=1.0
- /device/slider=0/75 (up edge)
  /device/slider=0.25 (down edge)
- local:/eos/wheel/coars/pan=3.0
- udp:local:<U2>$Chan 1#
- local:/eos/chan/1=50

Fields

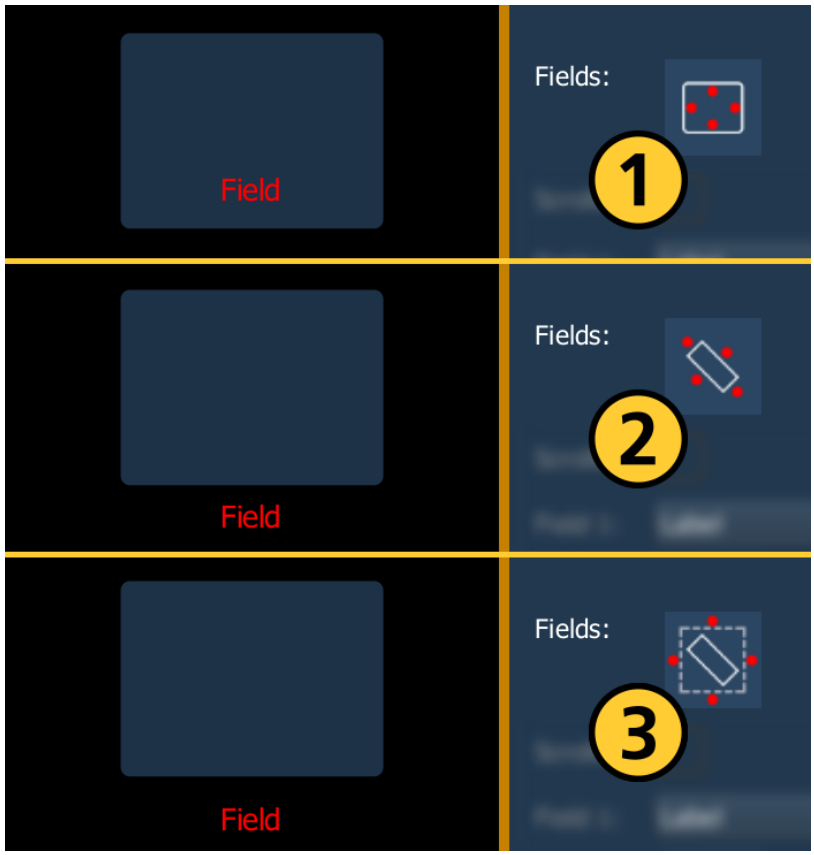
Fields are configurable displays of information that can be associated with an object.



{Orientation}

The orientation of fields around an object can be adjusted by pressing the field orientation icon.

The following options are available:



1	Interior	Fields will be in the interior of the object. This orientation is useful for console buttons.
2	Exterior Bounds	Fields will be exterior to the object and will remain at a position regardless of the rotation of the object.
3	Exterior Shape	Fields will be exterior to the object and will move in relation to the object's rotation.

{Keep Text Upright}

Toggles the upright orientation of any field text added to an object. Disabled by default.

When enabled, object edits with *{Flip}* that would typically rotate text with its object will only rotate the object. Text will remain in the original upright orientation.

Scroller

Adds a scroller indicator to *Fixtures* on your magic sheet. Enabling this option for other object types does nothing. Disabled by default.

{Field}

Up to six different fields of custom information can be displayed per object. These data options correspond to Choose a data option for the field to display using the dropdown menu.

The following options are available:

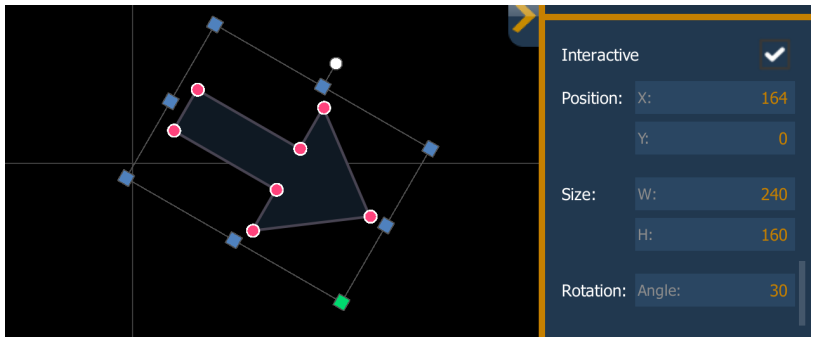
- Active SK
- Address
- Alternate SK
- Beam

- Cell
- Channel
- Color
- Color Swatch
- DMX
- DMX Bar
- Fixture Type
- Focus
- Form
- Icon
- Image
- Intensity
- Label
- Next Move
- Notes
- Parameter
- Parameter Bar
- Patch Text
- Port/ Offset
- Prev Move
- Scene
- Shutter
- SK Number
- Status
- Summary
- Target Id
- Target Name
- Text 1 through 10
- Text Gel
- Value

Not all data options are available for all object types.

Field Text

Field text is tied to the field type and cannot be edited. The font, size, color, style, and justification for each field can be adjusted with the same options as the *Text* properties above.



{Interactive}

Toggles whether or not the object is interactive. Interactive objects can be selected with a click or touch the same way as a direct select or virtual fader. Objects with disabled interactivity cannot be selected, and will only display information.

This option does not appear for inherently non-interactive objects (such as a *Command Line*).

Position

The position of the object on the magic sheet, relative to the center of the magic sheet at the intersection of the X and Y axes. Alter a selected object's position by dragging it around the magic sheet, or by entering specific X and Y values in the **X** and **Y** fields.

Size

The size of the object. Alter a selected object's size using the *Object Handles* resize options, or by entering specific width and height values in the **W** and **H** fields.

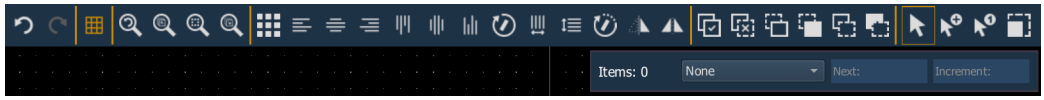
Although any object sizes can be entered, some object types (such as *Tombstone* objects) can only scale proportionally. Giving these objects non-proportional values will increase the size of the object's exterior bounds, not the object itself.

Rotation

The rotation of the object. Rotate a selected object in either direction using the *Object Handles* rotation option, or to the right (clockwise) by entering a degree value in the **Angle** field.

Magic Sheet Layout Toolbar

The layout toolbar is always visible at the top of the editor, providing various options for adjusting and arranging magic sheet objects.



Undo and Redo

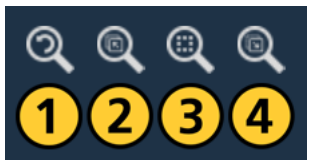
Use **{Undo}** and **{Redo}** to revert and restore changes made while in the *Magic Sheet Editor*. When hovered over, a tooltip will provide a description of the action to be undone or redone. When no available actions can be undone or redone, the respective button is disabled.

These tools can also be activated with the default Windows or macOS keyboard shortcuts for undo (CTRL+Z or CMD+Z) and redo (CTRL+Y or CMD+Y).

{Grid Toggle}

A grid is overlaid on the magic sheet background by default, which objects snap to when positioned. To hide or show the grid, use the **{Grid Toggle}** *(CTRL+I)* button at the left of the toolbar. When disabled, objects can be freely positioned without snapping.

Zoom



The zoom tools adjust the view of the magic sheet open in the editor.

The following options are available:

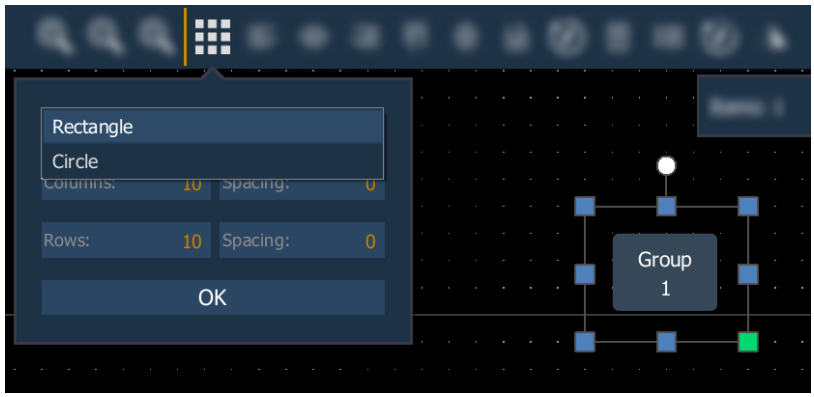
1	{Reset Zoom}*(CTRL+0)*	Centers the display and returns to the default zoom level.
2	{Zoom to All}*(CTRL+1)*	Senters the display and returns to the default zoom level.
3	{Zoom to Selection} *(CTRL+2)*	Shows all selected objects.
4	{Center on Selection} *(CTRL+3)*	Centers the display on the selected objects without changing the zoom level.

Alignment and Distribution

These tools adjust the physical positions of the objects in the magic sheet.

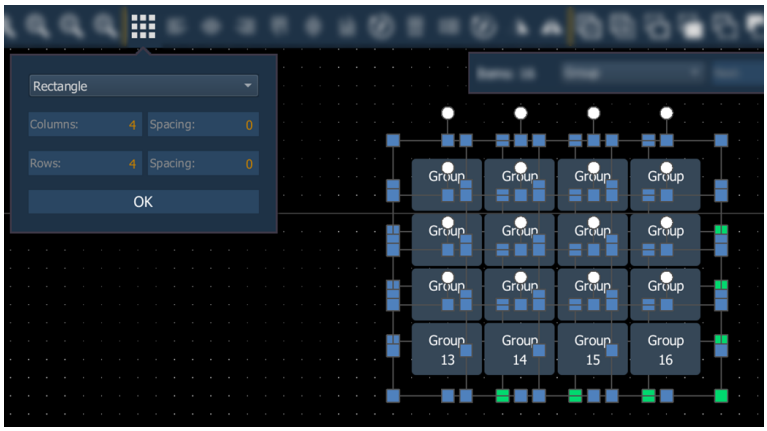
{Create Array}

The array tool creates arrays of a selected object. With the object selected, use {Create Array} to open a pop-up menu to define the array shape and size.

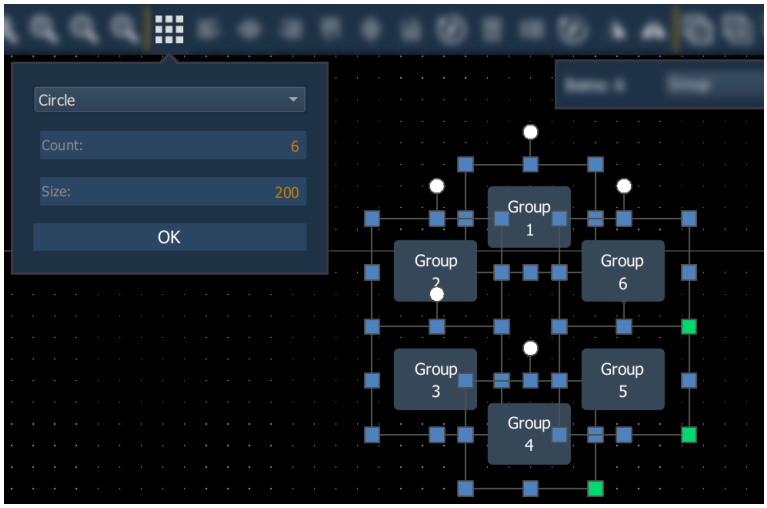


The following options are available:

- **Rectangle** - creates an array of the selected object in a rectangle. Enter the number of **Columns** and **Rows**, and the **Spacing** between each.



- **Circle** - creates an array of the selected object in a circle. Enter the **Count** of objects and the **Size** of the circle.



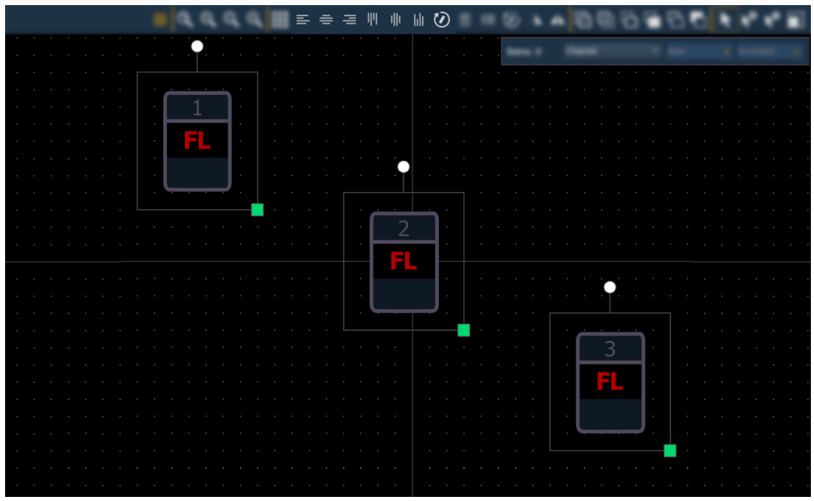
Arrays increment the object being arranged, rather than duplicating. For example, using a **Group 1** button to create an array of six adds buttons for **Group 2** through **Group 6**, not five additional **Group 1** buttons.

Align

These tools alter the position of selected objects relative to a common point.

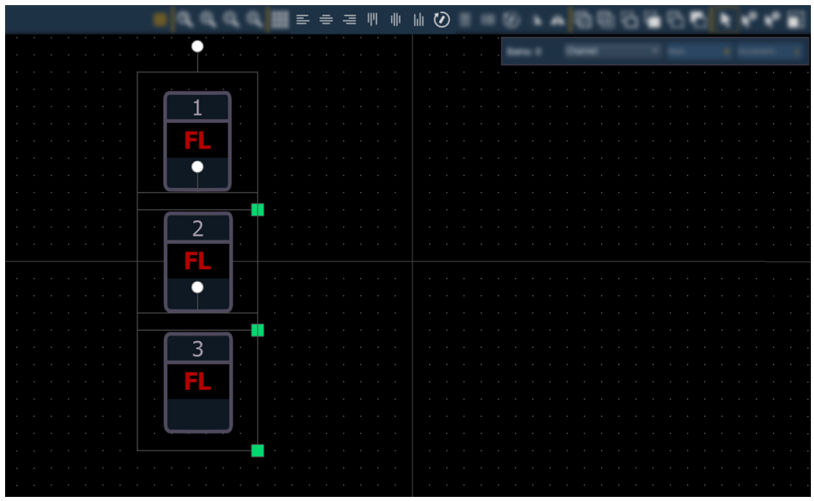
The following options are available:

The example images below are relative to the following starting arrangement of three *Tombstone* objects:



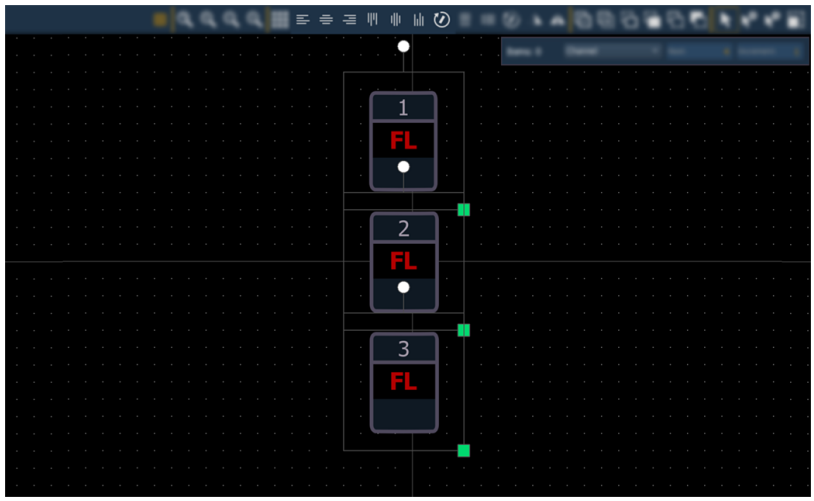
{Align Left}

Aligns selected objects with the furthest left object's left side.



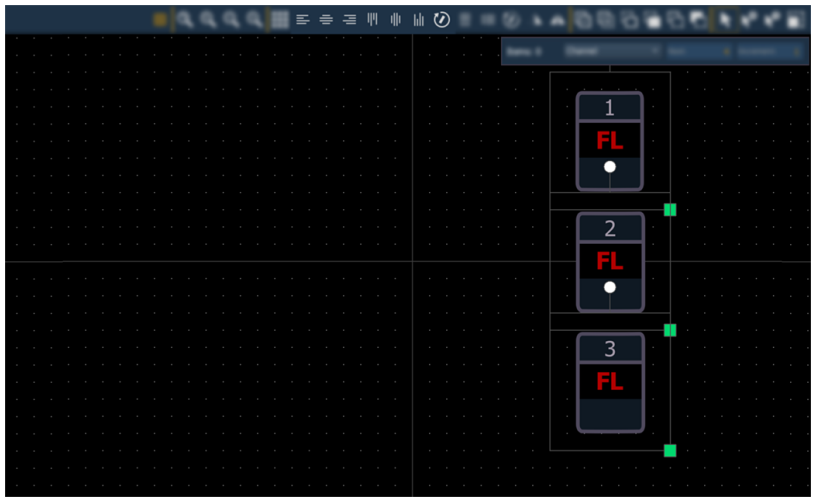
{Align Center}

Aligns selected objects vertically with the most central object.



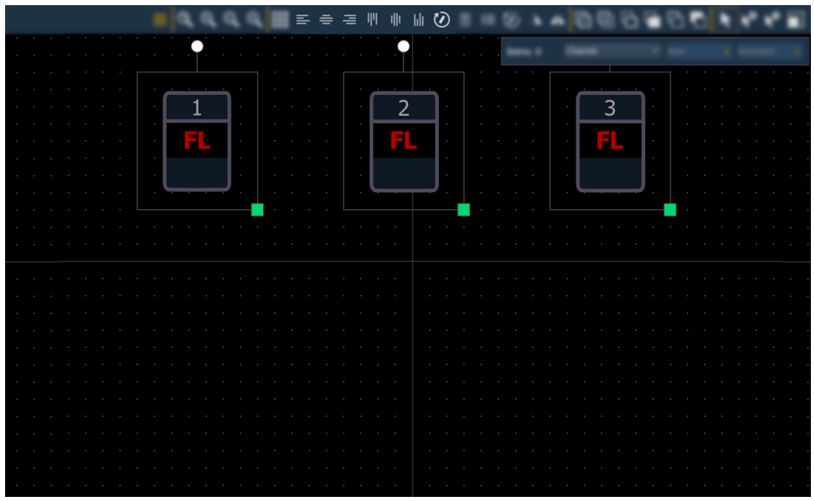
{Align Right}

Aligns selected objects with the furthest right object's right side.



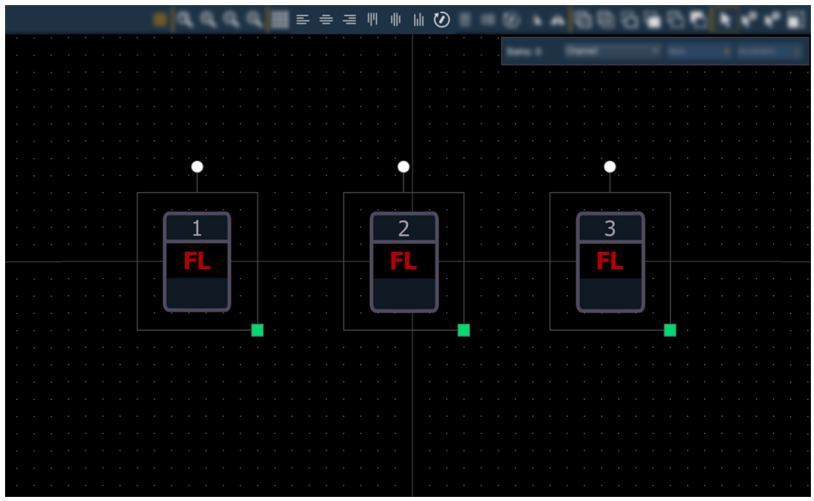
{Align Top}

Aligns selected objects with the highest object's top side.



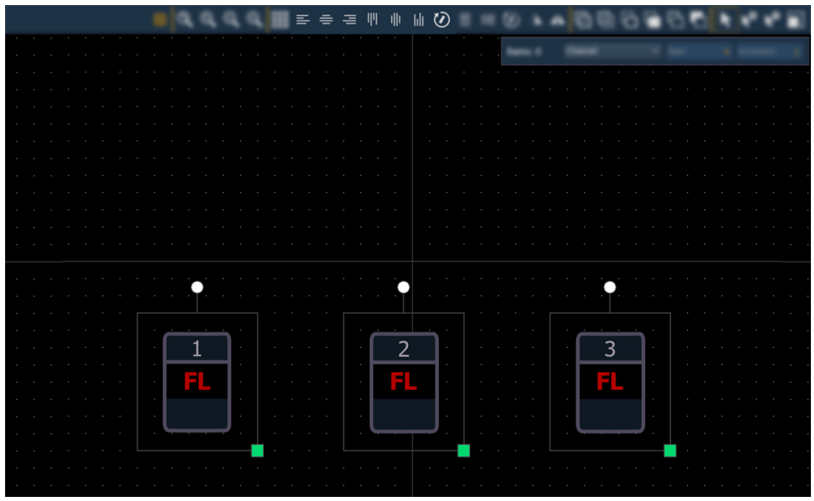
{Align Middle}

Aligns selected objects horizontally with the most central object.



{Align Bottom}

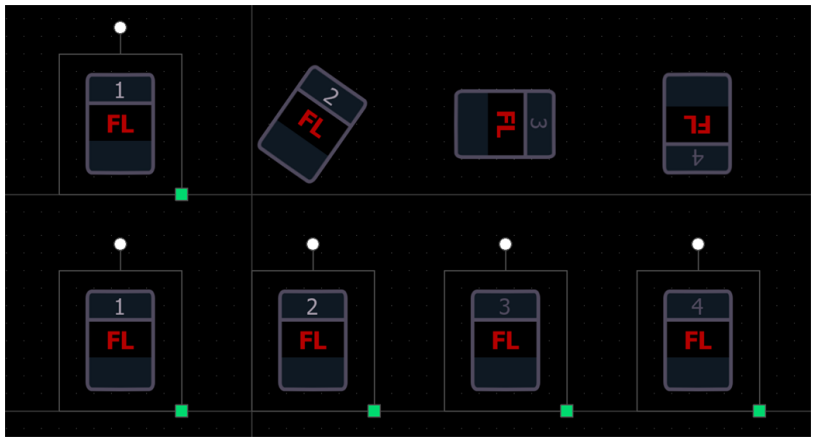
Aligns selected objects with the lowest object's bottom side.



{Align Rotation}

Aligns the rotation of selected objects with the rotation of the first object selected.

For example, a channel 1 tombstone is straight and tombstones for channels 2 through 4 are rotated. If the tombstones are selected in order, aligning rotation will straighten channels 2 through 4 to align them with the rotation of channel 1.



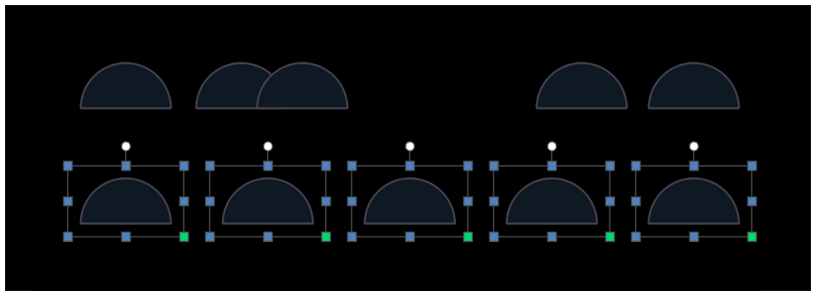
Distribute

These tools alter the position of selected objects based on the distance between them.

The following options are available:

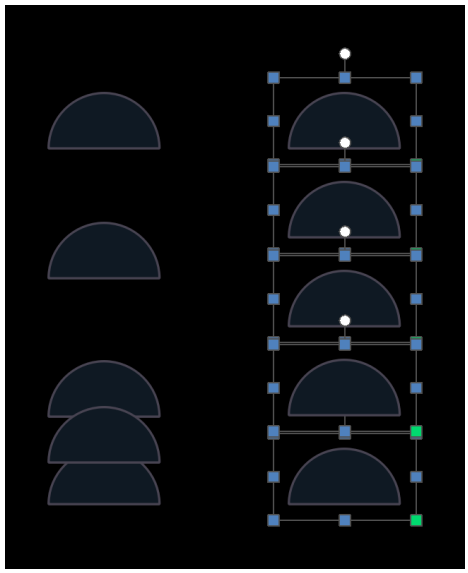
{Distribute Horizontally}

Distributes selected objects at equal horizontal distances between the furthest left and furthest right objects.



{Distribute Vertically}

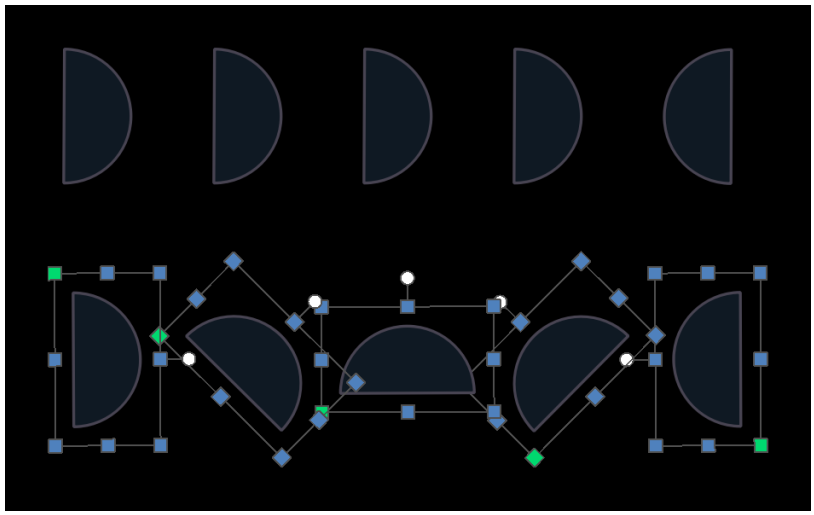
Distributes selected objects at equal vertical distances between the highest and lowest objects.



{Distribute Rotation}

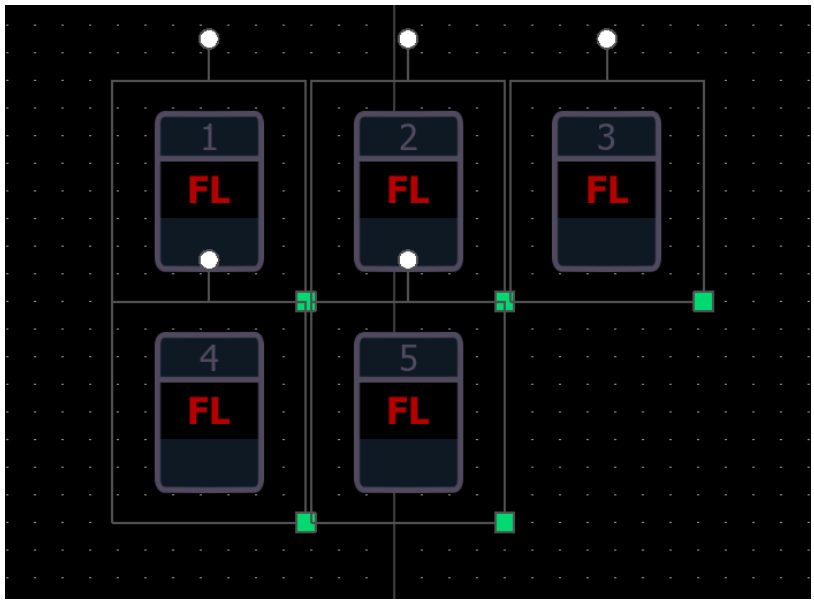
Evenly distributes the rotations of the selected objects between the angle of the furthest left object and the angle of the furthest right object.

For example, four objects in a line are not rotated and the fifth is rotated. Distributing rotation will space the middle three objects at 45, 90, and 135 degrees between the 0 degrees of the leftmost object and the 180 degrees of the rightmost object.



{Flip}

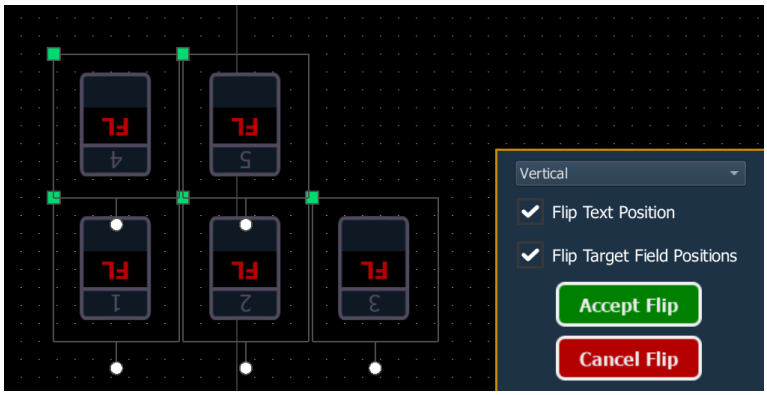
Reverses the positions of one or more selected objects horizontally or vertically.



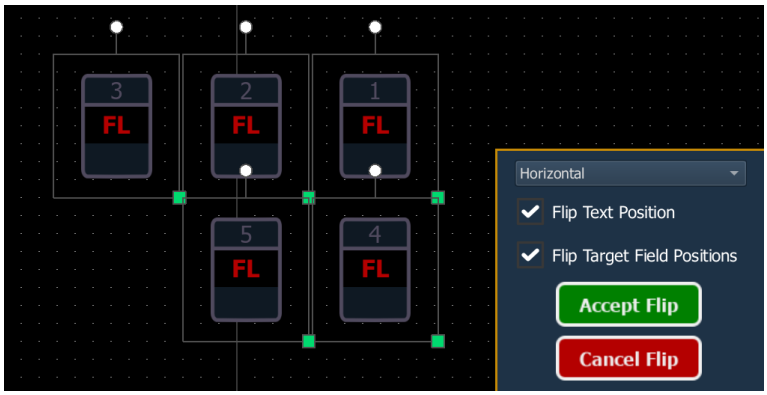
New positioning is previewed as soon as **{Flip}** is used. Select **{Accept Flip}** to apply the results, or **{Cancel Flip}** to close the flip options without making changes.

The following options are available:

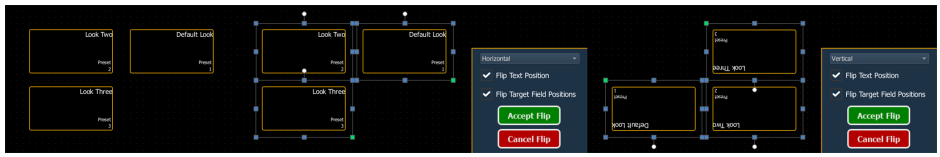
- **Vertical** *(CTRL+F)* - repositions the selection across a vertical axis.



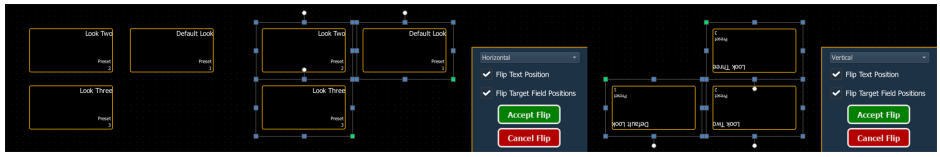
- **Horizontal** *(CTRL+SHIFT+F)* - repositions the selection across a horizontal axis.



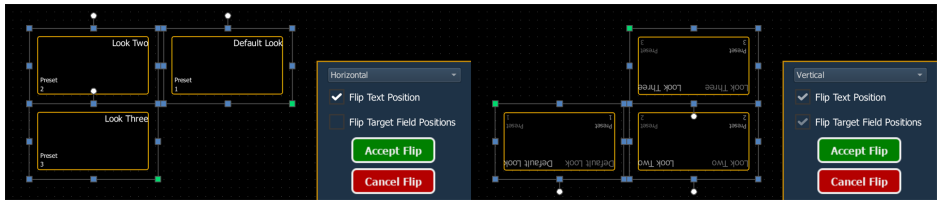
- **Flip Text Position** - repositions object *Text* when flipping the object and its target fields. Enabled by default.
  - For example, presets 1 through 3 are assigned to buttons with text in the top left corners and *Fields* identifying the preset in the bottom left. When this option is enabled, the text moves to the top right of the buttons in their flipped positions.



  - When disabled, the text remains in the top left of the buttons in their flipped positions.

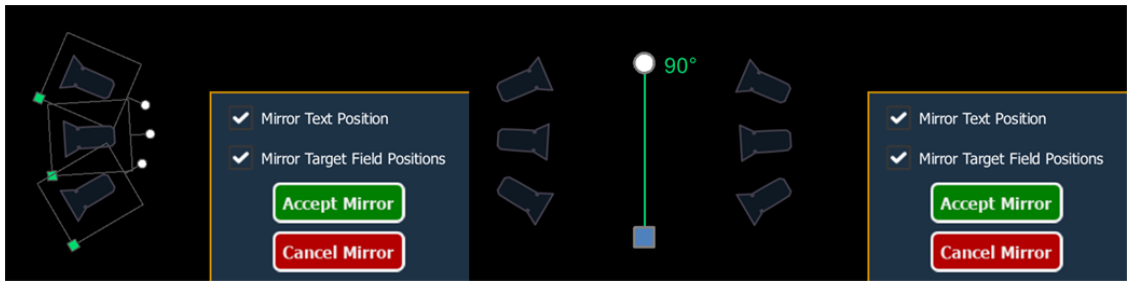


- **Flip Target Field Positions** - repositions object target *Fields* when flipping the object and its text. Enabled by default.
  - In the same example, when this option is enabled, the target fields move to the bottom right of the buttons in their flipped positions. When disabled, the target fields remain in the bottom left of the buttons in their flipped positions.



{Mirror}

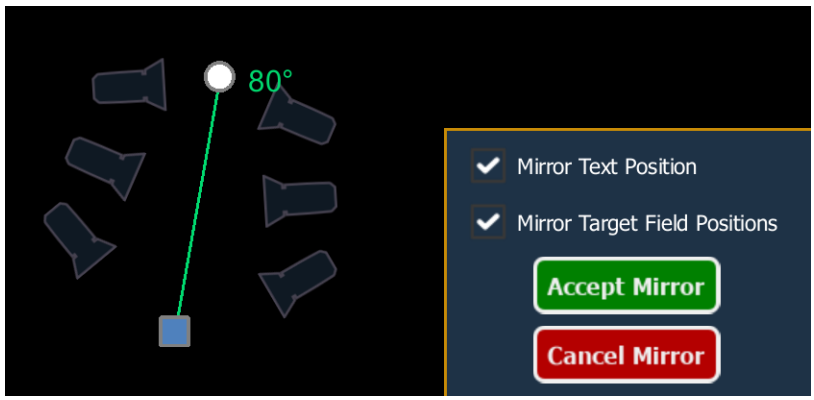
{Mirror} *(CTRL+M)* duplicates one or more selected objects, mirroring them across a chosen axis.



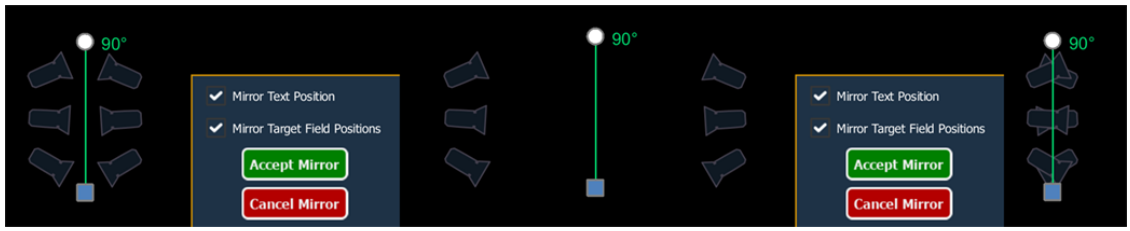
The following options are available:

Select the desired objects, and use **{Mirror}** *(CTRL+M)* to open the mirror dialog in the bottom right of the editor. Click or touch and drag to draw a green line across which the objects will be mirrored, with rotation and movement *Object Handles*. The current axis angle is displayed by the rotation handle (white circle).

New positioning is previewed as soon as an axis is drawn. Use the rotation handle to change the angle of the axis.



Use the movement handle (blue square) to adjust the position of the axis. Move the axis closer to the original objects to bring the previewed mirrored objects closer, or move the axis further away to create more space between the original and mirrored objects. The axis can be moved anywhere along its own angle without affecting the position of the previewed objects.



Select **{Accept Mirror}** to apply the results and duplicate the selection across the axis, or **{Cancel Mirror}** to close the mirror dialog without making changes.

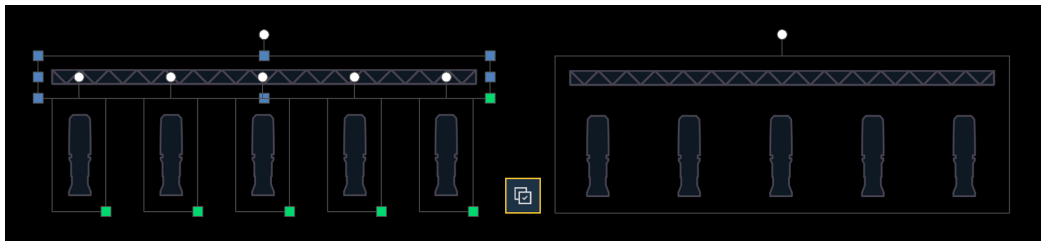
Group and Order

The order tools adjust the relationships between the objects in a magic sheet.

The following options are available:

{Group}

{Group} *(CTRL+G)* associates multiple selected objects so that they can be moved and rotated like a single object.

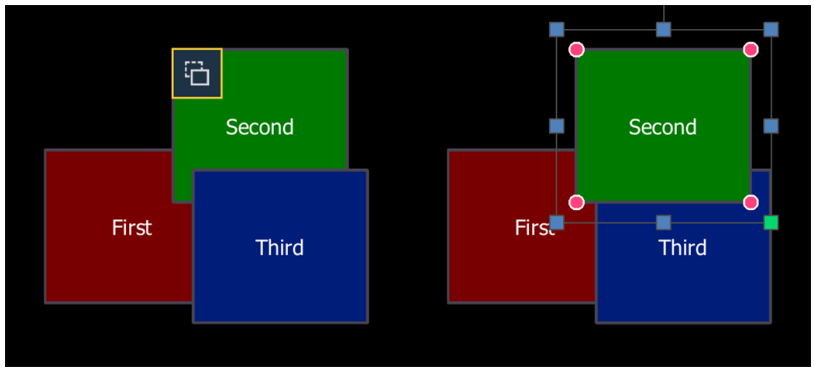


{Ungroup}

{Ungroup} *(CTRL+SHIFT+G)* removes the association from any selected grouped objects.

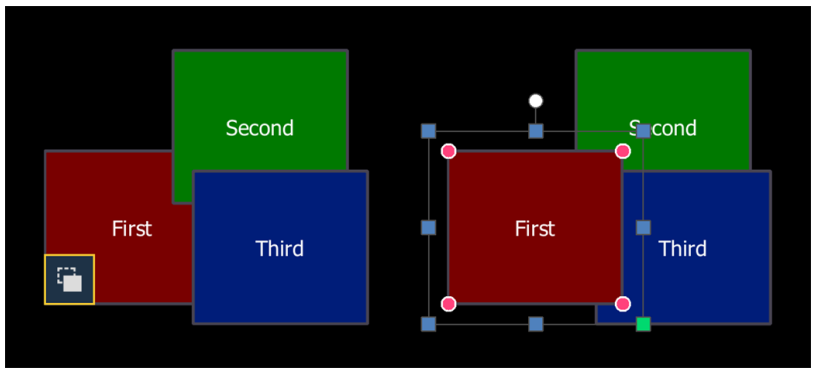
{Bring Forward}

Moves the selection above the next object up.



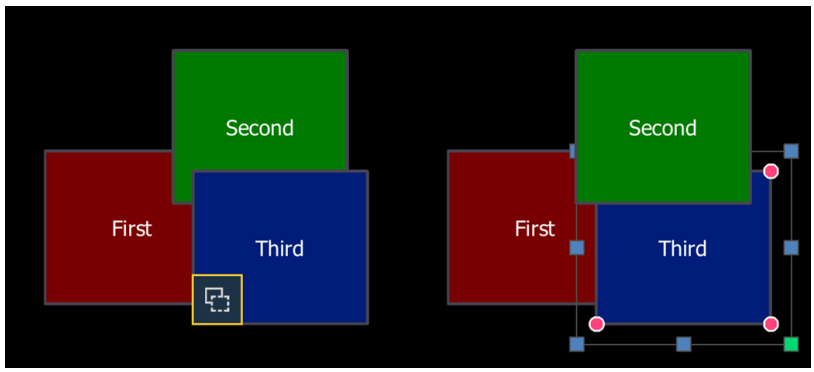
{Bring to Top}

Moves the selection above all other objects.



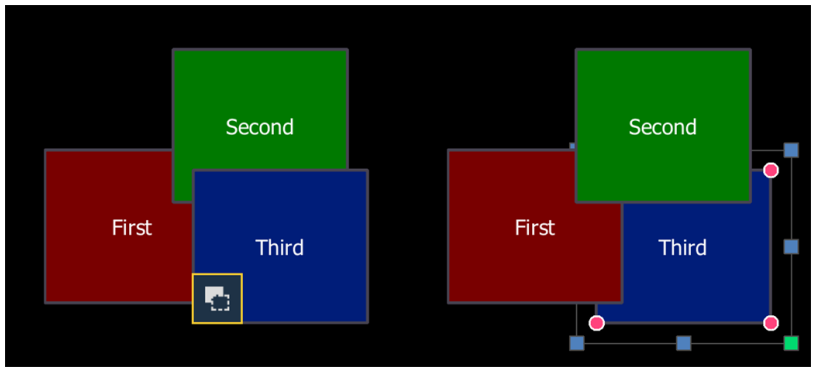
{Send Backward}

Moves the selection below the next object down.



{Send to Bottom}

Moves the selection below all other objects.

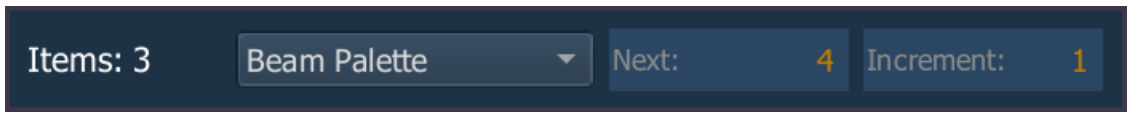


Layout

The layout tools affect how objects can be added to a magic sheet from the *Magic Sheet Object Library*.

Target Bar

The target bar is always visible below the toolbar, indicating a target type, the target number that will be used for the next object, and the increment used between those target numbers.

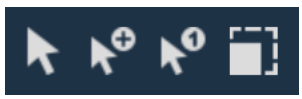


The following options are available:

- **Items** - the quantity of currently selected objects on the magic sheet.
- **Target** - the *{Target}* type of the currently selected objects, the intended target type to add objects with **{Quick Layout}**, or the desired target type to assign when using **{Renumber}**. The target can be changed via the dropdown menu.
  - Selecting one or more objects on your magic sheet will indicate their target type in this field.
  - If multiple target types are selected, the most common target type in the selection will be indicated.
  - If an equal number of different target types are selected, the target type of the most recently selected object will be indicated.
- **Next** - the target number that will be used for the next object added to the magic sheet.
- **Increment** - the offset between the current target number and the next target number to be used.

The **Next** and **Increment** fields can be edited for use with **{Quick Layout}** and **{Renumber}**.

Modes



The magic sheet cursor modes allow you to add and interact with objects in various ways. The current cursor mode will be outlined in gold.

The following options are available:

{Normal}

{Normal} *(CTRL+E)* is the default cursor mode for arranging and interacting with objects in the editor.

{Quick Layout}

{Quick Layout} allows you to select an object from the *Magic Sheet Object Library* and place multiple instances of that object on your magic sheet.

The **Next** and **Increment** fields in the target bar can be used to adjust the numbering of the new objects.

Use the **{Done}** button or choose another layout option to exit quick layout mode.

{Renumber}

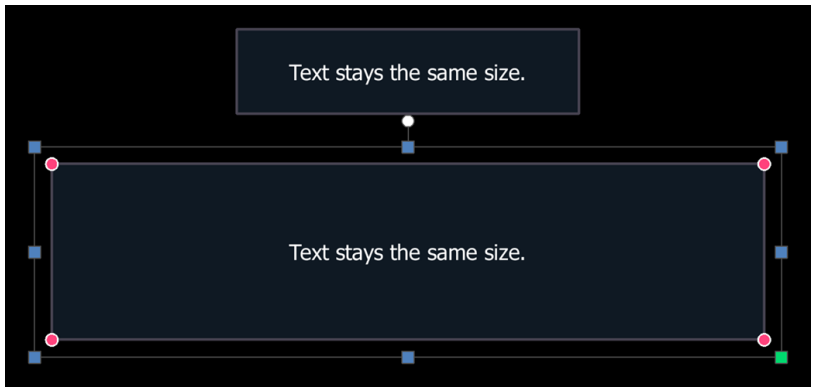
{Renumber} *(CTRL+SHIFT+R)* floats a preview of the next incremented target number as defined by the target bar. Click on an object to change its target number. The floating preview will increment, allowing you to continue renumbering.

- Use the target bar to select the desired target type from the dropdown menu, editing the **Next** and **Increment** fields if necessary.
- Select any object on the magic sheet with the cursor to change it to the target type and number defined by the target bar. Selecting objects with no target type selected will remove their target.
- Use the **{Done}** button or choose another layout option to exit renumber mode.

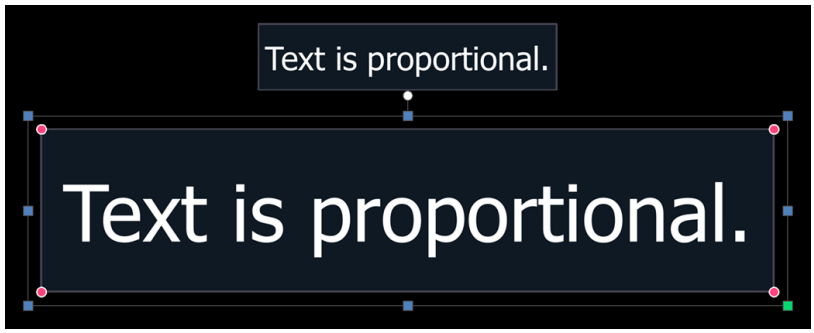
{Stretch}

{Stretch} *(CTRL+S)* resizes object *Text* proportionally when the object is scaled. You can also proportionally resize by holding CTRL while scaling up or down.

In **{Normal}** mode, objects can be made larger or smaller without the font size changing.



In stretch mode, the font size will scale up or down to proportionally match the size of the object.



Magic Sheet Settings

Magic sheet settings are available in the fourth tab of the *Magic Sheet Object Library*, allowing you to adjust magic sheet behavior, import existing magic sheets, and export your own.

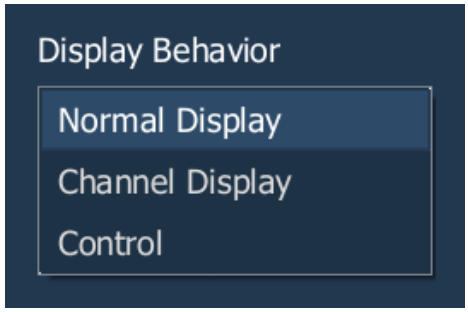
The following options are available:

- **Interactive** - toggles interactivity on or off for the entire magic sheet. If toggled on, all objects will respect their per-object *{Interactive}* settings. If toggled off, no objects will be interactive, regardless of their per-object settings. Enabled by default.

- **High Quality** - toggles high quality rendering of the selected magic sheet. If toggled off, optimizations will be made to the scaling and display of images in the magic sheet, which may improve performance and reduce lag, but at the expense of image quality. Enabled by default.
- **Optimize SVGs** - imports SVG files with minimal additional formatting, stripping out unreferenced data to make files smaller and more compatible. Enabled by default.

Display Behavior

Sets the behavior of magic sheet *Displays* within the Eos user interface.



The following options are available:

- **Normal Display** - the display will behave the same as other display tabs.
    - A locked tab will not be skipped.
    - A single click or tap on the tab will draw focus to that tab.
- **Channel Display** - this mode uses the following rules:
    - When focus is drawn to the playback status display, a magic sheet channel display will be brought to the front.
    - **[Shift] & [Live]** will cycle through magic sheet channel displays alongside Live channel displays.
    - Pressing **[Live]** or bringing a Live tab into focus will restore your last focused magic sheet channel display.
    - Magic sheet channel displays in the locked frame will not be skipped when using the **[Tab]** key to cycle through tabs.
- **Control** - the display will behave the same way *Control Tabs* do.
    - Locked tabs will be skipped.
    - A single click or tap will not draw focus.
    - A double click or tap will draw focus to the tab.

Live and Blind Backgrounds

Allows you to set one background for a magic sheet to use in Live and a second for it to use in Blind.

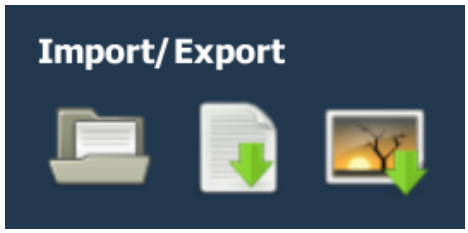
The following options are available:

- **{Use While Editing}** - makes the chosen background visible while using the *Magic Sheet Editor*.
- **Solid** - a single-color background. Choose a color by selecting the square color swatch to open a color picker, or manually enter RGB values.
- **Gradient** - a two-color background that fades from one color to the other. An additional swatch and set of RGB fields allow you to choose the two colors.

- **Image** - a background using *Images* from the *Magic Sheet Object Library*. The following options are available:
  - **RGB** - add a background color below the chosen image. The chosen color will be visible through any transparent parts of the image and around its outer edges.
  - **{Image}** - select the desired background image from the library pop-up. The image will appear at the center of the magic sheet.
  - **Width / Height** - adjust the size of the image. Dimensions are proportional to each other.
  - **Opacity** - adjust the transparency of the image from 1 (barely visible) to 100 (fully opaque). Defaults to 100.
  - **Normal / Inverted** - invert the colors of the image. Defaults to **Normal**.

Import / Export

Allows you to import and export magic sheets.

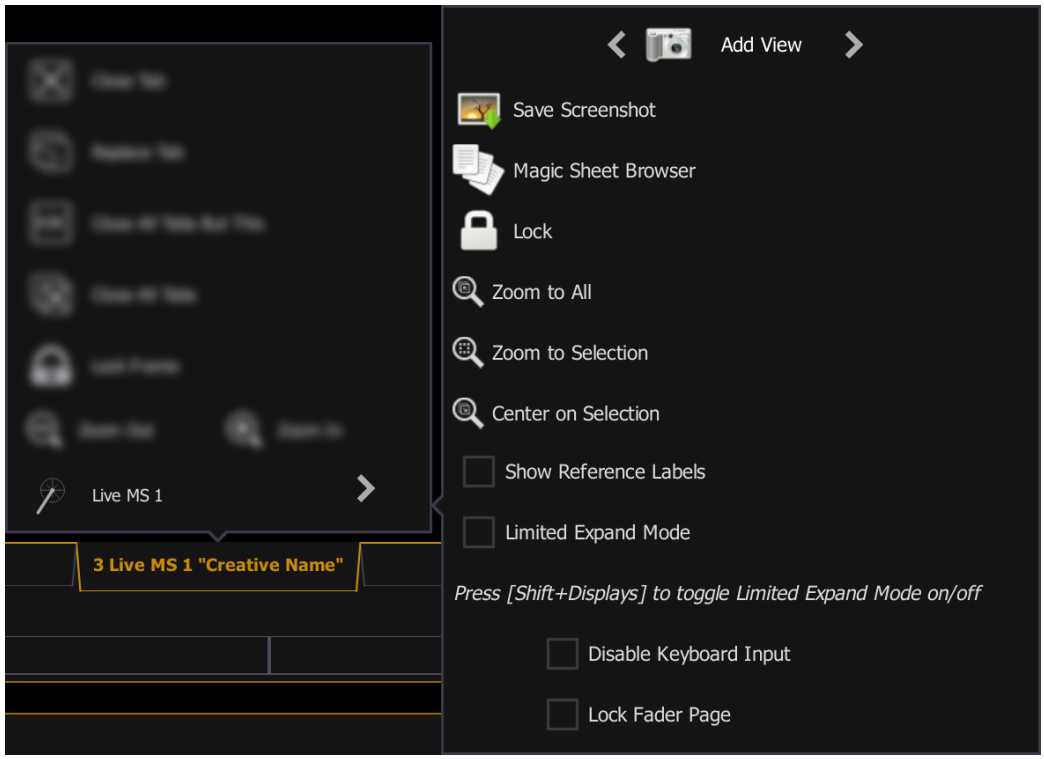


The following options are available:

- **{Import Text File}** - select an exported magic sheet in XML format and add it to your show file.
- **{Export Text File}** - export the current magic sheet to an XML file.
- **{Save as Image}** - saves a screenshot of the current magic sheet in Live mode. Select PNG or SVG from the dropdown menu.

Magic Sheet Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.



The following options are available:

- **Add View** - different views of the same magic sheet can be saved and recalled. Zoom and pan the display to change the view, and then select **{Add View}** to save. To change views, use the arrows on either side, or *Multi-Touch Gestures*. You can also use **{Magic Sheet}** [Magic Sheet Number] **[/]** [View Number] **[Enter]** to open a specific view.
  - For example, **{Magic Sheet}** [3] **[/]** [2] **[Enter]** will open view 2 of magic sheet 3.
- **Save Screenshot** - saves a screenshot of the magic sheet. Use the pop-up to select a save location. Choose to save in PNG or SVG format using the dropdown.
- **Magic Sheet Browser** - opens a pop-up magic sheet browser, which displays thumbnail images and labels for the created magic sheets. The browser can also be opened using *Multi-Touch Gestures*.
- **Lock** - locks the magic sheet so it cannot be zoomed or panned. This is useful for a customized direct select layout, where you want the buttons to always be in the same spot.
- **Zoom to All** - zooms to show all objects.
- **Zoom to Selection** - zooms to show all selected objects.
- **Center on Selection** - centers the display on the selected objects without changing the zoom level.
- **Show Reference Labels** - when enabled, channel objects that reference record targets (such as presets or palettes) with labels will have their labels displayed in the Magic Sheet rather than their target type and number. **[About]** & **[Label]** can be used to temporally toggle between views.

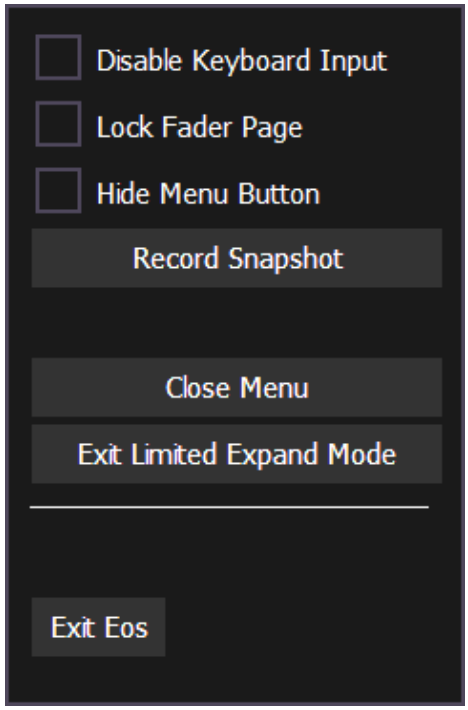
Limited Expand Mode

Limited expand mode allows magic sheets to be displayed fullscreen. While in this mode, the monitor with the magic sheet will not display a tab number, command line, or status bar, and other tabs open on the monitor will be closed or moved to a different display.

Magic sheets cannot be edited in limited expand mode.

Press **[Shift] & [Displays]** to enter or exit limited expand mode, or use the options in the tab configuration menu.

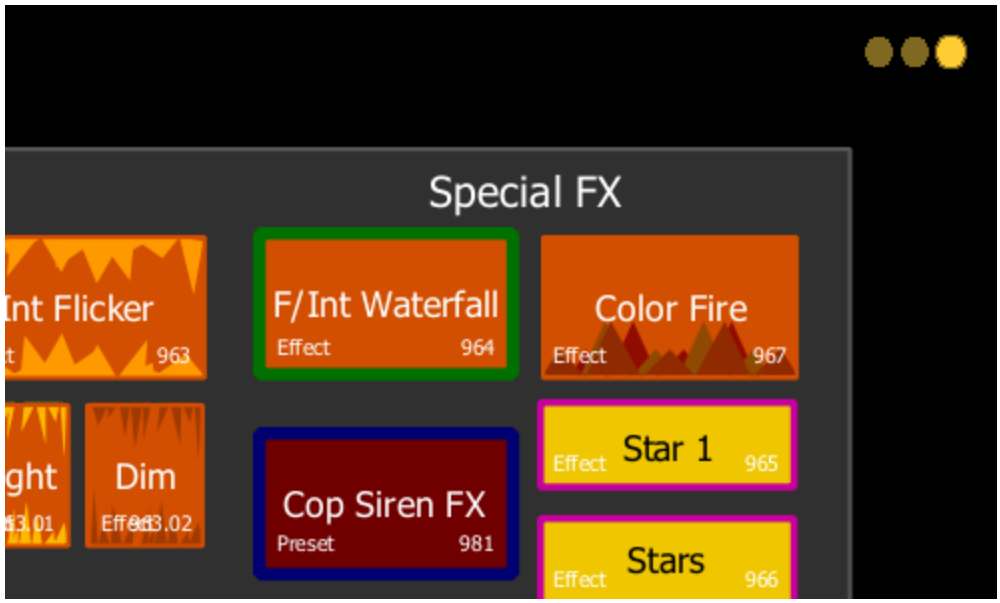
The following options are available:



- **Disable Keyboard Input** - disables input from the face panel and external keyboards. Fader and macro button input is not disabled. Disabled by default.
- **Lock Fader Page** - locks the fader page to the currently displayed one. Disabled by default.
- **Hide Menu Button** - hides the *Tab Tools* gear menu. When the icon is hidden, **[Shift] [Displays]** is the only way to exit limited expand mode. Disabled by default.
- **Record Snapshot** - allows you to record *Snapshots* while in limited expand mode.
- **Close Menu** - closes the limited expand menu. The menu can also be closed by selecting anywhere on the magic sheet.
- **Exit Limited Expand Mode** - exits limited expand mode and returns to the full Eos user interface.
- **Exit Eos** - exits the Eos application to the *ECU Welcome Screen*.

Health Indicator

The monitor will display a three dot heartbeat indicator in the top right hand corner. The indicator will move between three dots to show that any *Multi-Console Sessions* are operating as expected.



The following indicator colors will be used for multi-console activity:

- **Yellow** - system is operating as expected.
- **Red** - master or backup has gone offline.
- **Green** - master or backup has reconnected.
- **Gray** - offline.

Chapter 19

Augment3d

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Hardware and Software Requirements

Console

Augment3d on Eos Family consoles requires Eos Family Software v3.0.0 or later, and a console with at least one Display Port connector.

Windows and macOS

- Computer running Windows 7 (64-bit) or later, or macOS 13 (Ventura) or later
- Multicore processor with clock frequency higher than 2.0 GHz
- 3.5 GB free disk space or higher
- 2 GB RAM or higher
- Screen resolution of 1920x1080 or higher
- 64 MB video card or higher
- Direct X 11 or higher installed (Windows only)
- RJ-45 Ethernet network adapter (required to communicate with a lighting network and gateways for output)
- USB-A ports for connection of ETCnomad license key and output accessories

Android and iOS

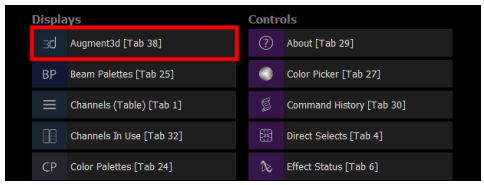
Augment3d includes a feature inside of the aRFR and iRFR mobile apps. For aRFR and iRFR hardware and software requirements, see the most recent version of the *aRFR and iRFR Release Notes*.

Note: *Focus wand also requires ARKit/ARCore functionality. Check your device's specifications to ensure compatibility, or reference the Augment3d Reality Support field in the app's About menu.*

Running Augment3d

Natively

Eos Family devices that meet the *Hardware and Software Requirements* can run Augment3d natively via *Augment3d [Tab 38]*.



On Eos devices running Augment3d natively, including ETC Puck, Augment3d render quality is limited to Low or Medium.

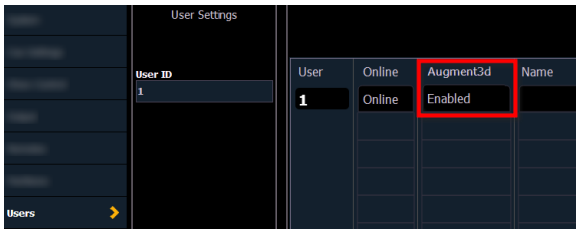
Augment3d Tether

You can also run Augment3d on a separate Windows or macOS computer, connected to a console using Augment3d Tether, one of the *Eos Device Roles*. Augment3d tether is an extension of the console it is connected to, rather than a standalone client. An ETCnomad dongle is not required for Augment3d tether.

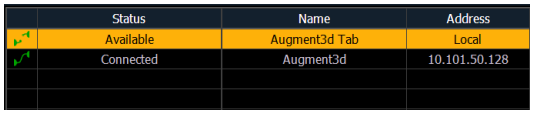
The setup for this mode is identical to that of an ETCnomad client computer in a networked system of consoles.

1. Ensure the computer is running the version of ETCnomad that matches the software version installed on the connected console.

2. On the console, enable Augment3d for your user number. In the CIA, navigate to **Setup > System > Users**.



3. Connect your computer using an Ethernet cable through a network switch. Ensure that the computer's network information is in a compatible range with the console.
4. Launch ETCnomad and select **{Augment3d Tether}**. Augment3d will launch in its own window, and try to connect to the console.
5. Choose the correct tether device on the console (see **Setup > Device >** *Augment3d*).



To exit tether mode, click the **{X}** in the corner. To exit when in Edit mode, choose **File > Exit**.

Tether Command Line

A command line can be displayed on the tethered device, which will mirror the command line on the connected console.

With the keyboard button toggled on, both Eos and Augment3d commands will be sent from the tether to the console. When toggled off, only Augment3d commands will be sent.

Click the **{X}** to disable the tether command line entirely, or toggle it from **Window > Command Line**.

Note: *On macOS, the **Window** menu is only accessible via Augment3d Edit Mode.*

Standalone ETCnomad

Augment3d can be run on Windows or macOS in a local tab as part of ETCnomad v3.0.0 and later, and used without a connected Eos device. Once ETCnomad v3.0.0 or later is installed, no additional installation is necessary.

Augment3d Terms

The following are specific terms and definitions of various features unique to Augment3d.

- **Click-To-Focus** - clicking or touching a point in the Augment3d model to perform XYZ programming on that point.
- **Control Mode** - the default display mode of Augment3d. Allows for visualization and navigation of your model, fixtures, and objects.
- **Edit Mode** - an alternate Augment3d mode. Allows for editing and configuration of your model's scenery and objects.
- **Find Me** - using aRFR/iRFR to perform XYZ programming aimed at the mobile device.
- **Focus Wand** - using aRFR/iRFR to perform click-to-focus.

- FPE - Fixture Position Estimation. Estimates the physical locations of fixtures based on fixture profile information and user-provided focus palettes.
- Origin - a known location in your space, represented as the intersection of the XYZ axes (0,0,0), that acts as a reference point for the measurements of the rest of your Augment3d model.
- Pan / Tilt Kinematics - an aspect of a fixture profile that turns DMX values into a direction the beam is pointing.
- Model - the Augment3d virtual 3D space.
- XYZ Programming - telling the console to aim a fixture's beam through a particular point in virtual space.
- Zones - objects in the Augment3d model that can automatically trigger various fixture behaviors.

Navigation and Orientation in Augment3d

Keyboard

In *Augment3d [Tab 38]*, use the standard arrow keys to move the camera around the Augment3d space. In *Augment3d Edit Mode*, both the standard arrow keys and WASD keys may be used.

- W / UP - moves the camera up.
- SHIFT + W / UP - moves the camera forwards in the direction it is current facing.
- A / LEFT - moves the camera to the left.
- S / DOWN - moves the camera down.
- SHIFT + S / DOWN - moves the camera backwards in the direction it is currently facing.
- D / RIGHT - moves the camera to the right.

Tap any key to increment or decrement the camera position, or hold the key down to move smoothly.

Mouse

- RIGHT MOUSE - drag to rotate the camera to look around the model.
- CENTER MOUSE - drag to pan the camera in the current perspective.
- ALT + RIGHT MOUSE - drag for orbital control.
- CTRL + RIGHT MOUSE - drag to pan the camera in the current perspective.

Note: *Use keyboard and mouse controls simultaneously for optimal navigation control.*

Eos Snapshots

Camera view and other Augment3d settings can be saved directly to *Snapshots* for quick recall.

Reference Point Images

The Focus Wand feature in the aRFR and iRFR mobile remote apps uses unique reference point images to synchronize with Augment3d and orient the mobile device within the 3D model.

1. Print at least four AR Target images to place in your space. Images can be exported from v3.0.0 and later Eos Family software via the CIA by navigating to **File > Export >** *Augment3d Reference Point Images*.
2. Place the images at points in your space that are easily measured and encompass as much of the floor as possible. Note which image is placed where, and their orientations. Alternatively, you can place the images on FPE Points that already exist in your Augment3d model.
3. In Augment3d, either create new Reference Points at the locations you placed the images, or at the locations of existing FPE Points. Assign each point its associated image, ensuring that the image selected and its orientation match their real-world counterparts.
4. Scan the images using Focus Wand to synchronize your mobile device with Augment3d.

For more information, see the *aRFR / iRFR Setup Guide*.

Augment3d [Tab 38]

Open a new tab and select **{Augment3d}** from the Displays list of the *Workspace Layout Menu*, or with **[Tab] & [3][8]**.

Control mode is the default Augment3d view, allowing for visualization and navigation of your space, fixtures, and objects.

Collectively, the Augment3d virtual environment is referred to as the model. All fixtures and objects must be part of the model in order to be configured.

A *Tether Command Line* can be toggled on or off in control mode on a connected Augment3d tether.

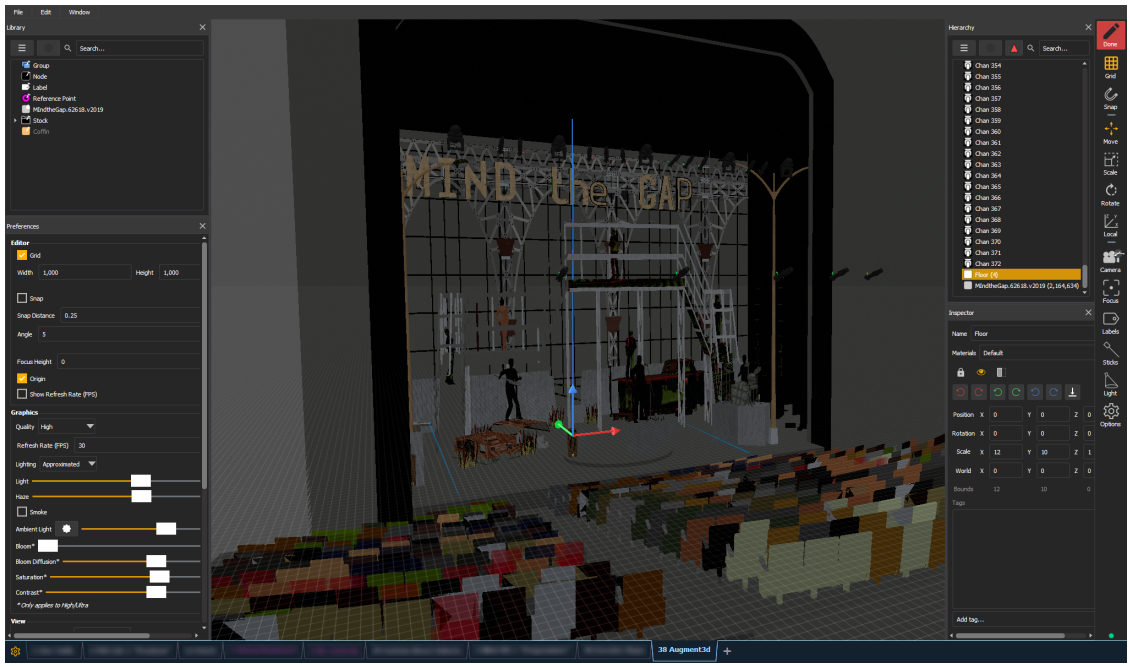
Toolbar

Limited toolbar options are available in control mode:

- *Camera Tool*
- *Focus Tool*
- *Labels Tool*
- *Sticks Tool*
- *Light Tool*
- *Options Tool*

Augment3d Edit Mode

Edit Mode is the secondary Augment3d view, allowing for editing and configuration of your model's scenery and objects.

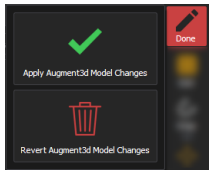


Surrounding the central workspace are primary windows to assist in fixture and object manipulation: the Library, Materials, Preferences, Hierarchy, and Inspector. These windows can be freely dragged, rearranged, re-sized, and closed.

Using Edit Mode

To enter Edit Mode, press the **{Edit}** button in the upper-right corner.

Note: *Only one console in a multi-console system can be in Edit Mode at a time.*



To exit Edit Mode, select **{Done}**. Choose whether to apply the changes you have made to the Augment3d model, or revert them and exit without saving changes.

In a multi-console system, only one console can edit the Augment3d model at once. If a connected console is already in Edit Mode, the option to force revert changes appears. This option will revert all changes made by the console currently in Edit Mode and exit all consoles from Edit Mode. It is not possible to undo or recover reverted changes.

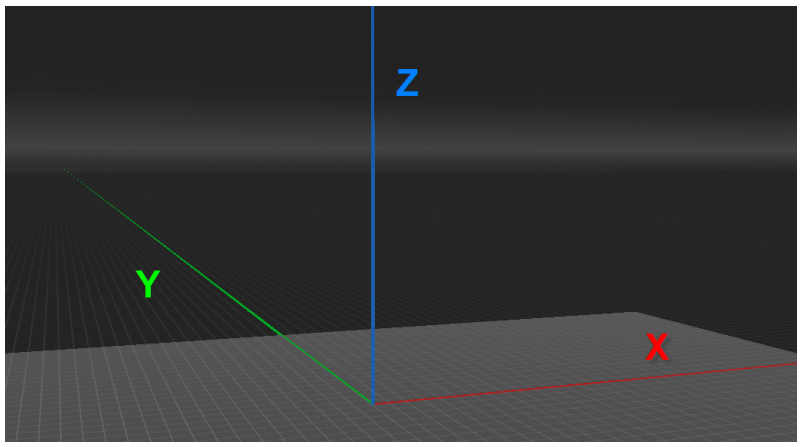
CAUTION: ***Do not use Eos Undo operations via the command line while editing an Augment3d model, as it can alter your show data unexpectedly. Full Undo options for Augment3d will be implemented in a future Eos software release.***

Editing Fixture Position and Rotation

Any changes made to the XYZ coordinates of a patched channel in Augment3d will instantly update the values in *Patch > Augment3d*. Similarly, any change made in Patch will be immediately reflected in Augment3d. XYZ changes to patched channels are independent from changes to the XYZ position of Augment3d objects and scenery, and are not saved or reverted with other Edit Mode changes.

XYZ & Origin

In Edit Mode, Augment3d models are arranged around three axes; horizontal X (red) and Y (green), and vertical Z (blue).

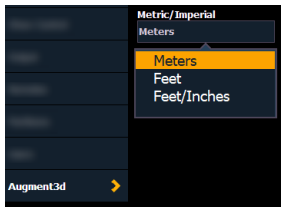


The point at the intersection of these axes (0,0,0) is the origin. This virtual point in Augment3d must correspond to a real point in your space, ideally on the floor. This could be in the center of your stage, in a corner, or any convenient point.

All other measurements in Augment3d reference the origin. To improve the accuracy of your model, choose a physical point that is easily accessible for measurements.

Units

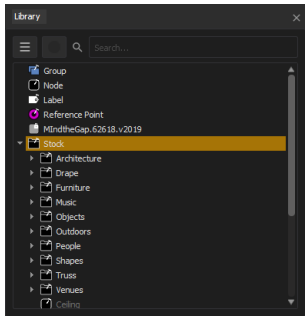
By default, Augment3d measures distance in metric (meters). This can be changed in **Setup > System > System >** *Metric / Imperial*.



Available options are meters, decimal feet, or feet and inches.

Library

The Library contains all of the non-fixture items in an Augment3d project and comes preloaded with a large number of stock objects for your convenience. You can also import your own by *Importing Augment3d Objects*.



Drag objects to add them from the Library into your model at the origin. Use the Search function to quickly locate specific items. Create folders from the dropdown to organize Library items.

Library Items

Objects

Any *Augment3d Objects* contained in the Stock folder can be added to an Augment3d model.

Any custom objects imported into Eos will also appear here.

Nodes

Nodes can be associated with one or more Augment3d objects in the *Hierarchy*. This allows those objects to be controlled together; for example, as patched *Scenic Elements*.

Scenic elements can be given intensity values, moved, rotated, etc. This allows you to change the visibility and position of Augment3d objects using cues, submasters, and so on.

Groups

A group is an Augment3d object designed to be the parent of other objects which have their own unique coordinates. Fixtures that have a group parent will display their relative coordinates in Patch.

A group cannot be scaled, but can be moved and / or rotated. Moving or rotating the group node will move or rotate all of its child objects.

Zones

Augment3d Zones are objects in the Augment3d model that can automatically trigger various fixture behaviors.

Labels

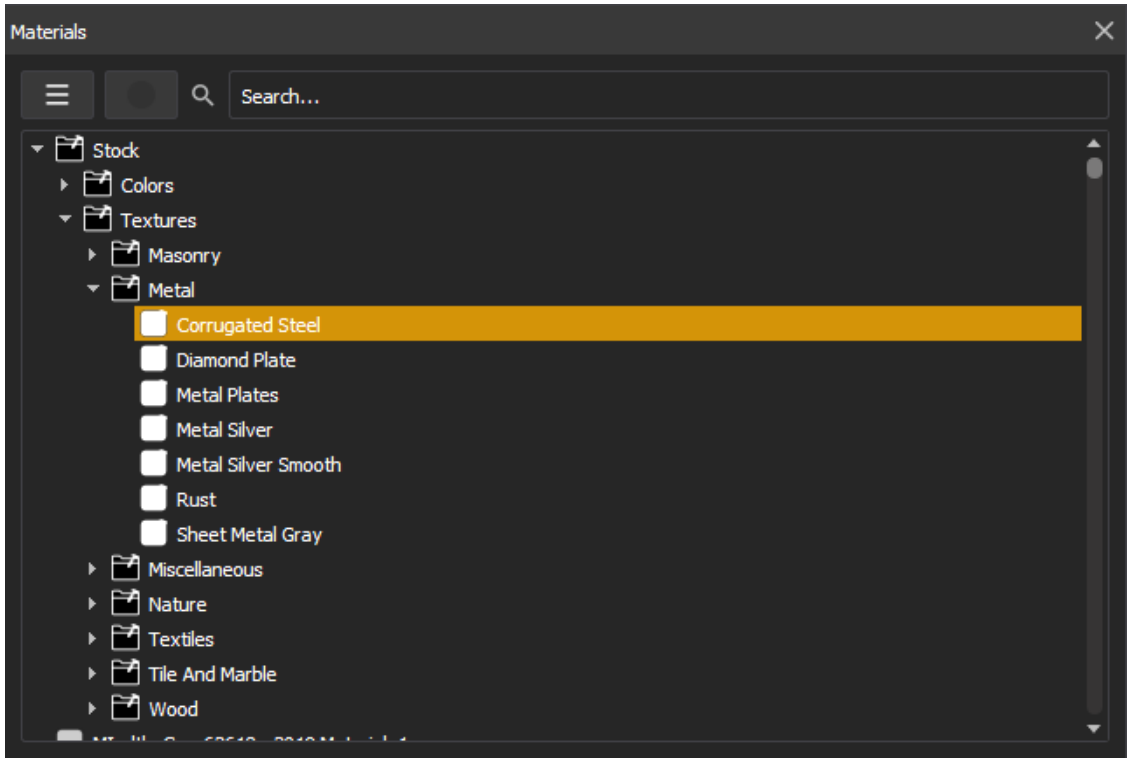
Labels are floating text that can be positioned anywhere in your Augment3d model.

Augment3d Materials

Materials in Augment3d are collections of assets that can be applied to objects. Materials can affect aspects of an object's appearance like color, texture, reflectiveness, and so on.

CAUTION: ***Augment3d materials are referenced data, meaning any material edits will be reflected across all objects with those materials applied.***

Materials Library

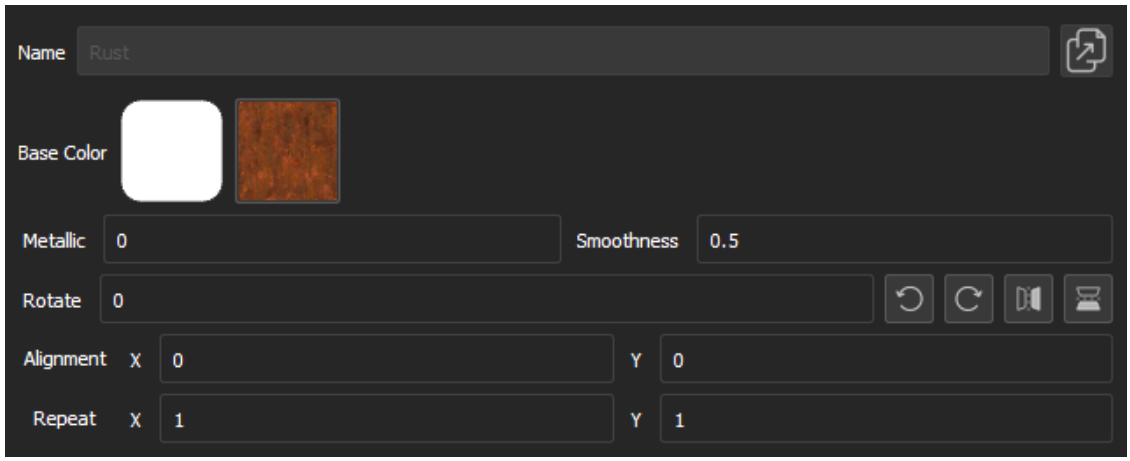


Navigating to **Window > Materials** will open a window with the materials library, containing all stock materials, along with any you have created or imported.

Stock materials cannot be edited or deleted. To alter a stock material, duplicate it and make changes to the copy.

Search for materials using the search bar. The dropdown menu allows you to create folders for further organization, or create new materials.

Materials can be dragged from the materials library into the Augment3d scene, and dropped onto objects or object subcomponents to apply the material directly.



Selecting a material in the library will display the following options:

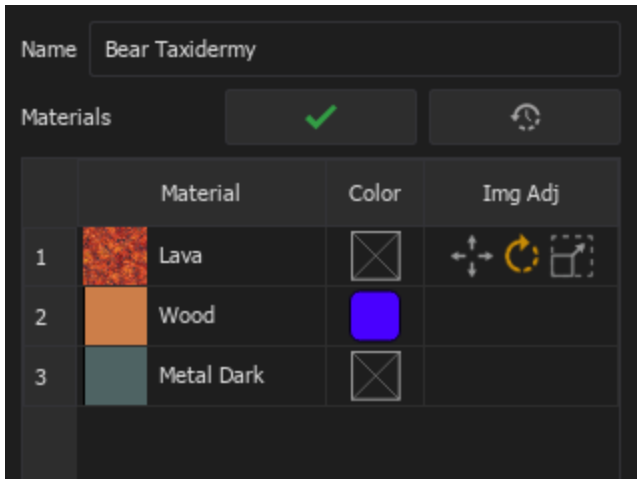
- **Name** - the name of the material.
- **Duplicate** - this button creates a copy of the selected material.
- **Base Color** - the underlying color used for the material.
- **Base Color Image** - the texture for the material. If transparent, the base color will show through.

Color materials only contain a base color. Texture materials have an additional base color image, for which the following properties are available:

- **Metallic** - adjusts the reflectiveness between dielectric / absorbing some light (0) to pure metal / reflects all light (1).
- **Smoothness** - adjusts the texture between roughest (0) and polished (1).
- **Rotate** - rotates the base color image in degrees.
  - Quick buttons are also available to rotate the material 90° CCW and CW, mirror left/right, and mirror top/bottom.
- **Alignment** - changes the texture's alignment on the object along the X and Y axes of the object's UV map (-1.0 to 1.0).
- **Repeat** - alters the texture's size by setting how many times it repeats along the X and Y axes between fewest repeating patterns (1) and most repeating patterns (100).

Accurately editing the properties above may rely on knowing the UV mapping of an object, the 2D representation of how materials are applied to the 3D surface. To aid in this, duplicate the stock UV Map texture (**Stock > Textures > Miscellaneous > UV Map**) and temporarily apply it to your object to see the stock mapping. Edit the properties above to test how your changes will be applied to the object with a different texture.

Materials in the Inspector



Selecting an object in the *Hierarchy* will display associated information in the *Inspector*. Selecting in the **Materials** field will show a list of all materials currently applied to that object.

Complex objects can be expanded to view and edit the materials for the object's component parts.

Select a material to open a dropdown version of the materials library, where new materials can be selected. New colors can quickly be added using the color picker and material name options from the color column. Materials with image assets have additional adjustment options to alter image alignment, rotation, and scale for the selected object.

To save changes and close the materials list, use the checkmark icon. To revert changes, use the counterclockwise icon.

Importing Materials

Custom materials can be imported into Augment3d with **File > Import > Augment3d Scenic Materials** in the browser, or from Augment3d Edit Mode via **File > Import to Library > Import 3D Model**. If a tether and a console are connected, objects must be imported via Augment3d Edit Mode on the tether device. A confirmation will appear for successful imports.

CAUTION: ***Custom materials must be applied to an object in order to be saved with the show file. Custom materials not applied are shown in darker text and will be deleted upon shutdown of Augment3d.***

Custom materials can be created by adding images of the following formats to a zipped folder:

- JPG
- PNG
- SVG
- SVGZ
- WEBP

The images must match the following naming conventions:

- **Base Color image** - filename_base_color.jpg/png
- **Normal Map image (optional)** - filename_normal_map.jpg/png

If a map image is not included, the stock mapping will be used.

Additional materials resources are also available on the ETC website, etcconnect.com.

Augment3d Preferences

Preferences contains all the settings for your Augment3d model.

Note: *Many of these options can also be changed from the Augment3d Toolbar.*

Editor

Grid

Toggles the grid on or off. Also available in **Toolbar > Grid**.

Snap

Toggles object placement snapping to the grid on or off. Also available in **Toolbar > Snap**.

Snap Distance

Sets the distance increment for the spacing of the grid, along with object placement snapping (in the chosen global unit).

Angle

Sets the angle increment for object placement snapping (in degrees).

Focus Height

Sets the Focus Height offset. Also available in **Toolbar > Focus**.

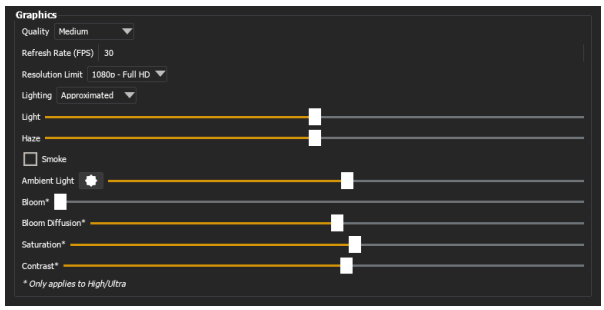
Origin

Toggles the origin point marker on or off.

Show Refresh Rate

Toggles visible frame rate monitoring on or off.

Graphics



Quality

The following graphics quality options are available:

- **Low** - no realtime lighting, simple beam indicator, low-texture resolution, no anti-aliasing, no shadows
- **Medium** - realtime lighting, low beam quality, medium-texture resolution, no anti-aliasing, no shadows
- **High** - realtime lighting, medium beam quality, high-texture resolution, anti-aliasing, medium-resolution hard shadows
- **Ultra** - realtime lighting, high beam quality, high-texture resolution, anti-aliasing, high-resolution soft shadows

On Eos Family consoles, Augment3d render quality is limited to Low or Medium. A tethered computer is required for High or Ultra.

Also available via **Toolbar** > *Performance Indicator*.

Refresh Rate (FPS)

The maximum refresh rate attempted by Augment3d. By default, this is set to 30 frames per second. This can be adjusted higher or lower in a range from 5 - 60 FPS, but will be ultimately limited by the graphics processor on the device running Augment3d. Also available via **Toolbar** > *Performance Indicator*.

Resolution Limit

Note: *This option is only available for Eos Apex consoles and ETCnomad on Windows and macOS.*

Sets the Augment3d resolution. The following options are available:

- **2160p - 4K**
- **1440p - 2K**
- **1080p - Full HD**
- **720p - HD**
- **480p**
- **360p**
- **240p**

Defaults to 1080p. Lower resolutions may result in improvements to Augment3d performance. Also available via **Toolbar** > *Performance Indicator*.

Lighting

Sets the lighting mode. The following lighting options are available:

- **Pass-Through** - light passes through objects. Least resource-intensive.
- **Approximated** (default) - light will pass through an object if all corners of the beam do not hit that object. Moderately resource-intensive.
- **Realistic** - accurately-modeled light. Most resource-intensive.

Note: *Console output will stay consistent regardless of Augment3d performance.*

Also available via **Toolbar** > *Performance Indicator*.

Light

Sets the overall intensity of the simulated light. Also available via **Toolbar > Light**.

Note: *This only affects the intensity of the simulated light beams in Augment3d, not the intensity values of the fixtures themselves.*

Haze

Sets the overall haze level. Also available via **Toolbar >** *Light Tool*.

Smoke

Toggles animated haze smoke particles on or off.

Ambient Light

Sets the color and level of ambient light. Also available via **Toolbar >** *Light Tool*.

Bloom*

Controls the amount that simulated light in the scene reflects on objects to make them glow. Also available via **Toolbar > Light**.

Bloom Diffusion*

Adjusts the concentration of the bloom effect. Also available via **Toolbar >** *Light Tool*.

Saturation*

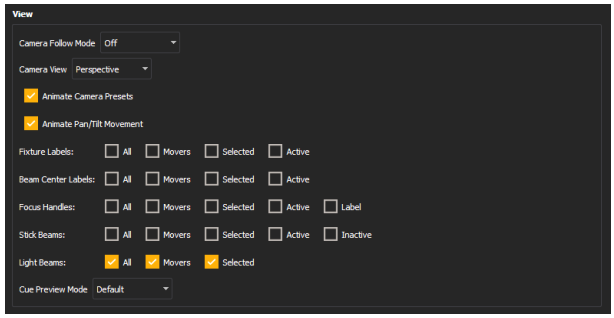
Sets the overall saturation of colors in the Augment3d model.

Contrast*

Sets the overall contrast of the Augment3d model.

Note: *Settings marked with an asterisk (*) are only applied in High and Ultra quality settings.*

View



Camera Follow Mode

Toggles Camera Follow Mode between Off and Fixture POV, which switches the camera view to that of the first selected fixture. Also available in **Toolbar > Camera**.

Camera View

Toggles between Perspective and Orthographic view. Also available in **Toolbar > Camera**.

Animate Camera Presets

Toggles animation while moving between camera presets.

Animate Pan/Tilt Movement

Toggles animation of automated fixtures. Also available in **Toolbar > Focus**.

Fixture Labels

Toggles labels over the fixture body for all, automated, selected, and / or active fixtures. Also available in **Toolbar > Labels**.

Beam Center Labels

Toggles labels in the center of the simulated beam for all, automated, selected, and / or active fixtures. Also available in **Toolbar > Labels**.

Focus Handles

Toggles beam-end handles for all, automated, selected, and / or active fixtures, and text labels for each handle. Also available in **Toolbar > Labels**.

Stick Beams

Toggles Stick Beams for all, automated, selected, active, and / or inactive fixtures. Also available in **Toolbar > Labels**.

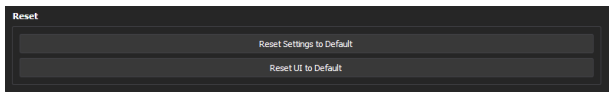
Light Beams

Toggles beams for all, automated, or selected fixtures. Also available in **Toolbar > Light**.

Cue Preview Mode

Toggles Cue Preview between Default (off) and Pending Cue. Pending Cue mode allows Augment3d to display a virtual preview of the look used in the next upcoming cue. Also available in **Toolbar > Options**.

Reset



Reset Settings to Default

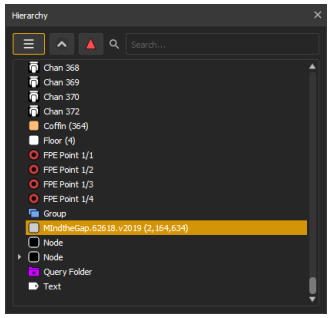
Resets all settings in Preferences back to defaults.

Reset UI to Default

Resets the Augment3d window size and layout back to defaults.

Hierarchy

The Hierarchy lists the objects and fixtures currently in your Augment3d model. This includes all objects that have been manually added and all fixtures automatically added via Patch.



The dropdown menu allows you to add query folders, as well as the option to create new objects and groups without using the Library.

The search bar allows you to search for objects by name or tag. This is useful for editing large, complicated models, which can have hundreds of objects and fixtures.

Right-clicking a hierarchy object allows you to change its color swatch.

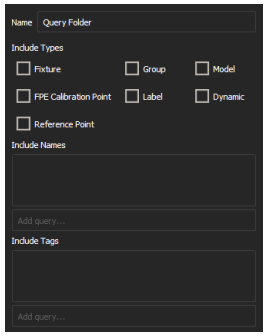
Note: *Color swatches are for identification only, and do not alter the color of the associated object.*

Groups

To create a new group, use the dropdown menu to add a new group folder. Items added to this folder from elsewhere in the hierarchy will be considered part of the same group, and can be moved, scaled, and rotated in unison. To remove an item from the group, remove it from the folder.

Query Folders

Query folders are smart folders that update their contents automatically. Once a query folder is created from the Hierarchy, the *Inspector* will display options for the folder.



Available options are:

- **Include Types (Fixture, Group, Model, FPE Calibration Point, Label, Dynamic, Reference Point)** - toggling any combination of these options will include all objects of that type in the folder.
  - Dynamic objects (currently Pipes, Trusses, and Curtains) proportionally adjust to scaling.

- Include Names - includes all objects of a specific name in the folder.
- Include Tags - includes all objects with a specific tag in the folder.

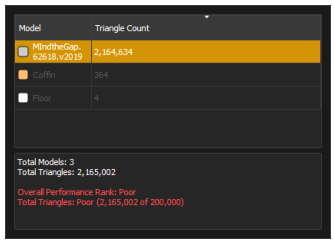
Refining Query Folders

You can further refine the Names and Tags options using wildcards. An asterisk (*) will replace multiple characters, and a question mark (?) will replace single characters. For example, three Person 1 objects have been added to the model, named "Alex," "Chris," and "Kim." A search for "*i*" will return Chris and Kim, (which both contain an "i"), while a search for "?i?" will only return Kim, the only three-character option containing an "i."

Sorting and Reordering

Use the Sort button next to the dropdown button to organize the contents of the Hierarchy between A-Z, Z-A, and unsorted. In unsorted mode, Hierarchy objects can be freely dragged and reordered. This order is temporarily stored, but may not be maintained.

Triangle Count



This button provides an overview of the objects using the most triangles, along with information about their impact on Augment3d. Reducing the number of triangles used in a model will improve processing performance.

Nesting Objects

Nesting objects within the Hierarchy associates multiple "child" objects with a "parent," allowing you to create sets of objects that can be moved, shown, and hidden in unison. Nest objects to a Scenic Element or Scenic Element Movable Channel so that they can be moved, shown, and hidden during cue playback.

To nest objects, select the desired child objects in the Hierarchy by clicking while holding SHIFT (for consecutive objects) or CTRL (for individual objects). Once selected, simply drag them over the parent object in the Hierarchy and release when the parent is highlighted to nest them underneath. Select and drag child objects out from under their parent to separate them again.

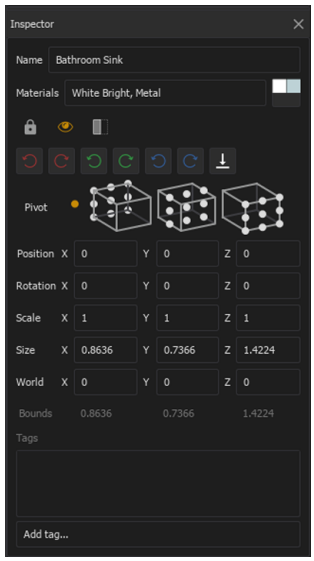
Position, Rotation, & Scale data for nested objects is relative to their parent, rather than the world position.

Expanding and Collapsing Objects

Complex objects added to the Hierarchy may be expanded into a series of nested objects by right-clicking on them and choosing "Expand." Child objects may be selectively recombined by right-clicking a child object at any level and choosing "Collapse."

Inspector

The Inspector window contains a variety of controls for modification of any selected objects.



Name

Sets the name for the object.

Materials

Allows you to edit the *Augment3d Materials* assigned to the object. A preview of the applied material or a mosaic of multiple applied materials is shown to the right.

Lock

Locks objects to prevent them from being altered in the Inspector.

Note: *Locked objects may still be moved, scaled, or rotated by selecting them in the Hierarchy.*

Visibility

Controls object visibility in the Augment3d scene.

Focus

Sets object focus behavior between the following options:

- Always Focus - if this object is clicked on, it is used as the point for click-to-focus.
- Never Focus - this object is ignored when using click-to-focus.
- Selective Focus - object is used as the point for click-to-focus. If CTRL is held while clicking, the object is ignored.

Rotation

These icons rotate the selected object counterclockwise (CCW / left) or clockwise (CW / right) about the X, Y, and Z axes respectively.

Move to Ground Plane

Aligns the selected object with the ground plane of the Augment3d model.

Pivot

Allows you to determine the point around which the selected object rotates. Select one of the white dots to choose it as the new pivot point. The standalone dot on the left is the object's default pivot point, usually defined by the software the object was created in.

Position, Rotation, & Scale

Allows you to manually enter the position, rotation, and scale data for the selected object. Values can be adjusted by typing in the corresponding box, or by dragging left or right on the box labels.

Position refers to the physical location where the item is placed in the space in relation to the origin, if the item is not nested to any other object. If the item is nested to another object, the position data represents the physical location where the item is placed in relation to its parent's origin.

World

Information about the world position and size of the selected object. The world position is always the physical location where the item is placed in the Augment3d scene in relation to the origin of the model. Values can be adjusted by typing in the corresponding box, or by dragging left or right on the box labels.

Bounds

Information about the size of the selected object.

Tags

You can add tags to objects in this field. In large or complicated models, this makes them easier to search for via the Hierarchy.

Augment3d Toolbar

The toolbar contains different options for altering Augment3d fixtures and objects.

Note: *Certain tools are only available in Edit Mode. See Edit Mode Tools.*

Camera Tool

{Camera} provides several options to change your view and position in Augment3d. Reset all options to default by clicking Restore Camera Mode Defaults.

In a multi-console system, the Augment3d camera view is synced between devices assigned to the same user ID. All other Augment3d settings are set and adjusted per-device.

Home

Returns you to the default camera position. This can be updated to the current position by holding down the Home bookmark, or reset by clicking Restore View Defaults.

Bookmarks

You can record up to five custom camera positions as bookmarks. Like Home, these can be updated by holding, or reset by clicking Restore View Defaults. Updated bookmarks can be stored and recalled using Eos Snapshots that include the Augment3d tab or tether (see *Snapshots*).

Look

The Look buttons provide shortcuts to different camera positions, oriented around the current camera position.

Fit

Zooms the camera view to whatever fixtures or objects are currently selected in Augment3d.

POV

Positions the camera from the point of view (POV) of the gate of the first selected fixture. Exiting POV mode returns the camera to its previous position. When enabled, a Fixture POV symbol will overlay the Camera icon. Also available in Preferences.

Mode

Toggles between Perspective and Orthographic camera modes. In Perspective mode, objects that are further away are smaller than nearby objects. In Orthographic mode, all objects are the same scale. The field of vision (**FOV**) can be adjusted. Also available in **Preferences**.

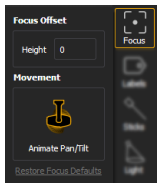
Move

Toggles between Fly and Orbit camera modes. In Fly mode (indicated by a Fly symbol overlaying the **Camera** icon), the mouse alters the angle of the camera. In Orbit mode (indicated by an Orbit symbol overlaying the **Camera** icon), the mouse moves the camera around a center point. Movement is still possible via keyboard controls in either mode. Hold ALT to temporarily reverse the behavior.

Video Streams

Allows you to overlay available video streams on your Augment3d camera view. Options are configured via **Setup > System > Video Streams >** *{Video Stream Pixel Maps}*.

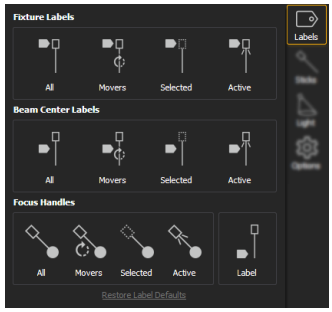
Focus Tool



Provides options to edit the Focus Offset height and toggle automated fixture animation on or off. LEFT MOUSE + CENTER WHEEL will also adjust the height. Also available in **Preferences**.

Labels Tool

Labels provides options to toggle various informational overlays on or off. Reset all options to default by clicking **Restore Label Defaults**. All label options are also available in **Preferences**.



Fixture Labels

Toggles labels overlaying fixture bodies for all, automated, selected, and / or active fixtures.

Beam Center Labels

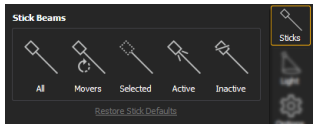
Toggles labels overlaying fixture beams for all, automated, selected, and / or active fixtures.

Focus Handles

Toggles focus handles for all, automated, selected, and / or active fixtures. Spherical handles may be moved to proportionally refocus automated fixtures. Cubic handles indicate a conventional fixture, but cannot be used to refocus. Labels overlaying focus handles can also be toggled.

Sticks Tool

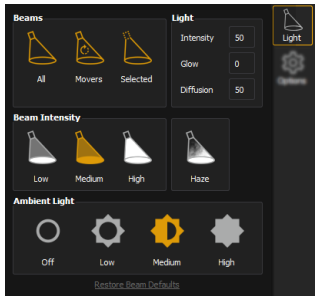
Stick beams can be toggled to see where a fixture is pointed (even if it is not currently outputting), or for differentiating between multiple fixtures focused on the same location.



Toggle stick beams for all, moving, selected, active, or inactive fixtures. Reset all options to default by clicking **Restore Stick Defaults**. Also available in **Preferences**.

Light Tool

Provides options to configure the simulated light in an Augment3d model. Reset all options to default by clicking **Restore Beam Defaults**. All light options are also available in *Graphics*.



Beams

Toggles simulated light beams for all, moving, or selected fixtures.

Light

Intensity adjusts the overall intensity of the simulated light. This option does not alter the actual intensity values of fixtures themselves.

Glow and Diffusion control the degree to which objects in the scene glow. These options only apply in High and Ultra quality.

Beam Intensity

Toggles between low, medium, and high intensity simulated beams. Toggle Haze on to increase the realism of the beams.

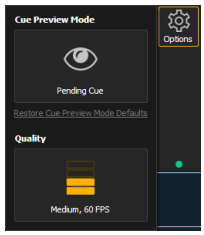
Ambient Light

Toggles between no, low, medium, and high overall ambient light levels in the Augment3d model.

Options Tool

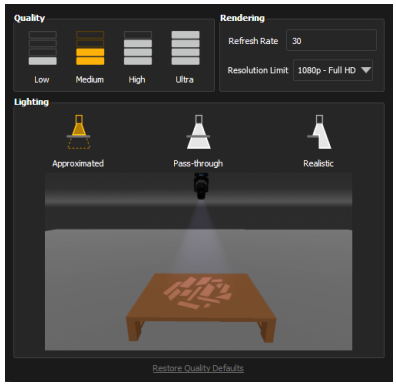
Pending Cue Mode

This mode allows Augment3d to display a virtual preview of the look used in the next upcoming cue.



Reset Cue Preview by clicking **Cue Preview Mode Defaults**. An eye will appear on the **Options** icon when in Cue Preview mode. Also available in **Preferences**.

Quality



Allows you to adjust the quality of the Augment3d render, the Refresh Rate, and the Lighting mode. Eos Apex consoles and ETCnomad on Windows and macOS allow you to set a resolution limit to improve performance. Also available in **Preferences**. See *Graphics*.

Note: *Augment3d render quality on consoles is limited to Low or Medium.*

Performance Indicator

This color-coded dot on the toolbar indicates Augment3d's current quality and performance level.

- High - 25 FPS and higher.
- Medium - 20 to 24 FPS.
- Low - 15 to 19 FPS.
- Very Low - 10 to 14 FPS.
- Poor - 10 FPS and lower.

Selecting the dot provides quick access to the quality, rendering, and lighting settings from the *Graphics* preferences menu.

Edit Mode Tools

The following tools are only available when in Edit Mode.

Grid Tool

Toggles the grid on or off. Also available in **Preferences**.

Snap Tool

Toggles object snapping to the grid on or off. Also available in **Preferences**.

Move Tool

Allows you to move objects along the X/Y/Z axes. Handles have conical ends.

Scale Tool

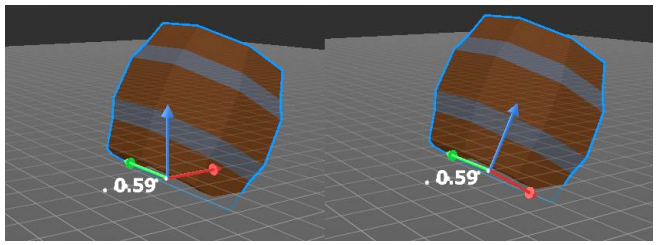
Allows you to resize objects along the X/Y/Z axes. Handles have cubic ends. Use the center handle to resize all dimensions proportionally.

Rotate Tool

Allows you to rotate objects around the X/Y/Z axes.

Local Tool

Toggles Move and Rotate object tools between global XYZ orientation and object XYZ orientation. Scale is always performed relative to the object's Local XYZ orientation.



On the left barrel, Local is toggled off, so the Move tool orients itself based on the Augment3d model. On the right, Local is toggled on, so the Move tool orients itself relative to the position of the barrel.

Fixtures in Augment3d

Fixtures must be patched in Eos and then added to an Augment3d model before they can be displayed and controlled. If you already know the position and orientation of your fixtures, you can manually add them to Augment3d through the Eos Patch screen on a channel-by-channel basis.

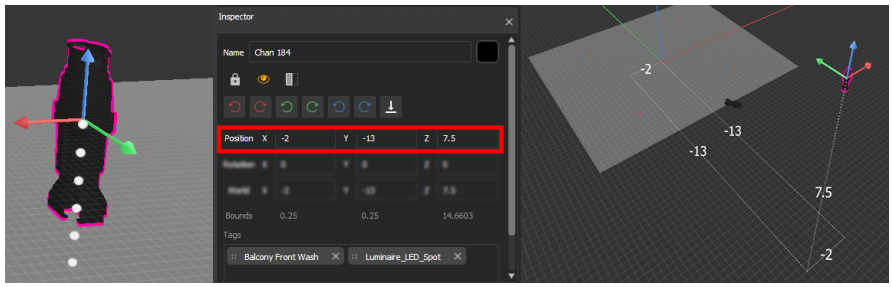
In Patch, certain fixtures will appear with a "3D" icon next to them. This symbol indicates profiles with an Augment3d model. Fixtures without the "3D" icon will use a default fixture model based on the closest fixture type. To change the model used by the fixture type, see *Physical Data Editor*.

Note: *Fixtures requiring a profile update will display with an asterisk (*). For more information, see Updating Fixture Profiles.*

Position and Orientation Data

Position

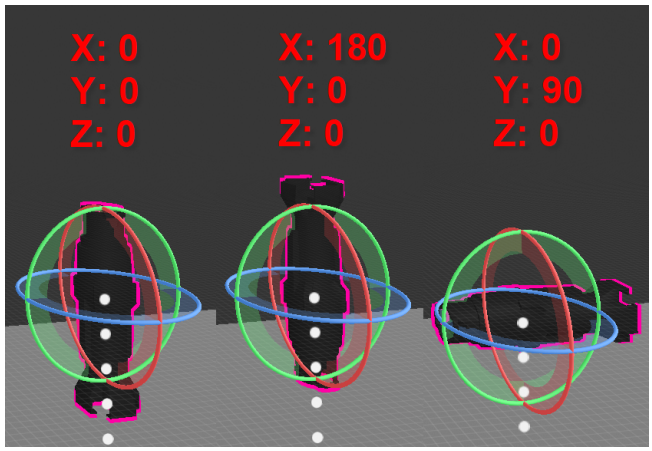
Position data is either local or world. See *Inspector*.



In the above example, the fixture patched to Channel 184 is -2 meters offset on the X axis, -13 meters offset on the Y axis, and 7.5 meters offset on the Z axis.

Orientation

Orientation data reflects how the fixture is rotated. The values for X, Y, and Z represent a rotation in degrees around that axis in relation to the global XYZ axes.



The above left example shows the default orientation of 0/0/0, or pointing straight down. The center shows a rotation of 180° about the X axis, pointing the fixture straight up. The final example shows a rotation of 90° about the Y axis, pointing the fixture to the side.

Adding Fixtures Manually

Under the Augment3d section in Patch, fixtures have fields for XYZ Position and Orientation. If the fixture is nested, this data is relative to the parent. World Position and Orientation are absolute, relative to the scene overall. If nested, an arrow indicator will appear next to the position and orientation fields. See *Nesting Objects*.

You can also edit the following additional properties:

- **Beam Angle** - set the beam angle from 1-179 degrees
  - 0 will reset back to the default (36 degrees) and clear the field
- **Shutters** - see *Shutter Graphic* .
- **Gobo Rotate** - set the gobo rotation
- **Beam Edge** - set the beam edge from 0-100 (empty/default is 50)
- **FPE Set** - see *FPE Sets*.
- **Hide Beam** - when enabled, the fixture's beam will not appear in Augment3d

Entering Fixture Position & Orientation Data

Select the channel of a fixture for which you have position and orientation data, and navigate to the Position & Orientation section of the Augment3d tab in Patch. Selecting one of the position or orientation fields opens a keypad to input specific values.

Alternatively, keyboard syntax can be used. Use **[/]** to separate X, Y, and Z when typing in multiple values, and **[Thru]** to enter information for multiple fixtures at once.

- **[Chan] [1] [Select] [5] [/] [5] [/] [5] [Enter]** sets the position of Channel 1 to 5,5,5.
- **[Chan] [1] [Select] [/] [2] [/] [Enter]** sets the Y coordinate of Channel 1 to 2. No changes are made to the X and Z coordinates.
- **[Chan] [1] [Select] [+] [3] [/] [/] [Enter]** adds 3 to the current X coordinate of Channel 1. No changes are made to the Y and Z coordinates.
- **[Chan] [1] [Select] [+] [/] [1] [/] [-] [5] [Enter]** adds 1 to the current Y coordinate of Channel 1, and subtracts 5 from the Z coordinate. No change is made to the X coordinate.
- **[Chan] [1] [Thru] [5] [Select] [0] [/] [0] [/] [5] [Thru] [10] [/] [10] [/] [5] [Enter]** sets the position of Channel 1 to 0,0,5 and the position of Channel 5 to 10,10,5. The positions of Channels 2, 3, and 4 are evenly distributed between the two.
- **[Group] [10] [Select] [5] [/] [/] [Thru] [10] [/] [/] [Enter]** distributes the X coordinate of all channels in Group 10 between 5 and 10. No changes are made to the Y and Z coordinates.

All trailing slashes are optional. **[Chan] [1] [Thru] [10] Position [5] [Thru]** auto-completes to **[Chan] [1] [Thru] [10] Position [5] [/] [*] [/] [*] [Thru]**.

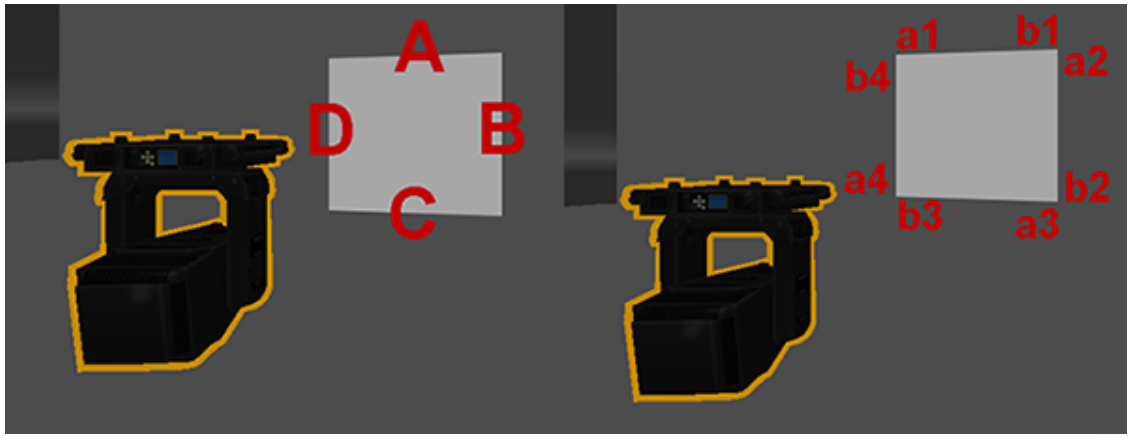
The corresponding fixture is automatically added to the Augment3d model. Repeat the process for any additional channels or fixtures, or edit fixture position and rotation using tools available in the toolbar or the Inspector.

Position [@] [Enter] will remove the pose (position and orientation) of the selection.
Orientation [@] [Enter] will reset the orientation of the selection to (0,0,0).

Shutters

If you have a fixture with shutters, they must be configured in the *Fixture Editor* to display accurately in Augment3d.

1. First ensure that the fixture is hung base up and that pan and tilt are moving the fixture in the correct directions. If not, correct these before continuing.
2. Adjust tilt to +90° or until the fixture is pointing at a wall.
3. Set the frame assembly angle near the mid-range so that the shutters form a square.



Standard shutter controls are now normalized relative to the square so that A controls the top edge, with controls B, C, and D continuing clockwise in that order.

Pushrod-style shutter parameters are normalized so that frame a1 corresponds to the counterclockwise side of the top edge and b1 to the clockwise side, with frames a2, b2, a3, b3, a4, and b4 continuing clockwise in that order.

Moving Mirrors

If your fixture has a moving mirror accessory, it must be patched to a two-part channel, with P1 patched to an address as a dimmer and P2 as a moving mirror accessory.

Chan		Address	Type	Position	Orientation	..
1	P1	1	Dimmer	(1, 2, 3)	(4, 5, 6)	..
	P2		Moving Mirror			
2						
3						

Position and orientation data for the fixture can only be added and edited in P1. Attempting to add position and orientation data to the entire channel will return a syntax error. The moving mirror can be controlled via the pan and tilt parameters for P2.

Regardless of the fixture and mirror type, the model will display in Augment3d as a Source Four with a generic mirror.

Editing Fixture Position and Rotation

Fixture position and rotation can also be edited in *Augment3d Edit Mode* using tools available in the toolbar or in the *Inspector*.

Any changes made to the XYZ coordinates of a patched channel in Augment3d will instantly update the values in *Patch > Augment3d*. Similarly, any change made in Patch will be immediately reflected in Augment3d. XYZ changes to patched channels are independent from changes to the XYZ position of Augment3d objects and scenery, and are not saved or reverted with other Edit Mode changes.

Setting Orientation for Conventional Fixtures in Patch

The Orientation property for conventional (non-automated) fixtures is used to aim static lighting fixture at the correct point.

1. Navigate to **Patch**.
2. Select conventional fixtures via the command line, or by selecting them in Augment3d. The fixtures will light up to indicate their selection.

> **Note:** *You do not need to enter Augment3d Edit Mode to select fixtures.*

3. Aim the fixtures at their intended target using a long selection, or SHIFT + left mouse.

Importing Fixtures for Augment3d

Fixtures can also be manually added by importing them into Augment3d object library *Browser* via **File > Import > MVR / Capture Model**. This option supports both MVR and GITF file formats. See *Supported 3D File Formats*.

Import Options and Mapping

When importing certain file types, you will likely need to adjust the data before proceeding.

Options

The following options are available:

- **Merge Augment3d Scenery (#)** - MVR files can also include 3D model data. If this option is enabled while Augment3d is running, any 3D scenery in the source file will be merged into Augment3d. Disabled by default. The number in parentheses indicates the total amount of 3D objects in the file. If Augment3d isn't running, or running on a tethered device, a notification will prompt you to open *Augment3d [Tab 38]* to merge scenery.
- **Starting / Ending Channel** - defines a specific range of channels to be imported.
- **Overwrite** - overwrites the data in the show file when enabled, and merges the data when disabled. Disabled by default.
- **Update fixture types** - enables or disables the update of fixture types in the show file. Enabled by default.
- **Only import Augment3d XYZ location** - enables import of just Augment3d location data. Disabled by default.
- **Only Import Text/Notes/Labels/Gels** - enables import of just the patch database text. Disabled by default.

Mapping Fields

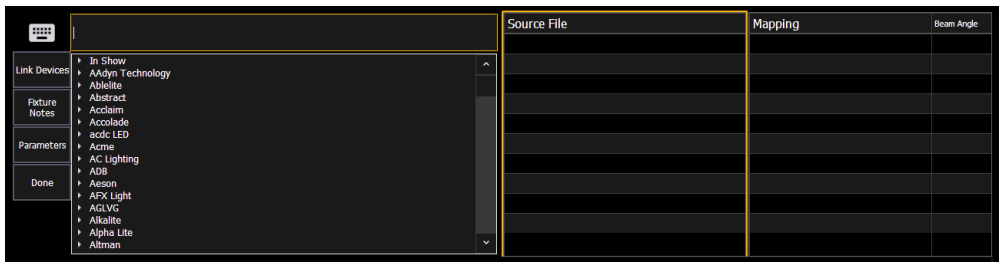
You can map Eos patch fields to fields in the source file being imported. Channel and Address are required; any other field can be ignored if desired. Options can be selected again for placement in multiple fields.

Address Formats

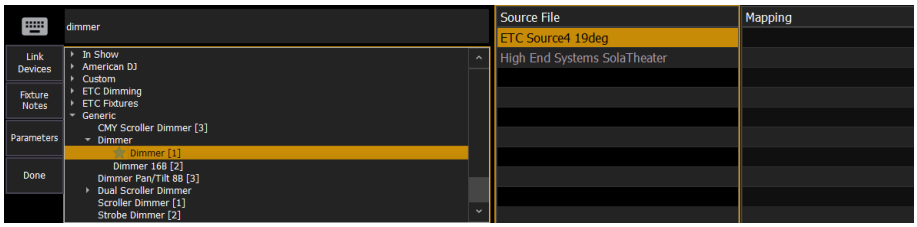
Eos can import addresses in both absolute and port/offset format. For example 513 or 2/1 are both valid formats for importing the first address of the second DMX universe. Eos will convert all formats to n/n.

{Map Devices}

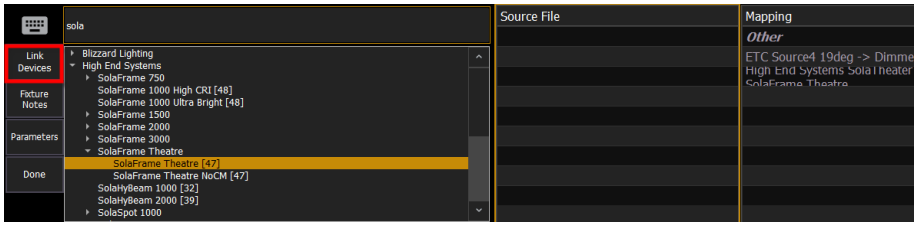
You can also map Eos fixture library devices to devices in the source file.



1. Select **{Map Devices}** to open the mapping utility.
2. Select a device from the Source File column and choose its matching Eos fixture profile. Multiple devices can be selected at a time.



3. Select **{Link Devices}**.



4. Repeat steps 2 and 3 until all devices have been associated with fixture profiles. To unlink a device, select it in the Mapping column and select **{Unlink Device}**.
5. When complete, select **{Done}**, then **{OK}**. Your devices and their associated position information will now appear in Patch and Augment3d.

Chan	Address	Type	Label	Position	Orientation
1	1/1	Dimmer			
2	1/2	Dimmer			
3	1/3	Dimmer			
4	1/4	Dimmer			
11	2/1-47	SolaFrame Theatre		(-3.0504, 0.079, 6.096)	(0, 0, 0)
12	2/51-97	SolaFrame Theatre		(-1.38, -0.291, 6.096)	(0, 0, 0)
13	2/101-147	SolaFrame Theatre		(0.2903, -0.9226, 6.096)	(0, 0, 0)
14	2/151-197	SolaFrame Theatre		(1.9607, -0.291, 6.096)	(0, 0, 0)
15	2/201-247	SolaFrame Theatre		(3.631, 0.079, 6.096)	(0, 0, 0)

Device mapping and import fields are saved with the show file.

Vectorworks Import Support

Eos 3.2.0 and newer utilize Vectorworks' MVR export to move model and fixture data, and require Vectorworks 2023 Service Pack 3 or later. Older versions of Eos use generic 3D exports from Vectorworks for models, and an ETC-made plug-in for fixture data.

For legacy installation instructions, see Appendix > Vectorworks Augment3d Plug-in.

Fixture Position Estimation (FPE)

If you don't know the position and orientation of your fixtures, Eos can automatically configure the location and orientation of automated fixtures in Augment3d using a process called Fixture Position Estimation (FPE). FPE associates four or more points in your space with corresponding Focus Palettes in order to estimate the location and rotation of your automated fixtures.

If you are setting up your fixtures for the first time, it is generally easier to choose FPE points first and then record Focus Palettes for each one. However, if you have existing Focus Palettes it may be possible to use those focus locations for your FPE points instead.

FPE Points

Each point is a known physical location in a space, measured in relation to the *XYZ & Origin*. It is recommended to choose at least four points on the floor encompassing the origin and as much of your space as possible.

For best results, the four points should be on the same plane (have the same Z coordinate). If differing Z coordinates must be used, list the points in a clockwise direction from the point of view of the fixtures. While four points is the minimum requirement, additional points may increase FPE accuracy.

1. Determine the X and Y coordinates of these points by measuring outwards from the origin point.

Once you have your points chosen and measured, enter the coordinates for each point.

2. Navigate to the Eos Patch screen. Click the Augment3d tab and select the FPE section.
3. Enter the measured coordinates of each point. Augment3d will automatically place an FPE Point at each location.

Updating XYZ coordinates in Patch will alter the FPE Point's location in the Augment3d model.

An error will appear if the points chosen are suboptimal. For help, see *Troubleshooting FPE*.

Focus Palettes

Once you have chosen, measured, and entered the coordinates of your points, associate each point with a Focus Palette.

1. Focus your fixtures at one of your FPE points and record a Focus Palette.

Note: *Fixture beams must be centered on the FPE point. Focusing fixtures one at a time, sharpening the beam edge, and narrowing the iris to create a smaller-sized beam may help you center the beam. Using a gobo with an easily-identifiable center point (such as a crosshair) may also help.*

---

2. In Patch, enter the Focus Palette number into the "FP#" column that corresponds with the point on which you focused.
3. Repeat this process until all your FPE points have associated Focus Palettes.

This association between FPE Points and Focus Palettes is crucial to the accurate rendering of fixtures in Augment3d.

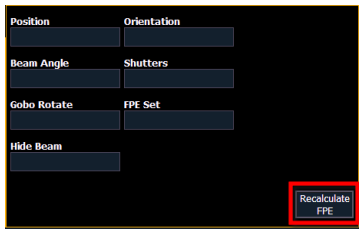
FPE Sets

If multiple sets of FPE calibration data are needed, FPE Points can be arranged in up to ten sets. Each set has its own FPE Points, allowing you to maintain FPE data for multiple spaces within the same Eos showfile. Each FPE set can then be assigned to a channel or range of channels. The fixtures patched to those channels will then use the FPE Points in that set for their calibration and focusing.

Multiple FPE sets can be useful for consoles that control more than one space, or for touring shows working in multiple venues. This can also be useful if all the fixtures in your space cannot focus on the same set of FPE points.

Calculating FPE

Once you have at least four FPE Points matched to Focus Palettes, you are ready to calculate FPE.



Press **Realculate FPE** , then **Confirm FPE** to commit your changes.

A window will appear summarizing any FPE changes and / or a table of errors.

Note: *Any errors must be resolved before proceeding. It is not possible to undo an FPE calculation.*

Press **Accept FPE Changes** to proceed.

If calculating FPE for the first time, this will automatically generate fixtures in your Augment3d model. You can also make subsequent FPE edits or recalculations the same way.

Selective FPE

With nothing selected in the command line, FPE will recalculate positions for all patched fixtures in a show file. If specific fixtures or ranges of fixtures are selected, the FPE calculation will only affect the selection.

Troubleshooting FPE

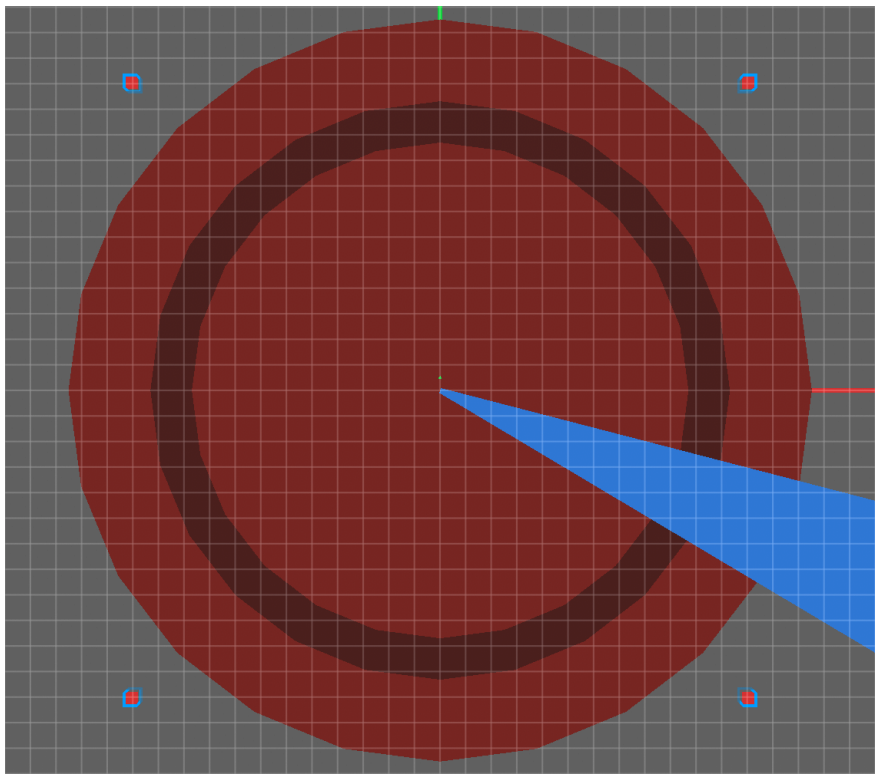
Accuracy

There are several ways to calculate the positions and rotations of the fixtures in your show. There are several factors that can also impact the accuracy of this estimation, including:

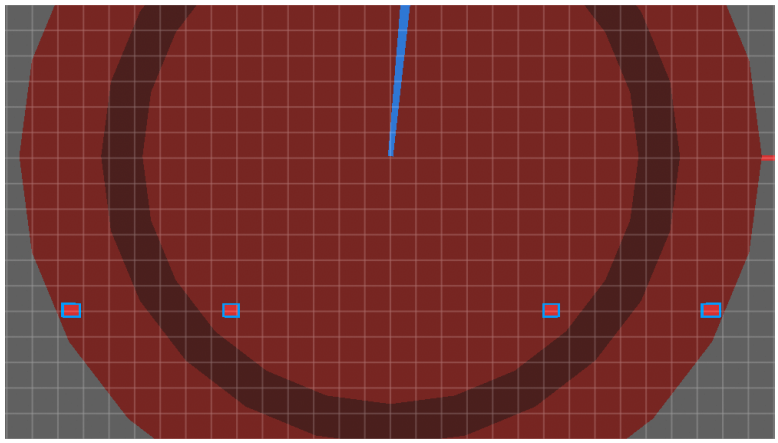
- Fixture profile inaccuracy
- Poor FPE point selection
- FPE point measurement error
- Slack in automated fixture belts
- Asymmetry about the tilt axis
- Fixture-to-fixture pan / tilt variations

FPE accuracy is dependent on profile information and user-supplied data. If the data is inaccurate, the computation will either fail or give poor results. Adequate care should be taken to ensure that profiles do not have errors and that the positions of FPE points are accurately measured.

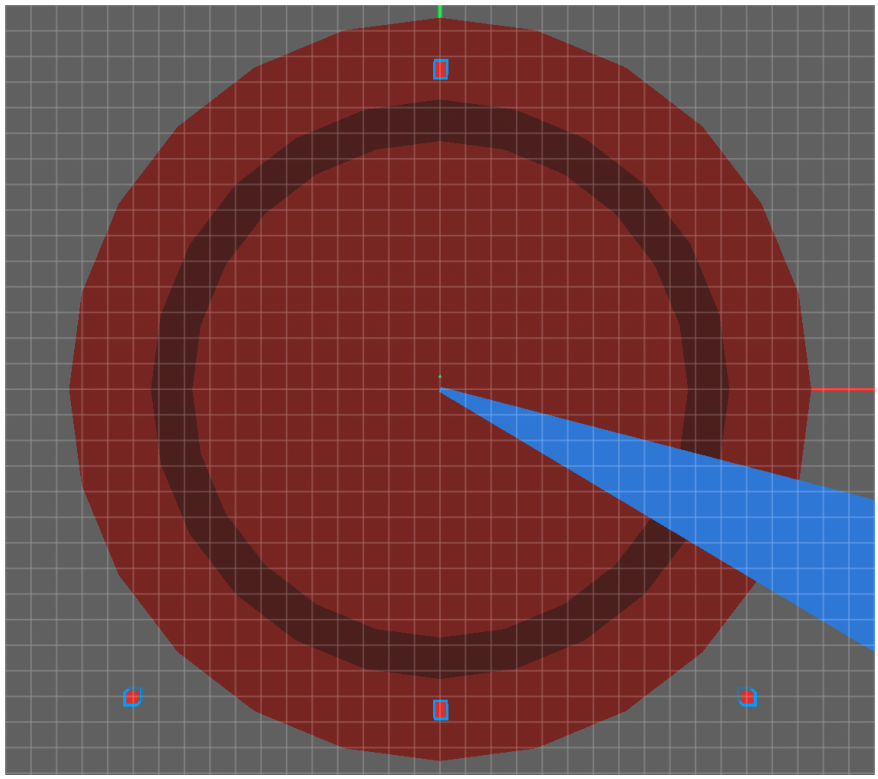
Best Practices



There are many ways to select FPE Point positions. The preferred method is to use at least 4 points close to the bounds of your space, as in the example above. Larger angles between points reduces the possibility of redundant information being used in the calculation. It may help to think of the points as outlining the base of a 3D shape that should cover as much of your space as possible.



One example of a poor configuration is shown above, with all FPE points in a line. The two center points are redundant, as they are part of the line from the two end points. Additionally, there is no coverage of the stage space possible with all points arranged in a line.

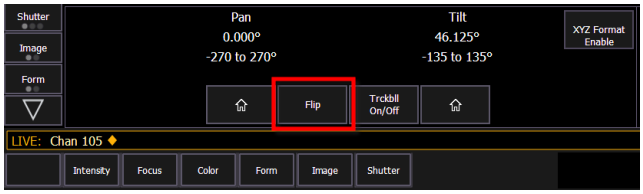


A better (but still problematic) configuration is pictured above. Since one of the points is in a line between two others, the data from that point is redundant and cannot be used to calculate the fixtures' positions.

Troubleshooting

If fixture response is inaccurate or if fixtures are not generated correctly in Augment3d, check the following:

- Ensure your fixture profiles are up to date, and update if not. See *Updating Fixture Profiles*.
  - This is likely to fix the problem if fixtures of one type respond accurately and fixtures of another type do not.
- Ensure the measured ground points in your space match how they were entered in Eos, and that the X and Y coordinates were not accidentally swapped.
- Verify you are using the correct units of measurement.
- Replay your Focus Palettes.
  - Did they record correctly?
  - Were they assigned to the correct Reference Point?
  - Do any of the fixtures pan more than 180 degrees? If so, press {Flip} and re-record (or update) the Focus Palette



- Add an additional FPE Reference Point and Focus Palette. Recalculate FPE. Is fixture response more accurate?

Other Common Issues

The following are some of the issues that most often affect the FPE calculation.

Beam Centering

The calculations expect the optical center of the beam to be at the measured ground points. If this is hard to see with the naked eye, using a crosshair gobo (or any gobo with an easily identifiable center point) can aid in lining up the beam more accurately over the ground point.

Fixture Profiles

Some automated fixtures may have pan and / or tilt settings that are incorrectly calibrated in their profile. These fixtures may require *Fixture Profile Correction* in order to accurately work with FPE.

User-Definable Pan / Tilt

Some fixtures have user-definable pan / tilt ranges that may cause inaccuracies. Check the settings of your fixture and ensure any parameter ranges set on the fixture match the ranges set in the fixture profile.

Fixtures

Some automated fixtures may be subject to mechanical defects that cause them to behave inaccurately when compared to their profile or other fixtures of the same model. Unless a custom profile is created that matches the specifications of that fixture, it will not work correctly with FPE.

Fixture Profile Correction

If FPE has been checked and run correctly, continuing issues may be due to inaccuracies in a fixture profile or the physical fixture itself.

Before continuing, please ensure that your fixture profile library is updated to the current version. See *Updating Fixture Profiles*.

Note: *If you correct inaccuracies in a fixture profile, please report the necessary updates via the ETC Augment3d forums at community.etcconnect.com. When possible, please include a copy of the fixture manual .*

Pan / Tilt Inversion

If a fixture in Augment3d pans and / or tilts in the opposite direction as it does in the real world, either parameter may be inverted.

Note: *Many fixtures have a setting to invert and/or swap pan and/or tilt within the fixture firmware. Ensure that these are not enabled before testing for inversion as described below.*

Testing for pan / tilt inversion

1. Set the fixture's pan to 0° and tilt to +90°. Increment the pan in either direction. Does the virtual fixture rotate in the same direction as the physical fixture?
2. Set the fixture's pan and tilt to 0°. Increment the tilt in either direction. Does the virtual fixture point in the same direction as the physical fixture?

Correcting pan / tilt inversion

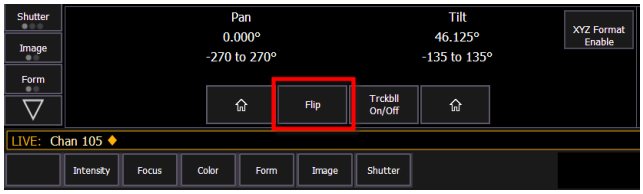
If you find that the pan or tilt value did not move in the correct direction, use the range editing tools in the *Fixture Editor* to invert the DMX range, or swap the DMX and User Min/Max at the same time.

Pan Range

If the pan direction is correct, but the virtual fixture pans further in either direction than the real fixture, the fixture's physical pan range or values may not match its profile.

Testing pan range

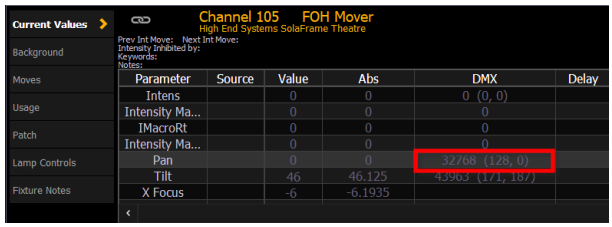
1. Aim your fixture at a point on your stage. Press the "Flip" button. Does the fixture return to the same point? If so, pan is mapped correctly. If not, set the fixture's tilt to +90°,or until the fixture is pointing forwards.



2. Test with pan values of -90°, 0°, and +90°. The fixture should point to the left, straight forwards, and to the right, respectively. If so, pan is mapped correctly. If not, follow the steps below to correct the pan range in the Fixture Profile Editor.

Correcting pan range

1. First, find the correct DMX home value for pan.
   a. Set pan to 0° and tilt to +90°.
   b. Increase or decrease pan, using the smallest value possible, until the optics are pointed away from the UI of the fixture.
   c. *Using [About]*, find the raw DMX values for pan (including course and fine), and note them.



   d. Set this new raw DMX level as your pan DMX home value in the *Fixture Editor*.
2. Then, using the new DMX home value, calculate the maximum.
   a. Set your pan value to the minimum DMX value (likely 0) and select a tilt value that targets a point in your venue.
   b. Increase your pan value 360° until the fixture is pointing at the same point again and note this DMX value as your found pan value.
   c. Note the minimum allowed DMX value for pan (likely 0) and the maximum allowed DMX value for pan (likely 255 or 65535).
   d. Calculate the User Min and Max Degree values:
      - min pan value = (360 ÷ (found pan - minimum pan)) * (minimum pan - pan DMX home value)
      - max pan value = (360 ÷ (found pan - minimum pan)) * (maximum pan - pan DMX home value)
3. Set the output of this calculation as your new user minimum and maximum.
4. Recalculate FPE (see *Calculating FPE*) and test for accuracy.

Tilt Range

If the tilt direction is correct, but the virtual fixture tilts further in either direction than the real fixture, the fixture's physical tilt range or values may not match its profile.

Testing tilt range

1. Aim your fixture at a point on your stage. Press the “Flip” button. Does the fixture return to the same point? If so, tilt is mapped correctly. If not, set the fixture's pan and tilt to 0°.
2. Pan the fixture in a circle. Does the fixture beam remain stationary, pointed straight down? If so, tilt is mapped correctly. If not, follow the steps below to correct the tilt range in the Fixture Profile Editor.

Correcting tilt range

First, find the correct DMX home value for tilt.

1. Set your tilt to 0°. Pan clockwise 360°, then counterclockwise 360°, and repeat.
2. Slowly increase or decrease your tilt value until the fixture spins with no wobble in the beam during the sweep.
3. Set the raw DMX value as your tilt DMX home value in the *Fixture Editor*.

Then, using the new DMX home value, calculate the maximum.

1. Set your tilt to your new DMX home value.
2. Begin increasing tilt until the fixture head is approximately perpendicular to its base and record this DMX value as your found tilt value.
3. Not ethe minimum allowed DMX value (likely 0) and the maximum allowed DMX value (likely 255 or 65535) for tilt.
4. Calculate the user min and max degree values:
    a. min tilt value = (90 ÷ (found tilt - tilt DMX home value)) * (minimum tilt - tilt DMX home value)
    b. max tilt value = (90 ÷ (found tilt - tilt DMX home value)) * (maximum tilt - tilt DMX home value)
5. Set the output of this calculation as your new user minimum and maximum.
6. Recalculate FPE (see *Calculating FPE*) and test for accuracy.

Fixture Defects

If none of the troubleshooting or profile correction steps help, there may be an issue with the fixture itself.

Certain mechanical defects may cause an automated fixture to behave inaccurately when compared to their profile or other fixtures of the same model. Unless a custom profile is created that matches the specifications of the fixture, it will not work correctly with FPE. See *Creating a New Fixture*.

Working with Fixtures in Augment3d

Once fixtures are added to your model, you can begin using Augment3d to focus and control them. There are a variety of tools available to help with this.

Fixture Selection & Focus

Selecting Fixtures

To select fixtures in Augment3d, either select them via the Eos command line or use a mouse. Click on a fixture to select it. You can also drag, or hold shift to select multiple fixtures.

There are three colors used for selection:

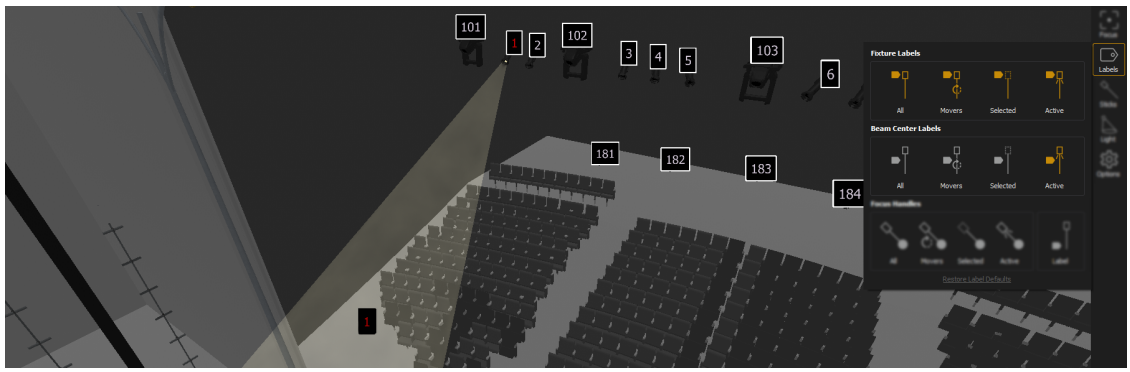
- Gold - fixtures selected in Eos.
- Blue - fixtures selected in Augment3d Edit Mode.
- Pink - fixtures selected in both Eos and Augment3d.

Focusing with Click-To-Focus

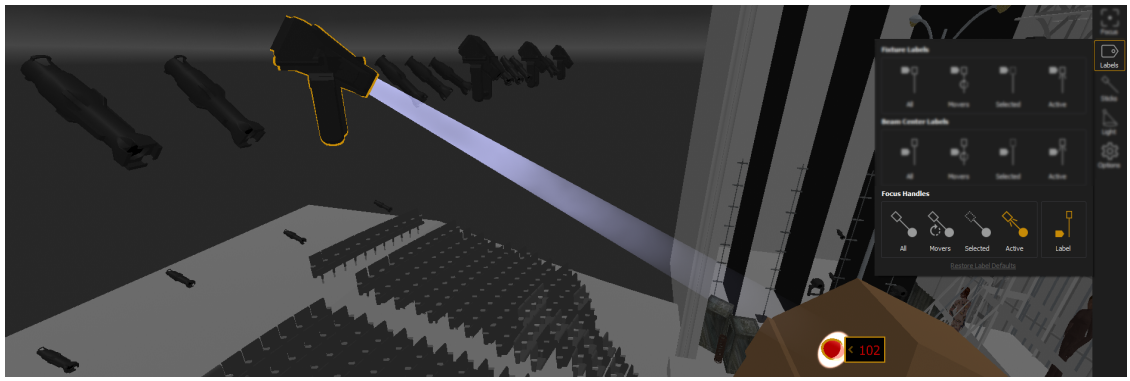
Selecting and holding on an object or plane in your Augment3d model will focus the selected fixture on that spot. Pressing SHIFT + LEFT MOUSE will also activate Click-To-Focus. You can also drag around the model to move the fixtures. Fixtures without pan / tilt parameters must be selected while in Patch for Click-to-Focus to work.

Other Useful Tools

Labels Tool

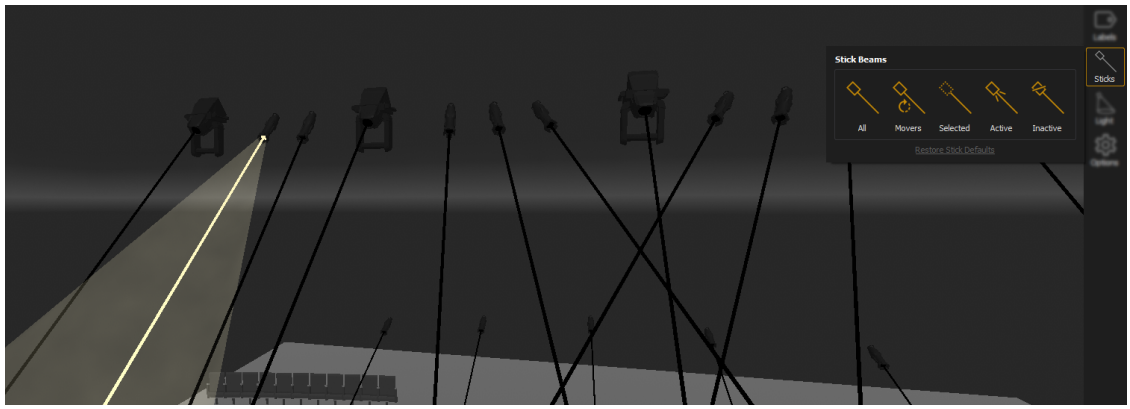


Fixture Labels display the channel number of the fixture. This can be useful in identifying which fixture is creating a particular beam of light.



Focus Handles create a controllable point at the end of the beam of an automated fixture, which can be dragged to focus a single fixture, or multiple fixtures together while maintaining their spatial relationships.

Sticks Tool



Stick Beams draws a line from the fixture to wherever the beam lands. Stick Beams do not require intensity and can be used to focus a fixture that is not currently outputting.

Focus Tool

Use the Focus Height feature to set a vertical offset from the location that is being focused on, in order to adjust focus to an actor's chest or face, instead of on the floor where they are standing.

Augment3d Objects

Objects are any non-fixture element of your Augment3d model.

Adding Objects

There are two ways to add an object to the Augment3d model.

From the Library

Objects can be dragged from the *Library* and placed into the model.

Note: *Objects are created with a (0,0,0) position on the XYZ axes when added to the model.*

From the Hierarchy

To add objects from within the Hierarchy, right-click, select **Create**, and choose the object you wish to add.

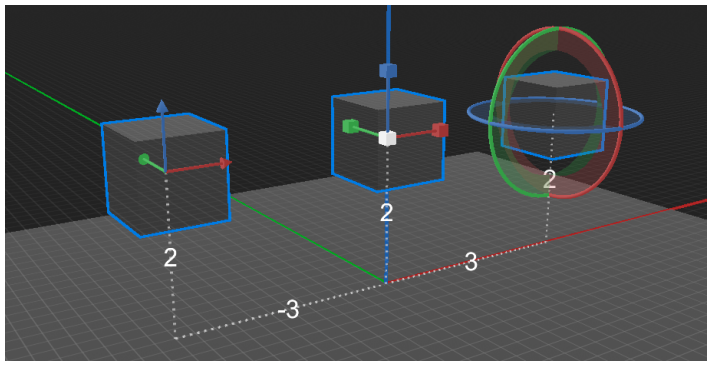
Copying Objects

Objects can be copied and pasted by selecting the object in the *Hierarchy* and using CTRL + C to copy. Use CTRL + V to paste the object. You can also duplicate selected objects using CTRL + D. If working in macOS, use CMD instead of CTRL.

Modifying Augment3d Objects

The Position, Scale, and Rotation of any object in an Augment3d model can be modified using one of the associated tools in the toolbar. See *Edit Mode Tools*

Selecting one of the modification tools from the toolbar puts the selected object or objects into the corresponding modification mode (Move, Scale, and Rotation, as seen left-to-right below).



These parameters can also be modified using the quick buttons in the Inspector. See *Rotation*.

Position

Select the Move tool. Drag on any of the X/Y/Z axes to move the object in that direction. Objects that have been moved away from their 0,0,0 default position will display a trail and distance measurement back to the Origin.

Scale

Select the Scale tool. Drag on any of the X/Y/Z axes to enlarge the object in that direction. Drag on the white center box to scale all dimensions proportionally.

Rotation

Select the Rotate tool. Drag on any of the X/Y/Z axes to rotate the object in that direction. The point around which the rotation occurs can be defined in the Inspector. See *Pivot*.

Scenic Elements

You may wish to change the visibility and position of Augment3d objects using cues, submasters, and so on. Two new profiles are available in Patch in order to accomplish this, under {Type} > {Manufctr} > {ETC Fixtures} > {Scenic Element}.

Note: *Objects patched as scenic elements are exempt from grandmaster and [Select Active] control.*

Scenic Element

An object nested under a channel patched as a scenic element can be shown or hidden on a cue-by-cue basis by giving the channel an intensity value. Any intensity value above 0% will show the nested object.

Imagine an object that is onstage in Act I but is removed for Act II. Instead of removing the object from Augment3d, you could simply hide it by giving its scenic element channel a 0 intensity value in the Act II cues.

Scenic Element Movable (SEM)

An object nested under a channel patched as a scenic element can be shown or hidden as above, but can also have their position, orientation, and rotation changed from cue-to-cue.

Imagine an object that remains onstage for the duration of the show, but changes position between Acts I and II. Instead of creating a separate object for each act, you can use the same object and simply change the position and orientation of its SEM channel in the Act II cues.

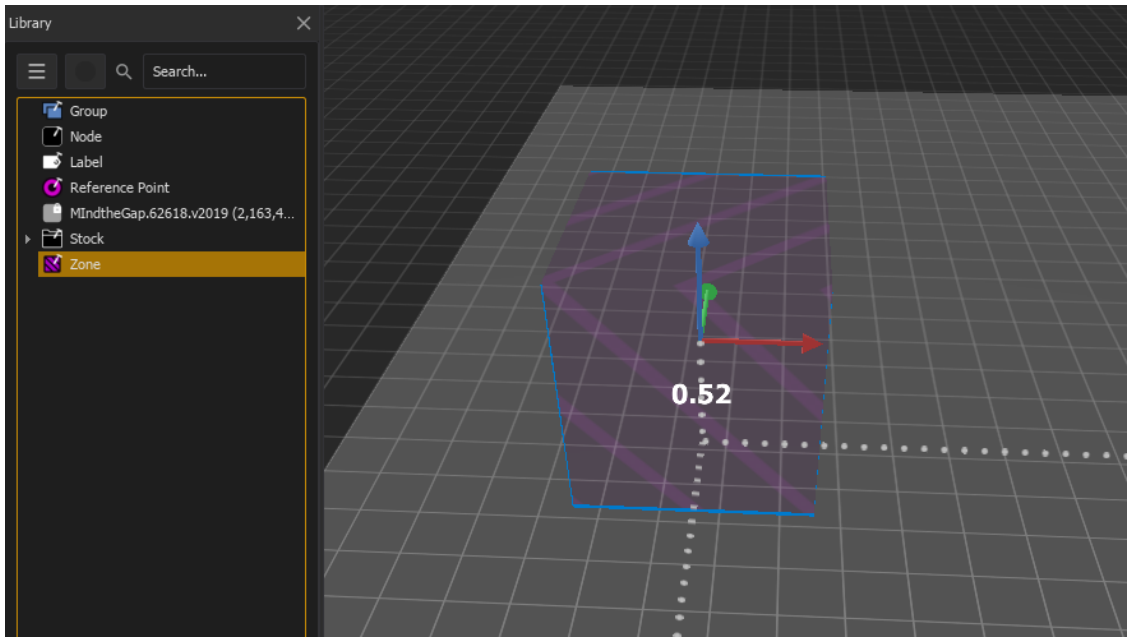
Editing SEMs

Once a channel has been patched as an SEM, its position and orientation can be set either by entering values in *Patch > Augment3d*, or by using any of the applicable tools in *Augment3d Edit Mode*.

This position and orientation data sets the origin point of the SEM. When an SEM is moved in Live, Blind, or Staging Mode, the new position will display in Augment3d linked to the origin. Any changes made to this new position in Augment3d are temporary and will revert back to the Live, Blind, or Staging Mode value on exiting Edit Mode.

Augment3d Zones

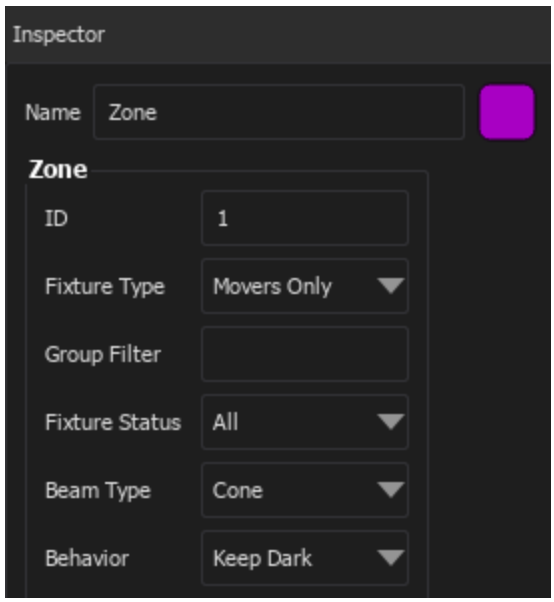
Zones are volumes (areas of your space) that can be defined in Augment3d which will affect any fixture whose beam interacts with them. The fixture behavior is configurable and will use override data, which will temporarily take control over any recorded or manual data.



Zones appear in the *Library* as a distinct object type that can be added to your Augment3d model.

Configuring Zones

Once added to your model, zones can be configured in the *Inspector*.



Fields are available to set the name, color, and unique ID number of the zone, along with the following options:

- **Fixture Type** - specify what type of fixture will be affected by the zone, in conjunction with any group filters.
  - **Movers Only** - only moveable fixtures with pan/tilt parameters.
  - **All Fixtures** - all fixture types, including single-parameter conventionals.
- **Group Filter** - optionally specify a group of fixtures that will be affected by the zone, in conjunction with the selected fixture type.

- Fixture Status - specifes which fixtures will be affected based on their current active status.
  - All - all active and inactive fixtures.
  - Active Only - only fixtures with an intensity greater than zero.
  - Inactive Only - only fixtures with an intensity of zero.
- Beam Type - choose which part of the fixture beam will intersect with the zone.
  - Cone - the outermost edge of the beam.
  - Stick - the center of the beam.

Note: *When beam type is set to cone, zone intersection is derived from the fixture's standard beam angle, including zoom parameters. Beam alterations from shutters, irises, and other parameters are not currently detected.*

- Behavior - sets the override action that happens when fixture beams enter or exit the zone boundary, using the fade out and fade in time specified.
  - Keep Dark - overrides fixture intensity to 0.
  - Make Bright - overrides fixture intensity to 100.
  - Make Palette - applies a specified intensity, focus, color, or beam palette.
  - Make Preset - applies a specified preset.
  - Trigger - plays up to two macros.

Depending on the chosen behavior, additional configuration options may be available:

- Fade Out (sec) - sets the fade out time of the intensity, palette, or preset change.
- Fade In (sec) - sets the fade in time of the intensity, palette, or preset change.
- Target - specifies which palette or preset to apply.
- Entry Macro - specifies which macro to play when fixture beams enter the zone boundary.
- Exit Macro - which macro plays when fixture beams exit the zone boundary.

Zone-based fixture instructions override any recorded or manual data. When one or more fixture beams enters the zone boundary, the override is applied, and the fixtures will follow the zone configuration. Pink text *Color Indicators* are used to indicate the zone source.

Once a fixture exits the zone, the override is released and background data is restored.

If an inactive fixture intersecting a zone is then made active, nothing will happen. Configured behavior only occurs when an active cone or stick beam moves into a zone or a zone moves into an active cone or stick beam.

Zones with Scenic Elements

Like other Augment3d objects, zones can be nested under *Scenic Elements*. Under a standard scenic element, this would allow you to show or hide zones from your Augment3d model. When hidden, the zone programming will not apply to any fixtures, allowing you to enable or disable fixture behavior on the fly by simply showing or hiding the zone.

Nesting a zone under a Scenic Element Moveable (SEM) allows you to give the zone movement and rotation instructions in addition to showing or hiding it. This opens up a variety of programming choices, as zones can now be moved into or out of beam trajectories to make the fixtures dynamically react. This may be especially useful in systems of conventional, non-moving fixtures.

Importing Augment3d Objects

Custom 3D objects can be imported into Augment3d *Browser* via File > Import > Augment3d Scenic Models, or from Augment3d Edit Mode via File > Import to Library > Import 3D Model. If a tether and a console are connected, objects must be imported via Augment3d Edit Mode on the tether device.

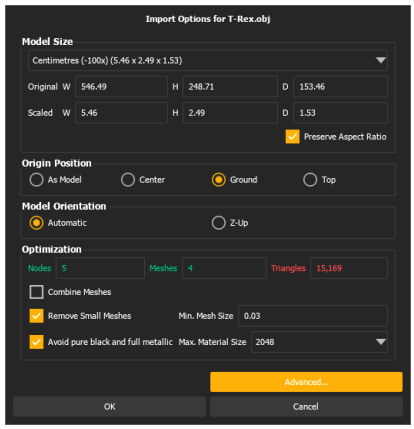
Once imported, the file will appear in the Library. Drag it into your workspace to add it to your model.

CAUTION: ***Custom objects must be used in the Augment3d model in order to be saved with the show file. Custom materials not added will be deleted upon shutdown of Augment3d.***

For a full list of supported 3D file types, see *Supported 3D File Formats*.

Import Options

After a file is selected via the file browser, the Import Options panel will display.



Use the available options to configure the import to correctly represent your file in Augment3d.

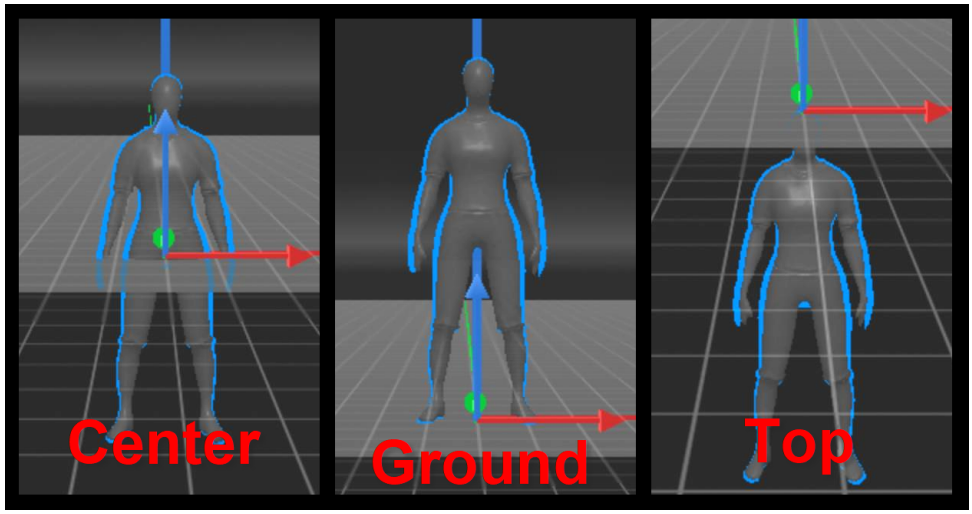
Model Size

The original object dimensions are displayed in the original unit. Choose a different measurement from the dropdown to import the object with those units.

Note: *Vectorworks converts objects to metric on export even when drawn in imperial. It is best to select meters on import, but check scaled values for accuracy.*

Origin Position

Determines the position of the object relative to the origin when added to the model from the Library. Defaults to **Ground**.



- **As Model** - the object will be placed using the origin point defined in the object model.
- **Center** - the object will be centered on the origin.
- **Ground** - the object's base will be aligned with the origin.
- **Top** - the object's top will be aligned with the origin.

Optimization

A color-coded display of the nodes, meshes, and triangles in the object. A large number of any of these properties in an imported object can affect Augment3d performance. If your object contains more than recommended, the number will display in red.

Select **Combine Meshes** to combine all meshes in the object. This cannot be undone.

{Advanced}

Reveals the following additional import options:

Model Size

- **Preserve Aspect Ratio** - when disabled, allows you to adjust each scaled dimension independently. Defaults to enabled.

Model Orientation

Unlike some 3D modeling software, Augment3d uses the Z plane for up / down positioning. Defaults to **Automatic**.

- **Automatic** - uses the coordinate assignments from the source software.
- **Z-Up** - assigns Z to up / down.

Note: *If your model imports sideways, reimport using Z-Up.*

Optimization

- Remove Small Meshes - removes meshes from the object below the specified size.
- Min. Mesh Size - sets the minimum mesh size.
- Avoid pure black and full metallic - avoids any pure black or full metallic materials by adjusting them just off pure.
- Max. Material Size - sets the maximum material size.

Supported 3D File Formats

Optimal Import Formats

Augment3d supports single-file import of model and fixture information from the following programs or later:

- Vectorworks 2023, Service Pack 3
  - MVR
- Capture 2022
  - MVR
  - Capture Model GITF
- WYSIWYG R46
  - MVR

Note: *Previous versions of Vectorworks require a plug-in for Augment3d import. See Vectorworks Augment3d Plug-in (on page 1).*

These 3D file formats have been found to work optimally for import into Augment3d:

- DAE
- ZAE
- FBX

DAE files, also known as Collada files, are the optimal export format for Augment3d from AutoCAD and Vectorworks.

All Compatible 3D Formats

This is a comprehensive list of all 3D file formats compatible with Augment3d:

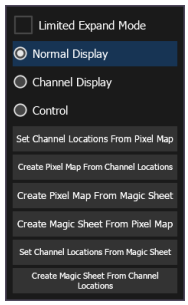
- 3D
- 3DS
- 3MF
- AC
- AC3D
- ACC
- AMF
- ASE
- ASK
- ASSBIN
- B3D
- BLEND*
- BVH
- COB
- CSM
- DAE
- DXF
- ENFF
- FBX
- GLB
- GLTF
- HMP
- IFC
- IFCZIP
- IRR
- IRRMESH
- LWO
- LWS
- LXO
- MD2
- MD3
- MD5ANIM
- MD5CAMERA
- MD5MESH
- MDC
- MDL
- MESHXML
- MESH
- MOT
- MS3D
- NDO
- NFF
- OBJ
- OFF
- OGEX
- PK3
- PLY
- PMX
- PRJ
- Q3O
- Q3S
- RAW
- SCN
- SIB
- SKP
- SMD
- STL
- TER
- UC
- VTA
- X
- X3D
- X3DB
- XGL
- XML
- ZAE
- ZGL

** Blender v2.79 and older. v2.8 and later versions are not supported.*

Augment3d Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.

The Augment3d tab configuration menu contains display options, as well as useful tools for *Setting Up Pixel Map Features* and working with *Magic Sheets*.



Display

The following options are available:

- **Limited Expand Mode** - allows Augment3d to be displayed fullscreen. While in this mode, the monitor with Augment3d will not display a tab number, command line, or status bar, and other tabs open on the monitor will be closed or moved to a different display.
  - A limited selection of *Augment3d Toolbar* tools are available.
  - Press **[Shift] & [Displays]** to enter or exit limited expand mode, or use the option in the gear icon menu.

These display options are also available in **Setup > User > Displays >** *{Augment3d Display Behavior}*.

- **Normal Display** - the display will behave the same as other display tabs.
  - A locked tab will not be skipped.
  - A single click or tap on the tab will draw focus to that tab.
- **Channel Display** - this mode uses the following rules:
  - When focus is drawn to the playback status display, an Augment3d channel display will be brought to the front.
  - **[Shift] & [Live]** will cycle through Augment3d channel displays alongside Live channel displays.
  - Pressing **[Live]** or bringing a Live tab into focus will restore your last focused Augment3d channel display.
  - Augment3d channel displays in the locked frame will not be skipped when using the **[Tab]** key to cycle through tabs.
- **Control** - the display will behave the same way *Control Tabs* do.
  - Locked tabs will be skipped.
  - A single click or tap will not draw focus.
  - A double click or tap will draw focus to the tab.

Pixel Maps

The following options are available:

- {Set Channel Locations From Pixel Map} - allows you to pull fixture locations from an existing pixel map in your show file. Specify the pixel map number and any X/Y/Z constraints. Select {Confirm} to place fixtures in your show at the same locations they exist in the pixel map.
- {Create Pixel Map From Channel Locations} - allows you to use your existing Augment3d fixture locations to create a pixel map. Specify the camera direction that the fixture locations will be pulled from and a pixel map number. Select {Confirm} to create a pixel map with fixtures at the same locations they exist in the Augment3d model.
  - This option is governed by fixture selection. If no fixtures are selected, all fixtures in the Augment3d model will be added to the pixel map.
- {Create Pixel Map From Magic Sheet} - allows you to create a Pixel Map from an existing magic sheet. Specify the pixel map to create and the magic sheet to pull from. Select {Confirm} to create a pixel map with fixtures at the same locations they exist in the magic sheet.

Magic Sheets

The following options are available:

- {Create Magic Sheet From Pixel Map} - allows you to create a magic sheet from an existing pixel map. Specify the magic sheet to create and the pixel map to pull from. Select {Confirm} to create a magic sheet with fixtures at the same locations they exist in the pixel map.
- {Set Channel Locations From Magic Sheet} - allows you to pull fixture locations from an existing magic sheet in your show file. Specify the magic sheet number and any X/Y/Z constraints. Select {Confirm} to place fixtures in your show at the same locations they exist in the magic sheet.
- {Create Magic Sheet From Channel Locations} - allows you to use your existing Augment3d fixture locations to create a magic sheet. Specify the camera direction that the fixture locations will be pulled from and a magic sheet number to create. Select {Confirm} to create a magic sheet with fixtures at the same locations they exist in the Augment3d model.
  - This option is governed by fixture selection. If no fixtures are selected, all fixtures in the Augment3d model will be added to the magic sheet.
  - Scale is measured as a ratio of pixels to 1 meter, and defaults to 80, which would create a magic sheet measuring 80 pixels for each meter in the Augment3d model. Enter a scale between 1 and 200.

Chapter 20

Virtual Media Server

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About Virtual Media Server

The virtual media server feature of Eos is comprised of two areas, the virtual media server and its virtual layers, and pixel maps. These areas are completely dependent on each other.

The virtual media server is a feature used to create layouts of fixtures, known as pixel maps, which then applies media content (images, movies, text, and procedurally generated effects) by way of virtual media layers to the pixel map.

A pixel map is a layout of fixtures onto a grid, which determines order of playback and how the data will be interpreted and outputted to create the desired image or effect. A pixel map creates relationships among the channels in an X-Y grid so that the channels and their parameters can be associated with pixels in an image.

A virtual media layer contains one piece of media content. A pixel map can contain up to 12 virtual media layers, which can be stacked on top of each other or used separately.

Pixel Map Media

Image, video, HTML, and text files can be applied to a pixel map. A stock library of media can be obtained by installing the Eos Family Pixel Mapping Installer.

Importing Media Content

Additional media content can be imported. Files must follow the naming convention filenumber_filename; for example, 002_Volcano.mov.

Size, resolution and length of any imported content should be as minimal as possible. For example, stock video content is under 10MB, under 320x180 resolution, and between 2-20 seconds.

Import All Pixel Map Media

Automatically import media via **File > Import > Pixel Map Media > All Pixel Map Media**.

Options when importing include:

- **{Library (1-255)}** - selects the library to import media.
- **{File (0-255)}** - selects the file number.
- **{Reorder Libraries}** - specify whether or not the library on the source device will be renumbered. If the source device's library is not numbered, it will be assigned the specified library number.
- **{Reorder Files}** - specify whether or not the files on the source device will be renumbered. If the source device's files are not numbered, they will be assigned the specified file number.
- **{Overwrite}** - overwrite the existing media files.
- **{Start Import}** - begins the import process. A progress bar will appear to indicate the status of the import process. When finished, select **{Done}**.
- **{Cancel}** - stops the import, and exits the display.

Import Show Pixel Map Media

Automatically import all media needed for the current show file used by backup and client consoles via **File > Import > Pixel Map Media > Show Pixel Map Media**. See *Synchronizing Media Archives*.

Import with the File Manager

Manually import media via **ECU > Settings > Maintenance >** *{File Manager...}*. Files should be numbered manually prior to import.

Streaming Media

Available video streams can be selected and used directly as pixel map media. Options are configured via **Setup > System > Video Streams >** *{Video Stream Pixel Maps}*.

Supported Media Formats

Image

- .gif
- .jpg
- .png
- .svg
- .tiff

Video

The following video formats are recommended:

- .gif
- .mov (.H264 encoding)
- .mp4

For a full list of supported video formats, please consult etcconnect.com.

HTML & Text

- .htm
- .html
- .txt

Exporting Media Content

Export Pixel Map Media

Automatically export all the media used in the current show file via **File > Export > Show Pixel Map Media**, selecting the device to which you want to export the media content. This includes any pixel map media stored in cues, presets, submasters, etc.

There are only two options available in this display:

- **{Start Export}** - begins the export process. A progress bar will appear to indicate the status of the import process. When finished, select **{Done}**.
- **{Cancel}** - stops the export and exits the display.

Export with the File Manager

Exporting with the file manager is very similar to importing with it. You select the files in the MediaArchive folder that you wish to export, and you can either copy or move them to your device.

Pixel Map [Tab 9]

A pixel map is a layout of fixtures onto a grid, which determines order of playback and how the media content will be interpreted and output to create the desired image or effect. A pixel map creates relationships among the fixtures in an X-Y grid so that the channels and their

parameters can be associated with pixels in an image.

Limitations of pixel maps include:

- 40 pixel maps per show file
- 12 layers per pixel map
- 16,384 pixels per pixel map grid

Open up the pixel map display via **[Displays] > {More SK} > {Pixel Maps}**. The display can also be opened from the home screen, or by using **[Tab] [9]**.

Hovering your cursor above the pixel map will display the column and row location for the pixel.

In the pixel map display, any numeric entry is assumed to be a pixel map. Each pixel map must have a unique number.

To create a pixel map, type in the number you want to assign to it and hit **[Enter]**.

Assigning Layers

The virtual media server and layers need to be assigned to the pixel map.

Using the softkeys, select **{Server Chan}**, **{Media Layer Chan}**, and **{Effect Layer Chan}**, and associate them with the channels you want to patch. If those channels are unassigned, Eos will automatically patch them accordingly. An error will appear if any channels are assigned to a different device type.

If you prefer to assign Pixel Map layers in Patch first, profiles are available under **{Type} > {Manufctr} > {ETC Fixtures} > {Virtual}**.

No addresses need to be assigned in Patch for the pixel map layers.

In this display you can also label the pixel map, assign the interfaces it will use, and adjust the width and height. Column and row guides can be created numerically in either the pixel map or in the Edit displays. The guides can aid in viewing a pixel map.

Pixel Map Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.

The following options are available:

- **Zoom to All** - zooms to show all objects.
- **Zoom to Selection** - zooms to show all selected objects.
- **Center on Selection** - centers the display on the selected objects without changing the zoom level.

Setting Up Pixel Map Features

After layers have been patched, press the **{Edit}** softkey to select the fixtures.

In the Edit screen, you will be able to define the array and types of fixtures. To do this, you can select pixels from the map by using a touchscreen or by holding down the left button on a mouse and dragging across the pixels you wish to select.

Once the pixels have been selected, you need to select their fixture type and then assign the starting address or starting channel.

- When either {Starting Channel} or {Starting Address} is selected, both fields will be cleared.
- Address-based pixels can not overlap with channel-based pixels. This includes the entire DMX fixture footprint.
- If using {Starting Channel}, any overlapping channel-based pixels will be removed and any overlapping address-based fixtures will be unpatched.
- If using {Starting Address}, any overlapping address-based pixels will be removed and any overlapping channel-based fixtures will be unpatched.
- When the [Data] key is latched, the address for channel-based pixels will display.
- When [Format] is pressed, the address will toggle between port/offset and address number.

By default, the addresses will be organized in rows starting from the left to the right and top to bottom. The edit screen shows a representation of the current mapping. The pixels are color coded based on if they have been patched or not. A color coding guide is provided on the screen.

Any pixel can have its size adjusted for better representation of the actual fixtures. This is done by selecting the pixel and then dragging the vertical and / or horizontal borders.

A pixel map can be moved within the edit display by holding down the right mouse button. The map can be zoomed either by using a mouse wheel or by holding down [Format] and moving the level wheel.

Options available for changing the mapping:

- {Horizontal Order} - toggle state from left to right to right to left
- {Vertical Order} - toggle state from top to bottom to bottom to top
- {Direction} - toggle state from rows to columns
- Click the {Apply} button to see the changes made while still in the edit display.

In the edit display, the softkeys will repaint to the following mapping options:

- {Rotate 90}
- {Flip V}
- {Flip H}
- {Invert}

To see the changes made by using the softkey mapping options, you don't need to press {Apply}.

The {Flash} button can be used to check the address output while still in the edit display. {Flash} works the same as it does in Live.

When editing is finished, press the {Done} softkey to exit the edit display.

Pixel Map Preview [Tab 10]

Before you begin working with the Virtual Media Server, you will want to open the Pixel Map Preview display from the home screen or by using [Tab] [1][0]. Pixel maps can be manipulated via encoders, ML Controls, by opening [Tab] [5], or via the quick access tools.

For any output, the Server Channel must be set to a level along with any layers you are using.

You can use Park and Address Check for Virtual Media Server outputs.

Pixel Map Preview Tab Configuration

Tab configuration menus contain additional sets of context-specific options for a display. They can be accessed from the bottom of the *Tab Tools* by right-clicking or double-tapping either the tab or the gear icon to the left of the frame's tab bar.

The following options are available:

- **Zoom to All** - zooms to show all objects.

Server Channel Controls

When working with the Server Channel, the following controls will be available:

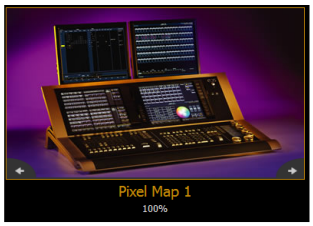
- **{Intensity}**
- **{Pan}** and **{Tilt}** - used to adjust layers within the frame.
- **{Color} -** filters color for all layers.
- **{FoView**} - field of view, or perspective. This only affects media when **{X Rotate}** and/or **{Y Rotate}** are not set to 0.
- **{Crossfade}** - used to adjust the priority when devices in the pixel map are also used as console channels. -100 gives the pixel map priority, and +100 give the console channel priority. At 0 (the default) the output is calculated using HTP. The Virtual Media Server crossfade parameter level will display in subscript beside the intensity.
- **{Blend}** - a smoothing function for crossfades. It is a linear parameter that defaults to zero.
- **{Inactive Media Behavior}** - sets the layer behavior when intensity is at 0 to one of the following options:
  - **Stop / Unload Layers** - stops the media, and unloads it from memory
  - **Pause Layers** - stops the media, but leaves it loaded in memory
  - **Let Layers Play** - media continues playing with 0 intensity
- **{Scale} -** adjusts scale of all layers.
- **{Aspect Ratio} -** adjusts aspect ratio of all layers.
- **{XYZ Rotation Controls} -** rotation control for all layers

Layer Channel Controls

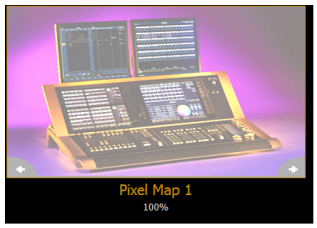
When working with the Layer Channels, the following controls will be available:

- **{Intensity}**
- **{Pan}** and **{Tilt}** - used to adjust the image of the individual layer within the frame.
- **{Color} -** filters the color of the content. For example, if all the colors are set to full, the content will play all colors normally. However if blue is at 0, then only the red and green pixels of the content will play. The color and gel pickers can be used to select color filtering quickly.
- **{Negative On/Off}** - with negative on, the output is the negative of the content. With it off, the content plays back normally.
- **{Image Brightness}** - this varies from intensity. The following images illustrates the differences between image brightness and intensity.

Note: *All Virtual Media Layers operate in 16-bit color mode.*



0% Brightness, Full Intensity



50% Brightness, Full Intensity

- {Playback Mode 1}:
    - {Display Centered}
    - {Display In Frame}
    - {Display Out Frame}
    - {Play Loop Forward}
    - {Play Loop Reverse}
    - {Play Once Forward}
    - {Play Once Reverse}
    - {Stop}
- {Playback Speed}
- {In Point} - determines where in the clip (frame number) you want to enter in.
- {Out Point} - determines where in the clip (frame number) you want to exit.
- {Mix Modes} - sets how the layers will interact. The following table shows the various mixer modes available. To illustrate the modes, the following layers were used:

Top Layer

Bottom Layer

Mode	Result	Description
{Over} (Default)		Top layer blended with bottom layer
{In}		Top layer with opacity reduced by opacity of bottom layer
{Out}		Top layer with opacity reduced by inverse opacity of bottom layer
{Atop}		Top layer with opacity reduced by opacity of bottom layer and then blended with bottom layer
{Add}		Top and bottom layers color and opacity added together

Mode	Result	Description
{Subtract}		Top and bottom layers color and opacity subtracted from each other
{Multiply}		Top and bottom layers color and opacity multiplied together
{Screen}		Top and bottom layers colors inverted and then multiplied together
{Overlay}		Does a multiply or screen effect based on the lightness or darkness of the bottom layer
{Lighten}		Top layer's color merges with bottom layer's color, with the lighter color winning
{Darken}		Top layer's color merges with the bottom layer's color, with the darker color winning
{Dodge}		Bottom layer's color brightened to reflect top layer's color
{Burn}		Bottom layer's color darkened to reflect the top layer's color
{Hard Light}		Does a multiply or screen effect on the lightness or darkness of the top layer
{Soft Light}		Darkens or lightens colors depending on the top layer
{Xor}		Top layer with opacity reduced by inverse opacity of bottom layer, and then blended with the bottom layer with opacity reduced by the inverse opacity of the top layer

- **{Library}** - selects the image library.
- **{File}** - selects the media file within the selected library.

- {Mask On/Off} - masks takes a lower layer and a higher layer, finds only the non-transparent pixels they have in common, and then displays the common pixels of the higher layer.
- {FoView} - perspective. This only affects media when {X Rotate} and/or {Y Rotate} are not set to 0.
- {Loop In} - sets the starting point of a gradient.
- {Loop Out} - sets the ending point of a gradient.
- {Scale} - changes the scale of the content to either be larger or smaller than the standard content playback.
- {Aspect Ratio} - stretches or shrinks the content only along the X axis, making it wide or squished looking. Z Rotate can be used to modify the aspect ratio along the Y axis.
- {XYZ Rotation Controls} - rotation control for all layers.

Effect Layers

The Virtual Media Server allows you to use procedurally generated content. This is content that is created algorithmically in real time, instead of rendering file based media.

In order to use procedurally generated content, you must patch the pixel map layer as a virtual effect layer instead of a virtual media layer. Setting up the pixel map is the same as for using virtual media layers. There are two versions of the effect layer, {Effect Layer Ver 1.0} and {Effect Layer Ver 1.1}.

Types of Effects

There are three main effect types:

- Two color gradients - adjustable gradients with start and end colors
- Rainbow gradients - fixed gradient, full hue spectrum
- Perlin noise - good for animating random color effects, adjustable gradients

The effects are stored in file 1. File 1:0 is a home position of no effect. 1 through 3 are perlin noise effects, 4 is a perlin noise/ rainbow gradient, 5 through 9 are rainbow gradients, and 10 through 19 are two color gradients.

Effects have various options of additional control.

Using Two Color Gradients

For the effects that use two color gradients (two color and perlin noise), there are several options for control of the gradients. The two colors are known as the start and end colors. Those options include:

- {Intensity} and {Intensity 2} - specifies the opacity of the start and end colors respectively for Virtual Effect Layer 1.0. If you want to fade a two color effect using this layer, you will need to fade both {Intensity} and {Intensity 2}.
- {Intensity 2} and {Intensity 3}- specifies the opacity of the start and end colors respectively. {Intensity} is a master opacity control for the entire layer. This is for Virtual Effect Layer 1.1. If you want to fade a two color effect using this layer, you can just fade the {Intensity}.
- {Red}, {Green}, {Blue} or {Hue} and {Saturation} - specifies the start color. You can also use the Start Color picker.

- {Red 2}, {Blue 2}, and {Green 2} - specifies the end color. You can also use the End Color picker.
- {In Point 1} and {Out Point 1} - changes the distribution of the two colors in the gradient. In Point 1 moves the start color position closer to the end color. Out Point 1 moves the end color position closer to the start color.
- {Playback Mode 1} - basic animation, forward or reverse.
- {Playback Speed 1} - speed of animation.
- {Layer Effect} - adjusts the number of repeats in the gradient. Layer Effect has a range of -100% to 100%. At the home value of 0%, one full gradient is shown. Moving toward 0%, you will see less of the gradient and moving toward 100%, you will see up to four repetitions of the gradient.

The button {Layer Effect 2} is for use with perlin noise effects.

Using Rainbow Gradients

For Rainbow Gradients, the colors cannot be adjusted. But the number of repeats can be adjusted by using {Layer Effect}. {Playback Mode 1} and {Playback Speed 1} work in the same way as for two color gradients.

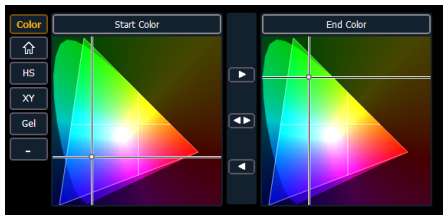
Using Perlin Noise

For perlin noise effects, there are different options for control:

- {Playback Mode 1} - basic animation of noise, forward or reverse.
- {Playback Speed 1} - speed of animation.
- {Layer Effect} - adjusts the amount of noise. -100% equals very little noise, and 100% equals a lot of noise.
- {Layer Effect 2} - adjusts the horizontal scrolling speed. -100% equals a fast left scroll, 0% equals no scrolling, and 100% equals a fast right scroll.

Effects Color Pickers

The effect layers have a two color pickers for selecting the start and end colors.



Using the buttons located between the two color pickers, you can also copy the start color to the end color, swap the start color and the end color, or copy the end color to the start color.

Pixel Mapping in a Multi-Console System

When using file based media in a multi-console environment, the primary console should be used as the 'base' media archive.

Media can be imported to the primary, and the backup console and / or any other clients can then synchronize their own, local media archives with the primary. The backup must synchronize media with the primary in the event that the backup must take control as the master. For clients, synchronizing the media is optional but useful if you wish to see the media playing back in the Pixel Map Preview display.

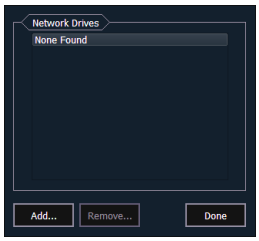
Configuring Multi-Console Pixel Mapping

Once the Eos Family Pixel Mapping Installer has been installed on all consoles, you can configure your multi-console system.

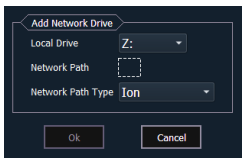
On the Primary, exit to the *ECU Welcome Screen* and navigate to *Settings > General*. Ensure that the {Share Media Archive} box is checked. This will allow for sharing of the primary's media archive. Copy the path name, as you will need it to set up any Backups or Clients.

Backup and Clients

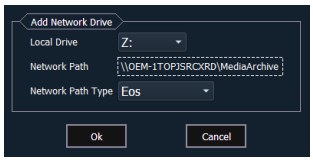
1. On the backup or client, exit to the Eos Configuration Utility (ECU).
2. Press the {Settings} button.
3. Press {Maintenance}.
4. Press {Network Drives}.



5. In the Network Drives display, click the {Add} button.
6. In the Add Network Drive display, choose a drive letter for {Local Drive}.



7. Enter in the {Network Path}. The path name is listed next to the primary's {Share Media Archive} checkbox.
8. Select the appropriate console type for the {Network Path Type}.



9. Click {Ok}. You will now be able to access the primary's media archive from the backup or client. This new drive will appear in the browser like a USB drive.
10. Click {Done} and launch the Eos application.

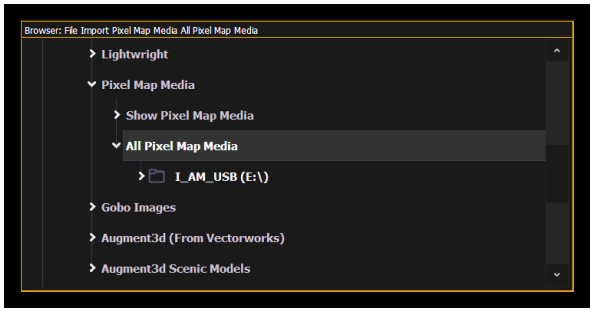
Synchronizing Media Archives

To view media playback in the pixel map preview display, you will need to first import the required media into your backup and / or client's local media archive. This is done from the browser. There are two options for importing media:

- Import Show Pixel Map Media - this import function should be used by any backups and clients. It is the easiest way to ensure that your console will have all of the media required by the current show file.
- Import All Pixel Map Media - this import function should be used by the primary to load the base media content and later to load media on the fly as required. This import function provides more complex options, like targeting which library and file the media data will be imported into. See *Pixel Map Media*.

Synchronize pixel map media with the following steps:

1. On the backup or client, navigate to the browser.
2. Expand **File > Import > Import Pixel Map Media > Import Show Pixel Map Media**.



3. Select the appropriate network drive.
4. The **Import Show Media** display will open. Press the **{Start Import}** button.
5. A progress bar will appear to indicate the status of the import process. When finished, click **{Done}**. You will now be able to see the media playing in the pixel map preview display on any backups or clients.

Chapter 21

Multi-Console Programming

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User ID

A user is a console defined by a user ID. If it has a unique user ID, the console will operate separately from other Eos devices on the network, but still track show data. If it shares a user ID, Eos will synchronize with like IDs.

When multiple users are on an Eos Family network, they can all act as one combined user, all as separate users, or any of the varying degrees between.

Any Eos Family console can be a separate user on an Eos Family network. Certain devices work well as independent users while others are intended to share a user ID with another device. For example, consoles and RPUs are likely candidates for working with a unique user ID while RVIs and client PCs can be useful sharing an ID with another device to track programming information from a second location.

User ID is a console-specific identifier that can be set uniquely for each Eos device or can be shared between multiple devices allowing for certain data to be shared between consoles. The user ID can be set anywhere from 1 to 99.

The decision to share a user ID is based on the desire to share a common work environment and command line. It is often common for a designer to be the same user as a programmer so his displays and operating modes follow a programmer, and his command line mimics the programmer's. Alternatively, mirror mode of a user can be called. It is also possible to set the designer up as a completely separate user, adding a command line object to a magic sheet to allow a view into programming activities.

Data Sharing & User ID

Data shared between Eos Family devices with the same User ID:

- Command line
- Null channels in live
- Selected channels
- Filters
- Selected cue
- Live / Blind mode
- Setup > User

Data specific to the Eos Family device, regardless of User ID:

- current fader page
- current encoder page
- focus on displays without command line
- display configuration (layout, format, visible parameters, flexichannel)
- paging without changing selected target or channels

Data identical between all Eos Family devices, regardless of User ID:

- all stage levels and edits
- all data stored in the show file
- playback, fader and grandmaster contents and progress

The default User ID for any Eos Family device is 1. You may change this based on your preference to allow or restrict the functionality described above.

After you have completed the setting changes described above, connect your Eos device to the network and reboot the device.

Using Partitions

When multiple users are working in an Eos Family system, partitioned control can be used to restrict a specific user's access to certain channels. This can help avoid overlapping control of channels by multiple programmers at once.

The most common example of this situation is when one user is programming automated fixtures while another user programs conventional fixtures. Partitioned control allows these users to divide the channels between them so they may work simultaneously. If one user stores data using record or record only, partition control will guarantee that only data for their partitioned channels will be stored. Data for channels not in their partition will be ignored when performing any store commands. Channels can be included in more than one partition.

When partitions are enabled and a partition is selected, you may only control and record data for the channels included in the partition, with the exception of parking and unparking channel parameters or playing back cues. If you try to control a channel that is not in your partition, Eos will post an advisory that this channel is outside of the partition, and you must confirm that you want to control that channel. You will not, however, be able to store information for that channel.

When you record a target (cue, preset, palette), only those channels that are partitioned to you are recorded. Other programmers' record actions to the same target can add to it (they do not replace it) unless channels are shared. When shared, the last value provided at the point of the record action will be stored.

Partition List

Setup > System > *Partitions* provides overviews and controls of all recorded partitions, including the four default partitions:

- Partition 0 - no channels and no fader control. This is the default for all users when partitioned control is enabled for the first time on a show. To gain control, you must select a different partition.
- Partition 901 - all channels. Allows the user access to all channels.
- Partition 902 - single parameter channels. Allows the user access to only channels with a single parameter.
- Partition 903 - multiple parameter channels. Allows the user access to only channels with multiple parameters.

To select a partition in the list, enter it in the command line.

- {Partition} [9][0][2] [Enter]

If partitioned control is enabled, this will now be your assigned partition.

Creating and Deleting Partitions

To create a new partition, press:

- {Partition} [x] [Enter] - where "x" is a number that does not yet exist in the partition list.

This will create a new partition, highlight it in the list, and (if partition is enabled) assign it as your partition.

To assign channels to that partition, enter them in the command line:

- [1] [Thru] [9] [6] [Enter]

You can also use **[+]**, **[-]**, and **[Group]** to further modify the channels in the partition. When adding/ subtracting channels to a partition, if you do not use **[+]** or **[-]** before channel numbers, the numbers will replace the channels in the partition, rather than adding to or subtracting from them. This overwriting does require a confirmation (if enabled in setup).

To delete any partition, use the command line syntax **[Delete] {Partition}** [x] **[Enter] [Enter]**. Default partitions cannot be deleted.

Partitions in Playback

In Eos, how faders are configured and what is loaded to those faders is shared across all control devices, with the exception of the master playback. As such, if the leftmost fader on page 1 is configured as submaster 1, all devices will display and control submaster 1 on that fader.

When content is played back from any device, it will be recalled in its entirety. If you wish to limit playback on cues, partitions can be assigned to cue lists. Additionally, filters can be placed directly on the playbacks to restrict what is recalled on that fader. Filters are system wide.

Eos allows each user to assign different cue lists to their master fader pair. Using this feature, programmers can work within their partitions, using the master fader pair for their specific cue list, without affecting the cue list that is loaded to the master fader of another user.

Partitions on Cue Lists

A partition may be assigned to a cue list. If a partition has already been applied to a cue list, any channels not in the cue list's partition will not be included in cues when they are stored or replayed.

Any data for a cue list that already existed before a partition is applied, will be maintained, including data for channels not included in the partition. If data existed before the partition was assigned, in blind, channels that are not in the partition will display without a channel graphic, any levels will be in gray, and a small superscript N will display with it.

Assigned partitions will display at the top of the cue list index and in the PSD.

Action	Syntax	Example	*Notes*
Assign a partition to a cue list.	**[Cue] [#] [/] {Partition} [#] [Enter]**	**[Cue] [2] [/] {Partition} [2] [Enter]** - assigns partition 2 to cue list 2.	
Remove a partition from a cue list.	**[Cue] [#] [/] {Partition} [Enter]**	**[Cue] [2] [/] {Partition} [Enter]** - removes assigned partitions from cue list 2.	

Note: *Element 2 and Element Classic consoles are limited to a single cue list.*

Flexichannel in Partitioned Control

When partitioning is enabled, a flexi mode, **{Partitioned}** is available as a softkey. When this is enabled, the flexi mode is limited to only those channels defined in the current partition. This mode may be further modified by use of the remaining flexi states. See *Using Flexichannel* and *Flexichannel Views in Patch*.

Mirror Mode

Mirror mode is used to mirror the external displays of another device. It can be used on any device on the network, including the primary. Any device being mirrored is referred to as the host. The is no limit to the number of mirrored devices a host can have. A console currently in mirror mode cannot be mirrored. Desk settings are not mirrored.

When a device is in mirror mode, the only action allowed from that device is paging via the page keys and shutdown / startup. When a device in mirror mode pages, it also pages the host. A device can select which user number it is mirroring by using the alphanumeric keyboard shortcut ALT+F1. ALT+F2 can be used to leave mirror mode. If a device is not currently in mirror mode, pressing M on an alphanumeric keyboard will post "Macro" to the command line.

See also

Mirror Mode Displays

When a device is placed in mirror mode, external monitors on the mirroring device will match the external monitors of the host. A client will mirror as many monitors as it has available.

All formats used on the host device are shown on the mirroring device including flexichannel states, column widths, chosen parameters, and pages.

The CIA will open on monitor 1. The CIA on the device in mirror mode can be locked open or closed. When left unlocked, the CIA will expand and close as normal. Not all CIA displays shown on the device in mirror mode. The following CIA displays are synchronized:

- *[About] [Tab 29]*
- *Effects Editor*
- *Effect Status [Tab 6]*
- *Color Picker [Tab 27]*
- *Curves [Tab 21]*
- *[Undo]*

The CIA can be completely hidden when locked by pressing the **[Displays]** key. Pressing **[Displays]** again will display and unlock the CIA.

Configuring Mirror Mode

Configuring a device to connect in Mirror mode is done from the Displays menu. When **[Displays]** is pressed, a **{Mirror}** softkey will be displayed. Pressing **{Mirror}** will open up a list of potential hosts in the CIA.

The mirror display can be navigated using the arrow keys or a mouse. When the required host is highlighted, press **[Enter]** or double click with a mouse to confirm the selection. This display can also be opened with the keyboard shortcut of ALT+F1. While in Mirror mode, the display will also have options for exiting and powering off the device.

Exiting Mirror Mode

Exiting mirror mode can be done by selecting **{Stop Mirroring}** in the mirror display or using the keyboard shortcut ALT+F2. When exiting mirror mode, the device will return to its normal, working state. Clients without a dongle cannot exit mirror mode.

Start in Mirror Mode

When a device is shut down in mirror mode, it will restart in mirror mode mirroring the same host as before. If the host has changed settings, mirror mode will need to be reselected on startup.

Mirror Mode Macros

Macros can be created to configure a device for mirror mode and to exit the mode.

If your console has dedicated macro hardkeys, the face panel button configuration in the ECU allows setup of these buttons.

To create a macro to place a device in mirror mode:

1. Set the User ID of all devices to match the Primary.
2. Press ALT+F1 on an attached alphanumeric keyboard to open the mirror mode display.
3. Highlight the device to mirror.
4. Press **[Learn] [**x**] [Enter]** to record the macro.

To create a macro to exit mirror mode:

1. With the console in mirror mode, press [**Learn] [**x**] [Enter]**
2. Press ALT+F2.
3. Press **[Learn]** to finish recording the macro.

Once the macros are created, you should save the show and reset all user IDs.

Using Mirror Mode on a Client without a Dongle

A client without a dongle can connect to the network. When this is done, the client can only operate in mirror mode, and it will always connect to the primary processor. No other options will be available.

Chapter 22

Show Control

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About Eos Family Show Control

Eos Family consoles can send and receive a variety of show control protocols.

- *Timecode*
  - SMPTE Timecode - an analog signal indicating time (subdivided into hours, minutes, seconds, and frames) that is used to sync events between multiple devices. Eos Family consoles receive SMPTE from Response Show Control Gateways. Eos devices only receive SMPTE, and do not send it.
  - MIDI Timecode (MTC) - a digital version of SMPTE sent over MIDI. MTC can be received through a local MIDI In port or through Response Show Control Gateways. Eos devices only receive MTC, and do not send it.
- *Real Time Clock (RTC)* - events can be triggered from the date and time on the console. With the correct location information, this includes astronomical events like sunrise and sunset.
- *Analog Inputs and Relay Outputs*
  - Analog - 0-10VDC inputs or contact closure inputs through a variety of interfaces. 0-10VDC inputs are received through Response Analog I/O Gateways. Contact closures can be received through the built-in closures on the console (when available) and through gateways.
  - Relays - normally closed and normally open contact closure outputs (SPDT). One relay is available on consoles that have built-in I/O ports. Multiple relays are available on Response Analog I/O Gateways.
- *sACN Input* - these incoming levels can be used to trigger show control actions. The console combines all incoming sACN levels for an address and uses the level from the highest priority source. If there are multiple sources at the same priority, it uses the highest level (HTP). The console will include its own sACN levels.
- *MIDI Show Control* - a standardized subset of MIDI System Exclusive (SysEx) commands used for show control. Eos Family devices can send or receive these messages. MIDI can be sent through the built-in MIDI ports (when available) and through Response Show Control Gateways.
- *String Commands*
  - Serial (RS232) - ASCII text strings, also known as plain text strings, can be sent or received via RS232 serial from Response Analog I/O Gateways.
  - Network Serial - ASCII strings can also be sent or received on the network via a UDP message.
- *MIDI Raw* - also known as MIDI Strings, MIDI Notes, or Channelized Event Data. Originally intended for communication between musical instruments, MIDI has been adapted for a variety of uses between devices. Certain Eos Family devices can send or receive MIDI messages through built-in hardware MIDI ports.
- *Open Sound Control (OSC)* - a network protocol using UDP/IP or TCP/IP over wired or wireless networks. It is used for communication between varying audio, video, and lighting devices. OSC can be sent and received from the console.

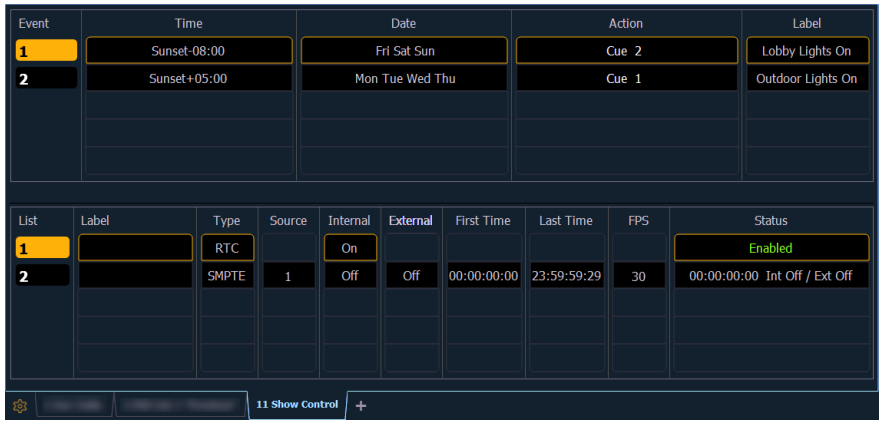
Most protocols that are received need to be configured in a Show Control list in the *Show Control [Tab 11]* display. These include MTC, SMPTE, Analog Inputs, RTC, MIDI Notes, Serial Strings, and sACN Input.

Show control settings are available via Setup > *System > Show Control*.

Show Control [Tab 11]

The Show Control display allows for the creation of show control events, organized into event lists. An event list defines how incoming show control events are processed by the console – any protocol that can be received by the console is handled here. Each event list is assigned a type of show control (timecode, analog inputs, RTC, or network). Specific information about setting up events for each show control type can be found later in this guide.

The show control display can be accessed via **[Tab] [1][1]**, or **{Show Control}** on the *Workspace Layout Menu*.



Event Lists

The lower portion of the show control display contains the event lists used in the console. Events are contained within a specific event list (like cues within a cue list). Each event list has a specific show control protocol type that it uses: MIDI, SMPTE, Analog, or RTC. Getting started with an event list is the same regardless of which show control protocol you are using.

Softkeys are available for the various event list options:

- **List** - is the event list number.
    - **<Event> [1][/][Enter]** - creates event list 1.
- **Label** - names the event list.
- **Type** - sets which type of show control protocol to use; MTC, SMPTE, Analog, Network, or RTC. Only one protocol can be used at a time per list.
- **Source** - should match the Group ID used in the connected Net3 Show Control, I/O Gateway, or the built-in ports (when available).
- **Internal** - enables the list to use internal timing sources. See *Internal and External Time* .
- **External** - enables the list to use external timing sources. See *Internal and External Time* .
- **First Time** - sets the first time that the console will use when using internal timing.
- **Last Time** - sets the last time that the console will use when using internal timing.
- **FPS** - sets how many frames per second (FPS) will be used; 30, 25, 24.
- **Status** - current status of the event list.

Events

The upper portion of the show control display shows the specific events that are contained in each event list. An event consists of an input condition, such as a timestamp, real time, an address, or input value, and an action. An event plays back (or "fires") when the input

condition is met (for example, the timecode passes the given timestamp, or a contact closure at the given address changes). Multiple events can be fired at the same time; however a single action can only be placed in each event.

Eos Family consoles support three event actions:

- Cues can be run.
- Submasters can be bumped, faded (via analog only), and turned on and off.
- Macros execute without interaction with the command line, unless the macro is set to foreground mode.

If another macro is fired before the first macro completes, the first macro will finish its action before the second is started.

If a macro is selected as the intended action, it will fire using the macro mode specified. See *Macro Editor [Tab 18]* for information on macro modes.

Softkeys are available for the various event options:

- Event - is the event number, used to select or create a specific event from the command line. Can also use [Next]/[Last] to select/navigate through the events.

The event number is not fixed, it is just provided as a way to select an event. For example, in timecode lists, the events are always chronological. The event number will change to match the chronology.

- Time/Address - used to specify the conditions when the event should trigger the action. This could be timecode, time of day, sACN levels, MIDI input, string input, OSC input, or an address used for analog inputs.

Time can be assigned to a list of events by using a range.

- {Event}[1] [Thru] [1][0] [Time] [1] [Thru] [1] [0] [Enter]
- Date - used to specify when the event should trigger the action, used only for *Real Time Clock (RTC)*.
- Action - is what the event is going to trigger; can be a cue, submaster, macro, or level by address, which sets the parameter at the assigned address to the incoming level manually.
  - {Event} [1] [/] [1] {Action} {Level By Address} [2] [/] [1] [Enter]
- Label - names a specific event.

Internal and External Time

Timecode (MIDI or SMPTE) is typically received from an input source, like a show control gateway. This timing source is referred to as external time, since it is coming from a source external to your console.

If the external time source is not available for any reason, each timecode event list within your console has an internal timing source which will assume control, if enabled. This internal timing source requires three pieces of information to determine how to generate its timing: first time, last time, and frame rate. When the internal clock reaches the last time, it will reset to the first time and continue running.

CAUTION: ***External timing sources may run faster or slower than the console's internal clock.***

Real Time Clock uses internal time only, but the clock can sync with an external time server using SNTP. Whether using internal time from the console or using external time from a time server, it is important that all the correct information for time zone, latitude, and longitude are properly setup. Refer to the Configuration Utility appendix in your console's manual for setup information.

Analog inputs and network inputs use the external setting only as a way to enable and disable the entire list.

Creating an Event List

Getting started with an event list is the same regardless of which show control protocol you are using.

To program an event list, you first must open the show control display.

- [Displays]><More SK>>{Show Control}

Create an event list by specifying it in the command line.

- <Event> [1] [/] [Enter]

Specify what the list will respond to (MIDI, SMPTE, Analog, or RTC).

- <Event> [1] [/] {Type} {MIDI} [Enter]

Define the group or source.

- <Event> [1] [/] {Source} [8] [Enter]

Activate the internal and / or external timing functions (see *Internal and External Time*). These functions are toggle on/off states.

- <Event> [1] [/] {Internal} {External} [Enter]

When defining an event list, it is feasible to enter multiple commands in the same command line. This can speed up your programming of an event list. For example:

- <Event> [2] [/] {Type} {MIDI} {Source} [5] [Enter]

Once the list is created, you will then need to create the specific events. Those steps will vary depending on what protocol is being used.

Timecode

Eos Family consoles can receive internal or external timecode to execute event lists.

Timecode lists can receive timing data from either SMPTE or MIDI sources. Eos Family consoles accept up to 32 SMPTE sources and 32 MIDI timecode (MTC) sources (each are numbered from 1-32). Up to 64 sources can be received simultaneously.

Enabling Timecode

Eos Family consoles have global settings in **Setup >** *System > Show Control* to enable or disable reception of MIDI Timecode and SMPTE Timecode.

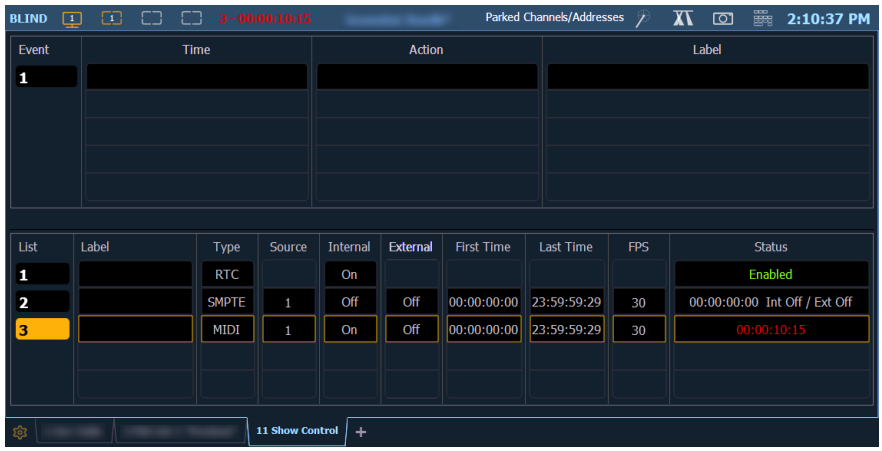
If the MIDI Timecode setting is disabled, all MTC event lists are disabled as well. Each event list can be enabled and disabled individually using the internal and external fields. Off is disabled, regardless of the global setting in the setup screen. The same is true for SMPTE Timecode.

Timing Data

Timing data is given in the form of (hours) : (minutes) : (seconds) : (frames). Therefore a timing value of 06:25:15:24 would be 6 hours, 25 minutes, 15 seconds, 24 frames.

The number of frames per second is determined by the timing source and the event list must be set to this same number of frames when programming. Number of frames can be 24, 25, or 30.

Color Coding



The color of the time in the Status column of the event list display indicates the source of the timing data. The colors and indications are:

- **Green** - Valid external timing is being received.
- **Red** - The internal clock is the data source and is running.
- **Gray** - No timecode is being received from internal or external sources.

Timecode Indicator

You will see an indicator in the upper portion of the main display if valid internal or external time is seen.

Select the indicator to see a dropdown menu of all active timecode sources. The menu shows the List number, list label (if any), current time (if any), a symbol for MIDI/SMPTE, subscript for framerate, and the list group ID.

Selecting **{Show Last Active Source}** will display the last active timecode source in the upper portion of the main display after the dropdown is closed. The selected list can be stored in *Snapshots*.

Timing and Clocks

The internal and external clocks can be enabled separately for each timecode list. If you enable the external clock only, events will play back as long as valid timing data is received from an external source. When the timing data stops, the events will stop.

When you enable the internal clock only, it starts running immediately and triggers events appropriate to the time.

When both internal and external clocks are enabled, the internal clock does not start running until the first valid external time is received. After that, it will run whenever the external time source is absent.

Loop Times

First and last times define the overall loop. Times can be set anywhere from 00:00:00:00 to 23:59:59:29. When external time is being received, your console ignores these times. However, you should still set them to match whatever loop times the external clock is using. When using internal timing, it is important to set the first and last times. These set the start and stop or loop points of the sequence.

Internal Clock

You can set the internal clock at any time by selecting the event list (**<Event List> [1] [/]**), pressing **[Time]**, and entering a time.

To reset the internal clock, select the event list and press **[Time] [Enter]**.

Programming a Timecode Event List

This process applies to both MIDI and SMPTE timecode.

Open the show control display.

- **[Displays] > <More SK> > {Show Control}**

Create a new event list.

- <Event> [1] [/] [Enter]

Define the type of input.

- <Event> [1] [/] {Type} {MIDI} [Enter]

Define the source of input (this is the source ID number of the Gateway 1-32).

- <Event> [1] [/] {Source} {1} [Enter]

Specify if internal and / or external timing is enabled.

- <Event> [1] [/] {Internal} {External} [Enter]

Define the first time and last time for the event list (times are given as 00:00:00:00).

- <Event> [1] [/] {FirstTime} [2] [0] [1] [5] [Enter]
- <Event> [1] [/] {LastTime} [2] [0] [4] [5] [1] [5] [Enter]

Specify the number of frames per second (FPS) used by the timing source (24, 25, or 30).

- <Event> [1] [/] {FrameRate} [2] [5] [Enter]

When working in Live, to show the timecode times in the Cue List, go to the Cue List Display.

- [Cue] [Cue]

Select the Cue List to be triggered.

- [Cue] [1] [/]

Now associate the Event List to the Selected Cue List.

- [Cue] [1] [/] {Execute} {Timecode} {1} [Enter]

Both the Event List and the Cue List are ready for events to be added. There are three ways that events can be added into the Event List.

You will notice as events are added in the Event List that the timecode will display on the Playback Status Display.

Execution While Editing

If the internal or external clock is running, events will fire, even if you are in the edit screen. As soon as an event is created, the event list is resorted, and the new event is eligible for playback.

Silent Mode

When a timecode list is in silent mode, its clock can run without firing its events. This can bea useful when learning events without firing existing events.

Adding Timecode Events

Using the Show Control Display

Events can be added directly from the show control display. A new event number must be specified for each event action.

Open the show control display.

- [Displays]><More SK>>{Show Control}

Select the event list.

- <Event> [1] [/] [Enter]

Specify a new event number.

- <Event> [1] [Enter]

Add the action that the event should execute.

- <Event> <1> [Cue] [1] [Enter]

Define the timecode position of the event.

- <Event> <1> [Time] [2][0][1][5] [Enter]

It is possible to enter multiple commands in the same command line. This can speed up your programming.

- <Event> [2] [Cue] [1.5] [Time] [2][4][1][3] [Enter]

Event timing can also be modified within a range. Let's say an additional 5 frames needs to be added to multiple events.

- <Event> [1] [Thru] [4] [Time] [+] [5] [Enter]

You will notice as events are added to the event list, the timecode will display on the Playback Status Display.

Using Live

Events can be added directly from Live using the same conventions used in the Show Control Display. The advantage to doing this from Live is there is no need to specify the event number, as the console automatically assigns the number.

From the Live display, select the cue to execute.

- [Cue] [3]

Now define the timecode location.

- [Cue] [3] {Timecode} [3][2][1][5] [Enter]

You will notice as events are added to the event list, the timecode will display on the Playback Status Display.

Using Learn

If you select an event list within the show control display, you can press the **[Learn]** hardkey to activate learn mode for that event list. When in learn mode, an event is created with the current list time whenever a cue is activated, a submaster bump is pressed, or a macro is run. Once in learn mode, the **[Learn]** key will remain lit to indicate that it is in learn mode. If the show control display is exited, the console remains in learn mode until deactivated.

Multiple timecode lists can be in learn mode simultaneously, each with their individual times. It is recommended that you associate the event list and cue list together, so events will be learned into the intended timecode list.

- [Cue] [1] [/] {Timecode} [1] [Enter]

To exit learn mode, the console must be in the show control display. Once there, select the event list then press **[Learn]** again. If **[Learn]** is pressed while viewing any other screen than the show control display an empty event will be placed on all event lists that are in learn mode.

- [Displays]<More SK>{Show Control} - opens the show control display
- <Event> [1] [/] - selects the event list to enable learning on

Press the **[Learn]** key. In the Status column it now says Learning, and the **[Learn]** button is illuminated.

A **{Learn Events}** softkey is available in the event list. This macro-able item allows you to enable and disable show control learn mode. Macros containing this softkey will not be included in learned events. Other Macros can be learned as events in an Event List. Use **{SC Learn}** softkey in the *Macro Editor [Tab 18]* to enable/ disable excluding specific Macros from being learned as events.

Real Time Clock (RTC)

Eos Family consoles have the ability to run Real Time Clock (RTC) events. RTC events are used to run a cue, submaster, or macro at a specific time on specific days. RTC events can run at a certain time of day, like 5:00pm on Tuesdays, a certain date, or at a time based off of astronomical events, such as sunrise and sunset.

Enabling Real Time Clock

For astronomical (sunrise and sunset) events to work properly, time zone, latitude, and longitude must be set up correctly. Those settings are found under the General tab in the Eos Configuration Utility (ECU).

Via **ECU >Network >Time Service (SNTP)**, you can configure the SNTP server or client so that the console can synchronize time across the network with other systems, such as Paradigm® architectural control.

For all RTC events, the option for internal must be set to on within the show control display. As long as the internal option is set to on, the RTC events will execute. However if internal is set to off, then the events will not trigger. The status in the show control list will indicate whether it is on or off. There is no way to disable a single event from triggering within the event list; you can only remove the event number.

Real Time Clock Events

RTC events are created using the *Show Control [Tab 11]*. RTC events consist of a time field, a day or date field, and an action. Time for RTC events can be specified as local time or as time relative to the astronomical events, sunrise and sunset. Local time is displayed in the 24 hour format. For example, if you want an event to run at 2:50pm, you would need to set it for 14:50.

Programming Real Time Clock Events

Open the show control display.

- **[Displays] <More SK> {Show Control}**

Create a new event list.

- **<Event> [1] [/]**

Specify the event list as RTC.

- **<Event> [1] [/] {Type} {RTC} [Enter]**

Enable the RTC.

- **<Event> [1] [/] {Internal} [Enter]**

Define the Time and Date for each event. A Date must be entered for the event to run.

Commands cannot be combined on the same command line.

- **<Event> [1] [Time] [1] [5] [0] [0] [Enter]** - sets the time for 3:00pm.
- **<Event> [1] {Days} {Mon} {Wed} {Fri} [Enter]** - adds on Mondays, Wednesdays, and Fridays.

Days of the week can either be entered in from their softkeys, or you can enter them in from the keypad using the conventional modifiers (+, -, thru). Monday is 1.

Define the Astronomical Time and Date.

- **<Event> [2] [Time] {Before Sunset} [3] [0] [Enter]** - sets the time for 30 minutes before sunset.
- **<Event> [2] {Days} [1] [+] [2] [+] [3] [+] [6] [Enter]** - adds on Monday, Tuesday, Wednesday, and Saturday.

To run an event daily, each day of the week must be added to the event.

Define the Astronomical Time and Date.

- **<Event> [3] [Time] {After Sunrise} [6] [0] [Enter]** - sets the time for an hour after sunrise.

The events will renumber themselves to be in the correct order of execution throughout the day. Event 3 is now listed as Event 1. The command line will change to Event 1 automatically.

- **<Event> [1] {Date} [2] [1] {Month} [1] [0] {Year} [2] [0] [1] [5] [Enter]** - sets the date to October 21, 2015.

Creating the action for each event is the same as timecode. Select the event and specify either cue, submaster, or macro.

- **<Event> [1] [Cue] [1][2] [Enter]**

Analog Inputs and Relay Outputs

Eos Family consoles can accept analog input through a variety of interfaces. 0-10VDC inputs are received through Response gateways. Contact closures can be received through the built-in remote trigger port on the console (when available) and through Response gateways.

Response gateways can be set up via the Concert software available in the shell. For more information, please refer to the Response Gateway Setup Guides. Configuration of your console's local ports, including the pin-out of the connector, is available in **Setup >** *System > Show Control*.

Analog inputs are programmed through the show control display, where each analog event in the event list consists of a port address and an action. Each event list source references a specific Group ID, which needs to match the ACN Group ID of the I/O Gateway or the Group ID of the built-in remote trigger port, and the events themselves are assigned addresses for the individual addresses or inputs within the gateway.

To enable the analog event list, the external time option must be enabled. This enables or disables function for the entire event list. There is also a global enable for all analog inputs found in **Setup > System > Show Control > Contacts >** *{Analog Inputs}*.

Analog Input Events

There are two types of analog input events – contact closures and 0-10VDC inputs.

Contact closures will fire an event the input circuit is closed. Events that can be triggered this way include running a cue, controlling a submaster, and firing a macro. The event is only triggered as the closure occurs. It will not be triggered again as the circuit is opened.

0-10VDC inputs can be used to control a submaster fader proportionally, where 0VDC represents 0% on the fader and 10VDC represents 100% on the fader. When assigned to a contact closure style of event, like a Sub Bump, the event will be triggered when the input passes 6.67VDC. The input must then pass below 3.3VDC and then above 6.67VDC to trigger the event again. This is designed to prevent the event from firing too many times, in case the input has noise that causes the voltage to fluctuate.

Create an Analog Event List

Open the show control display.

- **[Displays]<More SK>{Show Control}**

Create a new event list.

- **<Event> [4] [/] [Enter]**

Define the type of input.

- **<Event> [4] [/] {Type} {Analog} [Enter]**

Define the source of input.

- **<Event> [4] [/] {Source} {1} [Enter]** (This is the Source ID# of the Gateway.)

Specify the event list to be active.

- **<Event> [4] [/] {Internal} [Enter]**

Create an analog input event where an input on address 1 will fire cue 10.

- **<Event> [4] [/] [1] {Analog Address} [1] [Cue] [1] [0] [Enter]**

Actions

Cues, macros, and submasters can all be triggered from analog inputs (contact closure or analog voltage above 6.67V) or *sACN Input*.

Cues

Execute the cue with its programmed cue timing.

Create an event where an input on address 2 will fire cue 11.

Analog input:

- **<Event> [4] [/] [1] {Address} [2] [Cue] [1] [1] [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [2] [Cue] [1] [1] [Enter]**

Macros

Triggers the macro and begin execution immediately.

Create an event where an input on address 3 will fire macro 1.

Analog input:

- **<Event> [4] [/] [1] {Address} [3] [Macro] [1] [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [3] [Macro] [1] [Enter]**

Submasters

There are four modes: On, Off, Bump, and Fader.

On

The submaster will act as if the bump button was pressed and held down. This will toggle, or release the same state, when activated again.

Create an event where an input on address 4 will set Sub 1 to On.

Analog input:

- **<Event> [4] [/] [1] {Address} [4] [Sub] [1] {On} [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [4] [Sub] [1] {On} [Enter]**

Off

Used to release the submaster's bump button when triggered from a Sub On action elsewhere in a show control action

Create an event where an input on address 5 will set Sub 1 back Off.

Analog input:

- **<Event> [4] [/] [1] {Address} [5] [Sub] [1] {Off} [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [5] [Sub] [1] {Off} [Enter]**

Bump

Acts as if the input is directly controlling the bump button. If the submaster is set to have a dwell time of Man (manual), then it will instantly flash and turn back off. It is generally recommended to set the submaster to have a dwell time of Hold or a specified time. The first trigger will turn the submaster On. If the submaster is set to a dwell time of Hold, the second trigger will turn the submaster Off.

Create an event where an input on address 6 will bump Sub 1.

Analog input:

- **<Event> [4] [/] [1] {Address} [6] [Sub] [2] {Bump} [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [6] [Sub] [2] {Bump} [Enter]**

Fader

Acts as if the input is directly controlling the fader on the submaster. A contact closure will move the fader from 0 to 100% instantly. A 0-10VDC input will fade the value proportionally, where 0VDC is the fader at 0%, and 10VDC is the fader at 100%.

Create an event where an input on address 7 will control the fader for Sub 3.

Analog input:

- **<Event> [4] [/] [1] {Address} [7] [Sub] [3] {Fader} [Enter]**

sACN input:

- **<Event> [4] [/] [1] {sACN} [7] [Sub] [3] {Fader} [Enter]**

Relay Outputs

Eos Family consoles can trigger relay outputs on Net3 I/O Gateways and on the built-in relay output (when available). Relay outputs are also often called remote triggers, contact closures, or contact outputs. Relay outputs are controlled by external links in cues and submasters only. See **Setup >** *Device > Show Control*.

- **[Live] [Cue] [1] {Execute} {Relay} [1] [/] [2] {On} [Enter]** - 1 is the ACN Group ID of the I/O Gateway or built-in relay output and the 2 is the relay output address.

Note: *You enter relay information in the Live or Blind displays. This is not a show control display function.*

sACN Input

Eos Family consoles can receive streaming sACN level information from themselves and other devices on the lighting control network. Similar to Analog Inputs, these received sACN input levels can then be used in Show Control events to execute certain actions.

sACN allows for multiple sources to be present on the network. These sources (configured at the transmitting device) are each given a priority. The valid priority range is 1 (lowest) to 200 (highest) with 100 as the default. When determining the winning level for an address, the level with the highest priority will be used. If the sources have the same priority, the highest level will be used (also known as Highest-Takes-Precedence, or HTP).

sACN Inputs can be assigned to events. These events can run a cue, control a submaster, or fire a macro. Submasters can be turned On, Off, trigger the Bump button, or control the fader. See *Actions*.

Using sACN Input

With the exception of a submaster fader and bump, sACN Input will fire an event when the level rises above 50% (DMX 127). It does not fire again when the level drops below 50% (DMX 127). It only fires again when the level drops below 50% and then rises above 50%.

Submaster bump will act as if the bump button was pressed when the level rises above 50% (DMX 127), and acts as if the bump button was released when the level drops below 50%.

Run a Cue Based on sACN Input

Open the Show Control Display.

- [Displays] <More SK> {Show Control}

Create a new event list.

- <Event> [8] [/] [Enter]

Define the type of input.

- <Event> [8] [/] {Type} {Network} [Enter]

Create a new event.

- <Event> [1] [Enter]

Assign the sACN address using universe/address format.

- {sACN} [4] [/] [1] [Enter]

Add the action to execute. Actions can be either a cue, submaster, or macro.

- {Action} {Cue} [1] [Enter]

Control a Submaster Based on sACN Input

Open the Show Control Display.

- [Displays] <More SK> {Show Control}

Create a new event list.

- <Event> [8] [/] [Enter]

Define the type of input.

- <Event> [8] [/] {Type} {Network} [Enter]

Create a new event.

- <Event> [2] [Enter]

Assign the sACN address using universe/address format.

- {sACN} [4] [/] [2] [Enter]

Add the action to execute. Actions can be either a cue, submaster, or macro.

- {Action} {Sub} [1] {Fader} [Enter]

MIDI Show Control

Eos Family consoles can receive MIDI Show Control (MSC) data from Net3 Show Control Gateways and the built-in MIDI ports on a console or programming wing (when available). There can be up to 32 sources, and these sources can be assigned Group IDs between 1 and 32. MIDI Show Control is one of many different types of MIDI signals – MIDI timecode and MIDI Notes are supported, but described elsewhere in this document.

Eos Family consoles can also transmit MIDI Show Control data.

MIDI Show Control Devices

MIDI Show Control data carries a device ID (MIDI channel) within the data packet. **Setup > System > Show Control >** *MIDI* allows you to specify two device IDs: one for reception and one for transmission. This is different than the ACN Group Tx and Rx IDs, which are the show control gateway source ID and transmitting ID. The show control gateway, assigned an ACN Group Tx and Rx ID, can send MIDI messages to and from several Device IDs all on the same MIDI line.

Only MSC data that matches the MSC Receive Channel in Setup, or an All Call ID (127), will be interpreted by your console.

All outgoing MSC data contains the specified transmit device ID, as specified in Setup.

Eos Family Command Interpretation

MIDI Show Control commands contain a Command Format, or device type that is intended to receive a message. Eos Family devices will respond to Lighting—General messages. All other command formats are ignored.

Eos Family consoles can receive the following MSC commands:

- **Go** - runs a cue.
- **Stop** - pauses a cue.
- **Resume** - resumes a paused cue.
- **Set** - controls a submaster, playback, or Grandmaster.
- **Fire** - runs a macro.

In addition to the command and command format, the MSC commands also contain places for transmitting devices to provide additional data, or data fields, which further specify the intended action, like a submaster number. When Eos Family consoles output MSC, these fields cannot be edited and correspond to the cue, submaster, or macro that is being executed.

The cue-related commands (go, stop, resume) have three fields – Cue Number, Cue List, and Cue Path. Cue Path is not used by the console. Cue Number and Cue List are optional fields – if they are not provided, the console runs the next cue on the master fader on the console. The Cue List and Cue Number field, if provided, should match a cue list and / or cue number on the console.

In the command/ effect tables below, if a field is present in the MSC data, the name is indicated (such as "Cue"). If it is not present in the data, a "-" is indicated.

Go

When accompanying a MIDI "Go" command, data for the following fields will result in the following actions:

Cue Data Field	List Data	Field Action
Cue	List	Runs the specified cue in the specified cue list
Cue	-	Runs the specified cue in cue list 1
-	List	Runs the next cue in the specified list
-	-	Runs the next cue in cue list 1

Stop

When accompanying a MIDI "Stop" command, data for the following fields will result in the following actions:

Cue Data Field	List Data	Field Action
Cue	List	Stops the specified cue & list (if running)
Cue	-	Stops the running cue in cue list 1
-	List	Stops the current cue from the specified list
-	-	Stops the running cue on the master fader of the console that received the command

If a cue is not currently running (or already stopped), the Stop command will trigger Back, fading back to the previous cue.

Resume

When accompanying a MIDI "Resume" command, data for the following fields will result in the following actions. If there are no stopped cues, this action is ignored.

Cue Data Field	List Data	Field Action
Cue	List	Resumes the specified cue & list (if stopped)
Cue	-	Resumes the specified cue in the default cue list
-	List	Resumes the current cue in the specified list
-	-	Resumes all stopped cues

Set

The "Set" command allows MSC to control specific faders using both a numeric control value (which specifies the fader number) and a data field (which controls the level: 0-100). Control values are as follows:

Control Value	Data Field	Indication
1-127	0-100	Submaster 1-127
128	0-100	Primary playback in
129	0-100	Primary playback out
510	0-100	Grandmaster

All other control values are ignored.

See *Hexadecimal and MIDI Show Control Formatting* for information on formatting MIDI messages.

Fire

This command fires a macro. MSC supports macros 1 through 127 only. Therefore a numeric value of 1 through 127 followed by 00 (in hex) would accompany this command.

Sending MIDI Show Control

When MSC Transmit is enabled in **Setup > System > Show Control >** *MIDI*, the console will send MIDI Show Control commands to the specified MSC Transmit Channel (or Device ID) that correspond to the console's current action. For example, if Cue 1 in List 2 is executed, the console will send a MSC Go command for Cue 1 List 2.

The console will send the following MSC commands:

- **Go** - runs a cue
- **Stop** - pauses a cue
- **Resume** - resumes a paused cue
- **Fire** - runs a macro

Set commands (for submasters, the playback pair, and grandmaster) are not transmitted from Eos Family devices.

Hexadecimal and MIDI Show Control Formatting

When configuring other devices to send or receive MIDI Show Control, you may need to consider the hexadecimal data that is sent as a part of a MIDI Show Control command. Many software packages manage this formatting for you, but some instances require you to enter this manually. The following notes are intended as a quick reference for common use cases. For a more exhaustive reference on MIDI Show Control message formatting, please refer to the book referenced at the beginning of this guide – Show Networks & Control Systems by John Huntington.

Structure

A MIDI Show Control string can be written as a short hexadecimal message.

An example string would be:

- F0 7F 01 02 01 01 31 00 31 F7

There is a structure to these strings – this is what the same string looks like with the parts that can be modified identified in brackets:

F0 7F **[device_ID]** 02 **[command format] [command] [command_data]** F7

Note: *For Eos Family products, the command format field is always 01, for Lighting – General.*

The following commands discussed earlier in this document have the following command codes:

- **Go** - runs a cue = **Command 01**
- **Stop** - pauses a cue = **Command 02**
- **Resume** - resumes a paused cue = **Command 03**
- **Set** - controls a submaster, playback, or Grandmaster = **Command 06**
- **Fire** - runs a macro = **Command 07**

The other parts of the string are standardized. F0 7F and the ending F7 are parts of the standard MIDI System Exclusive message format. The 02 specifies the protocol is MIDI Show Control.

Go, Stop, Resume

The cue commands can target any available cue on the console. Hexadecimal doesn't natively handle decimal numbers, so the numbers are sent in a different format (ASCII text encoding).

There are four simple rules for formatting:

1. Specify the cue number first, and then the cue list
2. Place a "3" in front of every digit of the number
3. Place a "2E" wherever there is a decimal
4. Place a "00" when separating a cue number from the cue list

Examples include:

- Eos - Cue 1/54
    - MSC Formatted - 35 34 00 31
- Eos - Cue 4/101
    - MSC Formatted - 31 30 31 00 34
- Eos - Cue 10/55.6
    - MSC Formatted - 35 35 2E 36 00 31 30
- Eos - Cue 3/ (no cue number provided – play next cue in list 3)
    - MSC Formatted - 00 33
- Eos- Cue 1 (no cue list provided – assumes cue list 1)
    - MSC Formatted -31 00

For example, sending Device ID 3 a GO command for cue 5.4 in list 99 would be formatted as follows:

F0 7F 03 02 01 01 35 2E 34 00 39 39 7F

Setting Submasters, Playback Masters, or Grandmasters

Submasters from 1-127 are represented as values 01 to 7F

The master playback "up" fader (128) is represented as two hexadecimal numbers in a row - 00 01.

The master playback "down" fader (129) is represented as two hexadecimal numbers in a row – 01 01.

The grandmaster fader (510) is represented as two hexadecimal numbers in a row – 7E 03.

There are three simple rules for formatting:

1. Level values are sent as 0-100 in decimal form, which would be sent as 00-64 in hexadecimal
2. Submasters – send the fader number, followed by 00 (in hex), then the level value, and finally 00 (in hex). For example, sending submaster 1 to 100% would be sent as 01 00 64 00.
3. Playback Masters and Grandmasters – send the fader number, followed by 00 (in hex), and then the level value. You do not need to end the command with 00. For example, setting the grandmaster to 75% would be sent as 7E 03 00 4B

For example, sending Device ID 3 a SET command for sub 4 to 0% would be formatted as follows:

F0 7F 03 02 01 06 04 00 00 00 7F

As a second example, sending Device ID 10 a SET command for the playback master "up" fader to 100% would be formatted as follows:

F0 7F 0A 02 01 06 00 01 00 64 7F

Firing Macros

Macros are relatively simple. Only macros 1-127 can be triggered, represented by one hexadecimal byte.

- Eos - Macro 12
    - MSC Formatted - 0C

For example, sending Device ID 5 a FIRE command for macro 17 would be formatted as follows:

F0 7F 05 02 01 07 11 F7

String Commands

Eos Family consoles have the ability to send and receive command strings to and from other networked devices, such as Paradigm®, Crestron®, and media servers. These strings can be delivered in a variety of formats, including RS232 serial, UDP, ACN, and OSC.

You can configure sending and receiving the various serial protocols supported by the console in **Setup >** *System > Show Control*. Most string protocols are disabled by default.

Receiving String Commands

All text will be queued up until either a carriage return (hex 0D), a "\r", or a "#", is encountered in the string to show the end of the command.

Command Line

If the text begins with a "$", the text that follows until the carriage return (hex 0D), a "\r", or a "#" will be sent to the command line for user 0 and processed as if that user had typed it. Commands can be directed to a specific user command line by adding <UX> at the beginning of the string, where X is replaced by the intended user number. The carriage return (hex 0D), a "\r", or a "#" will also act as the **[Enter]** key for the command line. For example:

- **$ Chan 1 Color Palette 1#** - puts channel 1 into color palette 1 on the background user (User 0).
- **<U2> $ Chan 1 Thru 10 At Full /r** - sets channels 1 through 10 to full manually on User 2's command line.

Note: *It is best practice to place spaces after both the <UX> and the $ symbol to ensure the command is interpreted properly.*

Command line text needs to use the same language as your console. Language settings are found in ***ECU > General****.*

Event Handler (Non-Command Line)

Note: *Text requires either a carriage return (hex 0d), "\r", or "#" to terminate the command line.*

All other text that doesn't start with a "$" will be sent to the console's event handler. Here are a few examples:

- **Go 1** - fires cue list 1.
- **Cue 1 2** - runs cue 2 from list 1, on the appropriate fader.
- **Cue 1** - fires pending cue from list 2.
- **GoCue 0 1** - clears cue list 1 (fires cue 0).
- **Back_CueList 1** - runs previous cue from cue list 1.
- **Release 1** - releases cue list 1.
- **Off 1** - turns cue list 1 off.
- **Resume 1** - resumes cue list 1.
- **Assert 1** - asserts cue list 1.
- **Stop 1** - stops playback 1.
- **Stop Cue 1 2** - stops cue 2 from list 1 if it is running.
- **Stop** - stops all.
- **Resume Cue 1 2** - resumes cue 2 from list 1 if it is stopped.
- **Resume** - resumes all.

- FaderMove_CueList 1 50 - sets cue list 1's playback fader to 50 percent.
- Grandmaster 1 100 - sets grandmaster 1 to full.
- Macro 1 - fires macro 1.
- SubAssert 1 - asserts submaster 1.
- SubUnload 1 - unloads sub 1.
- SubDown 5 - presses sub 5's bump button down.
- SubUp 5 - releases sub 5's bump button.

Faders are accessed by adding 1000 to the fader number. This would affect any palettes or presets assigned to the fader. Subs must be used with their sub number only. For example:

- SubMove 1 25 - moves Sub 1 to 25%.
- SubMove 1001 50 - moves Fader 1 to 50%.
- SubMove 1011 75 - moves Fader 11 (fader 1 on page 2) to 75%.
- SubDown 1101 - presses Fader 101's bump button down (fader 1 on page 10).

Receiving UDP Strings

UDP strings must be sent to the console's IP address (unicast) and designated port to be processed. Multicast and broadcast UDP strings are not supported. To find your console's IP address, clear the command line and press [About]. See *[About] [Tab 29]*.

UDP Strings are configured via Setup > System > Show Control > *UDP Strings*.

Receiving ACN Strings

To receive ACN strings, {String RX} must be enabled in Setup > System > Show Control.

Bidirectional ACN Strings Send and Receive

To send and receive ACN strings from devices such as a Net3 Gateway, both {String TX} and {String RX} must be enabled, and the device's IP address must be set in the {String TX IP Address} field.

If you have multiple devices sending or receiving strings, separate each entry in the {String TX IP Address} field with a comma or semicolon.

Note: *If you have multiple devices sending or receiving strings, separate each entry in the {String TX IP Address} field with a comma.*

Receiving via the I/O Gateway

For your console to receive serial data from a Net3 I/O Gateway, the Serial Port Group ID assigned at the gateway must match the String RX Source ID in Setup > *System > Show Control*, and the String RX setting must be enabled.

Receiving Serial Commands to Trigger Events

All text will be queued up until either a carriage return (hex 0D), a "\r", or a "#", is encountered in the string to show the end of the command. The custom string is case-sensitive.

RS232, UDP, and ACN Strings

The sending device needs to add "SC " (without quotes, case-sensitive, and including the space) to the beginning of the string in order for it to be correctly processed.

- SC Hello# - sends the string "Hello" to the show control display via RS232, UDP, or ACN.

Event Commands

When a command is received that starts with the prefixes listed above, the console will look for a matching serial event defined in a Show Control List. Custom string input from any serial source (RS232, UDP, ACN, OSC) can be used to trigger the following actions:

- Cue - fires a cue.
- Submaster - bumps a submaster, turns a submaster on or off, sets a submaster to a fader percentage. OSC cannot be used to set fader levels via custom serial commands.
- Macro - fires a macro.

Programming Serial Events

- [Displays]><More SK>>{Show Control} or [Tab] + [1][1] - opens the show control display.
- <Event> [9] [/] [Enter] - creates a new event list.
- <Event> [9] [/] {Type} {Network} [Enter] - specifies the event list as Network.
- <Event> [9] [/] {External} [Enter] - enables the list (external only).

Then, select {Input String} and add the appropriate UDP or OSC command.

For OSC, type in the command you want the console to listen for. The sending device needs to start the command with /eos/sc/ in order for the console to listen to it. For example, type Hello in the Input String field. On your OSC sending device, have it send /eos/sc/Hello.

For UDP, type in the string you want the console to listen for. The sending device needs to add "SC" (case-sensitive) to the beginning of the string in order for it to be correctly processed. The string needs to be terminated with a carriage return (hex 0D), \r, or #. For example, type Hello in the Input String field. On your UDP sending device, have it send SC Hello#. To set the submaster fader percentage using UDP, you need to include a number (0-100) after the string. For example, blue 50#.

Then add the action to execute. Actions can be a cue, submaster, or a macro.

- {Action} {Cue} [1] [Enter]

Sending String Commands

The ability to send and receive strings can be done via RS232 ports (via a Net3 I/O Gateway), network UDP messages, and ACN String. See Setup > *System > Show Control*.

Note: *The console can be configured to send either ACN strings or UDP strings, as they share the String Tx IP Address field. A combination of device names for ACN and IP addresses for UDP is not supported. Combinations of I/O Gateways and either UDP or ACN Strings are allowed.*

Sending Strings

There are three ways that your console can send strings: from cues, macros, or user events. String TX must be set to Enabled in Setup for any strings to be sent.

Termination Characters

All strings are appended with CR LF unless the string contains an escape character (in which case no default termination is appended).

Escape Characters

Non-printable ASCII characters can be placed in the string using the escape characters "\x" followed by the hexadecimal character code. To place a carriage return (CR) in the string, type "\x0D".

If an escape character is embedded in the string (in any position), then the default termination is not applied.

- **[Cue] [1] {Execute} {Strings} "macro on"** – sends "macro on" with the default CR LF termination.
- **[Cue] [1] {Execute} {Strings} "macro on\x0A"** – sends "macro on" with a line feed (LF) termination.
- **[Cue] [1] {Execute} {Strings} "macro\x0Don"** – sends "macro <CR> on" with a carriage return in the middle and no termination.
- **[Cue] [1] {Execute} {Strings} "\x02\x03"** – sends ASCII characters 0x02 and 0x03 with no termination.

Sending from Cues

Cues can be assigned specific user-defined strings to send. When the cue is executed, the string will be sent to all enabled string interfaces. To assign the string, select the cue and press the **{Execute}** softkey. A **{String}** softkey will be displayed. When **{String}** is pressed, the alphanumeric keyboard will display. Enter the desired string, press **[Enter]** and text entered will be displayed in the external links field of the playback status display.

If there is already a string linked to the selected cue, the string will be displayed for editing. When **[Cue] [n] {Execute} {String}** is on the command line, pressing [Next] / [Last] will step through all the strings used in that show file. You can then modify the displayed string to simplify the process of entering similar strings.

Sending a String to Paradigm

Select the cue that should be executing the string.

- **[Cue] [1]**

Press the **{Execute}** softkey.

- **[Cue] [1] {Execute}**

New softkeys will appear, press the **{Strings}** softkey.

- **[Cue] [1] {Execute} {Strings}**

Define the serial string, in this case we will trigger a Macro On in Paradigm.

- **[Cue] [1] {Execute} {Strings} macro on Lights1 [Enter]**

Sending from Macros

A **{Send String}** softkey is available in the Macro Editor display. Any text entered after the string command in the macro will be sent to all enabled string interfaces when that macro is fired.

Sending From User Events

{String MSC TX} is an option in **Setup >** *System > Show Control*. When **{String MSC TX}** is enabled, MIDI Show Control messages will be sent as serial string messages when certain actions happen at the console.

Those actions are:

- A cue is fired.
    - Cue 1/2 is triggered. The console will send Cue 1 2.
- A cue is stopped.
    - Cue 3/1 is stopped. The console will send Stop Cue 3 1.
- A cue is resumed.

    - Cue 3/1 is resumed. The console will send Resume Cue 3 1.
- A sub's bump button is held down.
    - Sub 5's bump button is pressed down. The console will send SubDown 5.
- A sub's bump button is released.
    - Sub 5's bump button is pressed down. The console will send SubUp 5.
- A macro is fired.
    - Macro 1 is fired. The console will send Macro 1.

Sending UDP Strings

UDP strings will be sent from the console on an ephemeral (always changing) port number to the destination port specified in Setup. UDP strings sent to multicast IP addresses are not supported.

Note: *The console can be configured to send either ACN strings or UDP strings, as they share the String Tx IP Address field. A combination of device names for ACN and IP addresses for UDP is not supported.*

Sending ACN Strings

To send ACN strings, **{String TX}** must be enabled in **Setup > System > Show Control**, and the device's IP address must be set in the **{String TX IP Address}** field.

If you have multiple devices sending or receiving strings, separate each entry in the **{String TX IP Address}** field with a comma or semicolon.

Note: *The console can be configured to send either ACN strings or UDP strings, as they share the String Tx IP Address field. A combination of device names for ACN and IP addresses for UDP is not supported.*

Sending via I/O Gateways

For your console to send serial data to a Net3 I/O Gateway, the Serial Port Group ID assigned at the gateway must match the String TX Group ID in Setup, and String TX setting in Setup must be Enabled. See **Setup >** *System > Show Control*.

MIDI Raw

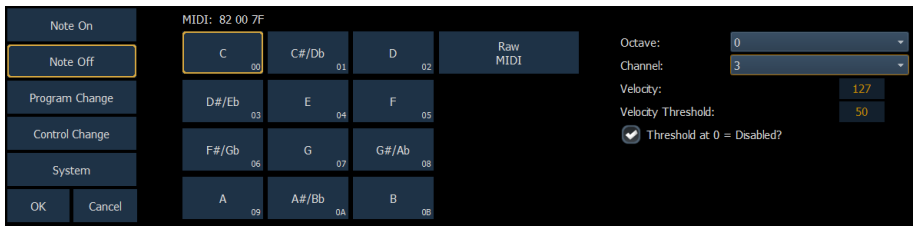
Also known as MIDI Strings, MIDI Notes, MIDI Messages, or Channelized Event Data. Originally intended for communication between musical instruments, MIDI has been adapted for a variety of uses between devices. Eos Family consoles can send or receive MIDI messages through the built-in MIDI ports (when available).

Net3 Show Control Gateways do not support MIDI RAW Note On/Off, Program Change, and Control Change functions. Those functions are only supported through the local I/O cards. System exclusive (SysEx) messages, including MSC, do work with a Show Control Gateway.

Receiving MIDI

Eos Family consoles can be configured to respond to specific MIDI messages or messages matching a specific pattern. These are configured in an Event List in the Show Control Display.

Strings are configured in the MIDI String configuration display, shown below:

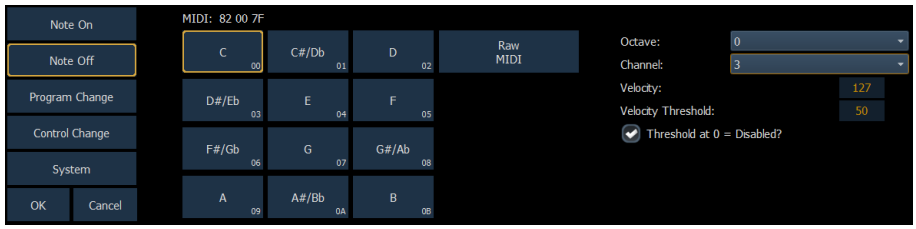


MIDI Message Types

The following MIDI messages can be received:

- *MIDI Note Events (Note On/Note Off)*
- *Program Change Events*
- *Control Change Events*
- *System Events (MIDI Show Control)*

MIDI Note Events (Note On/Note Off)



Note On and Note Off commands simulate activating (on) and releasing (off) a musical note. The MIDI data that is expected to be received is shown above the Note selection area, with 'N' shown where any valid number will be considered a match. This display will change as configuration options are selected. When finished configuring a Note On or Note Off event, press **{OK}** to store the event. Otherwise, press **{Cancel}** to undo the changes.

Message Structure

Note On has a structure of 9A CC DD, where 9 represents the Note On command, A represents the channel number, CC represents the note value, and DD represents the velocity.

Note Off has a structure of 8A CC DD, where 8 represents the Note Off command, A represents the channel number, CC represents the note value, and DD represents the velocity.

Options

The following options are available:

{Note}

You can choose any musical note name (C-B, chromatic), or use Raw MIDI to manually enter a value.

{Octave}

You can choose the specific octave for the note (octaves 0-10), or chose Any, and the console will respond when any octave of the selected note is received.

{Channel}

This should match the MIDI Channel for the note command (1-16 or 0-F). If set to Any, the console will respond when any MIDI channel is sent a note command.

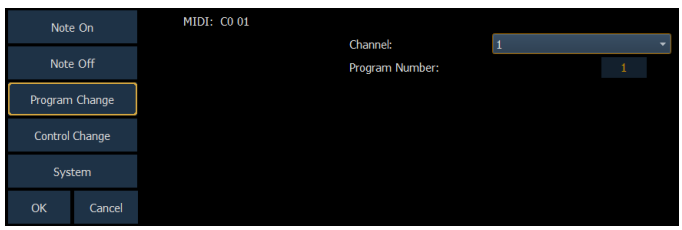
{Velocity} and {Velocity Threshold}

In MIDI, the velocity represents the relative loudness or intensity of the note, where 1 (01) is very soft, or ppp, and 127 (7F) is very loud, or fff. (A MIDI Note On with a velocity of 0 is a special case and is treated as a Note Off command). The velocity setting specifies the exact velocity in the MIDI Note message that must be received for the action to be executed. Whenever the exact velocity is received, regardless of threshold, the event will fire.

The threshold is an optional way to specify the minimum velocity that must be received for the action to be executed. In other words, the MIDI note velocity must be greater than or equal to the threshold value. If the threshold is 0, this parameter is ignored, unless the "Threshold at 0 = Disabled?" box is unchecked.

- **Velocity 127, Threshold 0, box checked** – looks for an incoming MIDI note with a velocity of 127 (7F). The threshold is ignored.
- **Velocity 127, Threshold 0, box unchecked** – looks for an incoming MIDI note with a velocity that is greater than or equal to 0. The velocity is redundant, as 127 is greater than 0.
- **Velocity 127, Threshold 50, box checked** – looks for an incoming MIDI note with a velocity that is greater than or equal to 50
- **Velocity 127, Threshold 50, box checked** – looks for an incoming MIDI note with a velocity that is greater than or equal to 50 (hex 32)
- **Velocity 1, Threshold 50, box checked** – looks for an incoming MIDI note with a velocity that is greater than or equal to 50 (hex 32). If the note with a velocity of 1 is received, the event will also fire as it matches the velocity parameter.
- **Velocity 0, Threshold 50, box checked** - looks for an incoming MIDI note with a velocity that is greater than or equal to 50 (hex 32). If the note with a velocity of 0 is received, the event will also fire as it matches the velocity parameter.
- **Velocity 0, Threshold 0, box checked** – looks for an incoming MIDI note that has a velocity of 0. The threshold is ignored.

Program Change Events



Program Change commands typically represent a change in the MIDI voice or instrument type that should be used for a particular MIDI channel. Similar to MIDI Note commands, the MIDI data that is expected to be received is shown in the CIA and changes as you select event parameters. When finished configuring the program change event, press {OK} to store the event. Otherwise, press {Cancel} to undo the changes.

Message Structure

Program change messages have the structure CN XX, where N represents the MIDI channel number and XX represents the program number.

Options

The following options are available:

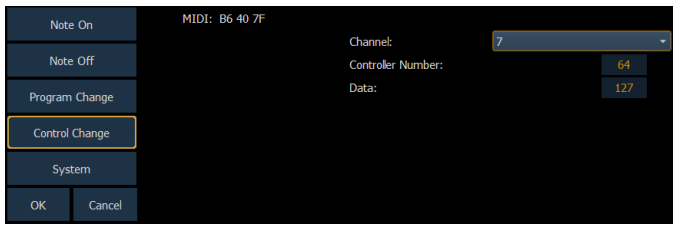
{Channel}

This should match the MIDI Channel for the note command (1-16, 0-F). If set to Any, the console will respond when any MIDI channel is sent a note command.

{Program Number}

The program number is any value between 0-127 (0-7F). Many devices will display this as 1-128 – if this is the case for your other device, subtract one from the desired program number.

Control Change Events



Control Change commands were designed to represent specific actions on MIDI devices, like pedals actuations and effects. For example, the Damper Pedal on a keyboard is often represented by controller number 64 (hex 40). Similar to MIDI Note commands, the MIDI data that is expected to be received is shown in the CIA and changes as you select event parameters. When finished configuring the control change event, press {OK} to store the event. Otherwise, press {Cancel} to undo the changes.

Message Structure

Program change messages have the structure BN XX YYY, where N represents the MIDI channel number, XX represents the controller number, and YY represents the data byte.

Options

The following options are available:

{Channel}

This should match the MIDI Channel for the note command (1-16, 0-F). If set to Any, the console will respond when any MIDI channel is sent a note command.

{Controller Number}

The controller number is any value between 0-127 (00-7F). Many devices will display this as 1-128 – if this is the case for your other device, subtract one from the desired controller number.

{Data}

The data parameter is any value between 0-127 (00-7F). Many devices will display this as 1-128 – if this is the case for your other device, subtract one from the desired data byte.

System Events (MIDI Show Control)

System commands allow you to specify specific MIDI Show Control messages that can be received and interpreted by the console. While any MIDI Show Control command that matches the configured Device ID will be executed normally, this type of event setup allows you to respond to messages sent to different device IDs, or take additional actions based on a show control command.

The MIDI data that is expected to be received is shown in the CIA and changes as you select event parameters. When finished configuring the system event, press **{OK}** to store the event. Otherwise, press **{Cancel}** to undo the changes.

Message Structure

see *Hexadecimal and MIDI Show Control Formatting* on the show control message structures.

Options

The following command options are available:

- **Go, Stop, Resume** - represents triggering a cue, stopping a cue, and resuming a cue, respectively. The following fields are available:
  - **Device ID** - the MIDI Show Control device ID that should respond to the message.
  - **List ID** - the cue list.
  - **ID** - the cue number.
- **Fire** – represents executing a macro. The following fields are available:
  - **Device ID** – the MIDI Show Control device ID that should respond to the message.
  - **ID** - the macro number to be fired.
- **Set** - represents controlling a fader. The following fader targets are available:
  - **Subs**
  - **Grandmaster**
  - **Master Fader Up** - the level of the Up fader on the master playback pair.
  - **Master Fader Down** - the level of the Down fader on the master playback pair.

The following fields are available for the fader targets:

- **Device ID** – the MIDI Show Control device ID that should respond to the message.
- **ID** (subs only) – the number of the submaster fader.
- **Level** – the specified level of the fader from 0-100% (0-127 decimal, 00-7F hex).

Creating a MIDI Event List and Event

Open the Show Control Display

- **[Displays]>[More SK]>{Show Control}**

Create a new Event List and choose the Network type

- <Event> [6] [/] {Type} {Network} [Enter]

Enable the list to respond to {External} sources

- <Event> [6] [/] {External} [Enter]

Creating a Note On Event

Create a new event and open the MIDI String configuration screen

- <Event> [1] [More SK] {MIDI String}

Select the {Note On} type

- {Note On}

Select the MIDI Note value, for example, Bb (B-flat)

- {A#/Bb}

Select the MIDI Note octave or leave it as Any. In this example, we'll choose Any.

- <Octave> {Any}

Select the MIDI channel

- <Channel> {1}

Select the velocity

- <Velocity> {127}

Optionally, select the velocity threshold so that the event will be triggered if the message is above this level. To disable velocity threshold, leave it at zero.

- <Velocity Threshold> {0}

Press {OK} to save the event

- {OK}

Specify the action for the event

- <Event> [1] [Macro] [1] [Enter]

Creating a Note Off Event

Create a new event and open the MIDI String configuration screen

- <Event> [2] [More SK] {MIDI String}

Select the {Note Off} type

- {Note Off}

Select the MIDI Note value, for example, Bb (B-flat)

- {A#/Bb}

Select the MIDI Note octave or leave it as Any. In this example, we'll choose Any.

- <Octave> {Any}

Select the MIDI channel

- <Channel> {1}

Select the velocity

- <Velocity> {0}

Optionally, select the velocity threshold so that the event will be triggered if the message is above this level. To disable velocity threshold, leave it at zero.

- <Velocity Threshold> {1}

Press {OK} to save the event

- {OK}

Specify the action for the event

- <Event> [2] [Macro] [2] [Enter]

Creating a Program Change Event

Create a new event and open the MIDI String configuration screen

- <Event> [3] [More SK] {MIDI String}

Select the {Program Change} type

- {Program Change}

Select the MIDI channel

- <Channel> {7}

Select the program number

- <Program Number> {3}{2}

Press {OK} to save the event

- {OK}

Specify the action for the event

- <Event> [3] [Cue] [1][0] [Enter]

Creating a Control Change Event

Create a new event and open the MIDI String configuration screen

- <Event> [4] [More SK] {MIDI String}

Select the {Control Change} type

- {Control Change}

Select the MIDI channel

- <Channel> {7}

Select the controller number

- <Controller Number> {6}{4}

Specify the data value

- <Data> {1}{2}{7}

Press {OK} to save the event

- {OK}

Specify the action for the event

- <Event> [4] [Sub] [1] {On} [Enter]

Sending MIDI Raw with Cues or Submasters

After selecting a cue or submaster and using **{Execute}**, the **{MIDI Raw}** softkey becomes available. Notes are input using hexadecimal values (00-FF) by default, but decimal values (0-255) can also be used if required by the connected device.

The string will be sent any time the cue or submaster is played back. See *Cue Triggers* and *Submaster Triggers*.

Hexadecimal Format

Select a cue or sub.

- **[Cue] [1]**

Press the **{Execute}** softkey.

- **[Cue] [1] {Execute}**

New softkeys will appear, press the **{MIDI Raw}** softkey.

- **[Cue] [1] {Execute} {MIDI Raw}**

Define the MIDI string, in this case we will use Hexadecimal to send a Note On command for note C3 to channel 2 with a velocity of 127.

- **[Cue] [1] {Execute} {MIDI Raw} 91 3C 7F [Enter]**

Decimal Format

Select a cue or sub.

- **[Sub] [1]**

Press the **{Execute}** softkey.

- **[Sub] [1] {Execute}**

New softkeys will appear, press the **{MIDI Raw}** softkey.

- **[Sub] [1] {Execute} {MIDI Raw}**

Define the MIDI string, in this case we will use decimal to send the same command as before - a Note On command for note C3 to channel 1 with a velocity of 127.

- **[Sub] [1] {Execute} {MIDI Raw} D 145 60 127 [Enter]**

Sending MIDI Raw with Macros

A **{MIDI Raw}** softkey is available in the macro editor display. Any text entered after the string command in the macro will be sent to all string interfaces when that macro is fired. The same syntax applies in macros as they would in cues – either hexadecimal or decimal values can be entered.

Open Sound Control (OSC)

Open Sound Control (OSC) is a network-based message format that allows you to communicate with a variety of devices in your show environment.

About OSC

About OSC provides important information about OSC and contains the following topics:

- *OSC Message Structure* - what makes up an OSC message.
- *OSC Data* - how OSC information is constructed and arranged.
- *OSC Networks* - how OSC works in a network.

Using OSC with Eos

Using OSC with Eos describes how to use OSC in an Eos environment and contains the following topics:

- *Eos OSC Setup* - settings and steps to enable the use of OSC with Eos.
- *OSC Eos Control* - using OSC to control Eos and receive information.
- *OSC Show Control* - creating and using OSC show control lists and events.
- *Eos OSC Conventions* - OSC definitions and uses specific to Eos.
- *OSC Third-Party Integration* - using OSC to tie Eos into third-party hardware and software.

OSC Dictionary

The *OSC Dictionary* page contains reference tables of all Eos OSC address pattern formats and key names, under the following categories:

- *OSC Inputs* - supported address patterns for OSC input to Eos.
- *Open Sound Control (OSC)* - supported address patterns for OSC output from Eos.
- *Open Sound Control (OSC)* - supported Eos key names for use in OSC messages.

About OSC

Open Sound Control (OSC) is a message encoding format that can be used for communication between a wide variety of software and hardware in a networked system. Developed as a more flexible, customizable alternative to *MIDI Show Control*, OSC can be used in many different ways, including syncing information between devices, remotely controlling or triggering actions, and creating custom control layouts similar to *Magic Sheets*.

Note: *While OSC is often informally referred to as a protocol, it is technically an encoding. True communications protocols include information about how to process their messages. OSC does not; rules regarding message processing are handled entirely by the device that is sending or receiving OSC.*

This section contains the following topics:

- *OSC Message Structure* - what makes up an OSC message.
- *OSC Data* - how OSC information is constructed and arranged.
- *OSC Networks* - how OSC works in a network.

OSC Specifications

OSC currently supports two specification formats:

- **1.0** - the original specification, established in 2002.
- **1.1** - a 2009 update that added new data types and features.

Eos can send and receive both implementations of OSC. While 1.1. is generally preferred, it may not be fully supported by all devices. Consult the documentation for any third-party OSC devices to determine which version to use.

OSC Terms

The following terms are useful to know when working with OSC and Eos.

- **Message** - an informal term used in this document for the entirety of an OSC packet of data, which includes the addressed command pattern and any arguments or additional data.
- **Address pattern** - the main portion of an OSC message, containing the address and the command.
- **Argument** - optional additional data that may be appended to specific OSC commands.
- **Server** - any device that sends OSC.
- **Client** - any device that receives OSC.

For general network terms you may encounter when working with OSC, see **Eos System Requirements and Setup > Eos Networking Overview >** *Network Terms*.

OSC Message Structure

OSC messages consist of the following elements:

- **Address Pattern** - a string of data indicating where to send the message to and what to do when it arrives.
- **Argument** - extra data added to the end of the message. This can be optional, depending on the address pattern.

While this structure is the same across all implementations of OSC, address patterns and arguments are specific to the software or hardware involved. While specific examples for both Eos and other OSC implementations are used throughout this section, consult the documentation for any third-party OSC devices to determine how to configure OSC messages for your system.

Address Pattern

The address pattern is the main body of an OSC message, consisting of an address determining where the message will be sent and instructions on what to do when it gets there. All OSC commands directed to Eos must begin with **/eos/**.

The address patterns used in this manual use angle brackets (**<>**) to denote a variable element, such as a cue or channel number (**<number>**) or a parameter name (**<parameter>**). For a full list of supported OSC address patterns, see the *OSC Dictionary*.

Action	Address Pattern	Examples
Run an Eos cue.	**/eos/cue/<number>/go**	**/eos/cue/1/go** - runs cue 1 in the current cue list.
Set an Eos channel to full.	**/eos/chan/<number>/full**	**/eos/chan/1/full** - sets channel 1 to full.
Stop a Hog cue list.	**/hog/playback/halt/<number>**	**/hog/playback/halt/1** - stops cue list 1.
Run a QLab cue.	**/workspace/<number>/go**	**/workspace/1/go** - runs the next cue in workspace 1.

Arguments

Arguments are additional data that can add specificity to an OSC message. Depending on the address pattern, an argument may or may not be necessary. Argument options are specific to the commands being sent, and not all argument options are compatible with all OSC commands.

Action	Address Pattern	Arguments	Examples
Run an Eos cue.	**/eos/cue/go**	Cue number.	**/eos/cue/go=1** - runs cue 1 in the current cue list.
Set an Eos channel to a level.	**/eos/chan/<number>/at**	Intensity level (0-100).	**/eos/chan/1/at=50** - sets channel 1 to 50%.
Set the Hog grand master to a level.	**/hog/hardware/fader/0**	Fader level (0-255).	**/hog/hardware/fader/0=127** - sets the grand master to 50%.

Most arguments will be numbers; see the **int32** and **float32** formats detailed in *OSC Data*. Eos uses the equals (=) character to separate address patterns from any included arguments. Third-party OSC devices may require a different character, and may not be able to interpret incoming messages that use equals. Consult the documentation for any third-party OSC devices to determine the appropriate character for appending arguments to your address pattern.

As you can see, there are often multiple ways to send an OSC message that achieve the same result; for example, **/eos/cue/1/fire** and **/eos/cue/fire=1** will both activate cue 1 in the current cue list.

OSC Data

As with other types of network-based communication, OSC messages are composed of specific types and formats of data that are organized into packets.

Data Types

OSC packets are encoded using the following types of data:

- **int32** - a 32 bit integer. An integer is any positive or negative whole number. 0, 1, 42, -9000, etc.
  - **uint32** - a variant that only allows positive integers.
  - **bool** - short for boolean, a data type that can only have a value of true (represented by 1), or false (represented by 0).
- **float32** - a 32 bit floating point number. A floating point number is any positive or negative number with one or more decimal places. 1.0001, -9.89, 10.5, etc.
- **string** - any set of characters or words. "Hello world," "I'm afraid I can't let you do that Dave," etc.
- **blob** - any binary data.
- **timetag** - the number of fractional seconds since January 1st, 1900.

Packet Contents

OSC packets consist of the following information:

- **Start** - in OSC v1.0, this indicates the length of the packet. In v1.1, this indicates the start of the packet.
- **Address pattern** - where to send the message and what to do when it arrives. Address patterns vary based on the OSC devices involved.

- **Type tag** - how many arguments of what type are included in the packet.
- **Arguments** - optional data that adds additional specificity to the OSC command. Arguments vary based on the address pattern.
- **End** - OSC v1.1 only. This indicates the end of the packet.

When working with OSC, Eos encodes the **start**, **type tag**, and **end** data automatically in the background. The **address pattern** and **arguments** are entered by the user and follow the *OSC Message Structure*.

OSC Networks

OSC is transport-independent, meaning it can be sent in a variety of ways in a network without changing the message content or encoding.

Eos settings for OSC networks can be found in *Setup* under *System > Show Control* > *OSC*.

For more information on Eos networked systems, see *Eos System Requirements and Setup*.

Protocols

The primary protocols used to send OSC are:

- **User Datagram Protocol (UDP)** - messages are sent with no true connection to any other devices. This means messages can be sent faster, but also means there is no guarantee that they have been delivered.
- **Transmission Control Protocol (TCP)** - messages are sent over a direct connection with error-checking. While TCP may be slower compared to UDP, message delivery is guaranteed.

Messages sent via TCP require matching versions of the OSC specifications mentioned in *About OSC*. In v1.0, the length of the message is sent first and is the only indication of where the message ends. OSC v1.1 uses start and end tags.

These protocols can be configured during *Eos OSC Setup*.

Wireless OSC

While OSC theoretically works over wireless connections, this is heavily dependent on the network setup and infrastructure involved.

- Other devices and protocols on the network may introduce traffic and complexity that affects OSC transmission.
- Via UDP, packets are likely to be intermittently dropped. TCP guarantees delivery, but packets may arrive later than desired.

As a general rule, using wireless OSC for operations that are precise or time-critical is not recommended.

Ports

Ports are specific endpoints associated with an IP address where network traffic is sent, helping the IP addressed device sort the different types of network protocols it receives.

Ports can be set up for each device in your network so that specific types of information are sent to specific ports.

- Port numbers 1–1023 are already in use by many applications and should be avoided.
- ETC has recommended ports 4703-4727, 8000, and 8001.
- Any port number between 1 and 65,535 is valid.

UDP Ports

UDP connections set different ports for OSC transmit (Tx) and receive (Rx).

Eos UDP port numbers can be managed via **Setup > System > Show Control > OSC >** *OSC UDP RX Port* and *OSC UDP TX Port*.

TCP Ports

In a direct TCP connection, two roles are applied:

- **Server** - the receiving device, listening for incoming connections.
- **Client** - the transmitting device, sending a request to connect to the server.

Eos TCP port numbers can be managed via **Setup > System > Show Control > OSC >** *OSC TCP Server Ports*.

Using OSC with Eos

There are a variety of ways you can use Eos to send OSC to other devices, or use other devices to send OSC to Eos.

This section contains the following topics:

- *Eos OSC Setup* - settings and steps to enable the use of OSC with Eos.
- *OSC Eos Control* - using OSC to control Eos and receive information.
- *OSC Show Control* - creating and using OSC show control lists and events.
- *Eos OSC Conventions* - OSC definitions and uses specific to Eos.
- *OSC Third-Party Integration* - using OSC to tie Eos into third-party hardware and software.

Troubleshooting OSC

The following tools can help verify network connectivity and latency when working with OSC.

OSC Ping

OSC Ping allows you to send an OSC message that Eos will reply to. This can be useful to test and verify that OSC communication is working between devices.

Once you believe that an OSC connection has been established, you can test the connection by sending a ping message to Eos. You can add any number of arguments to the command to help measure latency. For example, you could include the current time on the sending device to calculate how long a message takes the difference between when a message is sent and when one is received.

Action	Address Pattern	Arguments	Examples	*Notes*
Send a ping request.	**/eos/ping**	Any *OSC Data*.	**/eos/ping**	*These are all valid OSC ping requests. Increasing numbers of arguments may be added to a ping request to measure latency in the Eos reply.*
			/eos/ping="hello"	
			/eos/ping="answer",42	

If the request is received, Eos will respond on its configured port.

Action	Address Pat-tern	Arguments	Examples	*Notes*
Ping reply.	**/eos/out/ping**	Any arguments used in the ping request.	**/eos/out/ping**	*Eos will reply if the OSC connection is valid. Depending on the network connection and number of arguments in the ping request, the speed of the reply may vary.*
			/eos/out/ping="hello"	
			/eos/out/ping="answer",42	

Logging OSC

The following options are available via the *Diagnostics [Tab 99]* display:

- {Incoming OSC} - enables incoming OSC and logs any commands Eos receives.
- {Outgoing OSC} - enables or disables outgoing OSC and logs any commands Eos sends.

Eos OSC Setup

Setup

Eos options for OSC are available in *Setup* under System > Show Control > *OSC*.

UDP and TCP

Eos supports sending and receiving OSC through a TCP or UDP connection. The specific type used will depend on the other OSC device or software that you intend to use with Eos. You will need to check that documentation to confirm the connection types supported.

The console can be set to receive and / or transmit OSC messages. This is configured in Setup > *System > Show Control* > OSC with the {OSC RX} and {OSC TX} buttons.

In addition, you must enable the {UDP Strings & OSC} option for the network interface you wish to use in ECU > Settings > Network > *Interface Protocols*.

TCP

The preferred method for transmitting and receiving OSC packets is over a TCP connection. Eos will listen for incoming TCP connections on Port 3032. TCP communication still requires that {OSC RX} and {OSC TX} is enabled in the Show Control section of Setup.

In Setup > *System > Show Control* > OSC, there is an option for changing the OSC TCP mode. By default, OSC 1.0 is selected. There are two TCP modes available – OSC 1.0 (packet-length headers) and OSC 1.1 (SLIP). Check the documentation for the OSC device you wish to use over a TCP connection to see which mode it supports.

UDP

UDP connections can be used but are not preferred, as messages may be dropped or delivered out of order. When using UDP, the appropriate IP address and ports must be configured in the Show Control section of Setup. For systems without specific networking requirements, ETC recommends UDP port assignments in the range 4703 to 4727 or 8000 and 8001.

The UDP port settings are configured in Setup > *System > Show Control*. In addition to the OSC TX (Transmit) and RX (Receive) ports, you may wish to set the OSC TX IP address to match the OSC device you are using with your Eos system so that it can receive OSC messages from the console. Multiple TCP ports can be added using + or , to separate them.

Eos OSC Conventions

All OSC messages sent to Eos must use **/eos/** to start the command string.

All OSC traffic from or to an Eos multi-console session must be handled by the device acting as the session *Host*.

Parameter and Key Names

Eos parameter and key names in OSC messages use the following conventions:

- Name capitalization is ignored.
- Any combination of upper and lower case can be used.
- Full or abbreviated names can be used.

Action	Address Pattern	Arguments	Examples	*Notes*
Set a channel's intensity.	/eos/chan/<number>/intens	Intensity level (0-100).	/eos/chan/1/intens=10	*These are all valid OSC messages to set channel 1 to 10%.*
	/eos/channel/<number>/intensity		/eos/channel/1/intensity=10	
	/EOS/Channel/<number>/intens		/EOS/Channel/1/intens=10	

- Names that contain spaces can be written with spaces or underscores.
- Names that contain forward slashes (/) should be written with backwards slashes (\).

Action	Address Pattern	Arguments	Examples	*Notes*
Set a channel's gobo index speed.	/eos/chan/<number>/param/gobo_index\speed	Parameter level (0-100).	/eos/chan/1/param/gobo_index\speed=10	*These are all valid OSC messages to set channel 1's gobo index/speed to 10%.*
	/eos/chan/<number>/param/gobo index\speed		/eos/chan/#/param/gobo index\speed=10	
	/eos/chan/<number>/param/gobo ind\spd		/eos/chan/1/param/gobo ind\spd=10	

Button Edge

Button edge is an argument that specifies when an action happens during a button push, using the following values:

- 1.0 - down, or when the button is pushed.
- 0.0 - up, or when the button is released.

Like many arguments, including a button edge value is optional. If no value is specified, the action defaults to happening when the button is pushed.

OSC Numbers and Ranges

OSC arguments that contains numbers or number ranges will be sent as follows:

- Eos target numbers will be sent as 32-bit integers when possible.
- If a target number contains a decimal, it will be sent as a string.

- When a range contains 2 or more consecutive whole numbers, they will be represented as strings in <number> - <number> format.

User IDs and OSC

Many address patterns can also start with **/eos/user/<number>** instead of **/eos** to direct the command to a specific Eos *User ID*. Any number from 0 to 99 can be used when specifying a user via OSC; if the user number is not present on the *Host* device, a virtual OSC user is created. Once a user is set via OSC, it remains as specified until changed again.

If a user ID is not specified, the command defaults to the current Eos user. You can use **/eos/user/-1** to revert from a virtual OSC user back to the default.

The shaded rows in the *OSC Dictionary* > **OSC Inputs** table indicate which address patterns are compatible with the **/user** syntax.

Use this command to set the OSC user ID (which is not the console user ID). User 0 represents the background user (used in Background macros and elsewhere). User -1 represents the current user on the console receiving OSC commands.

OSC Method	Arguments	Examples/Comments
/eos/user	number for OSC user ID	/eos/user=1(set OSC user ID to 1) /eos/user=-1(set OSC user to match con- sole) /eos/user=0(set OSC user as background user)
Current User ID Output		
/eos/out/user	number for current OSC user ID	/eos/out/user=1

OSC Local

OSC commands entered from an Eos Family device (such as via a Magic Sheet object's *Command* field) can be prefaced with **local:** to loop them back into the device.

- **local:/eos/chan/1=50** - when executed, the console will send itself the OSC command to set channel 1 to 50%.

Fire and Go

OSC Cue and **OSC Cue Lists** allow the use of both **/fire/** and **/go/** to activate a cue. **/go/** is specific to cues and cue lists, and advances in sequence in the same way as the physical **[Go]** button.

/fire/ activates the specified cue or cue list regardless of sequencing, and can also be used to activate other targets, such as **OSC Macro** or **OSC Preset**.

OSC Gel

Gels will be represented as strings in the following format:

<Gel Manufacturer Abbreviation><Gel Number>

- **AP1150** - Apollo 1150.
- **L2** - Lee 2.
- **T12** - TokyoBS Poly Color 12.

OSC Eos Control

OSC provides many ways to interface with Eos, both via requesting information and controlling the console remotely. Remote control interfaces like TouchOSC can be used to create an entirely customized control layout that duplicates existing Eos functions.

All OSC sent to Eos must begin with **/eos**. All OSC sent from Eos will begin with **/eos/out**.

Setting Levels

These OSC methods provide various options for controlling intensity and parameter levels and values.

OSC Absolute Levels

Absolute level commands are used when there is an existing target already selected on the command line of the OSC user.

Set Levels

Address Pattern	Arguments	Examples	Notes
/eos/at	number for the level (0-100)	/eos/at= 75	Useful for mapping to an OSC fader.
/eos/at/out	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/out	
/eos/at/home	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/home	
/eos/at/remdim	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/remdim	
/eos/at/level	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/level	
/eos/at/full	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/full	
/eos/at/min	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/min	
/eos/at/max	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/max	
/eos/at/+%	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/+%	
/eos/at/-%	number for the button edge 1.0=down, 0.0=up (optional)	/eos/at/-%	

Set Parameter or DMX Information

Address Pattern	Arguments	Examples	Notes
/eos/at/DMX	number for the DMX level	/eos/at/DMX/128	Useful for mapping to an OSC fader.
/eos/param/<parameter>	number for the level	/eos/param/pan=270	Useful for mapping to an OSC fader.
/eos/param/<parameter>/out	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/out	
/eos/param/<parameter>/home	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/home	
/eos/param/<parameter>/level	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/level	
/eos/param/<parameter>/full	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/full	
/eos/param/<parameter>/min	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/min	
/eos/param/<parameter>/max	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/max	
/eos/param/<parameter>/+%	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/+%	
/eos/param/<parameter>/-%	number for the button edge 1.0=down, 0.0=up (optional)	/eos/param/pan/-%	
/eos/param/<parameter 1>/<parameter 2>	number for all parameter levels multiple numbers for each parameter level	/eos/param/pan/tilt=45 - set pan & tilt to 45) /eos/param/pan/tilt=45,90 - set pan to 45 & tilt to 90)	

OSC Color

Set Color

Address Pattern	Arguments	Examples	Notes
/eos/color/hs	**Argument 1: Hue (0.0-360.0) Argument 2: Saturation (0.0-100.0)**	/eos/color/hs=330.0, 75.0 (pink color with 75% saturation)	
/eos/color/hsxy	**Argument 1: X (0.0-1.0) Argument 2: Y (0.0-1.0)**	/eos/color.hsxy=0.82, 0.31 (pink color with 75% saturation)	For simulating the Hue/Saturation wheel in a 2D XY graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0)
/eos/color/rgb	**Argument 1: Red (0.0-1.0) Argument 2: Green (0.0-1.0) Argument 3: Blue (0.0-1.0)**	/eos/color/rgb=1.0, 0.25, 0.63 (pink color with 75% saturation)	
/eos/color/xy	**Argument 1: x (0.0-1.0) Argument 2: y (0.0-1.0)**	/eos/color/xy=0.464, 0.254 (pink color with 75% saturation)	For setting (x, y) chromaticity point in the CIE 1931 xyY color space
/eos/color/xyz	**Argument 1: X Argument 2: Y Argument 3: Z**	/eos/color/xyz=0.851, 0.466, 0.516 (pink color with 75% saturation)	For setting (X, Y, Z) color point in XYZ color space

OSC Pan/Tilt

Set Pan/Tilt

Address Pattern	Arguments	Examples	Notes
/eos/pantilt/xy	**Argument 1: X (0.0-1.0) Argument 2: Y (0.0-1.0)**	**/eos/pantilt/xy=0.5, 0.5** - sets the current selection's pan and tilt to (0,0) on the pan/tilt graph.	2D pan/tilt graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0)

Pan/Tilt Output

Address Pattern	Arguments	Examples	Notes
/eos/out/pantilt = <pan min>, <pan max>, <tilt min>, <tilt max>, <pan>, <tilt>	**<pan min>: Float. <pan max>: Float. <tilt min>: Float. <tilt max>: Float. <pan>: Float. <tilt>: Float.**	**/eos/out/pantilt = -270.000, 270.000, -135.000, 135.000, 0.000, 0.000** - selected chan's pan and tilt values are at 0.	Current pan/tilt values of selected channel

OSC Switch

Switch is a variant of Wheel with the added functionality of continuously repeating wheel ticks until a subsequent OSC switch command sets the wheel ticks to zero. This may be used to continuously tick a wheel while a button is held down, for example.

The expected argument range is -1.0 to 1.0, which affects the tick rate accordingly, but can be a smaller or larger range for more subtle or rapid movement.

Switch and Encoder Levels

Address Pattern	Arguments	Examples	Notes
/eos/switch/level	**X level wheel ticks**		
/eos/switch	**Set OSC wheel mode - 0 = coarse, 1 = Fine**	**/eos/switch=1.0** - sets the wheel mode to fine.	
/eos/switch/<parameter>	**X OSC wheel mode ticks for specified parameter (ex: pan)**		
/eos/switch/<parameter 1>/<parameter 2>/...	**X OSC wheel mode ticks for specified parameters (ex: red, green, blue)**		
/eos/switch/fine/<parameter>	**X fine wheel ticks for specified parameter (ex: pan)**		
/eos/switch/fine/<parameter 1>/<parameter 2>/...	**X fine wheel mode ticks for specified parameters (ex: red, green, blue)**		
/eos/switch/coarse/<parameter>	**X coarse wheel ticks for specified parameter (ex: pan)**		
/eos/switch/coarse/<parameter 1>/<parameter 2>/...	**X coarse wheel mode ticks for specified param- eters (ex: red, green, blue)**		

Switch Output

Address Pattern	Arguments	Examples	Notes
/eos/out/switch	**Current OSC wheel mode**	/eos/out/switch=1.0	

OSC Wheel

OSC Wheel can be used to adjust channel levels and parameters.

Level Wheel

Address Pattern	Arguments	Examples	Notes
/eos/wheel/level	number for wheel ticks for the specified wheel mode (positive or negative)	/eos/wheel/level=1.0 (increase value) /eos/wheel/level=-1.0 (decrease value) /eos/wheel/level=4.0 (increase value rapidly) (	Defaults to Coarse mode, but wheel mode can be changed with the /eos/wheel command below.
/eos/wheel	number for wheel mode: 0=coarse, 1=fine	/eos/wheel=1.0	

Parameter Wheels and Encoders

Address Pattern	Arguments	Examples	Notes
/eos/wheel/<parameter>	number for wheel ticks (positive or negative)	/eos/wheel/pan=1.0	
/eos/wheel/<parameter 1>/<parameter 2>/...	number for wheel ticks (positive or negative)	/eos/wheel/pan/tilt=1.0	
/eos/wheel/fine/<parameter>	number for fine wheel ticks (positive or negative)	/eos/wheel/fine/pan=1.0	
/eos/wheel/fine/<parameter 1>/<parameter 2>/...	number for fine wheel ticks (positive or negative)	/eos/wheel/fine/pan/tilt=1.0	
/eos/wheel/coarse/<parameter>	number for coarse wheel ticks (positive or nega tive)	/eos/wheel/coarse/pan=1.0	
/eos/wheel/coarse/<parameter 1>/<parameter 2>/...	number for coarse wheel ticks (positive or negative)	/eos/wheel/coarse/pan/ tilt=1.0	

Wheel Output

Address Pattern	Arguments	Examples	Notes
/eos/out/wheel	number for current wheel mode: 0=coarse, 1=fine	/eos/out/wheel=1.0	
/eos/out/active/wheel/#		/eos/out/active/wheel=4	
/eos/out/pantilt		Current pan/tilt values of selected channel	

OSC XYZ

OSC XYZ coordinates are measured in decimal meters, regardless of the unit selected in **Setup > System > System >** *Metric / Imperial*.

Set Position

Address Pattern	Arguments	Examples	Notes
/eos/xyz	**XYZ coordinates**		Set XYZ position of selected channel
/eos/chan/#/xyz	**XYZ coordinates**		Set XYZ position of a specific channel
/eos/cmd	**Channel number, XYZ_Format Enable#, XYZ_Format Disable#**	/eos/cmd=Chan 1 XYZ_Format Enable# /eos/cmd=Chan 1 XYZ Format Disable#	Enables or disables XYZ formatting for Channel 1

XYZ Output

Address Pattern	Arguments	Examples	Notes
/eos/out/xyz			Current position of selected channel

Command Line Control

These OSC methods allow you to directly control *The Command Line*.

OSC Command and Event

Command line instructions can be sent directly. String substitution with arguments is also allowed. To add a substitution, add %1 (or %2, %3, etc…) where the number given is the argument number where the actual value should be found.

- **"Chan %1 At FL", 101** - Eos will substitute 101 in place of %1, meaning the command is interpreted as Chan 101 At FL.
- **"Chan %1 At %2", 75, 50** - Eos will substitute 75 in place of %1 (the first argument), and 50 in place of %2. The command is interpreted as Chan 75 At 50.

Command or Event

Address Pattern	Arguments	Examples	Notes
/eos/cmd	string with command line text	/eos/cmd="Chan 1 At 75"	Unterminated command.
		/eos/cmd="Chan 1 At 75#" /eos/cmd="Chan 1 At 75 Enter"	Terminated commands.
/eos/cmd		/eos/cmd="Chan 1 At 75" /eos/cmd="Chan %1 At %2#", 1, 75	In-line command line. Both are valid syntaxes for setting Channel 1 to 75.
/eos/cmd/<text>/<text>/<text>/...	in-line command line arguments	/eos/cmd/Chan/1/At/75 /eos/cmd/Chan/%1/At/%2#=1, 75	Both are valid syntaxes for setting Channel 1 to 75.
/eos/event			Same behavior as **/eos/cmd**, treated as console event.

New Command or Event

Same behavior as above, but resets the command line first.

Address Pattern	Arguments	Examples	Notes
/eos/newcmd			
/eos/newevent			

Command Line Output

Address Pattern	Arguments	Examples	Notes
/eos/out/user/<number>/cmd	String argument with current command line text for the current console user		
/eos/out/cmd	String argument with current command line text		

Console Keys

These OSC methods provide the same functionality as the hardkeys and softkeys on Eos Family devices.

OSC Hardkey

OSC Hardkey allows you to create OSC analogs of the physical buttons on a console face panel.

For a list of supported key names, see **OSC Dictionary >** *OSC Eos Keys*. OSC names for each key can also be viewed on the *Virtual Keyboard [Tab 7]* by selecting **OSC /key Names** in the bottom-right dropdown menu.

Key Control

Address Pattern	Arguments	Examples	Notes
/eos/key/<name>	**number for button edge: 1.0=down, 0.0=up (optional)**	/eos/key/select active=1.0 (press [Select Active] but- ton) /eos/key/select active=0.0 (release [Select Active] but- ton) /eos/key/go 0(press & release [Go] button)	

Staging Mode

Address Pattern	Arguments	Examples	Notes
/eos/key/staging_mode			Toggles *Staging Mode* on and off.

OSC Softkey

OSC Softkey allows you to control any of the 2 pages of 6 softkeys, numbered sequentially from 1-12.

Address Pattern	Arguments	Examples	Notes
/eos/softkey/<index>	**number for button edge: 1.0=down, 0.0=up (optional)**	**/eos/softkey/1=1.0** - press 1st softkey **/eos/softkey/1=0.0** - release 1st softkey	

Targets

These OSC methods allow you to select and control various show file *Record Targets*.

OSC Address

Address Selection

Address Pattern	Arguments	Examples	Notes
/eos/addr	**number for address to select**	/eos/addr=513	

Set Address Levels

Address Pattern	Arguments	Examples	Notes
/eos/addr/<address>	**number for level to set address to (0-100)**	**/eos/addr/513=100**	Useful for mapping to an OSC fader.
/eos/addr/<address>/DMX	**number for DMX level to set address to (0-255)**	**/eos/addr/513/DMX=255**	Useful for mapping to an OSC fader.

OSC Channel

OSC Channel allow you to select Eos channels. You can directly change the channel level information in the same command, or use this as a selection tool for other controls.

OSC channel selection behaves the same way as channel selection via the tombstone icons or direct select buttons, leaving the command line unterminated.

Channel Selection

Address Pattern	Arguments	Examples	Notes
/eos/chan	number for channel to select	/eos/chan=1	
/eos/chan/<number>	number for channel level	/eos/chan/1=75	Useful for mapping to an OSC fader.

Set Channel Levels

Address Pattern	Arguments	Examples	Notes
/eos/chan/<number>/out	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/out	
/eos/chan/<number>/home	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/home	
/eos/chan/<number>/remdim	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/remdim	
/eos/chan/<number>/level	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/level	
/eos/chan/<number>/full	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/full	
/eos/chan/<number>/min	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/min	
/eos/chan/<number>/max	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/max	
/eos/chan/<number>/+%	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/+%	
/eos/chan/<number>/-%	number for button edge: 1.0=down, 0.0=up (optional)	/eos/chan/1/-%	

Set Parameter and DMX Levels

Address Pattern	Arguments	Examples	Notes
/eos/chan/<number>/DMX	number for channel DMX level	/eos/chan/1/DMX=255	
/eos/chan/<number>/param/<parameter>	number for parameter level	/eos/chan/1/param/pan=90	Useful for mapping to an OSC fader.
/eos/chan/<number>/param/<parameter 1>/<parameter 2>/...	number for all parameter levels multiple numbers for each parameter level	/eos/chan/1/param/pan/tilt=90(set channel 1 pan & tilt to 90) /eos/chan/1/param/pan/tilt=45,90(set channel 1 pan to 45 & tilt to 90)	
/eos/chan/<number>/param/<parameter>/DMX	number for parameter DMX level	/eos/chan/1/param/pan/DMX=255	
/eos/chan/<number>/param/<parameter 1>/<parameter 2>/.../ DMX	numbers for parameter DMX levels	/eos/chan/1/param/pan/tilt/DMX=255	

Channel Output

Address Pattern	Arguments	Examples	Notes
/eos/out/active/chan	String with active channels (selected) and current value from first channel	/eos/out/active/chan="1-2 [100]"	

OSC Curve

Address Pattern	Arguments	Examples	Notes
/eos/curve	number of curve to select	/eos/curve=1	

OSC Effects

Address Pattern	Arguments	Examples	Notes
/eos/fx	number of effect to select	/eos/fx=1	

OSC Group

OSC Group allows you to select and control groups of channels, using the same syntax as OSC Channel.

Address Pattern	Arguments	Examples	Notes
/eos/group	number for group to select	/eos/group=1	
/eos/group/<number>	number for channel level	/eos/group/1=75	
/eos/group/<number>/out	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/out	
/eos/group/<number>/home	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/home	
/eos/group/<number>/level	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/level	
/eos/group/<number>/full	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/full	
/eos/group/<number>/min	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/min	
/eos/group/<number>/max	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/max	
/eos/group/<number>/+%	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/+%	
/eos/group/<number>/-%	number for button edge:1.0=down, 0.0=up (optional)	/eos/group/1/-%	
/eos/group/<number>/DMX	number for DMX level1.0=down, 0.0=up (optional)	/eos/group/1/DMX=127	
/eos/group/<number>/param/<parameter>	number for parameter level	/eos/group/1/param/pan=90	
/eos/group/<number>/param/<parameter 1>/<parameter 2>/...	numbers for parameter	/eos/group/1/param/pan/tilt=90, 75	

Address Pattern	Arguments	Examples	Notes
	levels		
/eos/group/<number>/param/<parameter>/DMX	number for parameter DMX level	/eos/group/1/param/pan=255	
/eos/group/<number>/param/<parameter 1>/<parameter 2>/.../ DMX	numbers for DMX parameter levels	/eos/group/1/param/pan/tilt/DMX=255	

OSC Macro

Selects and fires (executes) macros.

Address Pattern	Arguments	Examples	Notes
/eos/macro	number for macro to select	/eos/macro=1	
/eos/macro/fire	number for macro to run	/eos/macro/fire=1	
/eos/macro/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/macro/1/fire=1.0	

OSC Magic Sheet

Address Pattern	Arguments	Examples	Notes
/eos/ms	number of the magic sheet to open	/eos/ms=1	
/eos/ms/<ms number>	number of the magic sheet view to open (optional)	/eos/ms/1=2	

OSC Palettes

OSC Palettes allows you to select and recall the four Eos *Palette Types*.

Intensity Palettes

Address Pattern	Arguments	Examples	Notes
/eos/ip	number of intensity palette to select	/eos/ip=1	Selects a palette.
/eos/ip/fire	number of intensity palette to recall	/eos/ip/fire=1	Recalls a palette.
/eos/ip/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/ip/1/fire	Fires a palette.

Focus Palettes

Address Pattern	Arguments	Examples	Notes
/eos/fp	number of focus palette to select	/eos/fp=1	Selects a palette.
/eos/fp/fire	number of focus palette to recall	/eos/fp/fire=1	Recalls a palette.
/eos/fp/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/fp/1/fire	Fires a palette.

Color Palettes

Address Pattern	Arguments	Examples	Notes
/eos/cp	number of color palette to select	/eos/cp=1	Selects a palette.
/eos/cp/fire	number of color palette to recall	/eos/cp/fire=1	Recalls a palette.
/eos/cp/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/cp/1/fire	Fires a palette.

Beam Palettes

Address Pattern	Arguments	Examples	Notes
/eos/bp	number of beam palette to select	/eos/bp=1	Selects a palette.
/eos/bp/fire	number of beam palette to recall	/eos/bp/fire=1	Recalls a palette.
/eos/bp/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/bp/1/fire	Fires a palette.

OSC Pixel Map

Address Pattern	Arguments	Examples	Notes
/eos/pixmap	number of pixel map to select	/eos/pixmap=1	

OSC Preset

Address Pattern	Arguments	Examples	Notes
/eos/preset	number of preset to select	/eos/preset=1	Selects a preset.
/eos/preset/fire	number of preset to recall	/eos/preset/fire=1	Recalls a preset.
/eos/preset/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	/eos/preset/1/fire	Fires a preset.

OSC Snapshot

Address Pattern	Arguments	Examples	Notes
/eos/snap	number of snapshot to recall	/eos/snap=1	

OSC Submaster

Address Pattern	Arguments	Examples	Notes
/eos/sub	number for sub to select	/eos/sub=1	
/eos/sub/<number>	floating point number to set sub percent to	/eos/sub/1=0.75	Useful for mapping to an OSC fader.
/eos/sub/<number>/out	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/1/out	
/eos/sub/<number>/home	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/home	
/eos/sub/<number>/level	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/1/level	
/eos/sub/<number>/full	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/1/full	
/eos/sub/<number>/min	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/1/min	
/eos/sub/<number>/max	number for button edge: 1.0=down, 0.0=up (optional)	/eos/sub/max	
/eos/sub/fire	number for sub to bump	/eos/sub/fire=1	
/eos/sub/<number>/fire	number for button edge: 1.0=down, 0.0=up (optional)	**/eos/sub/1/fire=1.0** - bump sub 1 on. **/eos/sub/1/fire=0.0** - bump sub 1 off.	

Targets with Banks

OSC Cues and Cue List Banks

Fire and Go

OSC Cue and **OSC Cue Lists** allow the use of both **/fire/** and **/go/** to activate a cue. **/go/** is specific to cues and cue lists, and advances in sequence in the same way as the physical **[Go]** button.

/fire/ activates the specified cue or cue list regardless of sequencing, and can also be used to activate other targets, such as **OSC Macro** or **OSC Preset**.

The incoming and outgoing OSC format Eos uses for cues and cue lists can be set via **Setup > System > Show Control >** *OSC Cue Receive String* and *OSC Cue Send String*. These settings can be overridden on specified cue lists using *Cue Triggers*.

Select Cues

Address Pattern	Arguments	Examples	Notes
/eos/cue	**Number of cue to select**	/eos/cue=1.5	
/eos/cue/<list number>	**Number of cue to select (in the specified cue list)**	/eos/cue/1=1.5	
/eos/cue/<list number>/<cue number>	**Number of cue part to select (in the specified cue list and cue number)**	/eos/cue/1/1.5=2	

Run Cues

Address Pattern	Arguments	Examples	Notes
/eos/cue/fire	**Number of cue to run**	/eos/cue/fire=1	
/eos/cue/<cue number>/fire	**Number for button edge: 1.0=down, 0.0=up (optional)**	/eos/cue/1.5/fire	
/eos/cue/<list number>/<cue number>/fire	**Number for button edge: 1.0=down, 0.0=up (optional)**	/eos/cue/1/1.5/fire	
/eos/cue/<list number>/<cue number>/<part number>/fire	**Number for button edge: 1.0=down, 0.0=up (optional)**	/eos/cue/1/1.5/2/fire	
/eos/key/Stop_Back_Main_CueList			

Cue List Banks

<index> is a 1-based index of any number of OSC cue list banks you wish to create. Eos will send the cue list label and cue information for all OSC cue list banks. OSC Cue List Banks is updated once per second.

Address Pattern	Arguments	Examples	Notes
/eos/cuelist/<index>/config/<cue list number>/<num prev cues>/<num pending cues>		/eos/cuelist/1/config/2/3/6 (create OSC cue list bank #1 for cue list 2, showing 3 previous cues, the current cue, and 6 pending cues) NOTE: s	Set <cue list number> to zero to follow the current cue list.
/eos/cuelist/<index>/config/<cue list number>/<num prev cues>/<num pending cues>/<offset>		/eos/cuelist/1/config/2/3/6/10 (create OSC cue list bank #1 for cue list 2, showing 3 previous cues, the current cue, and 6 pending cues, starting at offset 10 into the cue list) offset is a zero-based index into the entire cue list, where each cue counts as one item and each cue part counts as one item NOTE: set <cue list number> to zero to follow the current cue list	
/eos/cuelist/<index>/page/<delta>		/eos/cuelist/1/page/1 (page OSC cue list bank down 1 row) /eos/cuelist/1/page/-1 (page OSC cue list bank up 1 row) /eos/cuelist/1/page/0 (jump back to the current cue and follow it)	
/eos/cuelist/<index>/select/<cue number>		/eos/cuelist/1/select/100.4 (jump to cue 100.4)	
/eos/cuelist/<index>/reset		Resets the specified cue list bank	

OSC Faders and Fader Banks

Fader banks share fader mapping with Eos, but since an OSC Fader Bank can have any number of faders per page, the paging will be different. Like Direct Selects, you must first send one of the OSC Fader Bank creation commands before the fader pages will work. Faders will be mapped to the same fader number as Eos.

<index> is a 1-based index of any number of discrete sets of OSC fader banks you wish to create. Eos will send the description and fader labels for all OSC fader banks. Use an <index> of zero to reference the master fader.

Action	Address Pattern	Arguments	Examples	*Notes*
Create an OSC fader bank with a specific number of faders.	**/eos/fader/<bank index>/config/<fader count>**		**/eos/fader/1/config/10**	*OSC Fader 1/1 is the same as console fader 1/1. OSC Fader 2/1 (Fader 11) is the same as console fader 2/1.*
			/eos/fader/1/config/5	*OSC Fader 2/1 (Fader 6) is the same as console fader 1/6 (Fader 6). OSC Fader 3/1 (Fader 11) is the same as console fader 2/1 (Fader 11).*

Create Fader Banks

Address Pattern	Arguments	Examples	Notes
/eos/fader/<bank index>/config/<fader count>		/eos/fader/1/config/10 (create OSC fader bank #1 with 10 faders)	
/eos/fader/<bank index>/config/<page number>/<fader count>		/eos/fader/1/config/2/10 (create OSC fader bank #1 with 10 faders on page 2) Can also be used to quick jump to a specific page	

Fader Controls

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/config/<page number>/<fader count>		/eos/fader/1/config/2/10 Jump to a specific fader page (OSC Fader Map 1, Page 2 of 10 faders)	
/eos/fader/<index>/page/<delta>		/eos/fader/1/page/1 (page down by 1) /eos/fader/1/page/-1 (page up by 1)/eos/fader/1/page/10 (page down by 10)	
/eos/fader/<index>/<fader index>	floating point number to set sub percent to	/eos/fader/1/2=0.75 (set the second fader in OSCfader bank #1 to 75%)	
/eos/fader/<index>/<fader index>/load		/eos/fader/1/2/load	
/eos/fader/<index>/<fader index>/unload		/eos/fader/1/2/unload	
/eos/fader/<index>/<fader index>/stop		/eos/fader/1/2/stop	
/eos/fader/<index>/<fader index>/fire		/eos/fader/1/2/fire	
/eos/fader/<index>/<fader index>/out		/eos/fader/1/2/out	
/eos/fader/<index>/<fader index>/home		/eos/fader/1/2/home	
/eos/fader/<index>/<fader index>/min		/eos/fader/1/2/min	
/eos/fader/<index>/<fader index>/max		/eos/fader/1/2/max	
/eos/fader/<index>/<fader index>/full		/eos/fader/1/2/full	
/eos/fader/<index>/<fader index>/level		/eos/fader/1/2/level	
/eos/fader/<index>/<fader index>/+%		/eos/fader/1/2/+%	
/eos/fader/<index>/<fader index>/-%		/eos/fader/1/2/-%	
/eos/fader/<index>/reset			Resets the specified fader bank.

Fader Output

Eos will delay sending fader levels for faders that have been moved via OSC commands for 3 seconds. If you move a fader on an OSC remote control, Eos will send the actual fader level 3 seconds later.

Address Pattern	Arguments	Examples	Notes
/eos/out/fader/<index>/<fader>/name	**String argument with fader label for OSC fader**	/eos/out/fader/1/1="S 1 Label" Sub 1 with a label "Label"/eos/out/fader/1/2="IP 1 Label" IP 1 fader labeled "Label"	
/eos/out/fader/<index>/<fader>/name	**Floating point argument for fader percent (0.0-1.0)**	/eos/out/fader/1/1=0.75/eos/out/fader/1/2=0.0	
/eos/out/fader/<index>	**String argument, descriptive text for OSC fader bank at index**	/eos/fader/1="1"	

OSC Direct Selects and Direct Select Banks

OSC Direct Selects are virtual buttons and are mapped separately than standard *Direct Selects [Tab 4]*. To use direct selects, you must first send one of the direct select creation commands. Direct selects are mapped as a single target type. Eos will send the description and button labels for all OSC direct selects.

<index> is a 1-based index of any number of OSC direct select banks you wish to create. <target type> may be one of the following:

- Chan
- Group
- Macro
- Sub
- Preset
- IP (Intensity Palette)
- FP (Focus Palette)
- CP (Color Palette)
- BP (Beam Palette)
- MS (Magic Sheet)
- Curve
- Snap (Snapshot)
- FX (Effects)
- Pixmap (Pixel Map)
- Scene

Direct Selects Creation

Address Pattern	Arguments	Examples	Notes
/eos/ds/<index>/<target type>/<button count>		**/eos/ds/1/chan/10** - create OSC direct select bank #1 with 10 channel buttons **/eos/ds/2/group/25** - create OSC direct select bank #2 with 25 group buttons	
/eos/ds/<index>/<target type>/ flexi/<button count>		**/eos/ds/1/chan/flexi/10** - create OSC direct select bank #1 with 10 channel buttons, in Flexi mode	
/eos/ds/<index>/<target type>/<page number>/<button count>		**/eos/ds/1/chan/3/10** - create OSC direct select bank #1 with 10 channel buttons on page 3	Can also be used to quick jump to a specific page.
/eos/ds/<index>/<target type>/ flexi/<page number>/<button count>		**/eos/ds/1/chan/flexi/3/10** - create OSC direct select bank #1 with 10 channel buttons on page 3, in Flexi mode	Can also be used to quick jump to a specific page.

Direct Selects Paging

Address Pattern	Arguments	Examples	Notes
/eos/ds/<index>/page/<delta>	**number for page delta**	**/eos/ds/1/page/1** - page down by 1 **/eos/ds/1/page/-1** - page up by 1 **/eos/ds/1/page/10** - page down by 10	

Direct Selects Control

Address Pattern	Arguments	Examples	Notes
/eos/ds/<index>/<button index>	**number for button edge: 1.0=down, 0.0=up (optional**	**/eos/ds/1/1=1.0** - press first button of OSC direct select bank #1 **/eos/ds/1/1=0.0** - release first button of OSC direct select bank #1	

Direct Selects Output

Address Pattern	Arguments	Examples	Notes
/eos/out/ds/<index>	String argument containing descriptive text for direct select at <index>: target name, page number, mode	/eos/out/ds/1/1="Channels [1]"/eos/ds/1/1="Groups [1 – Flexi]"	
/eos/out/ds/<index>/<button index>	String argument containing target description (name/number)	/eos/out/ds/1/1="Cyac [1]"	

Status Information

These OSC methods provide information about the status of your show file.

OSC Active Cue

The incoming and outgoing OSC format Eos uses for cues and cue lists can be set via **Setup > System > Show Control >** *OSC Cue Receive String* and *OSC Cue Send String*. These settings can be overridden on specified cue lists using *Cue Triggers*.

OSC Active Cue is updated once per second.d

Active Cue Output

Address Pattern	Arguments	Examples	Notes
/eos/out/active/cue/<list>/<cue>	Float argument with percent complete 0.0=started, 1.0 complete	/eos/out/active/cue/5/1=0.75	Updated once per second.
/eos/out/active/cue	Float argument with percent complete 0.0=started, 1.0 complete	/eos/out/active/cue=0.75	Updated once per second.
/eos/out/active/cue/text	String argument with descriptive text about active cue	/eos/out/active/cue/text= "1/1 Label 5.00 100%"	
/eos/out/pending/cue/<list>/<cue>		/eos/out/pending/cue/5/1.5	
/eos/out/pending/cue/<list>/<cue>/text	String argument with descriptive text about active cue	/eos/out/pending/cue/text= "1/1.5 Label 5.00"	
/eos/get/setup			Gets default cue times.

QLab Compatible Output

Address Pattern	Arguments	Examples	Notes
/cue/%1/start	%1 - cue number %2 - cuelist number %3 - cue whole number only (i.e. if it's cue 17.5, send only 17) %4 - cue point number only (i.e. if it's cue 17.5, send only 5) %5 - cue label		

OSC Live/Blind State

State Output

Address Pattern	Arguments	Examples	Notes
/eos/out/event/state	Integer argument: 0=Blind, 1=Live		

OSC Reset

OSC Reset clears any active switches, resets all persistent OSC settings (like OSC user ID & wheel modes), and sends all implicit OSC output commands.

Address Pattern	Arguments	Examples	Notes
/eos/reset			

OSC Show Control

OSC also provides many options for external control of entire shows. Using OSC, Eos can be integrated with show control software like QLab into a unified workflow, controlling multiple entertainment control systems simultaneously from a single user interface, and synchronizing lighting, sound, video, and other show elements.

Show Control Lists and Events

One of the simplest methods of Eos OSC show control is via *Show Control [Tab 11]* events, which allow you to map any OSC input string with an Eos action.

This can be useful if you don't know the specific OSC syntax to achieve an effect in Eos.

Tying OSC input to events also keeps integration constant, allowing you to change either the OSC string or the Eos action without one affecting the other.

OSC Cue Send and Receive String

These options are found under the *OSC* tab of **Setup** > *System > Show Control*.

OSC Cue Send String allows you to specify a different outgoing OSC string format than the standard Eos implicit string for integration with other applications. The following wildcard options can be used:

- **%1** - cue number
- **%2** - cue list number
- **%3** - cue whole number

- **%4** - cue point number
- **%5** - cue label

This setting can be overridden on specified cue lists using *Cue Triggers*> {OSC Cue Send String}.

OSC Cue Receive string you to specify a different incoming OSC string format for integration with other applications, using the following wildcards:

- **%1** - cue number.
- **%2** - cue list number.

For example:

- **/go/%1** - when Eos receives an OSC string matching (ex. /go/32.5), it fires the matching cue number (Cue 1/32.5)
- **/go/%2/%1** - when Eos receives /go/2/18.2, it fires Cue List 2 Cue 18.2

This setting can be overridden on specified cue lists using **Cue Triggers >** *{OSC Cue Recv String}*.

OSC Methods

OSC Show Control Events

Show control events are fired as the console executes the corresponding action, much like MIDI Show Control output events.

The incoming and outgoing OSC format Eos uses for cues and cue lists can be set via **Setup > System > Show Control >** *OSC Cue Receive String* and *OSC Cue Send String*. These settings can be overridden on specified cue lists using *Cue Triggers*.

Address Pattern	Arguments	Examples	Notes
/eos/out/event/cue/<cue list number>/<cue number>/fire			
/eos/out/event/cue/<cue list number>/<cue number>/stop			
/eos/out/event/sub/<sub number>	**Integer argument: 0=Bump Off, 1=Bump On**		Notifies when the specified submaster is used.
/eos/out/event/macro/<macro number>			Notifies when the specified macro is executed.
/eos/out/event/relay/<relay number>/<group number>	**Integer argument: 0=On, 1=Off**		Notifies when the specified relay is activated.
/eos/out/event			Used for timecode learn.

OSC Subscribe

OSC Subscribe allows you to request ongoing updates about changes to Eos show data.

You can also subscribe to specific parameters. Once subscribed, Eos will reply with an OSC packet per parameter as data changes.

Action	Address Pattern	Arguments	Examples
Subscribe to Eos show data.	**/eos/subscribe=x**	unit32 for x where 0=unsubscribe and 1=subscribe	**/eos/subscribe=1**
Subscribe to a specific parameter.	**/eos/subscribe/param/<parameter>**	1=subscribe, 0=unsubscribe	**/eos/subscribe/param/red=1**

OSC Third-Party Integration

Overview

The OSC methods discussed in this section are primarily oriented towards application development and integration. For most implementations of OSC with Eos systems and shows, the commands discussed in *OSC Eos Control* and *OSC Show Control* are sufficient.

OSC UID

UIDs uniquely identify each show data target, and are preserved in the show file. This allows you to synchronize with a show file once and then again at a later time, even if changes were made in between.

UIDs will be specified as strings in the following format: XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX. For example, B0BAE0A0-3BBE-4004-888B-F61CA125D0B0.

OSC List Convention

The OSC List convention is used to send OSC commands that may exceed 512 bytes of data.

To add an OSC List of items to an OSC Command, append the OSC address pattern with **/list/<index>/<count>**, where **<index>** is the zero-based index offset into the entire list and **<total>** is the total number of elements in the entire list.

OSC List that fits in a single packet:

- **/eos/out/get/curve/901/list/0/3** = <uint32: 0> <string: 0DF9082C-4A39-40FC-9532-6C3AC01BC6B5> <string: IES Square>

OSC List that spans 2 packets:

- **/eos/out/get/curve/901/list/0/3** = <uint32: 0> <string: 0DF9082C-4A39-40FC-9532-6C3AC01BC6B5> /eos/out/get/curve/901/list/2/3 = <string: IES Square>

For performance reasons, **<index>** is only valid when detailed information is requested via **/index**.

General Integration Methods

The primary OSC method of integration with Eos is *OSC Get*. Other OSC methods that may be useful are listed below.

OSC Active Data

The parameter <index> is a 1-based index referencing the list of current parameters for the selected channels. Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately.

Wheel

Address Pattern	Arguments	Examples	Notes
/eos/active/wheel/<index>	number of wheel ticks for the specific wheel mode (positive or negative)	/eos/active/wheel/1=1.0 (increase value) /eos/active/wheel/1=-1.0 (decrease value) /eos/active/wheel/1=4.0 (increase value rapidly)	Defaults to Coarse mode, but wheel mode can be changed with the **/eos/switch** command.
/eos/active/wheel/fine/<index>	number of fine wheel ticks (positive or negative)	/eos/active/wheel/fine/1=1.0	
/eos/active/wheel/course/<index>	number of coarse wheel ticks (positive or negative)	/eos/active/wheel/coarse/ 1=1.0	

Switch

Address Pattern	Arguments	Examples	Notes
/eos/active/switch/<index>	number of wheel ticks for the specific switch mode (positive or negative)	/eos/active/switch/1=1.0 (increase value) /eos/active/switch/1=-1.0 (decrease value) /eos/active/switch/1=4.0 (increase value rapidly) /eos/active/switch/1=0.25 (increase value slowly)	Defaults to Coarse mode, but wheel mode can be changed with the **/eos/switch** command.
/eos/active/switch/fine/<index>	number of fine wheel ticks (positive or negative)	/eos/active/switch/fine/1=1.0	
/eos/active/switch/coarse/<index>	number of coarse wheel ticks (positive or negative)	/eos/active/switch/coarse/ 1=1.0	

Active Data Output

This can be used to create a ML Controls style interface via OSC. For example, on the OSC-enabled device, setup 10 wheels (/eos/active/wheel/<1-10>) with matching labels. If using in conjunction with "/eos/active/switch/<number>", you should still use "/eos/out/active/wheel/<number>" to display feedback for that switch.

Address Pattern	Arguments	Examples	Notes
/eos/out/active/wheel<number>	**2 arguments: String with parameter name and current value from first channel**	/eos/out/active/wheel/1="Intensity", 100	
/eos/out/active/chan	**String argument with active channels and current value from the 1st channel**		
/eos/out/active/wheel/<number>	**String argument with parameter name and current value from the 1st channel: 0=Null/Unassigned, 1=Intensity, 2=Focus, 3=Color, 4=Image, 5=Form, 6=Shutter**		

OSC DMX

OSC DMX can be used to set manual DMX levels for specified targets or parameters.

All OSC DMX syntaxes can also be used with OSC Override, and the two methods can be combined. See the *OSC Dictionary* for a full list of supported address patterns.

Address Pattern	Arguments	Examples	Notes
/eos/addr/<address>/dmx=<dmx level>	**<address>: Int. The absolute address to select. <level>: Float, 0.0-100.0. <dmx level>: Int, 0-255.**	**/eos/addr/513/dmx=255** - sets address 513 to output a DMX value of 255.	Addresses are parked while on the OSC command line.
/eos/at/dmx=<dmx level>	**<dmx level>: Int, 0-255.**	**/eos/at/dmx=128** - sets the currently selected params to output a DMX value of 128.	Multiple parameters can be targeted in any **/eos/at/** method by listing them as **/<param1>/<param 2>/** and so on.
/eos/param/<param>/dmx=<dmx level>	**<param>: parameter name as a string. <dmx level>: Int, 0-255.**	**/eos/param/<param>/dmx=128** - sets the DMX channels assigned as Pan for the current selection to output 128.	

OSC Filter

Filter can be used to limit OSC traffic to devices that only need specific OSC messages from Eos. When one or more filters are set, Eos will only send OSC messages to the device that matches the filters.

Action	Address Pattern	Arguments	Examples	*Notes*
Add a filter.	**/eos/filter/add**	one or more string arguments representing one or more filters that may contain * wildcards	/eos/filter/add=/eos/out/param/*	*The device will now only receive OSC messages that start with **/eos/out/param/**.*
Remove a filter.	**/eos/filter/remove**	one or more string arguments representing one or more filters that may contain * wildcards	/eos/filter/remove=/eos/out/param/*	*If other filters have been set, the device will no longer receive messages that start with **/eos/out/param**. If no other filters have been set, the device will receive all OSC messages from Eos.*
Remove all filters.	**/eos/filter/clear**			*Clears all set filters, so the device receives all OSC messages from Eos.*

OSC Override

OSC can set and release override data, which appears in pink, has priority over other data types, and is not recorded.

All OSC DMX syntaxes can also be used with OSC Override, and the two methods can be combined. See the *OSC Dictionary* for a full list of supported address patterns.

Set Overrides

Address Pattern	Arguments	Examples	Notes
/eos/chan/1/param/intens/override	**override level data**	/eos/chan/1/param/intens/override=50 - override level data sets the channel to 50 and displays in pink.	
/eos/chan/1/param/intens/DMX/override	**override DMX data**	/eos/chan/1/param/intens/DMX/override=252 - override DMX data sets the DMX to 252 and displays in pink.	

Release Overrides

Address Pattern	Arguments	Examples	Notes
/eos/release			
/eos/at/release			
/eos/param/x/release	parameter number		
/eos/chan/x/release	channel number		
/eos/chan/x/param/y/release	channel number, parameter number		
/eos/group/x/release	group number		
/eos/group/x/param/y/release	group number, parameter number		

OSC Show File Information

Address Pattern	Arguments	Examples	Notes
/eos/out/show/name	String argument with show title		
/eos/out/event/show/saved	String argument with file path		
/eos/out/event/show/loaded	String argument with file path		
/eos/out/event/show/cleared	String argument with file path		

OSC Wheel

Indexed Wheels

Address Pattern	Arguments	Examples	Notes
/eos/wheel/<index>/level	number for wheel ticks for the specified wheel mode (positive or negative)	/eos/wheel/2/level=1.0 (increase value) /eos/wheel/2/level=-1.0 (decrease value) /eos/wheel/2/level=4.0 (increase value rapidly) (defaults to Coarse mode, but wheel mode can be changed with the /eos/wheel command below)	
/eos/wheel/<index>	number for wheel mode: 0=coarse, 1=fine	/eos/wheel=1.0	

OSC Set

Set is a special OSC implementation allowing direct editing of certain Eos show data. This can be used to make direct edits to compatible data, or as an alternative to using *OSC Command and Event*.

Address Pattern	Arguments	Examples	Notes
/eos/set/patch/<channel number>/label	**<string: text>**		Include channel part number in the path when necessary.
/eos/set/patch/<channel number>/text1	**<string: text>**		
/eos/set/patch/<channel number>/text2	**<string: text>**		
/eos/set/patch/<channel number>/text3	**<string: text>**		
/eos/set/patch/<channel number>/text4	**<string: text>**		
/eos/set/patch/<channel number>/text5	**<string: text>**		
/eos/set/patch/<channel number>/text6	**<string: text>**		
/eos/set/patch/<channel number>/text7	**<string: text>**		
/eos/set/patch/<channel number>/text8	**<string: text>**		
/eos/set/patch/<channel number>/text9	**<string: text>**		
/eos/set/patch/<channel number>/text10	**<string: text>**		
/eos/set/patch/<channel number>/notes	**<string: text>**		
/eos/set/patch/<channel number>/gel	**<string: text>**		
/eos/set/patch/<channel number>/augment3d/position	**<string: text> (pos_x,pos_y,pos_z,orientation_x,orientation_y,orientation_z)**		
/eos/set/patch/<channel number>/<part number>/augment3d/position	**<string: text>**		
/eos/set/cuelist/<cue list number>/label	**<string: text>**		
/eos/set/cue/<cue list number>/<cue number>/label	**<string: text> (base data)**		
/eos/set/cue/<cue list number>/<cue number>/<cue part number>/label	**<string: text> (part data)**		
/eos/set/group/<group number>/label	**<string: text>**		
/eos/set/macro/<macro	**<string: text>**		

Address Pattern	Arguments	Examples	Notes
number>/label			
/eos/set/sub/<sub number>/label	**<string: text>**		
/eos/set/preset/<preset number>/label	**<string: text>**		
/eos/set/ip/<ip number>/label	**<string: text>**		
/eos/set/fp/<fp number>/label	**<string: text>**		
/eos/set/cp/<cp number>/label	**<string: text>**		
/eos/set/bp/<bp number>/label	**<string: text>**		
/eos/set/curve/<curve number>/label	**<string: text>**		
/eos/set/fx/<fx number>/label	**<string: text>**		
/eos/set/snap/<snap number>/label	**<string: text>**		
/eos/set/pixmap/<pixmap number>/label	**<string: text>**		
/eos/set/ms/<ms number>/label	**<string: text>**		

OSC Unicast sACN Universe

Sets unicast sACN destinations. Enter any sACN universe or range of universes for x, and one or more desired unicast destinations y.

Address Pattern	Arguments	Examples	Notes
/eos/newcmd=sACN Universe x Unicast_ Destinations y		/eos/newcmd=sACN Universe 1 Thru 10 Unicast_ Destinations 10.1.1.1	Sets the unicast destinations for sACN universes 1 through 10 to 10.1.1.1.
		/eos/newcmd=sACN Universe 1 Thru 10 Unicast_ Destinations 10.1.1.1+10.1.1.2	Multiple destinations can be added via +.

OSC Get

This OSC implementation allows you to request various pieces of information from Eos. This can be useful if you are trying to create an OSC-based application that works with Eos.

Get strings begin with **/eos/get/**. Eos replies begin with **/eos/out/get/**.

Integration

Integrating your application with Eos should typically follow a standard set of steps.

OSC Get Version

Any OSC integration should start by requesting the Eos software version using OSC Get Version.

Action	Address Pattern	Arguments	Examples	*Notes*
Request version information.	**/eos/get/version**			
Eos reply with current version information	**/eos/out/get/version**	string: X.X.X.X (software version or fixture library version) string: fixture library version bool: 0=Gel+S4 Lamp and 1=Gel Only (color picker gel swatch mode)	**/eos/out/get/version="3.2.12.1"**	*Eos software version is 3.2.12.1.*
			/eos/out/get/version="3.2.10.23"	*Eos fixture library version is 3.2.10.23.*
			/eos/out/get/version=1	*Color picker gel swatch mode is Gel Only.*

Synchronization

Once the software version has been obtained, your application should synchronize with Eos to get the current state of any relevant show data, and remain synchronized in order to display the most up-to-date information.

Request the number of items of a specific type of data you are interested in. Any data that can be retrieved by an OSC Get command can be requested. Eos will respond with counts for each individual request.

Specific synchronization patterns for individual methods are detailed below.

OSC Subscribe

Once your application has the current state of relevant show data, it needs to remain in sync using OSC Subscribe.

OSC Subscribe allows you to request ongoing updates about changes to Eos show data.

You can also subscribe to specific parameters. Once subscribed, Eos will reply with an OSC packet per parameter as data changes.

Action	Address Pattern	Arguments	Examples
Subscribe to Eos show data.	**/eos/subscribe=x**	unit32 for x where 0=unsubscribe and 1=subscribe	**/eos/subscribe=1**
Subscribe to a specific parameter.	**/eos/subscribe/param/<parameter>**	1=subscribe, 0=unsubscribe	**/eos/subscribe/param/red=1**

When your app receives a notification that Eos show data has changed, you should then request detailed information about the modified show data using either the target number or the UID. Eos will reply as if the detailed information were requested via index.

Specific subscription patterns for individual methods are detailed below.

Modification

Once information is synchronized between Eos and your application, you can proceed to show data modification.

Best practice is to do this via *OSC Command and Event* syntax, building Eos command lines and sending them with **/eos/cmd** or **/eos/newcmd**.

However, you can also use the *OSC Set* convenience commands to edit common show data attributes.

Get Methods

OSC Get Augment3d

Synchronize

Request the number of items:

- **/eos/get/3dserver/count**

Eos reply with the matching command:

- **/eos/out/get/3dserver/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/3dserver/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/3dserver/<3dserver number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/3dserver/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/3dserver/<3dserver number>**
- **/eos/get/3dserver/uid/<UID>**

OSC Get Cue

Synchronize

Request the number of items:

- **/eos/get/cue/<cue list number>/count**

Eos reply with the matching command:

- **/eos/out/get/cue/<cue list number>/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/cue/<cue list number>/index/<index number>**

Eos reply with the matching command:

- **/eos/out /get/cue/<cue list number>/<cue number>/<cue part number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/cue/<cue list number>/list/<list index>/<list count>** = <uint32: sequence number>, ...

Request detailed show data information via target number or UID:

- **/eos/get/cue/<cue list number>/<cue number>** - Eos returns base cue and all cue parts.
- **/eos/get/cue/<cue list number>/<cue number>/0** - base cue.
- **/eos/get/cue/<cue list number>/<cue number>/<cue part number>** - specific cue part.
- **/eos/get/cue/uid/<UID>**

Detailed Packet Contents

Cue (1 of 4)

/eos/out/get/cue/<cue list number>/<cue number>/<cue part number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cue
4	<cue list number>
5	<cue number>
6	<cue part number>
7	list
8	<list index>
9	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	uint32	up time duration (ms)
4	uint32	up time delay (ms)
5	uint32	down time duration (ms)
6	uint32	down time delay (ms)
7	uint32	focus time duration (ms)

Argument	*OSC Data* Type	Description
8	uint32	focus time delay (ms)
9	uint32	color time duration (ms)
10	uint32	color time delay (ms)
11	uint32	beam time duration (ms)
12	uint32	beam time delay (ms)
13	bool	preheat
14	OSC number	curve
15	uint32	rate
16	string	mark
17	string	block
18	string	assert
19	OSC number or string	link or string if links to a separate cue list
20	uint32	follow time (ms)
21	uint32	hang time (ms)
22	bool	all fade
23	uint32	loop
24	bool	solo
25	string	timecode
26	uint32	part count (not including base cue, cues with no parts are 0)
27	notes	
28	scene (text)	
29	bool	scene end
30		cue part index (-1 if not part of a cue, index otherwise)

Cue (2 of 4)

/eos/out/get/cue/<cue list number>/<cue number>/<cue part number>/fx/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cue
4	<cue list number>
5	<cue number>

Address	Description
6	<cue part number>
7	fx
8	list
9	<list index>
10	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC number range	effect list

Cue (3 of 4)

/eos/out/get/cue/<cue list number>/<cue number>/<cue part number>/fx/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cue
4	<cue list number>
5	<cue number>
6	<cue part number>
7	links
8	list
9	<list index>
10	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	linked lists

Cue (4 of 4)

/eos/out/get/cue/<cue list number>/<cue number>/<cue part number>/actions/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cue
4	<cue list number>
5	<cue number>
6	<cue part number>
7	actions
8	list
9	<list index>
10	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC number range	ext link action

OSC Get Cue List

Synchronize

Request the number of items:

- **/eos/get/cuelist/count**

Eos reply with the matching command:

- **/eos/out/get/cuelist/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/cuelist/index/<index number>**

Eos reply with the matching command:

- **/eos/out /get/cuelist/<cue list number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/cuelist/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- /eos/get/cuelist/<cue list number>
- /eos/get/cuelist/uid/<UID>

Detailed Packet Contents

Cue List (1 of 2)

/eos/out/get/cuelist/<cue list number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cuelist
4	<cue list number>
5	list
6	< list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	string	playback mode
4	string	fader mode
5	bool	independent
6	bool	HTP
7	bool	assert
8	bool	block
9	bool	background
10	bool	solo mode
11	uint32	timecode list
12	bool	OOS sync

Cue List (2 of 2)

/eos/out /get/cuelist/<cue list number>/links/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	cuelist
4	<cue list number>
5	links
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	linked cue lists list

OSC Get Curve

Synchronize

Request the number of items:

- **/eos/get/curve/count**

Eos reply with the matching command:

- **/eos/out/get/curve/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/curve/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/curve/<curve number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> ...

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/curve/list/<list index>/<list count>** = <uint32: sequence number>, ...

Request detailed show data information via target number or UID:

- **/eos/get/curve/<curve number>**
- **/eos/get/curve/uid/<UID>**

Detailed Packet Contents

Curve (1 of 1)

/eos/out/get/curve/<curve number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	curve
4	<curve number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label

OSC Get Effects

Synchronize

Request the number of items:

- **/eos/get/fx/count**

Eos reply with the matching command:

- **/eos/out/get/fx/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/fx/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/fx/<fx number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/fx/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/fx/<fx number>**
- **/eos/get/fx/uid/<UID>**

Detailed Packet Contents

Effects (1 of 1)

/eos/out/get/fx/<fx number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	fx
4	<fx number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	string	effect type
4	string	entry
5	string	exit
6	string	duration
7	uint32	scale

OSC Get FPE

Synchronize

Request the number of items:

- **/eos/get/fpe/count** - returns int value with number of fpe sets.
- **/eos/get/fpe/<set number>** - returns the label of the set, number of points in the set.
- **/eos/get/fpe/<set number>/count** - returns int value with number of points in the set.
- **/eos/get/fpe/<set number>/<point number>** - returns label of the set, focus palette number, position x, position y, position z.

Eos reply with the matching command:

- **/eos/out/get/fpe/count** = <uint32: count>
- **/eos/out/get/fpe/<set number>** = <uint32: count>
- **/eos/out/get/fpe/<set number>/count** = <uint32: count>
- **/eos/out/get/fpe/<set number>/<point number>** = <uint32: count>

Request detailed information for each item from index 0 to count:

- /eos/get/fpe/index/<index number>
- /eos/get/fpe/<set number>/index/<index number>
- /eos/get/fpe/<set number>/index/<index number>
- /eos/get/fpe/<set number>/<point number>/index/<index number>

Eos reply with the matching command:

- /eos/out/get/fpe/<fpe number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …
- /eos/out/get/fpe/<set number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …
- /eos/out/get/fpe/<set number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …
- /eos/out/get/fpe/<set number>/<point number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- /eos/out/notify/fpe/list/<list index>/<list count> = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- /eos/get/fpe/<fpe number>
- /eos/get/fpe/uid/<UID>

OSC Get Group

Synchronize

Request the number of items:

- /eos/get/group/count
- /eos/get/group/displayed/count

Eos reply with the matching command:

- /eos/out/get/group/count = <uint32: count>
- /eos/out/get/group/displayed/count = <uint32: count>

Request detailed information for each item from index 0 to count:

- /eos/get/group/index/<index number>
- /eos/get/group/displayed/index/<index number>

Eos reply with the matching command:

- /eos/out/get/group/<group number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …
- /eos/out/get/group/displayed/<group number>/list/<list index>/<list count> = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- /eos/out/notify/group/list/<list index>/<list count> = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- /eos/get/group/<group number>
- /eos/get/group/uid/<UID>
- /eos/get/group/displayed/uid/<UID>

Detailed Packet Contents

Group (1 of 2)

/eos/get/group/<group number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	group
4	<group number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label

Group (2 of 2)

/eos/get/group/<group number>/channels/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	group
4	<group number>
5	channels
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number List	channel list

OSC Get Macro

Synchronize

Request the number of items:

- **/eos/get/macro/count**

Eos reply with the matching command:

- **/eos/out/get/macro/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/macro/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/macro/<macro number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> ...

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/macro/list/<list index>/<list count>** = <uint32: sequence number>, ...

Request detailed show data information via target number or UID:

- **/eos/get/macro/<macro number>**
- **/eos/get/ms/uid/<UID>**

Detailed Packet Contents

Macro (1 of 2)

/eos/out/get/macro/<macro number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	macro
4	<macro number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	string	mode

Macro (2 of 2)

/eos/out/get/macro/<macro number>/text/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	macro
4	<macro number>
5	text
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	command text

If necessary, command text will be split into multiple packets via the *OSC List Convention*.

OSC Get Magic Sheet

Synchronize

Request the number of items:

- **/eos/get/ms/count**

Eos reply with the matching command:

- **/eos/out/get/ms/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/ms/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/ms/<ms number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/ms/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/ms/<ms number>**
- **/eos/get/ms/uid/<UID>**

Detailed Packet Contents

Magic Sheet (1 of 1)

/eos/out/get/ms/<ms number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	ms
4	<ms number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label

OSC Get Palettes

Synchronize

Request the number of items:

- **/eos/get/ip/count**
- **/eos/get/fp/count**
- **/eos/get/cp/count**
- **/eos/get/bp/count**

Eos reply with the matching command:

- **/eos/out/get/ip/count** = <uint32: count>
- **/eos/out/get/fp/count** = <uint32: count>

- **/eos/out/get/cp/count** = <uint32: count>
- **/eos/out/get/bp/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/ip/index/<index number>**
- **/eos/get/fp/index/<index number>**
- **/eos/get/cp/index/<index number>**
- **/eos/get/bp/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/ip/<ip number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …
- **/eos/out/get/fp/<fp number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …
- **/eos/out/get/cp/<cp number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …
- **/eos/out/get/bp/<bp number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/ip/list/<list index>/<list count>** = <uint32: sequence number>, …
- **/eos/out/notify/fp/list/<list index>/<list count>** = <uint32: sequence number>, …
- **/eos/out/notify/cp/list/<list index>/<list count>** = <uint32: sequence number>, …
- **/eos/out/notify/bp/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/ip/<ip number>**
- **/eos/get/ip/uid/<UID>**
- **/eos/get/fp/<fp number>**
- **/eos/get/fp/uid/<UID>**
- **/eos/get/cp/<cp number>**
- **/eos/get/cp/uid/<UID>**
- **/eos/get/bp/<bp number>**
- **/eos/get/bp/uid/<UID>**

Detailed Packet Contents

Palette (1 of 3)

/eos/out/get/<palette type>/<palette number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	<palette type>
4	<palette number>

Address	Description
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	bool	absolute
4	bool	locked

Palette (2 of 3)

/eos/out/get/<palette type>/<palette number>/channels/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	<palette type>
4	<palette number>
5	channel
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	channel list

Palette (3 of 3)

/eos/out/get/<palette type>/<palette number>/byType/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	<palette type>
4	<palette number>
5	byType
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	by type channel list

OSC Get Patch

Synchronize

Request the number of items:

- **/eos/get/patch/<channel number>/<part number>/augment3d/position** - returns index, UUID, position x, position y, position z, orientation x, orientation y, orientation z, fpe set number.
- **/eos/get/patch/<channel number>/<part number>/augment3d/beam** - returns index, UUID, beam angle, gel color, number of shutters, {thrust of shutter, angle of shutter} x N shutters, gobo (UUID), gobo description (from Patch), gobo rotation, hide beam status.

Eos reply with the matching command:

- **/eos/out/get/patch/<channel number>/<part number>/augment3d/position** = <uint32: count>
- **/eos/out/get/patch/<channel number>/<part number>/augment3d/beam** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/patch/index/<index number>**
- **/eos/get/patch/<channel number>/<part number>/augment3d/position/index/<index number>**
- **/eos/get/patch/<channel number>/<part number>/augment3d/beam/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/patch/<channel number>/<part number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

- **/eos/out/get/patch/<channel number>/<part number>/augment3d/position** = <uint32: list index> <string: UID> …
- **/eos/out/get/patch/<channel number>/<part number>/augment3d/beam** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/patch/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/patch/<channel number>** - Eos returns all parts.
- **/eos/get/patch/<channel number>/<part number>** -Eos returns specific channel parts.
- **/eos/get/patch/uid/<UID>**

Detailed Packet Contents

Patch (1 of 2)

/eos/out/get/patch/<channel number>/<part number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	patch
4	<channel number>
5	<part number>
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	string	fixture manufacturer
4	string	fixture model
5	uint32	address
6	uint32	address of intensity parameter
7	uint32	current level

Argument	*OSC Data* Type	Description
8	string	OSC Gel
9	string	text 1
10	string	text 2
11	string	text 3
12	string	text 4
13	string	text 5
14	string	text 6
15	string	text 7
16	string	text 8
17	string	text 9
18	string	text 10
19	uint32	part count

Patch (2 of 2)

/eos/out/get/patch/<channel number>/<part number>/notes

Address	Description
0	eos
1	out
2	get
3	patch
4	<channel number>
5	<part number>
6	notes

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	notes

OSC Get Pixel Map

Synchronize

Request the number of items:

- /eos/get/pixmap/count

Eos reply with the matching command:

- **/eos/out/get/pixmap/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/pixmap/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/pixmap/<pixmap number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/pixmap/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/pixmap/<pixmap number>**
- **/eos/get/pixmap/uid/<UID>**

Detailed Packet Contents

Pixel Map (1 of 2)

/eos/out/get/pixmap/<pixmap number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	pixmap
4	<pixmap number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	uint32	server channel
4	string	interface
5	uint32	width
6	uint32	height

Argument	*OSC Data* Type	Description
7	uint32	pixel count
8	uint32	fixture count

Pixel Map (2 of 2)

/eos/out/get/pixmap/<pixmap number>/channels/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	pixmap
4	<pixmap number>
5	channels
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	layer channel list

OSC Get Preset

Synchronize

Request the number of items:

- **/eos/get/preset/count**

Eos reply with the matching command:

- **/eos/out/get/preset /count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/preset/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/preset/<preset number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> ...

Subscribe

Eos notification of show data changes:

- /eos/out/notify/preset/list/<list index>/<list count> = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- /eos/get/preset/<preset number>
- /eos/get/preset/uid/<UID>

Detailed Packet Contents

Preset (1 of 4)

/eos/out/get/preset/<preset number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	preset
4	<preset number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	bool	absolute
4	bool	locked

Preset (2 of 4)

/eos/out/get/preset/<preset number>/channels/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	preset
4	<preset number>
5	channels

Address	Description
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	channel list

Preset (3 of 4)

/eos/out/get/preset/<preset number>/byType/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	preset
4	<preset number>
5	byType
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	by type channel list

Preset (4 of 4)

/eos/out/get/preset/<preset number>/fx/list/<list index>/<list count>

Address	Description
0	eos
1	out

Address	Description
2	get
3	preset
4	<preset number>
5	fx
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	effect list

OSC Get Snapshot

Synchronize

Request the number of items:

- **/eos/get/snap/count**

Eos reply with the matching command:

- **/eos/out/get/snap/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/snap/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/snap/<snap number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> …

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/snap/list/<list index>/<list count>** = <uint32: sequence number>, …

Request detailed show data information via target number or UID:

- **/eos/get/snap/<snap number>**
- **/eos/get/snap/uid/<UID>**

Detailed Packet Contents

Snapshot (1 of 1)

/eos/out/get/snap/<snap number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	snap
4	<snap number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label

OSC Get Submaster

Synchronize

Request the number of items:

- **/eos/get/sub/count**

Eos reply with the matching command:

- **/eos/out/get/sub/count** = <uint32: count>

Request detailed information for each item from index 0 to count:

- **/eos/get/sub/index/<index number>**

Eos reply with the matching command:

- **/eos/out/get/sub/<sub number>/list/<list index>/<list count>** = <uint32: list index> <string: UID> ...

Subscribe

Eos notification of show data changes:

- **/eos/out/notify/sub/list/<list index>/<list count>** = <uint32: sequence number>, ..

Request detailed show data information via target number or UID:

- **/eos/get/sub/<sub number>**
- **/eos/get/sub/uid/<UID>**

Detailed Packet Contents

Submaster (1 of 2)

/eos/out/get/sub/<sub number>/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	sub
4	<sub number>
5	list
6	<list index>
7	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	string	label
3	string	mode
4	string	fader mode
5	bool	HTP
6	bool	exclusive
7	bool	background
8	bool	restore
9	string	priority
10	string	up time
11	string	dwell time
12	string	down time

Submaster (2 of 2)

/eos/out/get/sub/<sub number>/fx/list/<list index>/<list count>

Address	Description
0	eos
1	out
2	get
3	sub
4	<sub number>

Address	Description
5	fx
6	list
7	<list index>
8	<list count>

Argument	*OSC Data* Type	Description
0	uint32	index
1	string	OSC UID
2	OSC Number Range	effect list

OSC Get Version

Action	Address Pattern	Arguments	Examples	*Notes*
Request version information.	**/eos/get/version**			
Eos reply with current version information	**/eos/out/get/version**	string: X.X.X.X (software version or fixture library version) string: fixture library version bool: 0=Gel+S4 Lamp and 1=Gel Only (color picker gel swatch mode)	**/eos/out/get/version="3.2.12.1"**	*Eos software version is 3.2.12.1.*
			/eos/out/get/version="3.2.10.23"	*Eos fixture library version is 3.2.10.23.*
			/eos/out/get/version=1	*Color picker gel swatch mode is Gel Only.*

OSC Dictionary

This page contains reference tables of all Eos OSC address pattern formats and key names, under the following categories:

- *OSC Inputs* - supported address patterns for OSC input to Eos.
- *OSC Outputs* - supported address patterns for OSC output from Eos.
- *OSC Eos Keys* - supported Eos key names for use in OSC messages.

OSC Inputs

Address patterns in shaded rows can also start with **/eos/user/<number>** instead of **/eos** to direct the command to a specific Eos *User ID*. Any number from 0 to 99 can be used when specifying a user via OSC; if the user number is not present on the *Host* device, a virtual OSC user is created. Once a user is set via OSC, it remains as specified until changed again.

If a user ID is not specified, the command defaults to the current Eos user. You can use **/eos/user/-1** to revert from a virtual OSC user back to the default.

Address Pattern	Arguments	Examples	Notes
/eos/active/switch/coarse/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of coarse wheel ticks to continuously change the parameter by.**	**/eos/active/switch/coarse/1=2.0** - Increases the parameter indexed by 1 (likely intensity) by 2 coarse wheel ticks continuously.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately. Switch is a variant of Wheel with the added functionality of continuously repeating wheel ticks until a subsequent OSC switch command sets the wheel ticks to zero.
/eos/active/switch/fine/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of fine wheel ticks to continuously change the parameter by.**	**/eos/active/switch/fine/1=2.0** - Increases the parameter indexed by 1 (likely intensity) by 2 fine wheel ticks continuously.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately. Switch is a variant of Wheel with the added functionality of continuously repeating wheel ticks until a subsequent OSC switch command sets the wheel ticks to zero.

Address Pattern	Arguments	Examples	Notes
/eos/active/wheel/coarse/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of coarse wheel ticks to change the parameter by.**	**/eos/active/wheel/coarse/1=2.0** - Increases the parameter indexed by 1 (likely intensity) by 2 coarse wheel ticks.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately.
/eos/active/wheel/fine/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of fine wheel ticks to change the parameter by.**	**/eos/active/wheel/fine/1=2.0** - Increases the parameter indexed by 1 (likely intensity) by 2 fine wheel ticks.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately.
/eos/active/wheel/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of wheel ticks to change the parameter by.**	**/eos/active/wheel/1=2.0** - Increases the parameter indexed by 1 (likely intensity) by 2 wheel ticks. **/eos/active/wheel/1=-2.0** - Decreases the parameter indexed by 1 (likely intensity) by 2 wheel ticks.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately. Defaults to Coarse mode, but wheel mode can be changed with the **/eos/wheel** command.

Address Pattern	Arguments	Examples	Notes
/eos/active/switch/<index>=<level>	**<index>: Int, 1-based index referencing the list of current parameters for the selected channel(s).** **<level>: Int, number of coarse wheel ticks to continuously change the parameter by.**	**/eos/active/switch/1=2.0** - Increases the parameter indexed by 1 (usually intensity) by 2 wheel ticks continuously. **/eos/active/switch/1=-2.0** - Decreases the parameter indexed by 1 (usually intensity) by 2 wheel ticks continuously. **/eos/active/switch/1=0** - Stops the continous change in the parameter indexed by 1.	Eos will send the parameter name and current value for each active parameter, so that the wheels on your OSC-enabled device may be labeled appropriately. Switch is a variant of Wheel with the added functionality of continuously repeating wheel ticks until a subsequent OSC switch command sets the wheel ticks to zero. Defaults to Coarse mode, but wheel mode can be changed with the **/eos/switch** command.
/eos/addr=<address> /eos/addr/<address>=<level> /eos/addr/<address>/dmx=<dmx level>	**<address>: Int. The absolute address to select.** **<level>: Float, 0.0-100.0. Useful for mappinig to an OSC fader.** **<dmx level>: Int, 0-255.**	**/eos/addr=513** - Selects Address 513 (2/1). **/eos/addr/513=100** - Sets Address 513 to output 100%. **/eos/addr/513/dmx=255** - Sets Address 513 to output a DMX value of 255.	While addresses are on the OSC command line, they are parked.
/eos/at/+% /eos/at/+%=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/+%** - Adjusts the currently selected params by +%, according to its setting.	Adjusts the current selection by +%, as specified in Setup.
/eos/at/-% /eos/at/-%=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/-%** - Adjusts the currently selected params by -%, according to its setting.	Adjusts the current selection by -%, as specified in Setup.

Address Pattern	Arguments	Examples	Notes
/eos/at/full /eos/at/full=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/full** - Sets the currently selected params to their Full levels.	Sets the current selection to their Full levels.
/eos/at/home /eos/at/home=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/home** - Sets the currently selected params to their Home levels.	Sets the current selection to their Home levels.
/eos/at/level /eos/at/home=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/level** - Sets the currently selected params to the Level value.	Sets the current selection to the Level value, as specified in Setup.
/eos/at/max /eos/at/max=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/max** - Sets the currently selected params to their Maximum levels.	Sets the current selection to their Maximum levels.
/eos/at/min /eos/at/min=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/min** - Sets the currently selected params to their Minimum levels.	Sets the current selection to their Minimum levels.
/eos/at/out /eos/at/out=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/out** - Sets the currently selected params to Out.	Sets the current selection to Out.

Address Pattern	Arguments	Examples	Notes
/eos/at/remdim /eos/at/remdim=<button edge>	**<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/at/remdim** - Dims all other unselected channels.	Dims all channels that aren't in the current selection.
/eos/at/<level> /eos/at/dmx=<dmx level>	**<level>: Float, 0.0-100.0.** **<dmx level>: Int, 0-255.**	**/eos/at=75** - Sets the currently selected params to 75. Useful for mapping to an OSC fader. **/eos/at/dmx=128** - Sets the currently selected params to output a DMX value of 128. **/eos/pan/at/10** - Sets the current selection's Pan parameter to a value of 10.	Sets the current selection to the specified level. Multiple parameters can be targeted in any **/eos/at/** method by listing each one as **<param1>/<param2>/...** .
/eos/bp/fire=<index> /eos/bp/<index>/fire=<button edge>	**<index>: Beam palette number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/bp/fire=1** - Runs Beam Palette 1. **/eos/bp/1/fire** - Runs Beam Palette 1.	Fires (executes) beam palettes.
/eos/bp=<index>	**<index>: Beam palette to select.**	**/eos/bp=1** - Selects Beam Palette 1.	Use to select beam palettes.
/eos/chan/<chan>/color/hs=<hue>, <saturation>	**<chan>: Channel number.** **<hue>: Float, 0.0-360.0.** **<saturation>: Float, 0.0-100.0.**	**/eos/chan/1/color/hs=330.0, 75.0** - Chan 1 set to pink color with 75% saturation.	Changes the given **<chan>** to the specified color.

Address Pattern	Arguments	Examples	Notes
/eos/chan/<chan>/color/hsxy=<x>, <y>	**<chan>: Channel number.** **<x>: Float, 0.0-1.0.** **<y>: Float, 0.0-1.0.**	**/eos/chan/1/color/hsxy=0.82, 0.31** - Chan 1 set to pink color with 75% saturation.	Changes the given **<chan>** to the specified color. For simulating the Hue/Saturation wheel in a 2D XY graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0).
/eos/chan/<chan>/color/rgb=<red>, <green>, <blue>	**<chan>: Channel number.** **<red>: Float, 0.0-1.0.** **<green>: Float, 0.0-1.0.** **<blue>: Float, 0.0-1.0.**	**/eos/chan/1/color/rgb=1.0, 0.25, 0.63** - Chan 1 set to pink color with 75% saturation.	Changes the given **<chan>** to the specified color.
/eos/chan/<chan>/color/xy=<x>, <y>	**<chan>: Channel number.** **<x>: Float, 0.0-1.0.** **<y>: Float, 0.0-1.0.**	**/eos/chan/1/color/xy=0.464, 0.254** - Chan 1 set to pink color with 75% saturation.	Changes the given **<chan>** to the specified color. For setting (x, y) chromaticity point in the CIE 1931 xyY color space.
/eos/chan/<chan>/color/xyz=<x>, <y>, <z>	**<chan>: Channel number.** **<x>: Float, 0.0-1.0.** **<y>: Float, 0.0-1.0.** **<z>: Float, 0.0-1.0.**	**/eos/chan/1/color/xyz=0.851, 0.466, 0.516** - Chan 1 set to pink color with 75% saturation.	Changes the given **<chan>** to the specified color. For setting(X, Y, Z) color point in XYZ color space.
/eos/chan/<chan>/pantilt = < x>, <y>	**<chan>: Channel number.** **<x>: Float, 0.0-1.0.** **<y>: Float, 0.0-1.0.**	**/eos/chan/1/pantilt/xy=0.5, 0.5** - Sets Chan 1's pan and tilt to (0,0) on the Pan/Tilt graph.	For 2D Pan/Tilt graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0).

Address Pattern	Arguments	Examples	Notes
/eos/chan/<chan>/+% /eos/chan/1/param/<param>/+% /eos/chan/<chan>/+%=<button edge> /eos/chan/1/param/<param>/+%=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/+%** - Adjusts Chan 1's intensity by +%, as specified in Setup. **/eos/chan/1/param/pan/+%** - Adjusts Chan 1's Pan parameter by +%, as specified in Setup.	Adjusts the channel specified by **<chan>**'s **<param>** by +%, as specified in Setup. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/-% /eos/chan/1/param/<param>/-% /eos/chan/<chan>/-%=<button edge> /eos/chan/1/param/<param>/-%=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/-%** - Adjusts Chan 1's intensity by -%, as specified in Setup. **/eos/chan/1/param/pan/-%** - Adjusts Chan 1's Pan parameter by -%, as specified in Setup.	Adjusts the channel specified by **<chan>**'s **<param>** by -%, as specified in Setup. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/full /eos/chan/1/param/<param>/full /eos/chan/<chan>/full=<button edge> /eos/chan/1/param/<param>/full=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/full** - Sets Chan 1's intensity to its Full value. **/eos/chan/1/param/pan/full** - Sets Chan 1's Pan parameter to its Full value.	Sets the channel specified by **<chan>**'s **<param>** to its Full value. If no **<param>** is given, Intensity will be affected.

Address Pattern	Arguments	Examples	Notes
/eos/chan/<chan>/home /eos/chan/1/param/<param>/home /eos/chan/<chan>/home=<button edge> /eos/chan/1/param/<param>/home=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/home** - Sets Chan 1's intensity to its Home value. **/eos/chan/1/param/pan/home** - Sets Chan 1's Pan parameter to its Home value.	Sets the channel specified by **<chan>**'s **<param>** to its Home value. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/level /eos/chan/1/param/<param>/level /eos/chan/<chan>/level=<button edge> /eos/chan/1/param/<param>/level=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/level** - Sets Chan 1's intensity to Level, as specified in Setup. **/eos/chan/1/param/pan/level** - Sets Chan 1's Pan parameter to Level, as specified in Setup.	Sets the channel specified by **<chan>**'s **<param>** to Level, as specified in Setup. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/max /eos/chan/1/param/<param>/max /eos/chan/<chan>/max=<button edge> /eos/chan/1/param/<param>/max=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/max** - Sets Chan 1's intensity to its maximum value. **/eos/chan/1/param/pan/max** - Sets Chan 1's Pan parameter to its maximum value.	Sets the channel specified by **<chan>**'s **<param>** to its maximum value. If no **<param>** is given, Intensity will be affected.

Address Pattern	Arguments	Examples	Notes
/eos/chan/<chan>/min /eos/chan/1/param/<param>/min /eos/chan/<chan>/min=<button edge> /eos/chan/1/param/<param>/min=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/min** - Sets Chan 1's intensity to its minimum value. **/eos/chan/1/param/pan/min** - Sets Chan 1's Pan parameter to its minimum value.	Sets the channel specified by **<chan>**'s **<param>** to its minimum value. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/out /eos/chan/1/param/<param>/out /eos/chan/<chan>/out=<button edge> /eos/chan/1/param/<param>/out=<button edge>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/out** - Sets Chan 1's intensity to Out. **/eos/chan/1/param/pan/out** - Sets Chan 1's Pan parameter to its Out value.	Sets the channel specified by **<chan>**'s **<param>** to Out. If no **<param>** is given, Intensity will be affected.
/eos/chan/<chan>/remdim /eos/chan/<chan>/remdim=<button edge>	**<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/chan/1/remdim** - Dims all channels to their RemDim state except Chan 1.	Dims all channels except the specified **<chan>**.

Address Pattern	Arguments	Examples	Notes
/eos/chan/<chan>=<level> /eos/chan/<chan>/param/<param>=<level> /eos/chan/<chan>/dmx=<dmx level> /eos/chan/<chan>/param/<param>/dmx=<dmx level>	**<chan>: Channel number.** **<param>: Parameter name as a string.** **<level>: Float, 0.0-100.0.** **<dmx level>: Int, 0-255.**	**/eos/chan/1=50** - Sets Chan 1's Intensity to 50. **/eos/chan/1/param/pan=50** - Sets Chan 1's Pan to 50. **/eos/chan/1/param/tilt/dmx=128** - Sets Chan 1's Tilt to output a DMX value of 128.	Sets the specified **<chan>**'s **<param>** to the specified level. Levels can be set directly or as a DMX output value. If no **<param>** is given, Intensity will be affected. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/chan/** methods.
/eos/chan/<chan>/xyz = <x>, <y>, <z>	**<chan>: Channel number.** **<x>: Float, Any number, in decimal meters.** **<y>: Float, Any number, in decimal meters.** **<z>: Float, Any number, in decimal meters.**	**/eos/chan/1/xyz/=1, 1, 1** - Sets Chan 1's focus to XYZ coordinates (1, 1, 1).	Sets XYZ position of selected channel according to Augment3d data. OSC XYZ coordinates are measured in decimal meters, regardless of the unit selected in Setup > System Settings > Augment3d. Channels can be focused this way regardless of whether they have XYZ Format enabled.
/eos/chan=<chan>	**<chan>: Channel number.**	**/eos/chan=1** - Selects Channel 1.	Use to select channels.

Address Pattern	Arguments	Examples	Notes
/eos/cmd=<command>	**<command>: String with command line text.**	**/eos/cmd="Chan 1 At 75"** - unterminated command. **/eos/cmd="Chan 1 At 75#"** - Eos interprets the "#" as a command termination. **/eos/cmd="Chan 1 At 75 Enter"** - Another terminated command. **/eos/cmd="Chan %1 At FL", 101** - Eos will substitute 101 in place of %1, meaning the command is interpreted as "Chan 101 At FL". **/eos/cmd="Chan %1 At %2", 75, 50** - Eos will substitute 75 in place of %1 and 50 in place of %2, meaning the command is interpreted as "Chan 75 At 50". **/eos/cmd/Chan/1/At/75** - Another way to format commands. **/eos/cmd/Chan/%1/At/%2#= 1, 75** - Eos will substitute the arguments and interpret this as "Chan 1 At 75#".	Command line instructions can be sent directly. String substitution with arguments is also allowed. To add a substitution, add %1 (or %2, %3, etc...) where the number given is the argument number where the actual value should be found.
/eos/color/hs=<hue>, <saturation>	**<hue>: 0.0-360.0.** **<saturation>: 0.0-100.0.**	**/eos/color/hs=330.0, 75.0** - pink color with 75% saturation.	Changes the current selection on the command line to the specified color.
/eos/color/hsxy=<x>, <y>	**<x>: 0.0-1.0.** **<y>: 0.0-1.0.**	**/eos/color/hsxy=0.82, 0.31** - pink color with 75% saturation.	Changes the current selection on the command line to the specified color. For simulating the Hue/Saturation wheel in a 2D XY graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0).
/eos/color/rgb=<red>, <green>, <blue>	**<red>: 0.0-1.0.** **<green>: 0.0-1.0.** **<blue>: 0.0-1.0.**	**/eos/color/rgb=1.0, 0.25, 0.63** - pink color with 75% saturation.	Changes the current selection on the command line to the specified color.

Address Pattern	Arguments	Examples	Notes
/eos/color/xy=<x>, <y>	**<x>: 0.0-1.0.** **<y>: 0.0-1.0.**	**/eos/color/xy=0.464, 0.254** - pink color with 75% saturation.	Changes the current selection on the command line to the specified color. For setting (x, y) chromaticity point in the CIE 1931 xyY color space.
/eos/color/xyz=<x>, <y>, <z>	**<x>: 0.0-1.0.** **<y>: 0.0-1.0.** **<z>: 0.0-1.0.**	**/eos/color/xyz=0.851, 0.466, 0.516** - pink color with 75% saturation.	Changes the current selection on the command line to the specified color. For setting (X, Y, Z) color point in XYZ color space.
/eos/cp/fire=<index> /eos/cp/<index>/fire=<button edge>	**<index>: Color palette number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/cp/fire=1** - Runs Color Palette 1. **/eos/cp/1/fire** - Runs Color Palette 1.	Fires (executes) color palettes.
/eos/cp=<index>	**<index>: Color palette to select.**	**/eos/cp=1** - Selects Color Palette 1.	Use to select color palettes.

Address Pattern	Arguments	Examples	Notes
/eos/cue/fire=<cue number> /eos/cue/<cue number>/fire /eos/cue/<list number>/<cue number>/fire /eos/cue/<list number>/<cue number>/<part number>/fire	**<list number>: Cue list to target.** **<cue number>: Cue number to fire.** **<part number>: Cue part to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/cue/fire=1** - Runs Cue 1 in the current Cue List. **/eos/cue/1.5/fire** - Runs Cue 1.5 in the current Cue List. **/eos/cue/1/1.5/fire** - Runs Cue 1.5 in Cue List 1. **/eos/cue/1/1.5/2/fire** - Runs Cue 1.5 Part 2 in Cue List 1.	Use to run Cues.
/eos/cue=<cue number> /eos/cue/<list number>=<cue number /eos/cue/<list number>/<cue number>=<part number>	**<list number>: Cue list to target.** **<cue number>: Cue number to fire.** **<part number>: Cue part to fire.**	**/eos/cue=1.5** - Selects Cue 1.5. **/eos/cue/1=1.5** - Selects Cue 1.5 in Cue List 1. **/eos/cue/1/1.5=2** - Selects Cue 1.5 Part 2 in Cue List 1.	Use to select Cues. If a **<list number>** is given, index is the cue to select within that list. If a **<list number>** and a **<cue number>** are provided, index is the cue part to select within that list and cue.

Address Pattern	Arguments	Examples	Notes
/eos/cuelist/<index>/config/<list number>/<num prev cues>/<num pending cues> /eos/cuelist/<index>/config/<list number>/<num prev cues>/<num pending cues>/<offset>	**<index>: Int, the OSC fader bank to reset.** **<list number>: Int, the OSC cue list number to create.** **<num prev cues>: Int, how many rows to display before the current cue.** **<num pending cues>: Int, how many rows to display after the current cue.** **<offset>: Int, 0-based index into the entire cue list, where each cue counts as one item and each cue part counts as one item.**	**/eos/cuelist/1/config/2/3/6** - create OSC cue list bank #1 for cue list 2, showing 3 previous cues, the current cue, and 6 pending cues. **/eos/cuelist/1/config/2/3/6/10** - create OSC cue list bank #1 for cue list 2, showing 3 previous cues, the current cue, and 6 pending cues, starting at offset 10 into the cue list.	Eos will send the cue list label and cue information for all OSC cue list banks.
/eos/cuelist/<index>/page/<delta>	**<index>: Int, the OSC fader bank to reset.** **<delta>: Int, how many rows to move.**	**/eos/cuelist/1/page/1** - page OSC cue list bank down 1 row. **/eos/cuelist/1/page/-1** - page OSC cue list bank up 1 row. **/eos/cuelist/1/page/0** - jump back to the current cue and follow it.	Pages OSC cue list specified by **<index>** up or down by **<delta>** rows. Use **/page/0** to jump back to the current cue and follow it. This only shifts the view, it does not play back cues.
/eos/cuelist/<index>/reset	**<index>: Int, the OSC cue list to reset.**	**/eos/cuelist/1/reset** - resets all configuration on OSC cue list bank 1.	Resets the specified OSC cue list bank as specified by **<index>**.

Address Pattern	Arguments	Examples	Notes
/eos/cuelist/<index>/select/<cue number>	**<index>: Int, the OSC fader bank to reset.** **<cue number>: Cue number to jump to.**	**/eos/cuelist/1/select/100.4** - jump OSC cue list bank 1 to cue 100.4.	Use to jump to a specified cue on the OSC cue list bank.
/eos/cues/<index>/fire /eos/cues/fire /eos/cues/fire=<button edge> /eos/cues/<index>/fire=<button edge>	**<index>: Cue list index.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/cues/2/fire** - Fires Cue List 2, like [Go].	Used to play back a cue list specified by **<index>**. If no **<index>** is given, it will fire the Cue List on the main playback.
/eos/cues/<index>/stop /eos/cues/stop /eos/cues/stop=<button edge> /eos/cues/<index>/stop=<button edge>	**<index>: Cue list index.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/cues/2/stop** - Stops an active fade in Cue List 2, or goes back a cue if not fading.	Used to stop or go back in the cue list specified by **<index>**. If no **<index>** is given, it will use the Cue List on the main playback.
/eos/cues/<index> /eos/cues=<index> /eos/cues/<index>=<button edge>	**<index>: The cue list number to select.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/cues/2** - Selects Cue List 2. **/eos/cues=2** - Selects Cue List 2.	Used to select Cue Lists.

Address Pattern	Arguments	Examples	Notes
/eos/curve=<index> /eos/curve/<index>=<button edge>	**<index>: Curve number to select.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/curve=901** - Selects Curve 901. **/eos/curve/901** - Selects Curve 901.	Use to select curves.
/eos/ds/<index>/page/<delta>	**<index>: Int, the OSC direct select bank to target.** **<delta>: Int, how many pages to move.**	**/eos/ds/1/page/1** - page OSC direct select bank 1 down by 1. **/eos/cuelist/1/page/-1** - page OSC direct select bank 1 up by 1. **/eos/ds/1/page/10** - page OSC direct select bank 1 down by 10.	Pages OSC direct select bank specified by **<index>** up or down by **<delta>** buttons.

Address Pattern	Arguments	Examples	Notes
/eos/ds/<index>/<target type>/<button count> /eos/ds/<index>/<target type>/flexi/<button count> /eos/ds/<index>/<target type>/<page number>/<button count> /eos/ds/<index>/<target type>/flexi/<page number>/<button count>	**<index>: Int, the OSC direct select bank to target.** **<target type>: Any of the following: Chan, Group, Macro, Sub, Preset, IP (Intensity Palette), FP (Focus Palette), CP (Color Palette), BP (Beam Palette), MS (Magic Sheet), Curve, Snap (Snapshot), FX (Effects), Pixmap, Scene.** **<button count>: Int, how many buttons to create this direct select page with.** **<page number>: Int, the direct select page number to target.**	**/eos/ds/1/bp/10** - create OSC direct select bank #1 with 10 Beam Palette buttons. **/eos/ds/1/macro/flexi/10** - create OSC direct select bank #1 with 10 Macro buttons in Flexi mode. **/eos/ds/1/chan/3/10** - create OSC direct select bank #1 with 10 Channels on page 3. Can also be used to quick jump to a specific page. **/eos/ds/1/fx/flexi/3/10** - create OSC direct select bank #1 with 10 Effect buttons on page 3, in flexi mode. Can also be used to quick jump to a specific page.	OSC direct selects are virtual buttons and are mapped separately than direct selects visible on the console. To use direct selects, you must first send one of the direct select creation commands. Direct selects are mapped as a single target type. Eos will send the description and button labels for all OSC direct selects.
/eos/event=<command>	**<command>: String with command line text.**	**/eos/event="Chan 1 At 75#"** - Terminated command that is interpreted as a console event (like macros that fire outside of the command line.).	Same behavior as **/eos/cmd**, but treated as a console event.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/<fader index>/+% /eos/fader/<index>/<fader index>/+%=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/+%** - Adjusts Fader 2 in OSC fader bank #1 by +%, as specified in Setup.	Adjusts the given **<fader index>** in OSC fader bank **<index>** by +%, as specified in Setup.
/eos/fader/<index>/<fader index>/-% /eos/fader/<index>/<fader index>/-%=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/-%** - Adjusts Fader 2 in OSC fader bank #1 by -%, as specified in Setup.	Adjusts the given **<fader index>** in OSC fader bank **<index>** by -%, as specified in Setup.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/config/<fader count> /eos/fader/<index>/config/<page number>/<fader count>	**<index>: Int, 1-based index of any OSC fader bank you wish to create. Use 0 to reference the master fader.** **<fader count>: Int, how many faders to include on a page.**	**/eos/fader/1/config/10** - create OSC fader bank #1 with 10 faders. (OSC Fader 1/1 is the same as console fader 1/1). **/eos/fader/1/config/2/10** - create OSC fader bank #1 with 10 faders on page 2. Can also be used to quick jump to a specific page if already created. OSC Fader 2/1 (Fader 11) is the same as console fader 2/1.	Fader banks share fader mapping with Eos, but since an OSC Fader Bank can have any number of faders per page, the paging will be different. Like Direct Selects, you must first send one of the OSC Fader Bank creation commands before the fader pages will work. Faders will be mapped to the same fader number as Eos.
/eos/fader/<index>/<fader index>/fire /eos/fader/<index>/<fader index>/fire=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/fire** - Fires Fader 2 in OSC fader bank #1.	Fires the given **<fader index>** in OSC fader bank **<index>**.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/<fader index>/home /eos/fader/<index>/<fader index>/home=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/home** - Sets Fader 2 in OSC fader bank #1 to its Home value.	Sets the given **<fader index>** in OSC fader bank **<index>** to its Home value.
/eos/fader/<index>/<fader index>/level /eos/fader/<index>/<fader index>/level=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/level** - Sets Fader 2 in OSC fader bank #1 to Level, as specified in Setup.	Sets the given **<fader index>** in OSC fader bank **<index>** to Level, as specified in Setup.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/<fader index>/load /eos/fader/<index>/<fader index>/load=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/load** - Loads Fader 2 in OSC fader bank #1.	Loads the given **<fader index>** in OSC fader bank **<index>**. Use when content is on the command line that you wish to load to a specific fader.
/eos/fader/<index>/<fader index>/max /eos/fader/<index>/<fader index>/max=<button edge> /eos/fader/<index>/<fader index>/full /eos/fader/<index>/<fader index>/full=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/max** - Sets Fader 2 in OSC fader bank #1 to its maximum value.	Sets the given **<fader index>** in OSC fader bank **<index>** to its maximum value.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/<fader index>/min /eos/fader/<index>/<fader index>/min=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/min** - Sets Fader 2 in OSC fader bank #1 to its minimum value.	Sets the given **<fader index>** in OSC fader bank **<index>** to its minimum value.
/eos/fader/<index>/<fader index>/out /eos/fader/<index>/<fader index>/out=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/out** - Sets Fader 2 in OSC fader bank #1 to Out.	Sets the given **<fader index>** in OSC fader bank **<index>** to Out.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/page/<delta> /eos/fader/<index>/page/<delta>=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<delta>: Int, how many pages to move.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/page/1** - Page OSC fader bank 1 down 1 page. **/eos/fader/1/page/-1** - Page OSC fader bank 1 up 1 page. **/eos/fader/1/page/10** - Page OSC fader bank 1 down 10 page.	Pages OSC fader bank specified by **<index>** up or down by **<delta>** pages. Each page has the number of faders given in the config command.
/eos/fader/<index>/reset	**<index>: Int, the OSC fader bank to reset.**	**/eos/fader/1/reset** - Resets OSC fader bank 1.	Resets the specified fader bank.
/eos/fader/<index>/<fader index>/stop /eos/fader/<index>/<fader index>/stop=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/stop** - Stops Fader 2 in OSC fader bank #1.	Stops the given **<fader index>** in OSC fader bank **<index>**.

Address Pattern	Arguments	Examples	Notes
/eos/fader/<index>/<fader index>/unload /eos/fader/<index>/<fader index>/unload=<button edge>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fader/1/2/unload** - Unloads Fader 2 in OSC fader bank #1.	Unloads the given **<fader index>** in OSC fader bank **<index>**.
/eos/fader/<index>/<fader index>=<level>	**<index>: Int, 1-based index of any existing OSC fader bank. Use 0 to reference the master fader.** **<fader index>: Int, index of the fader you wish to target in fader bank <index>.** **<level>: 0.0-1.0, The level to set <fader index> to.**	**/eos/fader/1/2=0.75** - Set the second fader in OSC fader bank #1 to 75%.	Sets the given **<fader index>** in OSC fader bank **<index>** to the provided level.

Address Pattern	Arguments	Examples	Notes
/eos/filter/add=<filter>	**<filter>: One or more string arguments, representing filter(s) that may contain "*" wildcards.**	**/eos/filter/add="/eos/out/param/*"** - Eos will only send OSC messages to this device that start with "/eos/out/param/".	Adds a filter, used to limit OSC traffic to devices that only need specific OSC messages from Eos. Any device can set up any number of filters.
/eos/filter/clear		**/eos/filter/clear** - Clears all filters configured for this device, so Eos will send all messages.	Clears all filters for the device that sent this command.
/eos/filter/remove=<filter>	**<filter>: One or more string arguments, representing filter(s) that may contain "*" wildcards.**	**/eos/filter/remove="/eos/out/param/*"** - Removes the existing filter.	Removes an existing filter on the device that sent this command.
/eos/fp/fire=<index> /eos/fp/<index>/fire=<button edge>	**<index>: Focus palette number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fp/fire=1** - Runs Focus Palette 1. **/eos/fp/1/fire** - Runs Focus Palette 1.	Fires (executes) focus palettes.
/eos/fp=<index>	**<index>: Focus palette to select.**	**/eos/fp=1** - Selects Focus Palette 1.	Use to select focus palettes.
/eos/fx=<index> /eos/fx/<index>=<button edge>	**<index>: Effect to select.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/fx=901** - Selects Effect 901. **/eos/fx/901** - Selects Effect 901.	Use to select effects.

Address Pattern	Arguments	Examples	Notes
/eos/get/3dserver			Use to get the IP addresses for the Augment3D server. Returns **/eos/out/get/3dserver**.
/eos/get/bp/count			Use to get the number of Beam Palettes in the show. Returns **/eos/out/get/bp/count**.
/eos/get/bp/index=<index>	**<index>: Int, index of the Beam Palette list, 0-indexed.**	**/eos/get/bp/index=0** - Returns details of the first palette in the Beam Palette List.	Same as **/eos/get/bp/<index>**, but 0-indexed from the Beam Palette list.
/eos/get/bp/uid=<uid>	**<uid>: String containing the UID of a Beam Palette.**	**/eos/get/bp/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the palette given by the UID.	Same as **/eos/get/bp/<index>**, but accessed with a Beam Palette's UID instead of its index.
/eos/get/bp/<index>	**<index>: Int.**	**/eos/get/bp/2** - Returns details about Beam Palette 2.	Returns **/eos/get/out/bp/<index>**. See **/eos/get/out/<palette type>/<index>**.
/eos/get/chans			Use to get the currently selected channels for the OSC user. Returns **/eos/out/get/chans**.
/eos/get/cp/count			Use to get the number of Color Palettes in the show. Returns **/eos/out/get/cp/count**.
/eos/get/cp/index=<index>	**<index>: Int, index of the Color Palette list, 0-indexed.**	**/eos/get/cp/index=0** - Returns details of the first palette in the Color Palette List.	Same as **/eos/get/cp/<index>**, but 0-indexed from the Color Palette list.
/eos/get/cp/uid=<uid>	**<uid>: String containing the UID of a Color Palette.**	**/eos/get/cp/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the palette given by the UID.	Same as **/eos/get/cp/<index>**, but accessed with a Color Palette's UID instead of its index.

Address Pattern	Arguments	Examples	Notes
/eos/get/cp/<index>	**<index>: Int.**	**/eos/get/cp/2** - Returns details about Color Palette 2.	Returns **/eos/get/out/cp/<index>**. See **/eos/get/out/<palette type>/<index>**.
/eos/get/csv			Use to get the CSV file. Returns **/eos/out/get/csv**.
/eos/get/cue/<cue list>/count /eos/get/cue/<cue list>/<cue index>/count	**<cue list>: Int.** **<cue index>: Int.**		Use to get the number of cues in the given **<cue list>** or the number of parts in a given **<cue index>**. Returns **/eos/out/get/cue/<cue list>/count** or **/eos/out/get/cue/<cue list>/<cue index>**.
/eos/get/cue/<list number>/index=<index>	**<index>: Int, index of the given <list number>, 0-indexed.**	**/eos/get/cue/1/index=0** - Returns details of the first Cue in Cue List 1.	Same as **/eos/get/cue/<list number>/<part number>**, but 0-indexed from the given cue list.
/eos/get/cue/<cue list>/noparts/count	**<cue list>: Int.**		Use to get the number of cues, not counting part cues in the given **<cue list>**. Returns **/eos/out/get/cue/<cue list>/noparts/count**.
/eos/get/cue/uid=<uid>	**<uid>: String containing the UID of a Cue.**	**/eos/get/cue/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the cue given by its UID.	Same as **/eos/get/cue/<list number>/<index>**, but accessed with a Cue's UID instead of its list and index.
/eos/get/cue/<list number>/<cue number>/<part number> /eos/get/cue/<list number>/<cue number>	**<list number>: Int.** **<cue number>: Int.** **<part number>: Int.**	**/eos/get/cue/1/1/1** - Returns information about Cue 1 Part 1 in Cue List 1.	Returns **/eos/get/cue/<list number/<cue number>/<part number>** or **/eos/get/cue/<list number/<cue number>**.
/eos/get/cuelist/count			Use to get the number of Cue Lists in the show. Returns **/eos/out/get/cuelist/count**.

Address Pattern	Arguments	Examples	Notes
/eos/get/cuelist/index=<index>	**<index>: Int, index of the cue list, 0-indexed.**	**/eos/get/cuelist/index=0** - Returns details of the first cuelist in the cue list display.	Same as **/eos/get/cuelist/<index>**, but 0-indexed from the list of cue lists.
/eos/get/cuelist/uid=<uid>	**<uid>: String containing the UID of a cue list.**	**/eos/get/cuelist/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the cue list given by the UID.	Same as **/eos/get/cuelist/<index>**, but accessed with a cue list's UID instead of its index.
/eos/get/cuelist/<index>	**<index>: Int.**	**/eos/get/cuelist/1** - Returns details about Cue List 1.	Returns **/eos/out/get/cuelist/<index>**.
/eos/get/curve/count			Use to get the number of Curves in the show. Returns **/eos/out/get/curve/count**.
/eos/get/curve/index=<index>	**<index>: Int, index of the Curve list, 0-indexed.**	**/eos/get/curve/index=0** - Returns details of the first Curve in the Curve List.	Same as **/eos/get/curve/<index>**, but 0-indexed from the Curve list.
/eos/get/curve/uid=<uid>	**<uid>: String containing the UID of a Curve.**	**/eos/get/curve/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Curve given by the UID.	Same as **/eos/get/curve/<index>**, but accessed with a Curve's UID instead of its index.
/eos/get/curve/<index>	**<index>: Int.**	**/eos/get/curve/2** - Returns details about Curve 2.	Returns **/eos/get/out/curve/<index>**.
/eos/get/emitters/<chan number>	**<chan number>: Int.**	**/eos/get/emitters/1** - Returns emitter information for Channel 1.	Use to get emitter details for the given channel. Returns **/eos/out/get/emitters<chan number>**.
/eos/get/fp/count			Use to get the number of Focus Palettes in the show. Returns **/eos/out/get/fp/count**.
/eos/get/fp/index=<index>	**<index>: Int, index of the Focus Palette list, 0-indexed.**	**/eos/get/fp/index=0** - Returns details of the first palette in the Focus Palette List.	Same as **/eos/get/fp/<index>**, but 0-indexed from the Focus Palette list.
/eos/get/fp/uid=<uid>	**<uid>: String containing the UID of a Focus Palette.**	**/eos/get/fp/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the palette given by the UID.	Same as **/eos/get/fp/<index>**, but accessed with a Focus Palette's UID instead of its index.

Address Pattern	Arguments	Examples	Notes
/eos/get/fp/<index>	**<index>: Int.**	**/eos/get/fp/2** - Returns details about Focus Palette 2.	Returns **/eos/get/out/fp/<index>**. See **/eos/get/out/<palette type>/<index>**.
/eos/get/fpe/count			Use to get the count of FPE sets in the show. Returns **/eos/out/get/fpe/count**.
/eos/get/fpe/<set index>/count	**<set index>: Int, index of the FPE set.**		Use to get the count of FPE points within the given set index. Returns **/eos/out/get/fpe/<set index>/count**.
/eos/out/get/fpe/<set index>/<point index>	**<set index>: Int, index of the FPE set.** **<point index>: Int, index of the point within <set index>.**	**/eos/get/fpe/1/1** - Returns details of the first FPE point in the FPE set 1.	Use to get details about the given FPE point in the given FPE set. Returns **/eos/out/get/fpe/<set index>/<point index>**.
/eos/get/fpe/index=<index>	**<index>: Int, index of the FPE Set list, 0-indexed.**	**/eos/get/fpe/index=0** - Returns details of the first FPE set in the FPE set list.	Use to get details about the given FPE set. Returns **/eos/out/get/fpe/<set index>**.
/eos/get/fx/count			Use to get the number of Effects in the show. Returns **/eos/out/get/fx/count**.
/eos/get/fx/index=<index>	**<index>: Int, index of the Effect list, 0-indexed.**	**/eos/get/fx/index=0** - Returns details of the first Effect in the Effect List.	Same as **/eos/get/fx/<index>**, but 0-indexed from the Effect list.
/eos/get/fx/uid=<uid>	**<uid>: String containing the UID of an Effect.**	**/eos/get/fx/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Effect given by the UID.	Same as **/eos/get/fx/<index>**, but accessed with an Effect's UID instead of its index.
/eos/get/fx/<index>	**<index>: Int.**	**/eos/get/fx/2** - Returns details about Effect 2.	Returns **/eos/get/out/fx/<index>**.

Address Pattern	Arguments	Examples	Notes
/eos/get/group/count			Use to get the number of groups in the show. Returns **/eos/out/get/group/count**.
/eos/get/group/displayed/count			Same as **/eos/get/group/count**. Returns **/eos/out/get/group/count**.
/eos/get/group/displayed/index=<index>	**<index>: Int, index of the group list, 0-indexed.**	**/eos/get/group/displayed/index=0** - Returns details of the first group in the Group List.	Same as **/eos/get/group/displayed/<index>**, but 0-indexed.
/eos/get/displayed/uid=<uid>	**<uid>: String containing the UID of a Group.**	**/eos/get/group/displayed/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the group identified by the UID.	Same as **/eos/get/group/displayed/<index>**, but accessed with a Group's UID instead of its index.
/eos/get/group/displayed/<index>	**<index>: Int, index of the group list, 0-indexed.**	**/eos/get/group/displayed/2** - Returns information about Group 2, with the channels listed as it would appear on the command line.	Returns **/eos/out/get/group/<index>**. Same as **/eos/get/group/<index>** except the channel list is returned as a single string as it would appear on the command line. This is useful to build custom command strings.
/eos/get/group/index=<index>	**<index>: Int, index of the group list, 0-indexed.**	**/eos/get/group/index=0** - Returns details of the first group in the Group List.	Similar to **/eos/get/group/<index>**, but 0-indexed.
/eos/get/group/uid=<uid>	**<uid>: String containing the UID of a Group.**	**/eos/get/group/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the group identified by the UID.	Similar to **/eos/get/group/<index>**, but accessed with a Group's UID instead of its index.
/eos/get/group/<index>	**<index>: Int, index of the group list, 0-indexed.**	**/eos/get/group/2** - Returns information about Group 2.	Returns **/eos/out/get/group/<index>**.
/eos/get/ip/count			Use to get the number of Intensity Palettes in the show. Returns **/eos/out/get/ip/count**.

Address Pattern	Arguments	Examples	Notes
/eos/get/ip/index=<index>	**<index>: Int, index of the Intensity Palette list, 0-indexed.**	**/eos/get/ip/index=0** - Returns details of the first palette in the Intensity Palette List.	Same as **/eos/get/ip/<index>**, but 0-indexed from the Intensity Palette list.
/eos/get/ip/uid=<uid>	**<uid>: String containing the UID of an Intensity Palette.**	**/eos/get/ip/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the palette given by the UID.	Same as **/eos/get/ip/<index>**, but accessed with an Intensity Palette's UID instead of its index.
/eos/get/ip/<index>	**<index>: Int.**	**/eos/get/ip/2** - Returns details about Intensity Palette 2.	Returns **/eos/get/out/ip/<index>**. See **/eos/get/out/<palette type>/<index>**.
/eos/get/macro/count			Use to get the number of macros in the show. Returns **/eos/out/get/macro/count**.
/eos/get/group/index=<index>	**<index>: Int, index of the macro list, 0-indexed.**	**/eos/get/macro/index=0** - Returns details of the first Macro in the Macro list.	Same as **/eos/get/macro/<index>**, but 0-indexed from the Macro list.
/eos/get/macro/uid=<uid>	**<uid>: String containing the UID of a Macro.**	**/eos/get/macro/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the macro identified by the UID.	Same as **/eos/get/macro/<index>**, but accessed with a Macro's UID instead of its index.
/eos/get/macro/<index>	**<index>: Int, index of the macro list, 0-indexed.**	**/eos/get/macro/2** - Returns information about Macro 2.	Returns **/eos/out/get/macro/<index>**.
/eos/get/ms/count			Use to get the number of Magic Sheets in the show. Returns **/eos/out/get/ms/count**.
/eos/get/ms/index=<index>	**<index>: Int, index of the Magic Sheet list, 0-indexed.**	**/eos/get/ms/index=0** - Returns details of the first Magic Sheet in the Magic Sheet List.	Same as **/eos/get/ms/<index>**, but 0-indexed from the Magic Sheet list.
/eos/get/ms/uid=<uid>	**<uid>: String containing the UID of a Magic Sheet.**	**/eos/get/ms/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Magic Sheet given by the UID.	Same as **/eos/get/ms/<index>**, but accessed with a Magic Sheet's UID instead of its index.

Address Pattern	Arguments	Examples	Notes
/eos/get/ms/<index>	**<index>: Int.**	**/eos/get/ms/2** - Returns details about Magic Sheet 2.	Returns **/eos/get/out/ms/<index>**.
/eos/get/params/<chan number>	**<chan number>: Int.**	**/eos/get/params/1** - Returns parameter information for Channel 1.	Use to get parameter details for the given channel. Returns **/eos/out/get/params<chan number>**.
/eos/get/patch/count			Use to get the number of channels in the show. Returns **/eos/out/get/patch/count**.
/eos/get/patch/index=<index>	**<index>: Int, index of the list of patched channels, 0-indexed.**	**/eos/get/patch/index=0** - Returns details of the first patched channel.	Same as **/eos/get/patch/<index>**, but 0-indexed from the patched channel list.
/eos/get/patch/uid=<uid>	**<uid>: String containing the UID of a patched channel.**	**/eos/get/patch/uid="00000000-0000-0000-0000-000000000000"** - See **/eos/get/patch/<index>**.	Same as **/eos/get/patch/<index>**, but accessed with a patched channel's UID instead of its index.
/eos/get/patch/<channel number> /eos/get/patch/<channel number>/<part number>	**<channel number>: Int.** **<part number>: Int.**	**/eos/get/patch/1/1** - Returns information about Chan 1 Part 1.	Returns **/eos/out/get/patch/<channel number>** or **/eos/out/get/patch/<channel number>/<part number>**.
/eos/get/pixmap/count			Use to get the number of Pixel Maps in the show. Returns **/eos/out/get/pixmap/count**.
/eos/get/pixmap/index=<index>	**<index>: Int, index of the Pixel Map list, 0-indexed.**	**/eos/get/pixmap/index=0** - Returns details of the first Pixel Map in the Pixel Map List.	Same as **/eos/get/pixmap/<index>**, but 0-indexed from the Pixel Map list.
/eos/get/pixmap/uid=<uid>	**<uid>: String containing the UID of a Pixel Map.**	**/eos/get/pixmap/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Pixel Map given by the UID.	Same as **/eos/get/pixmap/<index>**, but accessed with a Pixel Map's UID instead of its index.
/eos/get/pixmap/<index>	**<index>: Int.**	**/eos/get/pixmap/2** - Returns details about Pixel Map 2.	Returns **/eos/get/out/pixmap/<index>**.

Address Pattern	Arguments	Examples	Notes
/eos/get/preset/count			Use to get the number of Presets in the show. Returns **/eos/out/get/preset/count**.
/eos/get/preset/index=<index>	**<index>: Int, index of the Preset list, 0-indexed.**	**/eos/get/preset/index=0** - Returns details of the first Preset in the Preset List.	Same as **/eos/get/preset/<index>**, but 0-indexed from the Preset list.
/eos/get/preset/uid=<uid>	**<uid>: String containing the UID of a Preset.**	**/eos/get/preset/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Preset given by the UID.	Same as **/eos/get/preset/<index>**, but accessed with a Preset's UID instead of its index.
/eos/get/preset/<index>	**<index>: Int.**	**/eos/get/preset/2** - Returns details about Preset 2.	Returns **/eos/get/out/preset/<index>**.
/eos/get/processors			Returns **/eos/out/get/processors**.
/eos/get/session			Returns **/eos/out/get/session**.
/eos/get/setup			Use to get default cue timings. Returns **/eos/out/get/settings**.
/eos/get/show/path			Returns **/eos/out/get/show/path**.
/eos/get/snap/count			Use to get the number of Snapshots in the show. Returns **/eos/out/get/fx/count**.
/eos/get/fx/index=<index>	**<index>: Int, index of the Snapshot list, 0-indexed.**	**/eos/get/fx/index=0** - Returns details of the first Snapshot in the Snapshot List.	Same as **/eos/get/fx/<index>**, but 0-indexed from the Snapshot list.
/eos/get/fx/uid=<uid>	**<uid>: String containing the UID of a Snapshot.**	**/eos/get/fx/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Snapshot given by the UID.	Same as **/eos/get/fx/<index>**, but accessed with a Snapshot's UID instead of its index.
/eos/get/fx/<index>	**<index>: Int.**	**/eos/get/fx/2** - Returns details about Snapshot 2.	Returns **/eos/get/out/fx/<index>**.
/eos/get/sub/count			Use to get the number of Submasters in the show. Returns **/eos/out/get/sub/count**.

Address Pattern	Arguments	Examples	Notes
/eos/get/sub/index=<index>	**<index>: Int, index of the Submaster list, 0-indexed.**	**/eos/get/sub/index=0** - Returns details of the first Submaster in the Submaster List.	Same as **/eos/get/sub/<index>**, but 0-indexed from the Submaster list.
/eos/get/sub/uid=<uid>	**<uid>: String containing the UID of a Submaster.**	**/eos/get/sub/uid="00000000-0000-0000-0000-000000000000"** - Returns details of the Submaster given by the UID.	Same as **/eos/get/sub/<index>**, but accessed with a Submaster's UID instead of its index.
/eos/get/sub/<index>	**<index>: Int.**	**/eos/get/sub/2** - Returns details about Submaster 2.	Returns **/eos/get/out/sub/<index>**.
/eos/get/userlist			Use to get details about all users in the show. Returns **/eos/out/get/userlist**.
/eos/get/version			Returns **/eos/out/get/version**.
/eos/group/<group>/+% /eos/group/1/param/<param>/+% /eos/group/<group>/+%=<button edge> /eos/group/1/param/<param>/+%=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/+%** - Adjusts Group 1's intensity by +%, as specified in Setup. **/eos/group/1/param/pan/+%** - Adjusts Group 1's Pan parameter by +%, as specified in Setup.	Adjusts the group specified by **<group>**'s **<param>** by +%, as specified in Setup. If no **<param>** is given, Intensity will be affected.

Address Pattern	Arguments	Examples	Notes
/eos/group/<group>/-% /eos/group/1/param/<param>/-% /eos/group/<group>/-%=<button edge> /eos/group/1/param/<param>/-%=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/-%** - Adjusts Group 1's intensity by -%, as specified in Setup. **/eos/group/1/param/pan/-%** - Adjusts Group 1's Pan parameter by -%, as specified in Setup.	Adjusts the group specified by **<group>**'s **<param>** by -%, as specified in Setup. If no **<param>** is given, Intensity will be affected.
/eos/group/<group>/full /eos/group/1/param/<param>/full /eos/group/<group>/full=<button edge> /eos/group/1/param/<param>/full=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/full** - Sets Group 1's intensity to its Full value. **/eos/group/1/param/pan/full** - Sets Group 1's Pan parameter to its Full value.	Sets the group specified by **<group>**'s **<param>** to its Full value. If no **<param>** is given, Intensity will be affected.
/eos/group/<group>/home /eos/group/1/param/<param>/home /eos/group/<group>/home=<button edge> /eos/group/1/param/<param>/home=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/home** - Sets Group 1's intensity to its Home value. **/eos/group/1/param/pan/home** - Sets Group 1's Pan parameter to its Home value.	Sets the group specified by **<group>**'s **<param>** to its Home value. If no **<param>** is given, Intensity will be affected.

Address Pattern	Arguments	Examples	Notes
/eos/group/<group>/level /eos/group/1/param/<param>/level /eos/group/<group>/level=<button edge> /eos/group/1/param/<param>/level=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/level** - Sets Group 1's intensity to Level, as specified in Setup. **/eos/group/1/param/pan/level** - Sets Group 1's Pan parameter to Level, as specified in Setup.	Sets the group specified by **<group>**'s **<param>** to Level, as specified in Setup. If no **<param>** is given, Intensity will be affected.
/eos/group/<group>/max /eos/group/1/param/<param>/max /eos/group/<group>/max=<button edge> /eos/group/1/param/<param>/max=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/max** - Sets Group 1's intensity to its maximum value. **/eos/group/1/param/pan/max** - Sets Group 1's Pan parameter to its maximum value.	Sets the group specified by **<group>**'s **<param>** to its maximum value. If no **<param>** is given, Intensity will be affected.
/eos/group/<group>/min /eos/group/1/param/<param>/min /eos/group/<group>/min=<button edge> /eos/group/1/param/<param>/min=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/min** - Sets Group 1's intensity to its minimum value. **/eos/group/1/param/pan/min** - Sets Group 1's Pan parameter to its minimum value.	Sets the group specified by **<group>**'s **<param>** to its minimum value. If no **<param>** is given, Intensity will be affected.

Address Pattern	Arguments	Examples	Notes
/eos/group/<group>/out /eos/group/1/param/<param>/out /eos/group/<group>/out=<button edge> /eos/group/1/param/<param>/out=<button edge>	**<group>: Group number.** **<param>: Parameter name as a string.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/out** - Sets Group 1's intensity to Out. **/eos/group/1/param/pan/out** - Sets Group 1's Pan parameter to its Out value.	Sets the group specified by **<group>**'s **<param>** to Out. If no **<param>** is given, Intensity will be affected.
/eos/group/<group>/remdim /eos/group/<group>/remdim=<button edge>	**<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/group/1/remdim** - Dims all groups to their RemDim state except Group 1.	Dims all groups except the specified **<group>**.
/eos/group/<group>=<level> /eos/group/<group>/param/<param>=<level> /eos/group/<group>/dmx=<dmx level> /eos/group/<group>/param/<param>/dmx=<dmx level>	**<group>: Group number.** **<param>: Parameter name as a string.** **level: Float, 0.0-100.0.** **<dmx level>: Int, 0-255.**	**/eos/group/1=50** - Sets Group 1's Intensity to 50. **/eos/group/1/param/pan=50** - Sets Group 1's Pan to 50. **/eos/group/1/param/tilt/dmx=128** - Sets Group 1's Tilt to output a DMX value of 128.	Sets the specified **<group>**'s **<param>** to the specified level. Levels can be set directly or as a DMX output value. If no **<param>** is given, Intensity will be affected. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/group/** methods.
/eos/group=<index>	**<index>: Group number to select.**	**/eos/group=1** - Selects Group 1.	Use to select Groups.

Address Pattern	Arguments	Examples	Notes
/eos/ip/fire=<index> /eos/ip/<index>/fire=<button edge>	**<index>: Intensity palette number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/ip/fire=1** - Runs Intensity Palette 1. **/eos/ip/1/fire** - Runs Intensity Palette 1.	Fires (executes) intensity palettes.
/eos/ip=<index>	**<index>: Intensity palette to select.**	**/eos/ip=1** - Selects Intensity Palette 1.	Use to select intensity palettes.
/eos/key/<key> /eos/key/<key>=<button edge>	**<key>: Any valid OSC key.** **<button edge>: Float. 1.0=down, 0.0=up. Optional to specify a button edge.**	**/eos/key/select_active** - Press and release [Select Active] button. **/eos/key/shift=1** - Hold down [Shift} key.	For a list of supported key names, see OSC Key list below. For the slash key, use a backslash (**/eos/key/**).
/eos/macro/fire=<index> /eos/macro/<index>/fire=<button edge>	**<index>: Macro number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/macro/fire=1** - Runs Macro 1. **/eos/macro/1/fire** - Runs Macro 1.	Fires (executes) macros.
/eos/macro=<index>	**<index>: Macro to select.**	**/eos/macro=1** - Selects Macro 1.	Use to select macros.

Address Pattern	Arguments	Examples	Notes
/eos/ms/fire=<index> /eos/ms/<index>/fire=<button edge>	**<index>: Magic Sheet to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/ms/fire=1** - Runs Magic Sheet 1. **/eos/ms/1/fire** - Runs Magic Sheet 1.	Fires (executes) Magic Sheets.
/eos/ms=<index>	**<index>: Magic Sheet to select.**	**/eos/ms=1** - Selects Magic Sheet 1.	Use to select Magic Sheets.
/eos/newcmd=<command>	**<command>: String with command line text.**	**/eos/newcmd="Chan 1 At 75#"** - Terminated Command that will reset the command line first.	Same behavior as **/eos/cmd**, but it resets the command line first.
/eos/newevent=<command>	**<command>: String with command line text.**	**/eos/newevent="Chan 1 At 75#"** - Terminated command that is interpreted as a console event (like macros that fire outside of the command line) that resets the command line first.	Same behavior as **/eos/event**, but will clear the internal command line first.
/eos/pantilt/xy=<x>, <y>	**<x>: 0.0-1.0.** **<y>: 0.0-1.0.**	**/eos/pantilt/xy=0.5, 0.5** - Sets the current selection's pan and tilt to (0,0) on the Pan/Tilt graph.	For 2D Pan/Tilt graph where bottom-left corner is (0.0, 0.0) and top-right corner is (1.0, 1.0).
/eos/param/<param>/+% /eos/param/<param>/+%=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/tilt/+%** - Adjusts the current selection's Tilt parameter by +%, as specified in Setup.	Adjusts the current selection's **<param>** by +%, as specified in Setup. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.

Address Pattern	Arguments	Examples	Notes
/eos/param/<param>/-% /eos/param/<param>/-%=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/tilt/-%** - Adjusts the current selection's Tilt parameter by -%, as specified in Setup.	Adjusts the current selection's **<param>** by -%, as specified in Setup. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/param/<param>/full /eos/param/<param>/full=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/tilt/full** - Sets the current selection's Pan and Tilt parameters to their Full values.	Sets the current selection's **<param>** to Full. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/param/<param>/home /eos/param/<param>/home=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/home** - Sets the current selection's Pan parameter to its Home value.	Sets the current selection's **<param>** to its Home value. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.

Address Pattern	Arguments	Examples	Notes
/eos/param/<param>/level /eos/param/<param>/level=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/tilt/level** - Sets the current selection's Tilt parameter to Level, as specified in Setup.	Sets the current selection's **<param>** to Level, as specified in Setup. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/param/<param>/max /eos/param/<param>/max=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/max** - Sets the current selection's Pan to its maximum value.	Sets the current selection's **<param>** to their maximum values. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/param/<param>/min /eos/param/<param>/min=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/min** - Sets the current selection's Pan to its minimum value.	Sets the current selection's **<param>** to to its minimum values. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.

Address Pattern	Arguments	Examples	Notes
/eos/param/<param>/out /eos/param/<param>/out=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/out** - Sets the current selection's Pan parameter to Out.	Sets the current selection to Out. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/param/<param>/remdim /eos/param/<param>/remdim=<button edge>	**<param>: Any valid parameter name. Multiple params can be targeted at once.** **<button edge>: 1.0=Down (default), 0.0=up, optional param to specify button edge.**	**/eos/param/pan/remdim** - Dims all other unselected channels.	Dims all channels that aren't currently selected. The specified parameter will not change the behavior.
/eos/param/<param>=<level> /eos/param/<param>/dmx=<dmx level>	**<param>: Parameter name as a string.** **<level>: Float, 0.0-100.0.** **<dmx level>: Int, 0-255.**	**/eos/param/pan=50** - Sets the Pan parameters of the current selection to 50. Useful for mapping to an OSC fader. **/eos/param/pan/tilt=50** - Sets the Pan and Tilt parameters of the current selection to 50. **/eos/param/<param>/dmx=128** - Sets the DMX channels assigned as Pan for the current selection to output 128.	Sets the current selection's **<param>** to the specified level. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** This works for all **/eos/param** methods.
/eos/ping=(arguments)	**(arguments): None Required, any number can be sent.**	**/eos/ping** - . **/eos/ping="abcde"** - . **/eos/ping="abcde", 4** - .	Use to test an OSC connection. Send a ping message and Eos will respond on its configured port with **/eos/out/ping/**.

Address Pattern	Arguments	Examples	Notes
/eos/pixmap=<index> /eos/pixmap/<index>=<button edge>	**<index>: Pixel Map to select.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/pixmap=1** - Selects Pixel Map 1. **/eos/curve/1** - Selects Pixel Map 1.	Use to select pixel maps.
/eos/preset/fire=<index> /eos/preset/<index>/fire=<button edge>	**<index>: Preset number to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/preset/fire=1** - Runs Preset 1. **/eos/preset/1/fire** - Runs Preset 1.	Fires (executes) presets.
/eos/preset=<index>	**<index>: Preset to select.**	**/eos/preset=1** - Selects Preset 1.	Use to select presets.

Address Pattern	Arguments	Examples	Notes
/eos/(target)/override=<value> /eos/(target)/override/dmx=<dmx value> /eos/(target)/release	**(target): A reference to a valid target. See examples.** **<value>: Int, the level to set the target to. The valid range changes depending on the targeted parameter.** **<dmx value>: Int, 0-255.**	**/eos/at/override=50** - Overrides the currently selected params to 50. **/eos/chan/1/param/intens/override=50** - Overrides Chan 1's intensity parameter to 50. **/eos/group/1/param/intens/override=50** - Overrides Group 1's intensity parameter to 50. **/eos/group/1/override=50** - Overrides Group 1's intensity parameter to 50. **/eos/chan/1/param/intens/dmx/override=252** - Overrides Chan 1's intensity parameter to a DMX output of 252. **/eos/release** - Releases all overrides. **/eos/at/release** - Releases overrides on the currently selected params. **/eos/group/1/release** - Releases overrides on Group 1. **/eos/chan/1/param/intens/release** - Releases overrides from Chan 1's intensity parameter.	OSC can set and release override data, which appears in pink, has priority over other data types, and is not recorded. Overridden levels will display in pink. Any selection or parameter can be overriden.
/eos/reset		**/eos/reset** - Triggers a reset of all OSC configuration.	Clears any active switches. Resets all persistent OSC settings (like OSC user ID & wheel modes). Send ALL implicit OSC output commands.
/eos/sc/<string>=<button edge>	**<string>: Input String for some Event.** **<button edge>: Int, optional. 1.0=down (default), 0.0=up.**	**/eos/sc/Event1** - Triggers an event whose Input String is "Event1" on a show control list whose type is Network Inputs).	Use to trigger events from a show control list. The List must be configured to Network Inputs and the **<string>** must match the input string exactly (case-sensitive). Sending the string will fire the event.
/eos/set/bp/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Beam Palette.**	**/eos/set/bp/1/label="New Label"** - Sets Beam Palette 1's Label to "New Label".	Use to set the Label of a given Beam Palette.

Address Pattern	Arguments	Examples	Notes
/eos/set/cp/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Color Palette.**	**/eos/set/cp/1/label="New Label"** - Sets Color Palette 1's Label to "New Label".	Use to set the Label of a given Color Palette.
/eos/set/cue/<list>/<number>/label=<text> /eos/set/cue/<list>/<number>/<part>/label=<text>	**<list>: Int.** **<number>: Int.** **<part>: Int.** **<text>: The string to set as the Label for the given Cue.**	**/eos/set/cue/1/1/label="New Label"** - Sets Cue 1 in Cue List 1's Label to "New Label". **/eos/set/patch/1/1/2/label="New Label"** - Sets Cue 1 Part 2 in Cue List 1's Label to "New Label".	Use to set the Label of a given Cue.
/eos/set/cue/<list>/<number>/notes=<text> /eos/set/cue/<list>/<number>/<part>/notes=<text>	**<list>: Int.** **<number>: Int.** **<part>: Int.** **<text>: The string to set as the Note for the given Cue.**	**/eos/set/cue/1/1/notes="New Note"** - Sets Cue 1 in Cue List 1's Note to "New Note". **/eos/set/cue/1/1/2/notes="New Note"** - Sets Cue 1 Part 2 in Cue List 1's Note to "New Note".	Use to set the Note of a given Cue.
/eos/set/cue/<list>/<number>/scene=<text> /eos/set/cue/<list>/<number>/<part>/scene=<text>	**<list>: Int.** **<number>: Int.** **<part>: Int.** **<text>: The string to set as the Scene for the given Cue.**	**/eos/set/cue/1/1/scene="New Scene"** - Sets Cue 1 in Cue List 1's Scene to "New Scene". **/eos/set/patch/1/1/2/scene="New Scene"** - Sets Cue 1 Part 2 in Cue List 1's Scene to "New Scene".	Use to set the Scene of a given Cue.
/eos/set/cuelist/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Cue List.**	**/eos/set/cuelist/1/label="New Label"** - Sets Cue List 1's Label to "New Label".	Use to set the Label of a given Cue List.

Address Pattern	Arguments	Examples	Notes
/eos/set/curve/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Curve.**	**/eos/set/curve/901/label="New Label"** - Sets Curve 901's Label to "New Label".	Use to set the Label of a given Curve.
/eos/set/fp/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Focus Palette.**	**/eos/set/fp/1/label="New Label"** - Sets Focus Palette 1's Label to "New Label".	Use to set the Label of a given Focus Palette.
/eos/set/fx/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Effect.**	**/eos/set/fx/901/label="New Label"** - Sets Effect 901's Label to "New Label".	Use to set the Label of a given Effect.
/eos/set/group/<index>/chans	**text: The string to set the Group's channels with.**	**/eos/set/group/1/chans="1 > 9 21 31"** - Sets Group 1's Channels to 1 Thru 9, 21, and 31.	Use to set the Channels a given Group should point to. Strings should be written how they appear in the Group List Display, with Thru ranges represented as "x > y".
/eos/set/group/<index>/label=<text>	**<index>: Int.** **text: The string to set as the Label for the given Group.**	**/eos/set/group/1/label="New Label"** - Sets Group 1's Label to "New Label".	Use to set the Label of a given Group.
/eos/set/ip/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Intensity Palette.**	**/eos/set/ip/1/label="New Label"** - Sets Intensity Palette 1's Label to "New Label".	Use to set the Label of a given Intensity Palette.

Address Pattern	Arguments	Examples	Notes
/eos/set/macro/<index>/label=<text>	**<index>: Int.** **text: The string to set as the Label for the given Macro.**	**/eos/set/macro/1/label="New Label"** - Sets Macro 1's Label to "New Label".	Use to set the Label of a given Macro.
/eos/set/ms/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Magic Sheet.**	**/eos/set/ms/1/label="New Label"** - Sets Magic Sheet 1's Label to "New Label".	Use to set the Label of a given Magic Sheet.
/eos/set/patch/<channel>/augment3d/position=<pos_x>, <pos_y>, <pos_z>, <orientation_x>, <orientation_y>, <orientation_z>	**<channel>: Int.** **<pos_x>: Int.** **<pos_y>: Int.** **<pos_z>: Int.** **<orientation_x>: Int.** **<orientation_y>: Int.** **<orientation_z>: Int.**	**/eos/set/patch/1/augment3d/position=0, 0, 0, 90, 90, 90** - Sets Chan 1 to be at the center of Augment3D's model, with 90deg rotation in all axes.	Use to set the Augment3D position and orientation data for the given channel in Patch.
/eos/set/patch/<channel>/gel=<gel string>	**<channel>: Int.** **<gel string>: Any string can be entered, but Eos will recognize certain manufacturer and gel number combinations in the format "manufacturer abbreviation/gel number".**	**/eos/set/patch/1/gel="AP1150"** - Sets Chan 1's gel to Apollo 1150. **/eos/set/patch/1/gel="L2"** - Sets Chan 1's gel to Lee 2. **/eos/set/patch/1/gel="R375"** - Sets Chan 1's gel to Rosco 375.	Use to set the Gel Field for a given channel in Patch. Any string can be entered, but certain combinations will be recognized as a gel for use in Augment3D and elsewhere on the console.

Address Pattern	Arguments	Examples	Notes
/eos/set/patch/<channel>/label=<text>	**<channel>: Int.** **text: String to set as the Label for the given chan.**	**/eos/set/patch/1/label="New Label"** - Sets the Label field to "New Label" for Chan 1.	Use to set the Label Field for a given channel in Patch.
/eos/set/patch/<channel>/text1=<text>	**<channel>: Int.** **text: String to set as Text1 for the given chan.**	**/eos/set/patch/1/text1="Text 1 Entry"** - Sets the Text1 field to "Text 1 Entry" for Chan 1.	Use to set the Text1 Field for a given channel in Patch.
/eos/set/patch/<channel>/text10=<text>	**<channel>: Int.** **text: String to set as Text10 for the given chan.**	**/eos/set/patch/1/text10="Text 10 Entry"** - Sets the Text10 field to "Text 10 Entry" for Chan 1.	Use to set the Text10 Field for a given channel in Patch.
/eos/set/patch/<channel>/text2=<text>	**<channel>: Int.** **text: String to set as Text2 for the given chan.**	**/eos/set/patch/1/text2="Text 2 Entry"** - Sets the Text2 field to "Text 2 Entry" for Chan 1.	Use to set the Text2 Field for a given channel in Patch.
/eos/set/patch/<channel>/text3=<text>	**<channel>: Int.** **text: String to set as Text3 for the given chan.**	**/eos/set/patch/1/text3="Text 3 Entry"** - Sets the Text3 field to "Text 3 Entry" for Chan 1.	Use to set the Text3 Field for a given channel in Patch.
/eos/set/patch/<channel>/text4=<text>	**<channel>: Int.** **text: String to set as Text4 for the given chan.**	**/eos/set/patch/1/text4="Text 4 Entry"** - Sets the Text1 field to "Text 4 Entry" for Chan 1.	Use to set the Text4 Field for a given channel in Patch.
/eos/set/patch/<channel>/text5=<text>	**<channel>: Int.** **text: String to set as Text5 for the given chan.**	**/eos/set/patch/1/text5="Text 5 Entry"** - Sets the Text1 field to "Text 5 Entry" for Chan 1.	Use to set the Text5 Field for a given channel in Patch.

Address Pattern	Arguments	Examples	Notes
/eos/set/patch/<channel>/text6=<text>	**<channel>: Int.** **text: String to set as Text6 for the given chan.**	**/eos/set/patch/1/text1="Text 6 Entry"** - Sets the Text6 field to "Text 6 Entry" for Chan 1.	Use to set the Text6 Field for a given channel in Patch.
/eos/set/patch/<channel>/text7=<text>	**<channel>: Int.** **text: String to set as Text7 for the given chan.**	**/eos/set/patch/1/text7="Text 7 Entry"** - Sets the Text7 field to "Text 7 Entry" for Chan 1.	Use to set the Text7 Field for a given channel in Patch.
/eos/set/patch/<channel>/text8=<text>	**<channel>: Int.** **text: String to set as Text8 for the given chan.**	**/eos/set/patch/1/text1="Text 8 Entry"** - Sets the Text8 field to "Text 8 Entry" for Chan 1.	Use to set the Text1 Field for a given channel in Patch.
/eos/set/patch/<channel>/text9=<text>	**<channel>: Int.** **text: String to set as Text9 for the given chan.**	**/eos/set/patch/1/text9="Text 9 Entry"** - Sets the Text9 field to "Text 9 Entry" for Chan 1.	Use to set the Text9 Field for a given channel in Patch.
/eos/set/pixmap/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Pixel Map.**	**/eos/set/pixmap/1/label="New Label"** - Sets Pixel Map 1's Label to "New Label".	Use to set the Label of a given Pixel Map.
/eos/set/preset/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Preset.**	**/eos/set/preset/1/label="New Label"** - Sets Preset 1's Label to "New Label".	Use to set the Label of a given Preset.
/eos/set/fx/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Snapshot.**	**/eos/set/fx/1/label="New Label"** - Sets Snapshot 1's Label to "New Label".	Use to set the Label of a given Snapshot.

Address Pattern	Arguments	Examples	Notes
/eos/set/sub/<index>/label=<text>	**<index>: Int.** **<text>: The string to set as the Label for the given Submaster.**	**/eos/set/sub/1/label="New Label"** - Sets Sub 1's Label to "New Label".	Use to set the Label of a given Submaster.
/eos/snap/fire=<index> /eos/snap/<index>/fire=<button edge>	**<index>: Snapshot to fire.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/snap/fire=1** - Runs Snapshot 1. **/eos/snap/1/fire** - Runs Snapshot 1.	Fires (executes) Snapshots.
/eos/snap=<index>	**<index>: Snapshot to select.**	**/eos/snap=1** - Selects Snapshot 1.	Use to select snapshots.
/eos/softkey/<index>=<button edge>	**<index>: Int, index of softkey to select. There are 6 softkeys and 2 pages, so valid <index> numbers are 1-12.** **<button edge>: Float, 1.0=down (default), 0.0=up. Optional param to specify button edge.**	**/eos/softkey/1=1.0** - press 1st softkey. **/eos/softkey/1=0.0** - release 1st softkey.	Used to press softkeys. The commands on those softkeys are determined by the state of Eos for the OSC user.

Address Pattern	Arguments	Examples	Notes
/eos/sub/fire=<index> /eos/sub/<index>/fire=<button edge>	**<index>: Int. Sub to fire.** **<button edge>: Float, 1.0=down, 0.0=up. Optional param to specify button edge.**	**/eos/sub/fire=1** - Fires Sub 1. **/eos/sub/1/fire=1** - Fires Sub 1, and holds it in Bump Down.	Fires (bumps) the given Sub. A button edge can be specified to do either a Bump Down or Bump Up action. If a Sub is bumped down, it will stay down until a bump up is received.
/eos/sub/<index>/full /eos/sub/<index>/full=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/full** - Sets the Submaster to its Full level.	Sets the Submaster to its Full level.
/eos/sub/<index>/home /eos/sub/<index>/home=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/home** - Sets the Submaster to its Home level.	Sets the Submaster to its Home level.
/eos/sub/<index>/level /eos/sub/<index>/level=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/level** - Sets the Submaster to the Level value.	Sets the Submaster to the Level value, as specified in Setup.

Address Pattern	Arguments	Examples	Notes
/eos/sub/<index>/max /eos/sub/<index>/max=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/max** - Sets the Submaster to its Maximum level.	Sets the Submaster to its Maximum level.
/eos/sub/<index>/min /eos/sub/<index>/min=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/min** - Sets the Submaster to its Minimum level.	Sets the Submaster to its Minimum level.
/eos/sub/<index>/out /eos/sub/<index>/out=<button edge>	**<index>: Int. Submaster to target.** **<button edge>: Float. 1.0=down (default), 0.0=up. Optional to specify a button edge.**	**/eos/sub/1/out** - Sets the Submaster to Out.	Sets the Submaster to Out.

Address Pattern	Arguments	Examples	Notes
/eos/sub=<index> /eos/sub/<index>=<level>	**<index>: Int. Submaster to select.** **<level>: A float to set the submaster to as a percent between 0 and 1. Can also be a keyword such as full, out, home, min, max, level.**	**/eos/sub=1** - Selects Sub 1. **/eos/sub/1=0.75** - Sets Sub 1 to 75%. Useful for mapping to an OSC slider. **/eos/sub/1=full** - Sets Sub 1 to Full.	Used to select Submasters and modify their levels.
/eos/subscribe/param/<param1>=<value> /eos/subscribe/param/<param1>/<param2>=<value>	**<value>: Int, 1=subscribe, 0=unsubscribe.**	**/eos/subscribe/param/red=1** - Subscribes to the Red parameter. **/eos/subscribe/param/pan/tilt=1** - Subscribes to both Pan and Tilt parameters.	Any number of parameters can be specified by continuing to list them as **<param1>/<param2>/<param3>...**. Once subscribed, Eos will reply with an OSC packed per parameter as they change.
/eos/switch/coarse/<param>=<level> /eos/switch/coarse/<param1>/<param2>=<level>	**<level>: Int, number of wheel ticks to change specified parameters by continuously.**	**/eos/switch/coarse/pan=1.0** - Increase the selection's pan by 1 coarse wheel tick continuously. **/eos/switch/coarse/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 coarse wheel tick continuously. **/eos/switch/coarse/pan/tilt=0** - Stop the continuous wheel ticking for pan and tilt parameters.	Continuously adjusts the given parameters by the given amount of fine wheel ticks until a **level=0** command is sent to stop it. Any number of parameters is allowed.
/eos/switch/fine/<param>=<level> /eos/switch/fine/<param1>/<param2>	**<level>: Int, number of wheel ticks to change specified parameters by continuously.**	**/eos/switch/fine/pan=1.0** - Increase the selection's pan by 1 fine wheel tick continuously. **/eos/switch/fine/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 fine wheel tick continuously. **/eos/switch/fine/pan/tilt=0** - Stop the continuous wheel ticking for pan and tilt parameters.	Continuously adjusts the given parameters by the given amount of fine wheel ticks until a **level=0** command is sent to stop it. Any number of parameters is allowed.

Address Pattern	Arguments	Examples	Notes
/eos/switch/level	**<level>: Int, number of wheel ticks to change specified parameters by continuously.**	**/eos/switch/level=1.0** - increase value. **/eos/switch/level=-1.0** - decrease value. **/eos/switch/level=4.0** - increase value rapidly.	Used to change the level of the selected parameter. Defaults to Coarse mode, but can be changed with **/eos/wheel** command.
/eos/switch=<wheel mode> /eos/switch/<param>=<level> /eos/switch/<param1>/<param2>=<level>	**<wheel mode>: Int for wheel mode. 0=coarse, 1=fine.** **<level>: Int, number of wheel ticks to change specified parameters by continuously. The expected range is -1.0 to 1.0, which affects the tick rate accordingly, but can be a smaller or larger range for more subtle or rapid movement.**	**/eos/switch=1.0** - Sets the wheel mode to fine. **/eos/switch/pan=1.0** - Increase the selection's pan by 1 wheel tick continuously. **/eos/switch/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 wheel tick continuously. **/eos/switch/pan/tilt=0** - Stop the continuous wheel ticking for pan and tilt parameters.	Changes the switch mode. Affects sensitivity of other switch commands. Switch is a variant of Wheel with the added functionality of continuously repeating wheel ticks until a subsequent OSC switch command sets the wheel ticks to zero. This may be used to continuously tick a wheel while a button is held down, for example. Any number of parameters is allowed.
/eos/user/auto		**/eos/user/auto** - Sets OSC user to an automatically different number than everyone else.	This command sets the OSC user to find a user ID not used by any other device. Useful for apps that want to have their own command line and avoid possible conflicts on the background user.

Address Pattern	Arguments	Examples	Notes
/eos/user=<user number>	**<user number>: Int, User number this OSC device should use. User 0 represents the background user (used in Background Macros and elsewhere). User -1 represents the current user on the console that is receiving OSC commands.**	**/eos/user=2** - Sets OSC user to User 2 on the console. **/eos/user=0** - Sets OSC user to the background user. No commands will appear on any command line. **/eos/user=-1** - Sets OSC user to the current user on the console.	Use to change the console user that receives OSC commands.
/eos/wheel/coarse/<param>=<level> /eos/wheel/coarse/<param1>/<param2>=<level>	**<level>: Int, number of wheel ticks to increment by.**	**/eos/wheel/coarse/pan=1.0** - Increase the selection's pan by 1 coarse wheel tick. **/eos/wheel/coarse/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 coarse wheel tick each.	Adjusts the given parameters by the given amount of coarse wheel ticks. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** .
/eos/wheel/fine/<param>=<level> /eos/wheel/fine/<param1>/<param2>=<level>	**<level>: Int, number of wheel ticks to increment by.**	**/eos/wheel/fine/pan=1.0** - Increase the selection's pan by 1 fine wheel tick. **/eos/wheel/fine/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 fine wheel tick each.	Adjusts the given parameters by the given amount of fine wheel ticks. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** .
/eos/wheel/level=<level>	**<level>: Int, number of wheel ticks to increment by.**	**/eos/wheel/level=1.0** - increase value. **/eos/wheel/level=-1.0** - decrease value. **/eos/wheel/level=4.0** - increase value rapidly.	Used to change the level of the selected parameter. Defaults to Coarse mode, but can be changed with **/eos/wheel** command.

Address Pattern	Arguments	Examples	Notes
/eos/wheel=<wheel mode> /eos/wheel/<param>=<level> /eos/wheel/<param1>/<param2>=<level>	**<wheel mode>: Int for wheel mode. 0=coarse, 1=fine.** **<level>: Int, number of wheel ticks to increment by.**	**/eos/wheel=1.0** - Sets the wheel mode to fine. **/eos/wheel/pan=1.0** - Increase the selection's pan by 1 wheel tick. **/eos/wheel/pan/tilt=1.0** - Increase the selection's pan and tilt by 1 wheel tick each.	Changes the wheel mode. Affects sensitivity of other wheel commands. Multiple parameters can be targeted by listing each one as **<param1>/<param2>/...** .
/eos/xyz=<x>, <y>, <z>	**<x>: Any number, in decimal meters.** **<y>: Any number, in decimal meters.** **<z>: Any number, in decimal meters.**	**/eos/xyz/=1, 1, 1** - Sets the current selection's focus to XYZ coordinates (1, 1, 1).	Sets XYZ position of current selection according to Augment3d data. OSC XYZ coordinates are measured in decimal meters, regardless of the unit selected in Setup > System Settings > Augment3d. Channels can be focused this way regardless of whether XYZ Format is enabled for them.

OSC Outputs

Address Pattern	Arguments	Examples	Notes
/eos/out/user = <user index>	**<user index>: Int.**	**/eos/out/user = 2** - OSC User is User 2.	Sends when the OSC user changes.
/eos/out/wheel = <wheel value>	**<wheel value>: Float.**	**/eos/out/wheel = 0.000** - Wheel is not moving.	Sends when an OSC wheel changes.
/eos/out/switch = <switch value>	**<switch value>: Float.**	**/eos/out/switch = 0.000** - Wheel is not moving.	Sends when an OSC switch changes.
/eos/out/get/version = <Eos version>, <FixLib version>, <gel swatch type>	**<Eos version>: String in the format "major.minor.patch.build".** **<FixLib version>: String in the format "major.minor.patch.build".** **<gel swatch type>: Int.**	**/eos/out/get/version="3.3.0.273", "3.3.0.102", 0** - Eos Version is 3.3.0.273, Fixture Library version is 3.3.0.102, and the gel swatch type is 0.	Returns information about the current Eos version. Useful to distinguish versions if OSC commands ever change.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/processors = <processor count> /eos/out/get/processors = <id>, <backup id>, <host flag>, <health status>, <label>, <name>, <desc>, <IP>, <universe string>	**<processor count>: Int, number of processors.** **<id>: Int, internal id of the processor.** **<backup id>: Int, the id of this processor's backup. -1 = no backup for this processor.** **<host flag>: Bool, True if this is the host processor.** **<health status>: Int. 0 through 3. 0 = Online, 1 = Offline, 2 = Warnings, 3 = Critical Error.** **<label>: String.** **<name>: String.** **<desc>: String.** **<IP>: String.** **<universe string>: String containing the universes this processor controls in the format "1>3".**	**/eos/out/get/processors= 1** - There is 1 expansion processor. **/eos/out/get/processors= 10, -1, True, 0, "Host Label", "Laptop Name", "ETCnomad", "0.0.0.0", "1>3" "Expansion Proccessor", "0.0.0.0", "4>6"** - The first processor has an id of 0, no backup, is the host, is online, its label, name, description, IP address, and assigned universes 1 thru 3.	Returns information about processors in the showfile. The first returned OSC message will have the number of processors in the showfile (and the number of upcoming OSC messages.) Each processor will send its data as a separate OSC command.
/eos/out/get/group/count = <count>	**<count>: Int.**	**/eos/out/get/group/count = 10** - 10 Groups in show.	Returns the number of Groups in the show.
/eos/out/get/macro/count = <count>	**<count>: Int.**	**/eos/out/get/macro/count = 10** - 10 Macros in show.	Returns the number of Macros in the show.
/eos/out/get/bp/count = <count>	**<count>: Int.**	**/eos/out/get/bp/count = 10** - 10 Beam Palettes in show.	Returns the number of Beam Palettes in the show.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/cp/count = <count>	**<count>: Int.**	**/eos/out/get/cp/count = 10** - 10 Color Palettes in show.	Returns the number of Color Palettes in the show.
/eos/out/get/fp/count = <count>	**<count>: Int.**	**/eos/out/get/fp/count = 10** - 10 Focus Palettes in show.	Returns the number of Focus Palettes in the show.
/eos/out/get/ip/count = <count>	**<count>: Int.**	**/eos/out/get/ip/count = 10** - 10 Intensity Palettes in show.	Returns the number of Intensity Palettes in the show.
/eos/out/get/preset/count = <count>	**<count>: Int.**	**/eos/out/get/preset/count = 10** - 10 Presets in show.	Returns the number of Presets in the show.
/eos/out/get/curve/count = <count>	**<count>: Int.**	**/eos/out/get/curve/count = 12** - 12 Curves in show.	Returns the number of Curves in the show.
/eos/out/get/ms/count = <count>	**<count>: Int.**	**/eos/out/get/ms/count = 2** - 2 Magic Sheets in show.	Returns the number of Magic Sheets in the show.
/eos/out/get/sub/count = <count>	**<count>: Int.**	**/eos/out/get/sub/count = 10** - 10 Submasters in show.	Returns the number of Submasters in the show.
/eos/out/get/fx/count = <count>	**<count>: Int.**	**/eos/out/get/fx/count = 12** - 12 Effects in show.	Returns the number of Effects in the show.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/snap/count = <count>	**<count>: Int.**	**/eos/out/get/snap/count = 3** - 3 Snapshots in show.	Returns the number of Snapshots in the show.
/eos/out/get/pixmap/count = <count>	**<count>: Int.**	**/eos/out/get/pixmap/count = 1** - 1 Pixel Map in show.	Returns the number of Pixel Maps in the show.
/eos/out/get/cuelist/count = <count>	**<count>: Int.**	**/eos/out/get/cuelist/count = 1** - 1 Cue List in show.	Returns the number of Cue Lists in the show.
/eos/out/get/cue/<cue list>/count = <count>	**<cue list>: Int, a number of a cue list.** **<count>: Int.**	**/eos/out/get/cuelist/1/count = 10** - 10 Cues in Cue List 1.	Returns the number of Cues in the given cue list, including part cues.
/eos/out/get/cue/<cue list>/noparts/count = <count>	**<cue list>: Int, a number of a cue list.** **<count>: Int.**	**/eos/out/get/cuelist/1/count = 10** - 10 Cues in Cue List 1.	Returns the number of Cues in the given cue list, excluding part cues.
/eos/out/get/cue/<cue list>/<cue index>/count = <count>	**<cue list>: Int, a number of a cue list.** **<cue index>: Int, a cue number.** **<count>: Int.**	**/eos/out/get/cue/1/1/count = 10** - 10 Parts in Cue 1 in Cue List 1.	Returns the number of Parts of the given cue in the given Cue List.
/eos/out/get/patch/count = <count>	**<count>: Int.**	**/eos/out/get/patch/count = 10** - 10 Patched fixtures in this show.	Returns the number of patched fixtures in the show.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/patch/<channel number>/<part number>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <manufacturer>, <fixture type>, <address>, <intensity address>, <current level>, <gel>, <text 1>, <text 2>, <text 3>, <text 4>, <text 5>, <text 6>, <text 7>, <text 8>, <text 9>, <text 10>, <part count>, <ending address> /eos/out/get/patch/<channel number>/<part number>/notes = <list index>, <UID>, <notes> /eos/out/get/patch/<channel number>/<part number>/augmented3d/position = <list index>, <UID>, <pos x>, <pos y>, <pos z>, <orientation x>, <orientation y>, <orientation z>, <fpe set index> /eos/out/get/patch/<channel number>/<part number>/augmented3d/beam = <list index>, <UID>, <beam angle>, <color>, <number of shutters>, (<shutter thrust> , <shutter angle>) repeated for every shutter), <gobo>, <gobo name>, <gobo rotate>, <hide beam state>	**<channel number>: Int.** **<part number>: Int, 0 if referring to the base channel.** **<list index>: Int, Usually optimized to -1. If target is recalled with some** **/eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String, UID of this Channel, in the form "00000000-0000-0000-0000-000000000000".** **<label>: String, label for this Channel.** **<manufacturer>: String containing the manufacturer name.** **<fixture type>: String containing the name of this fixture.** **<address>: Int, the starting absolute address of this Channel.** **<intensity address>: Int, the absolute address of the intensity parameter of this Channel.** **<current level>: Int, the current intensity level of this Channel.**	**/eos/out/get/patch/1/1/list/0/21= 0, "00000000-0000-0000-0000-000000000000", "Channel Label", "ETC_Fixtures", "Releve_Spot_Direct", 513, 513, 100, "", "Text1", "Text2", "Text3", "Text4", "Text5", "Text6", "Text7", "Text8", "Text9", "Text10", 1, 537** - Chan 1 Part 1's list index, UID, label, manufacturer, type, starting address, intensity address, current level, gel, text fields, part count, and ending address. **/eos/get/patch/1/1/notes=0, "00000000-0000-0000-0000-000000000000", "Note"** - Chan 1 Part 1's list index, UID, and note. **/eos/get/patch/1/1/augment3d/position=0, "00000000-0000-0000-0000-000000000000", 1.000, 1.000, 1.000, 45.000, 45.000, 45.000, 1** - Chan 1 Part 1's list index, UID, x pos, y pos, z pos, x orientation, y orientation, z orientation, and FPE set. **/eos/get/patch/1/1/augment3d/beam=0, "00000000-0000-0000-0000-000000000000", 0.000, "", 4, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, "", "", 0.000, False** - Chan 1 Part 1's list index, UID, beam angle, color, number of shutters, shutter thrust and shutter angle for each of the 4 shutters, gobo number, gobo name, gobo rotation, hide beam.	Returns a minimum of 4 OSC commands. Returns details about a given channel.

Address Pattern	Arguments	Examples	Notes
	<gel>: String. <text 1>: String. <text 2>: String. <text 3>: String. <text 4>: String. <text 5>: String. <text 6>: String. <text 7>: String. <text 8>: String. <text 9>: String. <text 10>: String. <part count>: Int. <ending address>: Int, absolute address of the last address for this Channel. <notes>: String. <pos x>: Float. <pos y>: Float. <pos z>: Float. <orientation x>: Float. <orientation y>: Float. <orientation z>: Float. <FPE set index>: Int, index of the FPE set used by this channel. <beam angle>: Float. <color>: String. <number of shutters>: Int. (<shutter thrust>, <shutter angle>): Floats, repeated		

Address Pattern	Arguments	Examples	Notes
	for every shutter. <gobo>: String. <gobo name>: String. <gobo rotate>: Float. <hide beam state>: Bool. <arg index>: Starting argument index for this packet. See OSC List Convention. <arg count>: Number of args sent in this packet.		

Address Pattern	Arguments	Examples	Notes
/eos/out/get/group/<index>/list/<arg index>/<arg count>= <list index>, <UID>, <label> /eos/out/get/group/<index>/channels/list/<arg index>/<arg count>= <list index>, <UID>, (channel args)	**<index>: Group index.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String, UID of this Group, in the form "00000000-0000-0000-0000-000000000000".** **<label>: String, label for this Group.** **(channel args): The list of channels contained within the group. If this command is the response to /eos/get/group/displayed/<index>, the channels will appear as they would on the.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/group/2/list/0/3= 1, "00000000-0000-0000-0000-000000000000", "Group 2 Label"** - Group 2's index, UID, and label. **/eos/out/get/group/2/channels/list/0/4= 1, "00000000-0000-0000-0000-000000000000", 1, "11-12"** - Group 2's index, UID, and Channels, which are Chan 1 and Chan 11 Thru 12. **/eos/out/get/group/2/channels/list/0/3= 1, "00000000-0000-0000-0000-000000000000", "1 + 11 Thru 12"** - Group 2's index, UID, and Channels, as a response to **/eos/get/group/displayed/<index>**.	Returns a minimum of 2 OSC commands. Returns details about a given group.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/macro/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <mode> /eos/out/get/macro/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <macro text>	**<index>: Macro index.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String, UID of this Macro, in the form "00000000-0000-0000-0000-000000000000".** **<label>: String, label for this Macro.** **<mode>: String, mode for this Macro.** **<macro text>: String containing the contents of the Macro.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/macro/2/list/0/4 = 1, "00000000-0000-0000-0000-000000000000", "Macro Label", "Foreground"** - Macro 2's list index, UID, label, and mode. **/eos/out/get/macro/2/list/0/3 = 1, "00000000-0000-0000-0000-000000000000", "Go_To_Cue Out Time 0"** - Macro 2's list index, UID, and macro string.	Returns a minimum of 2 OSC commands. Returns details about a given Macro.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/cue/<list number>/<cue number>/<part number>/list/<arg index>/<arg count>= <list index>, <UID>, <cue label>, <up time>, <up time delay>, <down time>, <down time delay>, <focus time>, <focus time delay>, <color time>, <color time delay>, <beam time>, <beam time delay>, <preheat>, <curve>, <rate>, <mark>, <block>, <assert>, <link> (int if cue is in same list, string if cue in different list), <follow time>, <hang time>, <all fade>, <loop>, <solo>, <timecode>, <number of parts>, <notes>, <scene>, <scene end>, <multipart index> /eos/out/get/cue/<list number>/<cue number>/<part number>/fx/list/<arg index>/<arg count>= <list index>, <UID>, (Effect args) /eos/out/get/cue/<list number>/<cue number>/<part number>/links/list/<arg index>/<arg count>= <list index>, <UID>, (Link args) /eos/out/get/cue/<list number>/<cue number>/<part number>/actions/list/<arg index>/<arg count>= <list index>, <UID>, (Execute Action args)	**<list number>: Int.** **<cue number>: Int.** **<part number>: Int, optional. If not present, the base cue is assumed.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<cue label>: String.** **<up time>: Int.** **<up time delay>: Int.** **<down time>: Int.** **<down time delay>: Int.** **<focus time>: Int.** **<focus time delay>: Int.** **<color time>: Int.** **<color time delay>: Int.** **<beam time>: Int.** **<beam time delay>: Int.** **<preheat>: Bool.** **<curve>: String.** **<rate>: Int.** **<mark>: String.** **<parts>: Int,**	**/eos/out/get/cue/1/1/1/list/0/31=1, "00000000-0000-0000-0000-000000000000", "Cue 1 Label", 5000, 0, -1, -1, -1, -1, -1, -1, -1, -1, False, "0", 100, "", "", "", "2/1", -1, -1, False, -1, False, "", 1, "Note", "Scene", True, 0** - Cue 1 Part 1 in Cue List 1's index, UID, label, cue times, attributes, flags, timecode, number of parts, notes, scene data, and multipart index. **/eos/out/get/cue/1/1/1/fx/list/0/4=1, "00000000-0000-0000-0000-000000000000", 901, "903-904"** - Cue 1 Part 1 in Cue List 1's index, UID, and effects. **/eos/out/get/cue/1/1/1/links/list/0/3=1, "00000000-0000-0000-0000-000000000000", 2** - Cue 1 Part 1 in Cue List 1's index, UID, and linked lists. **/eos/out/get/cue/1/1/1/actions/list/0/4=1, "00000000-0000-0000-0000-000000000000", "M5", "Q1 / 5"** - Cue 1 Part 1 in Cue List 1's index, UID, and execute actions.	Returns a minimum of 4 OSC commands. Returns info about a given Cue.

Address Pattern	Arguments	Examples	Notes
	number of parts this cue has. <notes>: String. <scene>: String. <scene end>: Bool, True if this cue is the end of a scene. <multipart index>: Int, 0-indexed list of cue parts of the base cue. 0 if this is a base cue. (Effect args): The effects in this Cue. Single Effects represented as separate int arguments. Ranges represented as strings in the format "x-y". (Link args): The links in this Cue as a list of string arguments. (Execute Action args): The Actions to Execute in this Cue as a list of string arguments. <arg index>: Starting argument index for this packet. See OSC List Convention. <arg count>: Number of args sent in this packet.		

Address Pattern	Arguments	Examples	Notes
/eos/out/get/cuelist/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <playback mode>, <fader mode>, <independent>, <HTP>, <assert>, <block>, <background>, <solo mode>, <timecode list>, <OOS sync> /eos/out/get/cuelist/<index>/list/<arg index>/<arg count>= <list index>, <UID>, (Link args)	**<index>: Int.** **<UID>: String.** **<label>: String.** **<playback mode>: String.** **<fader mode>: String.** **<independent>: Bool.** **<HTP>: Bool.** **<assert>: Bool.** **<block>: Bool.** **<background>: Bool.** **<solo mode>: Bool.** **<timecode list>: Int.** **<OOS sync state>: Bool.** **(Link args): Cues that link to this list as string arguments.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/cuelist/1/list/0/13= 0, "00000000-0000-0000-0000-000000000000", "Cue List Label", "Master (U2)", "Proportional", False, False, False, False, True, False, -1, False** - Cue List 1's list index, UID, label, playback mode, fader mode, independent state, HTP state, assert state, block state, background state, solo mode state, timecode list, and OOS sync state. **/eos/out/get/cuelist/1/links/list/0/3= 0, "00000000-0000-0000-0000-000000000000", "2/1"** - Cue List 1's list index, UID, and links.	Returns a minimum of 2 OSC commands. Returns details about the given Cue List.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/<palette type>/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <absolute palette>, <locked palette, <tracking channel> /eos/out/get/<palette type>/<index>/channels/list/<arg index>/<arg count>= <list index>, <UID>, (channel args) /eos/out/get/<palette type>/<index>/byType/list/<arg index>/<arg count>= <list index>, <UID>, (byType channel args)	**<palette type>: Bp (Beam Palette), cp (Color Palette), fp (Focus Palette), or ip (Intensity Palette).** **<index>: Int, palette ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<absolute palette>: Bool, True if palette is absolute.** **<locked palette>: Bool, True if palette is locked.** **<tracking channel>: Int.** **(channel args): The channels in the Palette. Single channels represented as separate int arguments. Ranges represented as strings in the format "x-y".** **(byType channel args): The By Type channels in the Palette. Single channels represented as separate int arguments. Ranges represented as strings in the format "x-y".** **<arg index>: Starting argument index for this**	**/eos/out/get/ip/2/list/0/6=1, "00000000-0000-0000-0000-000000000000", "Intensity Palette 2 Label", False, False, 0** - Intensity Palette 2's list index, UID, label, absolute state, locked state, and tracking channel. **/eos/out/get/ip/2/channels/list/0/4=1, "00000000-0000-0000-0000-000000000000", 1, "11-12"** - Intensity Palette 2's list index, UID, and channels. **/eos/out/get/ip/2/byType/list/0/4=1, "00000000-0000-0000-0000-000000000000", 2, "20-24"** - Intensity Palette 2's list index, UID, and By Type channels.	Returns a minimum of 3 OSC commands. Returns details about the given Palette.

Address Pattern	Arguments	Examples	Notes
	packet. See OSC List Convention. <arg count>: Number of args sent in this packet.		

Address Pattern	Arguments	Examples	Notes
/eos/out/get/preset/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <absolute palette>, <locked palette, <tracking channel> /eos/out/get/preset/<index>/channels/list/<arg index>/<arg count>= <list index>, <UID>, (channel args) /eos/out/get/preset/<index>/byType/list/<arg index>/<arg count>= <list index>, <UID>, (byType channel args) /eos/out/get/preset/<index>/fx/list/<arg index>/<arg count>= <list index>, <UID>, (effects args)	**<index>: Int, preset ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<absolute palette>: Bool, True if palette is absolute.** **<locked palette>: Bool, True if palette is locked.** **<tracking channel>: Int.** **(channel args): The channels in the Preset. Single channels represented as separate int arguments. Ranges represented as strings in the format "x-y".** **(byType channel args): The By Type channels in the Palette. Single channels represented as separate int arguments. Ranges represented as strings in the format "x-y".** **(effects args): The effects in the Preset. Single effects represented as separate int arguments. Ranges represented as strings in the format "x-y".**	**/eos/out/get/preset/2/list/0/6=1, "00000000-0000-0000-0000-000000000000", "Preset 2 Label", False, False, 0)** - Preset 2's list index, UID, label, absolute state, locked state, and tracking channel. **/eos/out/get/preset/2/channels/list/0/4=1, "00000000-0000-0000-0000-000000000000", 1, "11-12"** - Preset 2's list index, UID, and channels. **/eos/out/get/preset/2/byType/list/0/4=1, "00000000-0000-0000-0000-000000000000", 2, "20-24"** - Preset 2's list index, UID, and By Type channels. **/eos/out/get/preset/2/fx/list/0/4=1, "00000000-0000-0000-0000-000000000000", 901, "905-906"** - Preset 2's list index, UID, and effects.	Returns a minimum of 4 OSC commands. Returns details about the given Preset.

Address Pattern	Arguments	Examples	Notes
	<arg index>: Starting argument index for this packet. See OSC List Convention. <arg count>: Number of args sent in this packet.		

Address Pattern	Arguments	Examples	Notes
/eos/out/get/sub/<index> /list/<arg index>/<arg count> = <list index>, <UID>, <label>, <mode>, <fader mode>, <HTP>, <exclusive>, <background>, <restore>, <priority>, <up time>, <dwell time>, <downtime> /eos/out/get/sub/<index> /fx/list/<arg index>/<arg count>= <list index>, <UID>, (effects args)	**<index>: Int, submaster ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/ index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<mode>: String.** **<fader mode>: String.** **<HTP>: Bool.** **<exclusive>: Bool.** **<background>: Bool.** **<restore>: Bool.** **<priority>: Bool.** **<up time>: String.** **<dwell time>: String.** **<down time>: String.** **(effects args): The effects in the Submaster. Single effects represented as separate int arguments. Ranges represented as strings in the format "x-y".** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/sub/2/list/0/13=1, "00000000-0000-0000-0000-000000000000", "Sub 2 Label", "Additive", "Proportional", True, False, True, False, "P3", "0", "Man", "0"** - Sub 2's list index, UID, label, mode, fader mode, HTP state, exclusive state, background state, restore state, priority, up time, dwell time, and down time. **/eos/out/get/sub/2/fx/list/0/4=1, "00000000-0000-0000-0000-000000000000", 901, "905-906"** - Sub 2's list index, UID, and effects.	Returns a minimum of 2 OSC commands. Returns details about a given Submaster.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/fx/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <effect type>, <entry>, <exit>, <duration>, <scale>	**<index>: Int, effect ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<effect type>: String.** **<entry>: String.** **<exit>: String.** **<duration>: String.** **<scale>: Int.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/fx/901/list/0/8=0, "00000000-0000-0000-0000-000000000000", "Effect 901 Label", "Focus", "Immediate", "Immediate", "Infinite", 25** - Effect 901's list index, UID, label, effect type, entry, exit, duration, and scale.	Returns a minimum of 1 OSC command. Returns details about a given Effect.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/pixmap/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>, <server channel>, <interface>, <width>, <height>, <pixel count>, <fixture count> /eos/out/get/pixmap/<index>/list/<arg index>/<arg count> = <list index>, <UID>, (channel args)	**<index>: Int, Pixel Map ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<server channel>: Int.** **<interface>: String.** **<width>: Int.** **<height>: Int.** **<pixel count>: Int.** **<fixture count>: Int.** **(channel args): The channels in the Pixel Map. Single channels represented as separate int arguments. Ranges represented as strings in the format "x-y".** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/pixmap/2/list/0/9= 1, "00000000-0000-0000-0000-000000000000", "Pixel Map Label", 100, "sACN", 32, 32, 1024, 1024** - Pixel Map 2's list index, UID, label, server channel, interface, width, height, pixel count, and fixture count. **/eos/out/get/pixmap/2/list/0/3= 1, "00000000-0000-0000-0000-000000000000", 101, "105-106"** - Pixel Map 2's list index, UID, label, layer channels, which are Chan 101 and Chan 105 Thru 106.	Returns a minimum of 2 OSC commands. Returns details about a given Pixel Map.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/curve/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>	**<index>: Int, Curve ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/curve/2/list/0/9= 1, "00000000-0000-0000-0000-000000000000", "Curve Label"** - Curve 2's list index, UID, label.	Returns a minimum of 1 OSC command. Returns details about a given Curve.
/eos/out/get/ms/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>	**<index>: Int, Magic Sheet ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/ms/2/list/0/9= 1, "00000000-0000-0000-0000-000000000000", "Magic Sheet Label"** - Magic Sheet 2's list index, UID, label.	Returns a minimum of 1 OSC command. Returns details about a given Magic Sheet.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/snap/<index>/list/<arg index>/<arg count> = <list index>, <UID>, <label>	**<index>: Int, Snapshot ID.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list, 0-indexed.** **<UID>: String.** **<label>: String.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/snap/2/list/0/9= 1, "00000000-0000-0000-0000-000000000000", "Snapshot Label"** - Snapshot 2's list index, UID, label.	Returns a minimum of 1 OSC command. Returns details about a giveen Snapshot.
/eos/out/get/setup/list/<arg index>/<arg count> = <up time>, <down time>, <focus time>, <color time>, <beam time>,	**<up time>: Int, default Intensity Up time.** **<down time>: Int, default Intensity Down time.** **<focus time>: Int, default Focus time.** **<color time>: Int, default Color time.** **<beam time>: Int, default Beam time.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/get/setup/list/0/5= 5, 5, 5, 5, 5** - All Cue Default Times are set to 5.	Returns a minimum of 1 OSC command. Returns the default cue timings from Setup.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/<target type>/<target number>/<part number>	**<target number>: Any target number.** **<part number>: Omitted for targets without parts.**	**/eos/out/get/cue/1/1/1 =** - Cue 1 Part 1 in Cue List 1 does not exist.	This is an empty target packet. If the target does not exist, Eos will send this method.
/eos/out/get/show/path = <show file path>	**<show file path>: String, the file path to the show file.**	**/eos/out/get/show/path="C:\Users\user\Documents\ETC\Eos\ShowArchive\showfile.esf3d"** - The file path where the show file can be found.	
/eos/out/ping = (ping arguments)	**(ping arguments): Any number of arguments will be present, matching what was sent with /eos/ping.**	**/eos/out/ping="abcde", 4** - The response to the command **/eos/ping = "abcde", 4**.	Ping with **/eos/ping**. Any number of args can be passed.
/eos/fader/<index>/reset	**<index>: Int, OSC fader bank.**	**/eos/fader/1/reset** - Fader Bank 1 has been reset.	This method is sent when an OSC fader bank is reset.
/eos/cuelist/<index>/reset	**<index>: Int, OSC cuelist.**	**/eos/cuelist/1/reset** - Cue List 1 has been reset.	This method is sent when an OSC Cue List is reset.
/eos/out/get/userlist = <args per user>, (<user id>, <console type>, <console name>)	**<args per user>: Int, always 3.** **<user id>: Int.** **<console type>: String.** **<console name>: String.**	**/eos/out/get/userlist = 3, 1, "ETCnomad", "PC-Name"** - There is only one user on this show, running on ETCnomad off of PC-Name.	(**<user id>, <console type>, <console name>**) args will repeat for each user in the show.
/eos/out/get/chans = <chans>	**<chans>: String containing the currently selected chans by the OSC user.**	**/eos/out/get/chans = "2, 6-7"** - Channels 2 and 6 thru 7 are selected.	Sends the current selected channels by the OSC user.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/3dserver = <server address>, <UID>	**<server address>: String with the Augment3D server. Repeated for multiple IP addresses.** **<UID>: String containing the UID of the Augment3D server.**	**/eos/out/get/3dserver = "0.0.0.0:3040", "0.0.0.0:3040", "UID=00000000-0000-0000-0000-000000000000"** - The IP addresses and UID of the Augment3D server.	Sends the IP addresses of the Augment 3D server.
/eos/out/get/fpe/<set index>/count = <list index>, <count>	**<set index>: Int.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list,.** **<count>: Int, number of points in this FPE set.**	**/eos/out/get/fpe/1/count = 0, 4** - FPE set 1 has 4 FPE points.	Sends the number of points within the given FPE set.
/eos/out/get/fpe/count = <count>	**<count>: Int, number of FPE sets.**	**/eos/out/get/fpe/count = 1** - This show has 1 FPE set.	Sends the number of FPE sets.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/fpe/<set index>/<point index> = <list index>, <point list index>, <text name>, <index>, <x coord>, <y coord>, <z coord>	**<set index>: Int.** **<point index>: Int.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list,.** **<point list index>: Int, the point's index within its set, 0-indexed.** **<text name>: String in the format "FPE Point <set>/<point>".** **<index>: Int, FP Number.** **<x coord>: Float, x coordinate of this point.** **<y coord>: Float, y coordinate of this point.** **<z coord>: Float, z coordinate of this point.**	**/eos/out/get/fpe/1/0 = 0, 0, "FPE Point 1/1", 901, -3.000, 3.000, 0.000** - FPE Point 1/1's id number, and coordinates.	Sends back information about a particular FPE point.
/eos/out/get/fpe/<set index> = <list index>, <label>, <count>	**<set index>: Int.** **<list index>: Int, Usually optimized to -1. If target is recalled with some /eos/get/<target>/index=<list index>, this will return the given target's index within its list,.** **<label>: String.** **<count>: Int, number of points in this FPE set.**	**/eos/out/get/fpe/1 = 0, "FPE Label", 4** - FPE Set 1's list index, label, and number of points.	Sends back information about a particular FPE set.

Address Pattern	Arguments	Examples	Notes
/eos/out/get/params/<chan number> = <manufacturer>, <fixture type>, (<param name>, <level>, <min level>, <max level>)	**<chan number>: Int.** **<manufacturer>: String.** **<fixture type>: String.** **<param name>: String.** **<level>: Float.** **<min level>: Float.** **<max level>: Float.**	**/eos/out/get/params/1="ETC Fixtures", "Releve Spot Direct", "Intens", 0.000, 0.000, 100.000, "Red", 100.000, 0.000, 100.000, "Lime", 100.000, 0.000, 100.000, "Green", 100.000, 0.000, 100.000, "Blue", 100.000, 0.000, 100.000, "Pan", 0.000, -270.000, 270.000, "Tilt", 100.000, -135.000, 135.000** - Chan 1's fixture manufacturer, type, and params, with their current level, min level, and max level.	(**<param name>, <level>, <min level>, <max level>**) repeats for all params in the channel.
/eos/out/get/emitters/<chan number> = <manufacturer>, <fixture type>, (<param name>, <level>, <min level>, <max level>)	**<chan number>: Int.** **<manufacturer>: String.** **<fixture type>: String.** **<param name>: String.** **<level>: Float.** **<min level>: Float.** **<max level>: Float.**	**/eos/out/get/emitters/1="ETC Fixtures", "Releve Spot Direct", "Intens", 0.000, 0.000, 100.000, "Red", 100.000, 0.000, 100.000, "Lime", 100.000, 0.000, 100.000, "Green", 100.000, 0.000, 100.000, "Blue", 100.000, 0.000, 100.000** - Chan 1's fixture manufacturer, type, and emitters, with their current level, min level, and max level.	(**<param name>, <level>, <min level>, <max level>**) repeats for all emitters in the channel.
/eos/out/get/csv = <offset>, <filesize>, <file>	**<offset>: Int.** **<filesize>: Int, number of bytes in the CSV.** **<file>: Blob, the file stream.**	**/eos/out/get/csv = 0, 72608, (blob)** - Sends out the csv file in some format.	
/eos/out/event/cue/<cue list>/<cue id>/<action> = <label>	**<cue list>: Int.** **<cue id>: Int.** **<action>: Stop, resume, or fire (depending on the state of the triggered cue).**	**/eos/out/event/cue/1/7/fire= "Cue 7 Label"** - Cue 7 in List 1 was fired.	Sends every time a cue is fired, stopped, or resumed.
/eos/out/event/cue/<cue list>/<cue id>/<action> = <label>	**<cue list>: Int.** **<cue id>: Int.** **<action>: Stop, resume, or fire (depending on the state of the triggered cue).**	**/eos/out/event/cue/1/7/fire= "Cue 7 Label"** - Cue 7 in List 1 was fired.	Sends every timea cue is fired, stopped, or resumed as a custom cue event.

Address Pattern	Arguments	Examples	Notes
/eos/out/event		**/eos/out/event** - timecode Learn.	Sends when a timecode event is learned.
/eos/out/event/sub/<sub id> = <on/off>	**<sub id>: Int.** **<on/off>: Int, 0 = off, 1 = on.**	**/eos/out/event/sub/1 = 1** - Sub 1 was fired.	Sends when a sub is fired from a show control event.
/eos/out/event/macro/<macro id>	**<macro id>: Int.**	**/eos/out/event/macro/1** - Macro 1 was fired.	Sends when a macro is fired from a show control event.
/eos/out/event/relay/<address>/<level> = <on/off>	**<address>: Int.** **<level>: Int.** **<on/off>: Int, 0 = off, 1 = on.**	**/eos/out/event/relay/1/1 = 1** - Relay 1 was fired.	Sends when a relay is fired from a show control event.
/eos/out/event/show/<state> = <show file>		**/eos/out/event/show/saved = "C:\Users\user\Documents\ETC\Eos\ShowArchive\filename.esf3d"** - The show file was saved to this location.	Sends every time a file is saved, loaded, or cleared.
/eos/out/cmd = <command line>, <error>	**<command line>: String containing the command line.** **<error>: Int, 0 if no error, 1 if error.**	**/eos/out/cmd = "LIVE: Cue 1 : Chan 1 #", 0** - The command line, closed as noted by "#".	Sends every time the command line updates, sent only to that OSC user.
/eos/out/user/<user id>/cmd = <command line>, <error>	**<user id>: Int.** **<error>: Int, 0 if no error, 1 if error.** **<command line>: String containing the command line.**	**/eos/out/user/1/cmd = "LIVE: Cue 1 \: Chan 1 #", 0** - User 1's command line, closed as noted by "#" :$1.	

Address Pattern	Arguments	Examples	Notes
/eos/out/softkey/<softkey id> = <text>	**<softkey id>: Int, 1 through 12.**	**/eos/out/softkey/1 = "Address"** - Softkey 1's button text is now "Address".	Sends every time a softkey changes, in sets of 12 commands, for each softkey.
/eos/out/show/name = <show name>	**<show name>: String.**	**/eos/out/show/name = "New Show Name"** - The name of this showfile changed.	Sends when the name of the show changes.
/eos/out/previous/cue/<list>/<number>/<part>	**<list>: Int.** **<number>: Int.** **<part>: Int, if a cue part.**	**/eos/out/previous/cue/1/1** - Previous cue is now Cue 1 in List 1.	Sends when the previous cue changes.
/eos/out/previous/cue/text = <(cue list)/(cue number) (label) (duration)>	**<(cue list)/(cue number) (label) (duration)>: String formatted as "(cue list)/(cue number) (label) (duration)".**	**/eos/out/previous/cue/text = "1/1 Label 5.0"** - Previous cue is Cue 1 in List 1, with a 5 second duration.	Sends when the previous cue changes.
/eos/out/active/cue/<list>/<number> = <percent>	**<list>: Int.** **<number>: Int.** **<percent>: Float, the percent completed of the active cue, between 0.000-1.000.**	**/eos/out/active/cue/1/1 = 0.500** - Active cue (1/1) is halfway complete.	Sends while the active cue is fading.
/eos/out/active/cue/ = <percent>	**<percent>: Float, the percent completed of the active cue, between 0.000-1.000.**	**/eos/out/active/cue = 0.500** - Active cue (1/1) is halfway complete.	Sends while the active cue is fading.
/eos/out/active/cue/text = <(cue list)/(cue number) (label) (duration)>	**<(cue list)/(cue number) (label) (duration)>: String formatted as "(cue list)/(cue number) (label) (duration)".**	**/eos/out/active/cue/text = "1/1 Label 5.0"** - Active cue is Cue 1 in List 1, with a 5 second duration.	Sends when the active cue changes.
/eos/out/pending/cue/<list>/<number>/<part>	**<list>: Int.** **<number>: Int.** **<part>: Int, if a cue part.**	**/eos/out/pending/cue/1/1** - Pending cue is now Cue 1 in List 1.	Sends when the pending cue changes.

Address Pattern	Arguments	Examples	Notes
/eos/out/pending/cue/text = <(cue list)/(cue number) (label) (duration)>	**<(cue list)/(cue number) (label) (duration)>: String formatted as "(cue list)/(cue number) (label) (duration)".**	**/eos/out/pending/cue/text = "1/2 Label 5.0"** - Pending cue is Cue 2 in List 1, with a 5 second duration.	Sends when the pending cue changes.
/eos/out/active/chan = <chan>, <channel info>	**<chan>: Int.** **<channel info>: String formatted as "[(level)] (fixture type) (fixture description)".**	**/eos/out/active/chan = 2, "[100] ETC_Revolution_ Original FixtureNote"** - Channel 2 is selected, at Full intensity.	Sends when the active channel changes.
/eos/out/active/wheel/<index> = <param name & level>, <param group>, <level>	**<param name & level>: String formatted as "(param name) [(level)]".** **<param group>: Int, 1 through 6.** **<level: Float.**	**/eos/out/active/wheel/1 = "Intens [0]", 1, 0.000** - The first parameter is intensity, which is at 0.	Sends when the active wheels change. Each wheel will send as a different command, one for each parameter of the selection.
/eos/out/color/hs = <hue>, <saturation>	**<hue>: Float.** **<saturation>: Float.**	**/eos/out/color/hs = 296.445, 38.265** - The color of the current selection.	Sends when the active selection changes.
/eos/out/pantilt = <pan min>, <pan max>, <tilt min>, <tilt max>, <pan>, <tilt>	**<pan min>: Float.** **<pan max>: Float.** **<tilt min>: Float.** **<tilt max>: Float.** **<pan>: Float.** **<tilt>: Float.**	**/eos/out/pantilt = -270.000, 270.000, -135.000, 135.000, 0.000, 0.000** - Selected chan's pan and tilt values are at 0.	Sends when the active selection changes.
/eos/out/xyz = <x>, <y>, <z>	**<x>: Float.** **<y>: Float.** **<z>: Float.**	**/eos/out/xyz = 0, 0, 0** - Selected fixture is focused at (0, 0, 0).	Sends when the active selection changes.
/eos/out/event/state = <state>	**<state>: Int, 0 is Blind, 1 is Live.**	**/eos/out/event/state = 0** - Console is in Blind Mode.	Sends when the console state changes.
/eos/out/event/locked = <state>	**<state>: Int, 0 is unlocked, 1 is locked.**	**/eos/out/event/locked = 1** - Console is locked.	Sends when the console's lock state changes.

Address Pattern	Arguments	Examples	Notes
/eos/out/ds/<ds index>/<button index> = <target name>, <button name>	**<ds index>: Int, representing which Direct Select Bank this is.** **<button index>: Int.** **<target name>: String with the target's label in the form "(label) [(target id)]".** **<button name>: String.**	**/eos/out/ds/1/1 = "Beam Palette Label [1]", "1"** - The first Direct Select button in Bank 1 is set to Beam Palette 1.	Sends when the direct select bank changes. All buttons will refresh with a separate method.
/eos/out/ds/<ds index> = <target type>	**<ds index>: Int, representing which Direct Select Bank this is.** **<target type>: String in the format "(Target Type) [(page)]".**	**/eos/out/ds/1 = "Beam Palettes [1]"** - The first Direct Select Bank is filled with Beam Palettes.	Sends when the direct select bank changes. All buttons will refresh with a separate method.
/eos/fader/<bank index>/<fader index> = <level>	**<bank index>: Int, representing which OSC fader bank this is.** **<fader index>: Int.** **<level>: Float.**	**/eos/fader/1/1 = 0.500** - The first fader in OSC Fader Bank 1 is at 50%.	Sends when the fader bank changes. All faders will refresh with a separate method.
/eos/out/fader/range/<bank index>/<fader index> = <min>, <max>	**<bank index>: Int, representing which OSC fader bank this is.** **<fader index>: Int.** **<min>: Float, minimum level for this fader.** **<max>: Float, maximum level for this fader.**	**/eos/out/fader/range/1/1 = 0.00, 100.000** - The first fader in OSC Fader Bank has a range from 0 to 100.	Sends when the fader bank is created. All faders will refresh with a separate method.

Address Pattern	Arguments	Examples	Notes
/eos/out/fader/<bank index>/<fader index>/name = <target name>	**<bank index>: Int, representing which OSC fader bank this is.** **<fader index>: Int.** **<target name>: String.**	**/eos/out/fader/1/1 = "S 1 Hold P3"** - The first fader in OSC Fader Bank is targeting Sub 1.	Sends when the faders are updated. All faders will refresh with a separate method.
/eos/out/fader/<bank index> = <page index>	**<bank index>: Int, representing which OSC fader bank this is.** **<page index>: Strin representing the current fader page number.**	**/eos/out/fader/1 = "2"** - OSC Bank 1 is on page 2.	Sends when the fader page updates.
/eos/out/cuelist/<bank index> = <label>, <total cues>, <follow time>	**<bank index>: Int, representing which OSC cue list this is.** **<label>: String.** **<total cues>: String.**	**/eos/out/cuelist/1 = "Cue List 1", 10, 0** - Cue list 1's label, number of cues, and follow time.	Sends when the OSC cue list is updated.
/eos/out/cuelist/<bank index>/<cue index> = <OSC label>, <cue number>, <cue label>, <notes>, <scene>, <scene end>, <duration>, <remaining>	**<bank index>: Int, representing which OSC cue list this is.** **<cue index>: Int.** **<OSC label>: String with the cue number, and label.** **<cue number>: String with cue number and part if necessary.** **<cue label>: String.** **<notes>: String.** **<scene>: String.** **<scene end>: Bool.** **<duration>: Int.** **<remaining>: Int, -1 if not counting down.**	**/eos/out/cuelist/1/3 = "2 P2 Label", "2 P2", "Label", "note", "scene 2", False, 5000, -1** - Cue 2 Part 2's details.	Sends when the OSC cue list is updated.

Address Pattern	Arguments	Examples	Notes
/eos/out/param/<param name> = <value>, <min>, <max>	**<param name>: Name of the subscribed parameter.** **<value>: Float.** **<min>: Float.** **<max>: Float.**	**/eos/out/param/red = 20.000, 0.000, 100.000** - A red parameter was just set to 20.	Sends when a subscribed parameter updates. See **/eos/subscribe**.
/eos/out/notify/<target type>/list/<arg index>/<arg count> = <sequence number>, (changed IDs) /eos/out/notify/<target type>/<list number>/list/<arg index>/<arg count> = <sequence number>, (changed IDs)	**<target type>: Any valid Eos Target type.** **<list number>: Int, if target type is a cue, the cue list number will also send. Excluded for other target types.** **<sequence number>: Int, to keep track of how many /notify/ commands have been sent, this number will increase with each sent command to uniquely identify them.** **(changed IDs): List of target ids that changed as a list of arguments. Ranges are represented as a string "X-Y" and individual targets are represented as ints.** **<arg index>: Starting argument index for this packet. See OSC List Convention.** **<arg count>: Number of args sent in this packet.**	**/eos/out/notify/cue/1 = 0** - Cue 1's sequence number is 0.	In order to stay in sync with changes as a user makes them, OSC devices can request to be notified of changes with **/eos/subscribe=1**. After subscribing, any time a target.

OSC Eos Keys

OSC names for each key can also be viewed on the *Virtual Keyboard [Tab 7]* by selecting **OSC /key Names** in the bottom-right dropdown menu.

0	1	2
3	4	5
6	7	8
9	@	Label
Undo	Delay	External_Relationship
Full	Group	Rem_Dim
Time	Trace	Park
Learn	Mark	Sneak
Out	Part	Cue
Record	Sub	Thru
Update	Level	Follow
CueOnly	Query	Record_Only
Clear_Cmd	Delete	Enter
.	-	+
Bump	Color_Path	Live
Blind	Spreadsheet	Cue_Sheet
Setup	Fader_Display	Stop
Back	Load	Show_Control_Action
Resume	To_Full_Snapshot	Gel_Swatch_Setting_Gel_And_Source_Lamp
/ (use \ key in Address Pattern)	Page_Left	Page_Right
Page_Up	Page_Down	Go_0
Assert	Augment3d_Display_Behavior	Filter_Fader_Button
Go_To_Cue	Independent	Go_To_Cue_0
Manual_Override	Recall_From	Copy_To
Rate	Timing_Disable	Fader_Release
Fader_Freeze	Next	Last
Help	Select_All	Beam
Capture	Native	Filter_Mode
Image	Intensity	Select_Last
Select_Manual	Control	Focus

Color	Shutter	Display_Timing
Select_Active	Macro_1	Macro_2
Macro_3	Macro_4	Macro_5
Macro_6	Macro_7	Macro_8
Macro_Button	Snapshot	_+%
_-%	About	Record Rig Check
Run Rig Check	Clear Rig Check	Clear Errors
Repeat_On_Go	Restart_Effect	Flip
Color_Palette	Beam_Palette	Intensity_Palette
Focus_Palette	Effect	Preset
Page_Mode	HS	Softkey_1
Softkey_2	Softkey_3	Softkey_4
Softkey_5	Softkey_6	Softkey_7
Softkey_8	Control	Swap_Address
CIE_XYY	AUTO_DIM	Lock
Fine	Shift	Device_Discovered
Device_Disconnected	Display_Palettes	Display_Presets
Display_Groups	Block	Fan_
Offset	Patch_Done	Even
Odd	RGB	CMY
Lightwright	Gel_Match_Setting_Hybrid	Color_Gel_Match_Hybrid
SAT_ADJUST	COLOR_SCRUB	Allfade
Curve	Link	AutoMark_Off
Is_In	Isn't_In	Can_Be
Can't_Be	Unpatch	Stop_All
Move_To	Replace_With	SubType
GEL_	Hold	Color_Fade_Times
Plus_FX	Limited_Expand_Mode_ Toggle	FaderWing_Page
COLOR_SCRUB_REPLAY	WheelAndEncoderButton	FineWheelAndEncoderButton
Wheel	ADD_LOG_ENTRY	Down
Wheel0	Wheel1	Wheel2
Wheel3	Wheel4	Wheel5
Wheel6	Wheel7	Wheel8
Wheel9	Keywords	OOS_Sync

Patch_1_To_1	Fader_Page_Back	Magic_Sheet
Open_Magic_Sheet_Blind	Magic_Sheet_Recall	Hide_Mouse
Color_Gel	Only_Text	Only_Show
LD_Flags	Display_Intensity_Palettes	Display_Focus_Palettes
Display_Color_Palettes	Display_Beam_Palettes	Tab
Format	FlexiChannel_Mode	Preserve_Native_On_Patch_Change
Select	Escape	Parameter_View
Level_Wheel_Move	Display_Macros	Display_Channels
Continuous_Run	Complete	Device_Properties
ChannelParam	Device_Errors	Device_Sensors
Device_Ignore_Errors	HTP_	CueOnlyTrack
Lock_	Fader_Assert	Stop_Effect_Button
More_Softkeys	Slider_Move	Lamp_Control
Flash	OSC_RX	Manual
Lamp_On	Douse	Calibrate
ShutDown_Fixture	Test_Fixture	Labels_Only
Mirror_Mode	Attach	Detach
Moves_Only	Marks	Device_Lamp_Controls
End_Query	CLEAR_HOLD_COLOR_POINT_ORIGIN	Ordered_View
Reorder	Select_Event_At_Current_Time_Code	Flexi_Staging_Mode
Workspace	Gel_Swatch_Setting_Gel_Only	User_
Cell Editing	Scene	View
Go_Button	Stop_Button	Load_Button
Stop_Effect	Open_Fader_Config_Blind	Absolute
Linear	StepBased	Action
Focus_Effect	Color_Effect	Properties
Step	Duration	RCE_On_Off
CycleTime	Insert	Include_Color_Fade
RCE_Insert	Effect_Edit	RCE_Channels
Import_Path	Second_Action	PDV_Point
PDV_Time	Insert_Channel	Device_Clear_Errors
Select_Last_Params	Encoder Custom	Magic_Sheet_Edit

Magic_Sheet_Apply	Display_Magic_Sheets	Import_Gobo
OSC_Cue_Recv_String	OSC_Cue_Send_String	Park Buffer
Page_Column_1	Page_Column_2	Page_Column_3
Page_Column_4	Page_Column_5	Page_Column_6
Page_Column_7	Make_Null	Make_Absolute
Make_Manual	Preview	Unmark_At_Zero
Mapped_To	Number_Of_Controls	Scene_End
Discrete_Instance	Device	Fader_1
Fader_2	Fader_3	Fader_4
Fader_5	Fader_6	Fader_7
Fader_8	Fader_9	Fader_10
Fader_AB	Stop_1	Stop_2
Stop_3	Stop_4	Stop_5
Stop_6	Stop_7	Stop_8
Stop_9	Stop_10	Bump_1
Bump_2	Bump_3	Bump_4
Bump_5	Bump_6	Bump_7
Bump_8	Bump_9	Bump_10
Fader_Pages	Displays	Escape
Encoder_1	Encoder_2	Encoder_3
Encoder_4	Encoder_5	Encoder_6
Encoder_Wheel_Move	Encoder_Category_Color	Encoder_Category_Shutter
Encoder_Category_Image	Encoder_Category_Form	Encoder_Category_Intensity
Encoder_Category_Focus	Partitions	Rate_Wheel_Move
Fader_Rate	Unmap_Faders	Module_1_Connected
Module_2_Connected	Module_3_Connected	Module_1_Disconnected
Module_2_Disconnected	Module_3_Disconnected	Expand
Data	Insert_Before	Insert_After
ParamCategory	Edit_Target	Size
HForm	Loop	Done
Macro_Loop_Begin	Macro_Loop_End	Macro_Loop_Num
Macro_Wait	Execute	Pattern
Grouping	Trail	Open_Color_Picker
Open_Browser	Haptic_Level_Wheel_Move	Haptic_Rate_Wheel_Move

Haptic_Encoder_Wheel_Move	Open_Fader_Config	Master
Open_Pattern_Effects	Open_DMX_Patch	Clear_Module
Reverse	Interpolate	Run_Cue
Entry	Edit_Mode	Open_Cue_Blind
Open_Preset_Blind	Open_CP_Blind	Open_BP_Blind
Open_IP_Blind	Open_FP_Blind	Open_Sub_Blind
Open_Group_Blind	Open_Park_Blind	Open_Effect_Blind
Reverse_Steps	Scale	Close_Offset_Display
User	Dwell	InTime
DecayTime	OnState	OffState
StepTime	Check	Patch
Swap_Pan/Tilt	Invert_Pan	Invert_Tilt
Random_Channels	Lamp_Ctrls	Patch_Mode
Attribute_Mode	Database_Mode	FaderModule_1_Connected
FaderModule_2_Connected	FaderModule_3_Connected	Display_Effects
Bounce	Random_Groups	Random_Rate
Cycles	Action	Duration//Cycles
System_Settings	User_Settings	Device_Settings
RVI_Settings	Color_Gel_Match_Spectrum	Level_
Gel_Match_Setting_Spectrum	Delete_Device	Chan
Parameters	Effect_Time_Wheel	Effect_Shape_Vertical_Wheel
Effect_Size_Wheel	Effect_Axis_Wheel	Exit
Cascade_Entry	Gel_Match_Setting_Brightest	Negative
Alternate	Build	Hide_CIA
Address	Interface	Offline
sACN	Cascade_Exit	Proportion
OSC_UDP_RX_Port	OSC_UDP_TX_Port	OSC_UDP_TX_IP_Address
Open_Color_Path_Blind	Notes	Type
Single_Param	Multi_Param	Minus_Links
LoadForGo	Attributes	Event
Open_Effect_Status	On	Off
EventList	Source	SMPTE_Timecode
MIDI_Timecode	NumOfChannels	AutoMark
PartitionedControl	MidiTimecode	SmpteTimecode

_Fader	MSC_Tx_Device_ID	MSC_Rx_Device_ID
Manual_Up_Time	Manual_Down_Time	Scenes
Fader	Back_From_First	AllNPs
First_Time	Last_Time	Internal
External	Frame_Rate	VForm
Axis	Flexi_All	Flexi_Show
Flexi_Active	Flexi_Moved	Flexi_Selected
Positive	Forward	Toggle_Effects
Toggle_Effect_Shape_Mode_For_ Encoder	Effect_Shape_Horizontal_ Wheel	Open_Setup
EntryTime	ExitTime	Macro_Entry_Delete
AutoPlayback	Track	BackTime
RecordConfirm	AutoSave	AutoBlock_Clean
GoToCueTime	AssertTime	DeleteConfirm
AutoSaveTime	Int	Highlight
Intime_Effect	Highlight_Append	Encoders
Direct_Selects	Flexi_In_Use	Clear_CmdLine
ListView	Edit	HTP
Learn_Events	Effect_Scale_Wheel	Effect_Rate_Wheel
Reset_System	Clear_Show	Clear_Targets
Reset_System_Settings	Reset_User_Settings	Clear_Patch
Patch_1_to_1	Clear_MIDI	Clear_SMPTE
Effect_Rotate_Wheel	Effect_Form_Horizontal_ Wheel	Effect_Form_Vertical_Wheel
Fader_Off	Keyboard_Shortcuts	Or
And	Greater_Than	Less_Than
Visible_Workspaces	Faders	Chan_Per_Group
Open_Snapshot_Blind	Display_Snapshots	Save
Save_Folder	Export_Folder	Save_File
Export_File	Open_File	Import_File
RPU_21	Quit	Confirm_Command
Cancel_Command	Home	Spread
Solo	Infinite	Fade_By_Size
Fade_By_Size_And_Rate	Stop_And_Fade	Stop_And_Hold
Even_Effect	Text1	Text2

Text3	Text4	Text5
Text6	Text7	Text8
Text9	Text10	Gel
Control_	Close_Fader_Controls	Wrap
Cue_Out	Restore_Background	Do_Nothing
Go_From_Last	Cue_Up_Time	Cue_Down_Time
Cue_Focus_Time	Cue_Color_Time	Cue_Beam_Time
Encoder_Mode_1	Encoder_Mode_2	Encoder_Mode_3
Encoder_Mode_4	Encoder_Mode_5	RPU_1
RPU_2	RPU_3	RPU_4
RPU_5	RPU_6	RPU_7
RPU_8	RPU_9	RPU_10
RPU_11	RPU_12	RPU_13
RPU_14	RPU_15	RPU_16
RPU_17	RPU_18	RPU_19
RPU_20	Clear_Filters	Luminaire
Open_Macro_Preview	Discrete	Global
By_Type	MSC_Receive	MSC_Transmit
MIDI_Rx_Source_ID	MIDI_Tx_Source_ID	Request_File
Dimmer_Double_Offset	A	B
Undouble	Cues	Patch
Palettes	Groups	Macros
Presets	Submasters	Effects
Setup	DMX Patch	Show_Control
Fixtures	Snapshots	Curves
SW_Stop_1	SW_Stop_2	SW_Stop_3
SW_Stop_4	SW_Stop_5	SW_Stop_6
SW_Stop_7	SW_Stop_8	SW_Stop_9
SW_Stop_10	SW_Stop_11	SW_Stop_12
SW_Stop_13	SW_Stop_14	SW_Stop_15
SW_Stop_16	SW_Stop_17	SW_Stop_18
SW_Stop_19	SW_Stop_20	SW_Stop_21
SW_Stop_22	SW_Stop_23	SW_Stop_24
SW_Stop_25	SW_Stop_26	SW_Stop_27

SW_Stop_28	SW_Stop_29	SW_Stop_30
SW_Stop_31	SW_Stop_32	SW_Stop_33
SW_Stop_34	SW_Stop_35	SW_Stop_36
SW_Stop_37	SW_Stop_38	SW_Stop_39
SW_Stop_40	SW_Go_1	SW_Go_2
SW_Go_3	SW_Go_4	SW_Go_5
SW_Go_6	SW_Go_7	SW_Go_8
SW_Go_9	SW_Go_10	SW_Go_11
SW_Go_12	SW_Go_13	SW_Go_14
SW_Go_15	SW_Go_16	SW_Go_17
SW_Go_18	SW_Go_19	SW_Go_20
SW_Go_21	SW_Go_22	SW_Go_23
SW_Go_24	SW_Go_25	SW_Go_26
SW_Go_27	SW_Go_28	SW_Go_29
SW_Go_30	SW_Go_31	SW_Go_32
SW_Go_33	SW_Go_34	SW_Go_35
SW_Go_36	SW_Go_37	SW_Go_38
SW_Go_39	SW_Go_40	SubMove
SubDown	SubUp	Curves
Open_Curve_Preview	Print_File	Print_Folder
All	Break_Nested	Redo
Tab_Down	Tab_Up	FaderPagePress
FaderPageRelease	Command_History	Real_Time_Clock
Analog	Type_	Relay
Filters	Power_Off	Blackout_Enable
Fader_Control	Ion_Encoder_1	Ion_Encoder_2
Ion_Encoder_3	Ion_Encoder_4	Encoder_Ext_1
Encoder_Ext_2	Encoder_Ext_3	Encoder_Ext_4
Encoder_Ext_5	Encoder_Ext_6	Flexi_Patch
Fixtures	AddFilterParam	AddFilterCat
Go_Bump	Stop_Back	Assert_
Group_Select	Freeze_	Button_Disabled
Solo	Additive	At
Backspace	:	No_Priority

Emergency_Mark	Hang	Movefade
Attributes_	Enable	Disable
Release_CueList	Up	Assert_CueList
Rate_CueList	SubRelease	SubAssert
StopEffect	vFaderMove_CueList	FaderMove_CueList
Grandmaster	GoToCue	AttributeWheel
FineWheel	RateWheel	RemFilterParam
RemFilterCat	Partition	_Next
_Last	Min	Create_Type
StopBack	Off_CueList	GoCue0
TimingDisable	Freeze	Manual_Override_CueList
Device_Dimmers	Device_RDM	MiniWheel
(	Go_CueList	Open_Partition_Preview
Macro	Unown	Blackout
Solo_Mode	)	Form
Timing_Disable_Time	Analog_Input	Relay_Output
Preheat	Preheat_Off	Timing_Disable_Go
Timing_Disable_Back	Off_Time	Create_Virtual_HSB
Back_CueList	Stop_CueList	Swap
Flexi_Channel_Partition_Toggle	User_ID	Clear_Filters
Background_Priority	StopEffect_CueList	Snapshot_Recall
SET_CHAN_LEVEL	List_Partition	BPM
Phantom	MIDI String	_sACN
FaderMove	Limited_Expand_Mode_Enter	Limited_Expand_Mode_Exit
Paging_Mode_Offset_Change	Patch_Show_Tab	Patch_Manu_Tab
Patch_User_Tab	Update_Lin	New_Keyword
Status	Learn_Time_Sample_BPM	Preserve_Blind_Cue
Lowlight_Preset	Highlight_Preset	Home_Preset
Live_RemDim_Level	Mark_Time	Release_Time
Wait_For_Input	Intensity_Master	Proportional_Master
LTP	Exclude_From_Record	Magic Sheets
Edit_MIDI_SC_Data	Highlight_RemDim	View_Channels
Import_Ascii_File	Replace	Import_ASCIIFile_Custom
ResyncFrames	CIA_Softkey1	CIA_Softkey2

CIA_Softkey3	CIA_Softkey4	CIA_Softkey5
CIA_Softkey6	DMX_	ArtNet
Default	RTC_Time	Days
Date	Month	Year
Before_Sunrise	Before_Sunset	After_Sunrise
After_Sunset	Monday	Tuesday
Wednesday	Thursday	Friday
Saturday	Sunday	Live_
Earliest	Input_String	String_RX
String_RX_Source_IDs	Clear_Subs_1to1_	Latest
Learn_Time_Discrete_Steps	Print_Tracked_Levels	Print_Color_Printout
Print_Summary_View	New_Show	Repeat_Last_Command
Save_Show	Analog_Address	Only_Levels
Plus_Show	RFR	Intensity_Block
Force_Grandmaster_Move	Lamp_Controls_Edit	ASCII_Manuf
ASCII_Delims	ASCII_Levels	ASCII_Case
EffectSub	Trckbll On/Off	Inhibitive
ChannelFader	String_TX_Source_Name	String_RX_Source_Name
Time_Code_ID	Flexi_Patch_Address	Element_Bump_1
Element_Bump_2	Element_Bump_3	Element_Bump_4
Element_Bump_5	Element_Bump_6	Element_Bump_7
Element_Bump_8	Element_Bump_9	Element_Bump_10
Element_Bump_11	Element_Bump_12	Element_Bump_13
Element_Bump_14	Element_Bump_15	Element_Bump_16
Element_Bump_17	Element_Bump_18	Element_Bump_19
Element_Bump_20	Element_Bump_21	Element_Bump_22
Element_Bump_23	Element_Bump_24	Element_Bump_25
Element_Bump_26	Element_Bump_27	Element_Bump_28
Element_Bump_29	Element_Bump_30	Element_Bump_31
Element_Bump_32	Element_Bump_33	Element_Bump_34
Element_Bump_35	Element_Bump_36	Element_Bump_37
Element_Bump_38	Element_Bump_39	Element_Bump_40
Element_Bump_41	Element_Bump_42	Element_Bump_43
Element_Bump_44	Element_Bump_45	Element_Bump_46

Element_Bump_47	Element_Bump_48	Element_Bump_49
Element_Bump_50	Element_Bump_51	Element_Bump_52
Element_Bump_53	Element_Bump_54	Element_Bump_55
Element_Bump_56	Element_Bump_57	Element_Bump_58
Element_Bump_59	Element_Bump_60	Open_ML_Controls
Playback	Grandmaster_	_Scene_End
Network_Inputs	Fader_Edge_Up	Fader_Edge_Down
Pixel_Cell_Mapping	Clear_Points	Pending
Previous	ACN_Device_Disconnect	Effect_Rate
Effect_Size	Rate_Master	Show_Control
Scroller_Frame	Fader_Disabled	Use_Content_Config
SubStopEffect	Sneak_Effect	SubMove_From_CommandLine
Page_Subs	Step	In_Time
On	Delete_Effect	Device_Discovery
SubFreeze	SubOff	Preheat_Time
Add_To_Show	Apply	Restore_Effect
Clear_Effect	vSubMove	Dwell
Toggle NI Params In Spreadsheet	DMX	Masters_Off
Open_Mirror_Dialog	Time_Code	Shutter_Order
Center	InterLeave	Num_Groups
Mirror_Out	Repeat	Cluster
Tracking	Select_NonSub_Active	Lock
Always_Absolute	Print_Feedback_Errors	Fan_Curve
Last_Ref	Ref_Only	Update_Mode
MultiConsole_Power_On	MultiConsole_Power_Off	Cleanup
Flexi_Manual	Reset_Update	Break_Nested_Off
Last_Ref_Off	Direct_SelectDC_Recall_From	Pixel Maps
Split_Cue_Time	Flash_On	Flash_Off
GM_Exempt	Earliest_M	PixelMap
Pixel_Maps	Encoder Flexi	Spacebar_Go
Height	Width	Server_Chan
Snap	Manual_Master	Fader_Mode
Macro_Mode	Background_Mode	Foreground_Mode
Default_Mode	Pixel_Map_Edit	Pixel_Map_Done

Pixel_Map_Delete	Invert	Flip_H
Flip_V	Rotate_90	Pixel_Map_Snapshot
TB_XY_Swap	TB_Pan_Swap	TB_Tilt_Swap
PSD_Time_Countdown	Open_Chan_Effect_Display	String
String_TX	String_TX_Source_IDs	Mirror_In
String_TX_Port	String_RX_Port	Release
Off_	String_MSC_TX	String_TX_IP_Address
Send_String	Shield	Cue List
Feedback Errors	Utilization Reports	Show Channels
Media_Layer_Chan	Import_All_Media	Export_Media
Wait_For_Enter	Import_Show_Media	Priority
Pixel_Map_Column_Guides	Pixel_Map_Row_Guides	Pixel_Map_Start_Address
Pixel_Map_Horizontal_Order	Pixel_Map_Vertical_Order	Pixel_Map_Direction
Pixel_Map_Apply_Check	Pixel_Map_Flash	Pixel_Map_MASK
Pixel_Map_Overlay	Pixel_Map_Last	Pixel_Map_Next
Prev_Channels	MIDI_Cue_List	Pixel_Map_Library
Pixel_Map_File	Pixel_Map_Reorder_Libraries	Pixel_Map_Reorder_Files
Pixel_Map_Overwrite	Display_Time_Mode_Latch	Data_Mode_Latch
Curve_Edit	Gio_Encoder_Display	Device_Mode
Encoder_Lockout	Clear_All_Tabs	Show_Reference_Labels
Display_Color_Path_Mode_Latch	Display_Next_Cue_Move	Display_Next_Cue_Move_Latch
Display_Park_Level	Display_Park_Level_Latch	Jump
Favorite	Column_Resize_Smaller	Column_Resize_Larger
Column_Move_Right	Column_Move_Left	Expand_Right
Expand_Down	Expand_Collapse_Left	Background_
Minimum	Background	Restore
Port_Offset	Post_Select_Softkeys	Only_Active
Fade_By_Rate	MIDI_Raw	Send_MIDI_Raw
Fader_Spread	Display_Color_Path	Color_Fade_Type
ClearCues_CueList	System_Startup_Macro	System_Shutdown_Macro
Select_Live_Cue_Live	Select_Live_Cue_Blind	Page_Encoders_Up
Page_Encoders_Down	Left_Side_SK_1	Left_Side_SK_2
Left_Side_SK_3	Left_Side_SK_4	Left_Side_SK_5
Left_Side_SK_6	Left_Side_SK_7	Next_Live_Display

Next_Blind_Display	Flexi_Time	Clear_Calibration
Edit_Frame	Degrees_Per_Rev	Percent_Per_Rev
Toggle_Accel	Disconnect_Macro	All_Speed
Spacebar_disabled_in_setup,_ALT-G_to_enable	Hard_Poweroff	Macro_801
Macro_802	Macro_803	Macro_804
Macro_805	Macro_806	Macro_807
Macro_808	Macro_809	Macro_810
Macro_811	Macro_812	Macro_813
Macro_814	Macro_815	Macro_816
Macro_817	Macro_818	Macro_819
Macro_820	Time_Template	Resources and Media
Plus_Patch	Unpatched	Expand_Collapse_Up
CLEAR_TEXT	Clear_All_Workspace_Tabs	Clear_All_Visible_Tabs
Reset_All_Tabs	All_Workspaces	Popup_Virtual_Keyboard
Macro_701	Macro_702	Macro_703
Macro_704	Macro_705	Macro_706
Macro_707	Macro_708	Macro_709
Macro_710	Macro_711	Macro_712
Color_	_Red	_Green
_White	Dark	Color Path
Down_Fade	Off_When_Stomped	Unload_When_Stomped
Nothing_When_Stomped	Release_When_Stomped	Insert_Last_Target
Toggle_Blink	Scene_Only	Go_After_Loop
Host	Backup	All_Users
All_But_Me	Fader_Load	Notes_Only
Target	Invert_Rack	Master_User
Release_	Wing_Fader_Pages	WingFaderPagePress
WingFaderPageRelease	Filter	Inhibit_This_Fader
Exclude_From_Solo	Exclude_From_Inhibitive	Exclude_From_Grandmaster
SET_CHAN_LEVEL_DMX	Master_Only_	Master_Only
Back_	Manual_Focus_Time	Manual_Color_Time
Manual_Beam_Time	Fader Config	Display_Non_Manual_Level
Display_Non_Manual_Level_Latch	Display_Cue_Part_Num	Display_Cue_Part_Num_Latch
Display_Source	Display_Source_Latch	Display_Prev_Cue_Move

Display_Prev_Cue_Move_Latch	Display_Marked	Display_Marked_Latch
Display_Address	Display_Addresses_Latch	Display_DMX
Display_DMX_Latch	Up_Moves	Down_Moves
Live_Moves	Dark_Moves	Autoblock
Broken_Mark	Marking	From_Absolute
Exclude_From_Event_List	Display_Fader_Ribbon	Low_Priority
High_Priority	Start_Effect_Off_Zero	Display_Help_Prompts
Effect_Master	Effect_And_Levels	Start_Stop_Effect
Mark_NPs	Fire_Relay	Clear_Partitions
Levels_Only	Attrs_Only	Popup_Magic_Sheet
Popup_Nav_Lock	Silent_Mode	Staging_Mode
Max	Man_Time	Fire_Macro
Visible_To_Mobile_Apps	Cell	Global_FX
Cue_List	Manual_	Send_String_Global
Cells_Off	Cells_Only	Minus_Cells
Level_By_Address	SET_LEVEL_FROM_ADDRESS	DMX_Outputs
Default_Output_Protocol	Output_In_Client_Mode	USB_MIDI/SMPTE
Local_MIDI/SMPTE_Rx	Local_MIDI_Tx	In_Source_Id
In_Address_1	In_Address_2	In_Address_3
In_Address_4	Relay_Out_Source_Id	Relay_Out_Address
OSC_TX	MSpeed_Controls	Preheat_Preset
RFR_Record	Device_Startup_Macro	Device_Shutdown_Macro
Device_Name	Sound_Enable	Use_Shift_As_Eos_Shift
Element_Stop_1	Element_Stop_2	Element_Stop_3
Element_Stop_4	Element_Stop_5	Element_Stop_6
Element_Stop_7	Element_Stop_8	Element_Stop_9
Element_Stop_10	Element_Stop_11	Element_Stop_12
Element_Stop_13	Element_Stop_14	Element_Stop_15
Element_Stop_16	Element_Stop_17	Element_Stop_18
Element_Stop_19	Element_Stop_20	Element_Stop_21
Element_Stop_22	Element_Stop_23	Element_Stop_24
Element_Stop_25	Element_Stop_26	Element_Stop_27
Element_Stop_28	Element_Stop_29	Element_Stop_30
Element_Stop_31	Element_Stop_32	Element_Stop_33

Element_Stop_34	Element_Stop_35	Element_Stop_36
Element_Stop_37	Element_Stop_38	Element_Stop_39
Element_Stop_40	Element_Pos_1	Element_Pos_2
Element_Pos_3	Element_Pos_4	Element_Pos_5
Bounce_Channels	Console_Lockout	Position
Orientation	Save_Fixture	Cancel_Edit
Relative_FX_Draw	Relative_FX_Select	Relative_FX_Move
Relative_FX_Form	Relative_FX_Gamma	Relative_FX_Size
Relative_FX_Rotate	Relative_FX_Select_All	Relative_FX_Smooth
Relative_FX_Mirror_Horiz	Relative_FX_Mirror_Vert	Relative_FX_Subdivide
Relative_FX_Remove	Relative_FX_Undo	Relative_FX_Redo
Use_ESF_File_Format	Break_Mode	|
All_Cells	XYZ	Set_Focus_to_Wand
Focus_Wand	Virtual_Fixture_Move	OSC_TCP_Server_Ports
Beam_Angle	Gobo	System_Status_Notify_ID
Reboot	*	Invert
Group_Cells	Shutters	Metric/Imperial_Mode
Gobo_Rotate	FPE_Set	Physical_Data
Editor	Lamp_Controls	_Invert_
Meters	Feet	Feet/Inches
A3D_Edit	MIDI_Raw_Send	Network_List_Receive
A3D_Camera_View	Push_Shutter_Limit	Augment3d
CIA_Open	CIA_Close	Internal_Wing_Offset_Toggle
Clear_A3D_Model	XYZ_Format	Augment3d Model
Sync_A3D_Model	Hide_Beam	Order_From_Group
Effect_Layer_Chan	Store_Staging_Mode_ Changes	Clear_Staging_Mode
Random_Modifier	Request_A3D_Edit	Release_A3D_Edit
Variable_1	Variable_2	Variable_3
Variable_4	Variable_5	Variable_6
Variable_7	Variable_8	Variable_9
Variable_10	Variable	Display_Colors_In_D65
Background__	Random_Subgroups	Beam_Edge
Next_Target	Last_Target	Complete_Number

Encoder_Category_Intensity_Page_Down	Encoder_Category_Color_Page_Down	Encoder_Category_Shutter_Page_Down
Encoder_Category_Image_Page_Down	Encoder_Category_Form_Page_Down	Custom_Direct_Select
Open_Direct_Select_List_Blind	Custom Direct Selects	Fader_Move_Additive
Fader_Wheel_Button	Scroll_Wheel_Button	Scroll_Wheel_Mode
Icon	Load_Modifer_Button	Fader_Scroll_Button
Fader_Scroll_Wheel_Move	Blind_Next/Last_Affects_Target	Next_Channel
Last_Channel	Brightness_Preset_Recall	Brightness_Preset_Record
Extinguish	Encoder_Map	Encoder Map
Open Encoder Mapping List	Default_Encoder_Map	Default_Mini_Encoder_Map
Filter_To_Users	Map_To_Fixture	Create_From_Fixture
Missing_Fixture(s)	Recall_Faders_From_SnapShot	USB_SERIAL
Scroll_Percent_Per_Rev	Mini_Percent_Per_Rev	Minus_FX
Intensity_Cue_Only	Intensity_Cue_Only_Off	Fan_Toggle
Select_Target	Record_Effects_In_Presets	Normal_Display
Channel_Display	Control__	MIDI_Ignore_Active_Sensing
MIDI_Ignore_Beat_Clock	Backup_Processor	Force_Confirmed
Track_SEM	sACN_Priority	Per_Address_Priority
Output_Priority	Universe	Output_Protocol
Backups_Use_Higher_Priority	Start_Subnet	Broadcast_Mode
Start_Universe	Limited	Directed
Processor	Processors	Add_Processor
OSC_TCP_Mode	Packet_Length_(v1.0)	SLIP_(v1.1)
Macro_Zone_Trigger	ZoneChan	ZoneID
FDX_2000_Feedback	Override	Zones
Other	CLICK_TO_FOCUS	Fader_Wheel_Page
Fader_Wheel_Independent_Mode	Fader_Wheel_Extended_Mode	Augment3d_Flags
Fader_Wheel_Page_Mode	Alert_Time	Learn_Alert_Time
New_Template_Show	Go_Main_CueList	Stop_Back_Main_CueList
Unicast_Destinations	Use_Multicast	Use_Broadcast
Backups_Automatically_Take_Control	Ignore_Channel_Selection	Forward_
Zones	ArtPoll	Log_Message
Expansion_Processing	Lumens	Output_Universes

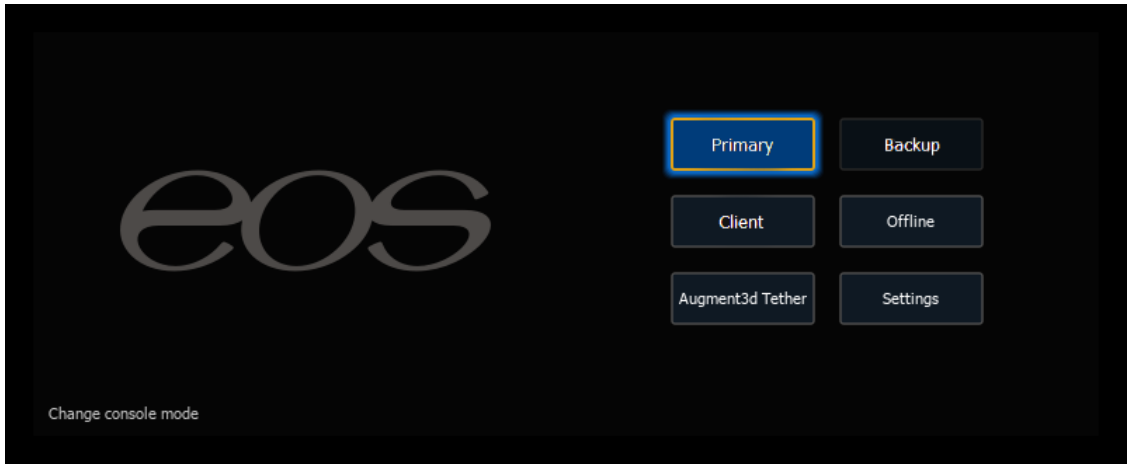
Internal_Start_Cue_Hang	Internal_Template_Show_Load_Clear	Timing_Disable_Stop
Take_Control	Wing_Group	Path
Allow_Multiconsole_Power_On	Allow_Multiconsole_Power_Off	Expansion_Processing_Hold_Last_Look
Expansion_Processing_Hold_Last_Look_Time	On_	SubOn

Chapter 23

Eos Configuration Utility (ECU)

ECU Welcome Screen 991
Settings > General 991
Settings > Network 997
Settings > Maintenance 1003
Buttons 1006
RFR 1007

ECU Welcome Screen



This is the starting screen of the ECU. From here you can choose to boot the device in one of several different *Eos Device Roles*, change various settings, or power off the console.

You can force the console to boot into the utility instead of the main console application. During the boot process, a countdown timer will appear. You will have 5 seconds to click the timer or to simultaneously hold down "E", "O" and "S" on a connected alphanumeric keyboard. Otherwise, you can exit to the ECU from the Eos application via **Browser > Exit**.

Consoles can also be assigned to always directly *Open in "Shell" E.C.U.*.

Device Role

A lone Eos Family device should generally log in as a Primary. Additional roles, which determine the device's behavior and abilities, are available for systems of multiple Eos devices.

For details on modes and their functions, see *Eos Device Roles*.

Settings

Opens the ECU Settings.

Power Off

Powers the console down following a confirmation.

Change Console Mode

This setting allows you to toggle the Eos software into Element mode, which is required for networked connections to other Element-class devices. This mode is specific to ETCnomad and is unrelated to the Eos device roles used when *Multi-Console Sessions*.

Settings > General

Device Name

This specifies the name the console will use to identify itself on the network to other devices. Examples might be Booth Desk or Tech Table.

24 Hour Clock

The time is displayed in a 24-hour format as HH:MM:SS. Disabled by default.

Time

The time the console is using. Time can be changed from the shell via *Time Service (SNTP)*. Defaults to 12 hour format. To use 24 hour format, make sure **24 Hour Clock** is enabled.

The time can also be changed manually within Eos via the *Quick Access Pop-Up Tools* tools.

Date

The date the console is using. This can be changed manually or via SNTP (Simple Network Time Protocol) time service. See *Time Service (SNTP)*.

The date is displayed as DD / MM / YYYY.

Time Zone

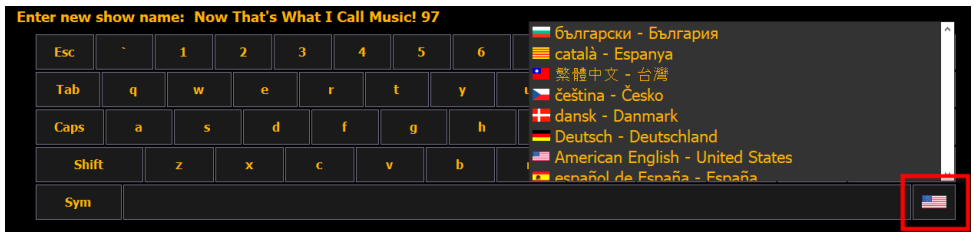
The time zone the console is using. This is an offset from Greenwich Mean Time (GMT). Each setting in the pull-down list displays the offset, the name of the time zone and a couple of cities in that time zone.

Language

Allows you to select the display language of Eos. Choices include English, Catalan, Bulgarian, German, Spanish, French, Italian, Slovak, Turkish, Japanese, Korean, Russian, Chinese - simplified, and Chinese - traditional.

Keyboard

Allows you to select the language for the alphanumeric keyboard within Eos. A wide variety of keyboards are supported.

The keyboard can also be changed in the application when the virtual keyboard is open. Click on the flag icon to see a language drop-down menu.

Press **{Sym}** to switch the keyboard from alphanumeric to symbols. When in symbol mode, press **{Abc}** to return to the alphanumeric keyboard.

Use Shift key as Eos Shift

Allows the SHIFT key on an alphanumeric keyboard to be used as the console's **[Shift]** key. The Z key on an alphanumeric keyboard will function as the **[Shift]** key.

Open in "Shell" E.C.U.

When enabled, the device will boot to the welcome screen without automatically launching the Eos application. When disabled, the console will boot into whichever of the *Eos Device Roles* it was last used in.

Automatically Update Software

Note: *Not available on ETCnomad.*

Enables devices used in *Multi-Console Sessions* to receive remote software updates from the primary. Updating the software on the primary device will also copy the software to its hard drive and disconnect any connected devices until the software installation is complete and the primary is back online. Connected devices will then be prompted to update their software before they can reconnect with the primary.

This option requires Eos v1.9 or later.

Allow Automatic Update from Older Eos Version (v2.x)

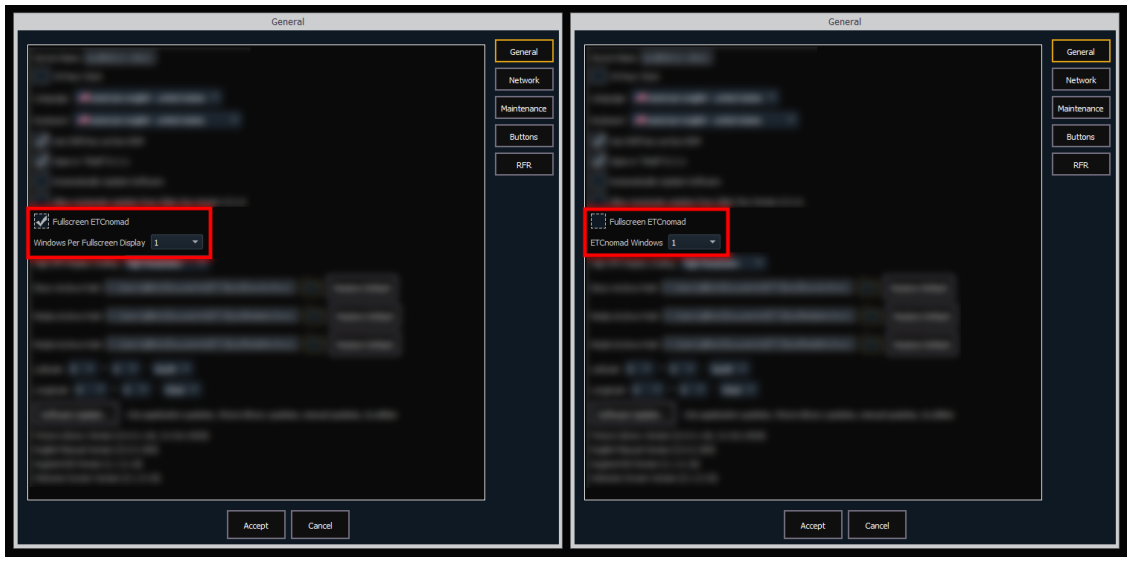
Note: *This option is not available on Windows 10 devices or ETCnomad.*

When checked, this box allows primary consoles running software v3.0 and later to update backup and client consoles running v2.x software.

Fullscreen ETCnomad

Note: *This option is only available on ETCnomad.*

When enabled, ETCnomad will automatically launch fullscreen, on all connected monitors of your computer. Select "1" in the "Windows Per Fullscreen Display" dropdown to show a single fullscreen ETCnomad display on each monitor, or "2" to subdivide each fullscreen display into 2 ETCnomad windows.



When disabled, ETCnomad will launch in a standard windowed display. The "ETCnomad Windows" dropdown allows you to choose to open up to 6 separate windows.

Show / Media / Model Archive Path

Allows you to enter the paths to the default *Save Location* for show files, media files, or Augment3d models. The full path must be typed in and specified in a legal Windows format.

If you decide to change this setting, it is recommended that you keep this location on the D: drive. The **{Restore Default}** buttons will return a changed location to the ETC default.

Share Show / Media / Model Archive

Enables you to share the show, media, or Augment3d model archive folders on the console with another console via Windows File Sharing (SMB).

Template Show

When a show file is assigned as a template, Eos will create a copy of the file in the **Templates** folder to be used as the default starting point for any new show files. A new option will appear in the CIA under **File > New From Template (***Template Show File Name***)** to create a new show file identical to the template. A blank show file can always be created with the **File > New** option.

Templates can be managed via **ECU > Settings > Maintenance >** *{File Manager...}*, and are unaffected by deep clears.

Latitude

Allows you to select the latitude the console is using.

Longitude

Allows you to select the longitude the console is using.

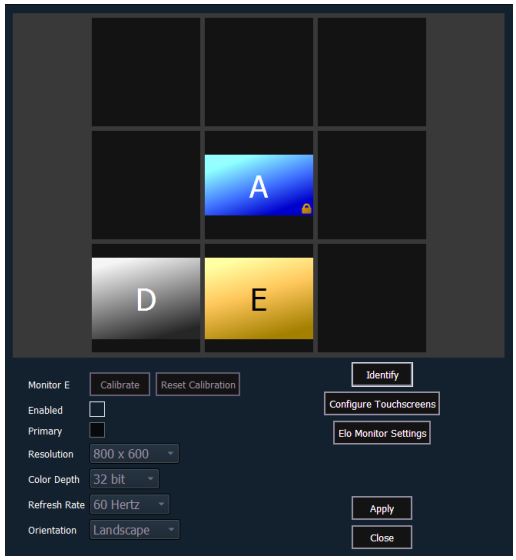
{Calibrate Elo External Touch Screen}

Note: *Before you calibrate your external touchscreens, you may need to first use the External Monitor Arrangement display. See {Monitor Arrangement...}*

Allows you to calibrate an Elo touchscreen. With the touchscreen connected, press the **{Calibrate Elo External Touchscreen}**.

The first display will have you touch some targets, and the second will have you touch various parts of the display to make sure the cursor follows your finger. If that works fine, press the green checkbox. If you need to return to the previous display, press the blue arrow button.

{Monitor Arrangement...}



The monitor arrangement tool will dictate how and where the pointer moves from one monitor to another. Generally speaking, you will want the logical placement on this screen to match your physical placement.

The selected monitor will display in yellow. External monitors can be dragged to any of the surrounding black boxes to mimic actual monitor layout. Internal monitors are locked in relationship to each other and have read-only settings that cannot be changed.

The following buttons are available in the monitor arrangement display:

- **{Calibrate}** - calibrates the selected touchscreen.
- **{Reset Calibration}** - restores default calibration data for selected display.
- **{Identify}** - displays the video ports that your monitors are connected to on the physical monitors to confirm where you have placed them.
- **{Enabled}** - When checked, the monitor is available for use. The console will display the **{Enabled}** box checked for any monitors it recognizes.
- **{Primary}** - selects which monitor will display the Eos Configuration Utility and Central Information Area (CIA). On consoles with internal monitors, the primary is locked to the right touchscreen on the console.
- **{Resolution}** - sets how many pixels the monitor will display.
- **{Color Depth}** - sets how many colors will be displayed.
- **{Refresh Rate}** - sets the number of times in a second the monitor refreshes.
- **{Orientation}** - sets the monitor layout.
- **{Apply}** - will save and use your settings. A window will open asking if you want to **{Keep Changes}** or **{Revert}** back to the defaults. **{Revert}** will be selected after 15 seconds if nothing else has been selected first.
- **{Close}** - will close the display. **{Close}** will not save any settings if **{Apply}** has not been used.
- **{Configure Touchscreens}** - is used to map the touchscreens to the displays.
- **{Elo Monitor Settings}** - opens the properties window for the monitor. See *{Calibrate Elo External Touch Screen}*.
- **{ETC Monitor Settings}** - opens the properties window for the monitor.

Monitor options may vary, and only supported options will display. The minimum recommended resolution is 1920x1080, although it is possible to assign lower resolutions.

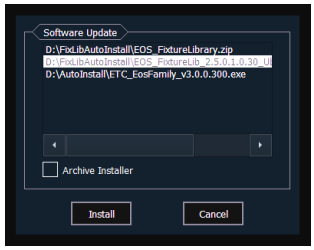
CAUTION: ***Devices without internal monitors that run Eos software (Ion Xe, Ion Xe 20, Element 2, ETC Puck, Ion Classic, and Element Classic) must have at least one external monitor connected for the Eos application to initialize.***

{Software Update}

Allows the installation of Eos Family software and other ETC-approved software (Concert, UpdaterAtor, GCE, and NCE). Updating Eos Family software does not affect or update the software in any other networked device such as a Net3 Gateway.

When you select **{Software Update...}**, the console looks at the root directory of any connected USB storage device for an Eos Family console software update file. You will be shown the names of any updater files found on the drive. Select the file you would like to install and click the **{Install}** button, or click **{Cancel}**. The software will first save to the hard drive before opening the installer.

You will also receive a message if no software update file can be found.



{Software Update...} also recognizes zipped fixture library files provided by ETC.

1. Select the desired ZIP file from the Software Update window.
2. You will be asked to confirm that you want to install the selected file. Click **{Yes}** to continue or click **{No}** or **{Cancel}** to return to the Software Update window.
3. A window will open showing the progress of extracting the ZIP file. The installer will then launch after the file has been extracted.

{Installer Archive}

Shows the available Eos software version installers currently saved on the console's local hard drive. You can save multiple software versions onto your console's hard drive in case you wish to downgrade.

While installing the software, you can archive the installer used. Check the Archive Installer box for the selected version, and it will archive while installing the software. If you would like to archive installers without installing their software, you can do that by using the *{File Manager...}* utility in **ECU >** *Settings > Maintenance*.

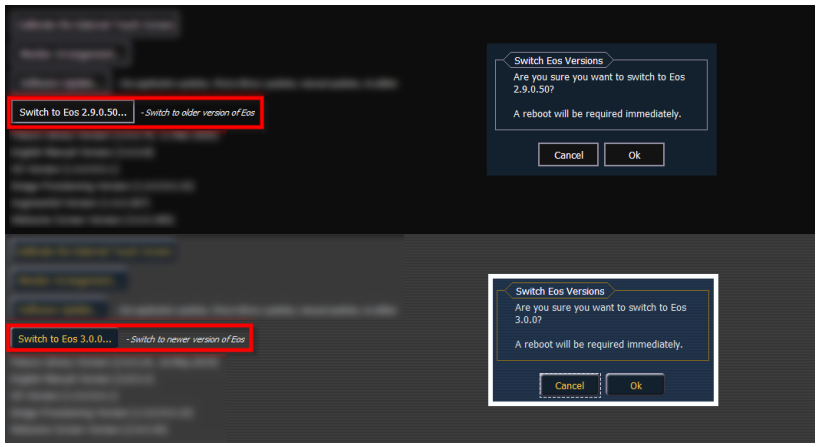
You can also retrieve these versions from the archive to save them to a USB drive by using the File Manager.

Note: *On new consoles, some versions are preselected to be archived when initially shipped from ETC. This includes the version of software that is currently installed from the factory as well as any patches to that version (if available). For future releases, you will need to download the Eos Family software from the ETC website, etcconnect.com.*

{Switch to Eos 2.9.x}

Note: *This option is not available on Windows 10 devices.*

Eos v3.0.0 introduced the ability to switch between v2.9.x and v3.0.0 and later on consoles capable of running both. If v2.9.x is already installed, installing v3.0.0 or later automatically retains the 2.9.x version of software.



Use the softkey to alternate between versions. A restart will be required before any changes can take effect.

Note: *If a console is updated to v3.0.0 or later from a version prior to v2.9.X, you will be able to revert from v3.0.0 or later to the prior version. However, you will be unable to return to v3.0.0 or later without first updating to v2.9.X.*

Version Information

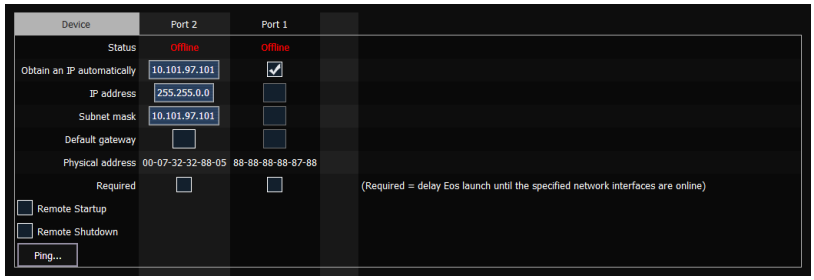
Key information about installed software and other components. {Extended Version Info...} will open a window with additional details.

Settings > Network

The Network page of ECU Settings provides options for various categories of network configuration settings.

Note: *Some settings can also be accessed from within the Eos application via **Setup > Device >**Network.*

Device



These are the settings that determine the method to get an IP address and / or the actual IP address information that Eos uses for network communication. On ETCnomad devices, these settings are determined by Windows or macOS and cannot be edited here.

Devices with more than one network interface card (NIC) should avoid connecting more than one port to the same network or subnet. Eos supports one network interface per physical network port. For more information, see *Eos Network Requirements*.

Status

A port is "online" in green if it is configured, connected to a network and operational. If any of those conditions is not true, it reports as "offline" in red.

Obtain IP Automatically

Note: *ETC recommends the use of a static IP address for compatibility with other ETC devices, though the needs of your particular installation may vary.*

When enabled, this allows the console to request an IP address from a DHCP server during startup. If one responds, it will use the assigned IP address.

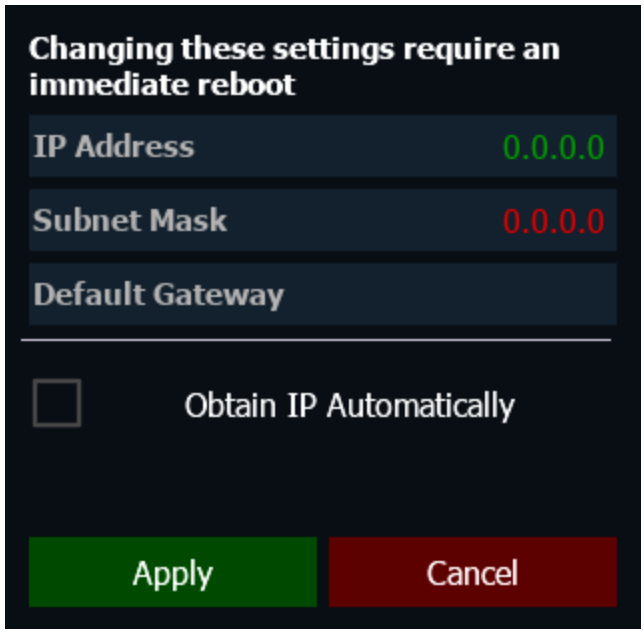
If no DHCP server is available, the console will default to a self-generated link-local IP address in the range of 169.254.X.X. The IP address used by the console in this configuration may change dynamically as needed. A change should typically only occur when there are changes to the network configuration or to resolve an IP address conflict.

Enabling or disabling this setting will require you to reboot the console for the new setting to take affect.

Note: *You cannot set the console to receive an IP address via DHCP and act as a DHCP server at the same time. It can either send dynamic addresses or receive them, but not both at the same time.*

IP Address

Allows you to assign a static IP address if **Obtain IP Automatically** is disabled. Select the field to open a pop-up allowing you to enter the address.



If **Obtain IP Automatically** is enabled, this field will display the IP address that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

For more information about IP addresses, see **Eos Network Overview > Network Protocols >** *Internet Protocol (IP)*.

Subnet Mask

Allows you to assign a static subnet mask if **Obtain IP Automatically** is disabled. The default subnet mask is 255.255.0.0.

If **Obtain IP Automatically** is enabled, this field will display the subnet mask that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

Default Gateway

Allows you to assign a static gateway IP address if **Obtain IP Automatically** is disabled.

Eos consoles controlling a Net2 system should use their IP address as the default gateway. All other consoles should default to 10.101.1.1.

If **Obtain IP Automatically** is enabled, this field will display the gateway IP address that is being used by the console (whether it is served via DHCP or a self-generated link-local IP address and subnet mask).

Physical Address

The physical address is the *Media Access Control (MAC) Address*, a unique identifier of a network port that cannot be modified.

Network Interface Delay (Required)

Note: *Not available on ETCnomad.*

When **{Required}** is enabled, the console will wait for the network connection to be fully initialized before launching the Eos application.

When enabled, a launching window will display on start-up. If a network connection is not made, you will have the option to **{Start Anyway}**, **{Start Offline}**, or to **{Cancel}**.

- **{Start Anyway}** - launches without a network interface. Only User 1 is displayed above the CIA.
- **{Start Offline}** - starts in offline mode.
- **{Cancel}** - remains in start-up without launching into the Eos application.

{Reset to Defaults}

These are the settings that determine the method to get an IP address and / or the actual IP address information that Eos uses for network communication. On ETCnomad devices, these settings are determined by Windows or macOS and cannot be edited here.

Devices with more than one network interface card (NIC) should avoid connecting more than one port to the same network or subnet. Eos supports one network interface per physical network port. For more information, see *Eos Network Requirements*.

CAUTION: ***This button will restore all network settings on the selected port to their ETC defaults. This includes factory-default IP addresses and settings.***

Remote Startup and Shutdown

Most Eos Family devices in *Multi-Console Sessions* can be remotely powered on and off from the Primary after they have synchronized at least once. **{Remote Startup}** and **{Remote Shutdown}** must be enabled before a device can receive remote power commands. Both default to disabled. Windows and macOS devices cannot be remotely powered on and off.

Remote power commands for devices in a session can be activated from the *Browser* on a Primary or Client via **Network > Power On MultiConsole System** and **Power Off MultiConsole System**.

{Ping}

Ping is used to test the network connection between two devices.

1. Click the empty box on the left, and enter the IP address of the device you want to ping.
2. Press Start. You will either see replies from the device, or "response timed out," indicating the device is not responding to the ping.

Allowed Outputs

Entering one or more ranges of allowed output addresses limits your device to only be able to output to the addresses entered. Addresses outside any of the ranges will be ignored. By default, addresses 1 through 32,767,488 are allowed.

Note: *Some settings can also be accessed from within the Eos application via* ***Setup > Device >****Network*.

MultiConsole

Enables communication on the selected port for *Multi-Console Sessions*. Enabled by default. See *Multi-Console Configuration*.

Network Type

This setting adjusts the timeout period before a backup device will take control from the primary. Defaults to **Standard**.

- **Standard Network** - After five seconds of no response from the master, the backup will assume the primary has disconnected and will then take control.
- **Engineered Network** - After 1.6 seconds of no response from the primary, the backup will assume the primary has disconnected and will then take control.

File Transfer

This setting adjusts the show file transfer speed between devices in a session. Defaults to **Fast File Transfer**. Slowing the transfer speed by selecting **Normal File Transfer** may help if you are experiencing connection issues between devices.

Sensor/FDX3000 Feedback

Allows your console to receive feedback over the network from CEM+, CEM3, or FDX3000. Enabled by default. See *[About] Address*.

Network RDM

Enables RDM functionality on all Ethernet ports, including device discovery. Enabled by default.

RDM requires use of a Net3 or Response Gateway. Net3 Gateways must be using version 5.1 or higher.

DHCP Service

Dynamic Host Configuration Protocol (DHCP) service supplies IP addresses to network devices. Only one Eos device (typically the primary) on the network is necessary to do this properly. Therefore you should disable the DHCP server on all Eos devices other than the intended primary.

CAUTION: ***Enabling or disabling DHCP services requires rebooting your console.***

If this section is grayed out and you are unable to change any settings, you may need to install Net3 Services on your console. Net3 Services are installed with ETC's Gateway Configuration Editor (GCE) software, available for download from etcconnect.com.

Enable

Enables the Eos DHCP address server. DHCP is a TCP/IP protocol that dynamically assigns an IP address to a network device when it requests one.

The Eos DHCP server is intended to be used on non-routed networks and will not serve IP addresses across a router.

CAUTION: ***While there should only be a single DHCP server active on a network, it is still possible to start more than one DHCP server at a time. This can lead to unstable conditions and network communications issues.***

The Eos DHCP server then uses the following settings to determine which IP addresses it gives out.

First IP Address

This sets the starting IP address of the range of IP addresses the DHCP server will give out.

Number of Addresses

This sets how many IP addresses the DHCP server will give out. A setting of 500 means it will give out IP addresses to the first 500 devices that ask for an IP address.

Subnet Mask

This sets the logical network size vs. the device address. ETC's default is 255.255.000.000 (class B). This is the subnet mask that the DHCP server will give to network devices.

Routed

If checked, you can use the default gateway box, below, to specify the gateway you would like DHCP devices to use. If unchecked, the DHCP server will serve the same value for both the devices IP address and gateway, which is a suitable configuration for non-routed networks.

Default Gateway

This specifies the IP address of a router if one is present on your network. This is the gateway IP address that the DHCP server will send to network devices to use. If you are on a flat or non-routed network, the Gateway IP address should match the IP address of the device. In order to configure this DHCP server to send out matching gateway IP addresses, configure this gateway IP address to match the IP Address field. Then the DHCP server will give out a gateway IP address that matches the IP address.

Learn Network Devices

Clicking this button will trigger the DHCP service to search the network for existing devices, and add them to its table of known addresses. If you have equipment with statically assigned IP addresses in your network, this will ensure the DHCP service does not serve out any IP addresses which conflict with those devices.

Time Service (SNTP)

Note: *Not available on ETCnomad.*

Enable

Enables the Simple Network Time Protocol (SNTP) service. Disabled by default. When enabled, the following additional settings are available.

Mode

When configured as a client, a console will attempt to synchronize its time with the rest of the devices in the system, by listening for time information and altering its own clock. When configured as a server, a console will serve out time to other devices on the network.

ETC Net2 Time

When enabled, the time server will periodically broadcast (as a server) or receive (as a client) the current time. This is required by devices using the ETCNet2 protocol, such as Legacy Unison systems.

External Time Server

Allows you to synchronize your console to a third party time system at a specific IP address using the NTP or SNTP protocols. This allows use of a specific time clock for time sync. This requires a high accuracy time clock on your network.

External Server IP

When enabled, you will need to specify the IP address of your external NTP or SNTP time server in this field.

Legacy Settings

The settings in this section are only used when loading show files saved prior to Eos v3.2.0. When an older showfile is loaded, Eos will use these settings to set up sACN, Art-Net, and Local DMX patch protocols.

Output Protocols

See *Patch > Protocols*.

Settings > Maintenance

{Deep Clear...}

Clears unsaved console data and temporary files. A deep clear is automatically performed when new software is installed. Sometimes it is useful to perform a deep clear between updates.

The advantage of deep clear is that you can clear all console data before reloading the console's current state during start-up. This is helpful if you are moving a new console onto the network and don't want it to suddenly take control of a system or if you somehow end up with a corrupt show file that is causing issues upon start-up.

Deep clear does not reset any ECU settings.

{Reclaim Disk Space...}

Removes extraneous files such as temp files, logs, and diagnostics to free up disk space.

{Save Logs...}

Displays a dialog box prompting you to save the console log files for troubleshooting purposes.

By clicking on the **{Advanced}** button, you can select or deselect any of the various individual log files to be saved.

Clicking **{Next}** you will be able to provide additional information, the date, and time of the issue.

Clicking **{Next}** again you will see a drop down menu to select the target export location from any available write-enabled removable media such as a USB drive.

If you experience software problems with your system that cannot be reproduced, sending these log files for *Help from ETC Technical Services* can assist in isolating the issue.

{Backup Show Archive...}

Allows you to either backup the most current version of each show file or every version of each file to a USB drive.

{Restore Show Archive...}

Allows you to restore show files from a USB drive.

{Backup System Settings...}

Allows you to backup all ECU settings, including Net3 services. **{Backup System Settings...}** will open a window that allows you to save an .ini file to a selected drive. To backup settings, select a drive from the drop down menu, and press **{Accept}** to save or **{Cancel}** to exit without saving.

{Restore System Settings...}

Open a window that allows you to select a saved.ini file. Select the desired file and press **{Ok}** to restore settings. Press **{Cancel}** to close the window without restore settings.

{Face Panel Test...}

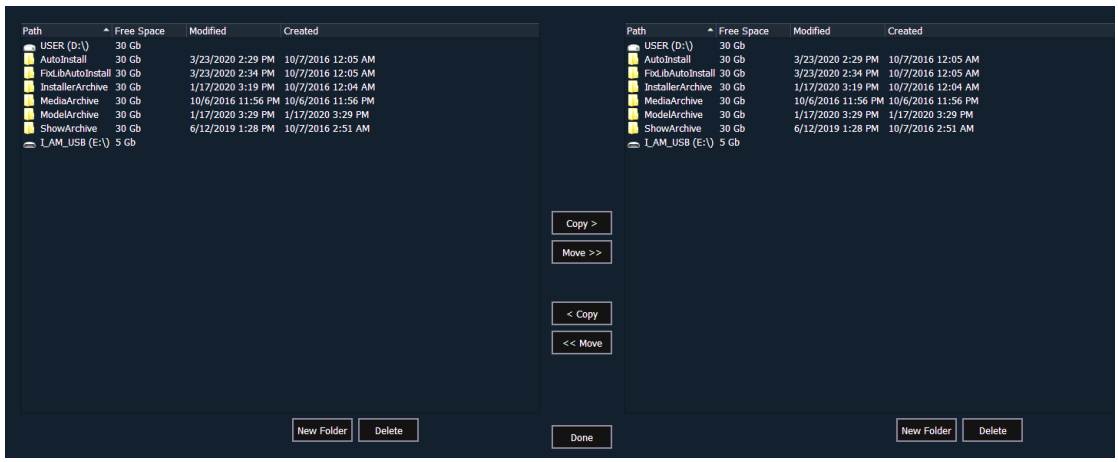
Provides a way to verify the functional state of all of the keys, encoders, and faders on the console. Press/ move every key, encoder, and fader to verify that those events register on the diagnostic test screen.

{Classic Peripheral Test...}

Allows you to test peripherals such as fader wings.

{File Manager...}

Provides a way to manage show files, show data, and software installers. You can create and delete new folders, move, and copy files between the console and USB drives.



The file manager display will show the ShowArchive folder on your console as well as any external USB drives that are detected. The display is split into two windows, so you can see two different folders at the same time for copying or moving data between them.

Template Show Files are stored in a separate Templates folder rather than ShowArchive.

{Gateway Configuration Editor (GCE)...}

Note: *This option is not available on Windows 10 devices.*

Launches the GCE software. This softkey will only display if the software is installed on your console.

{Concert...}

Launches the Concert software. This softkey will only display if the software is installed on your console.

{UpdaterAtor...}

Launches the UpdaterAtor software. This softkey will only display if the software is installed on your console.

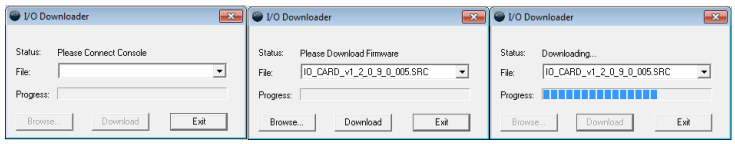
{Touch Screen Test...}

Opens an application for testing your touchscreens.

{Upgrade Console...}

This softkey is used for upgrading the console's outputs.

{Upgrade I/O Firmware...}

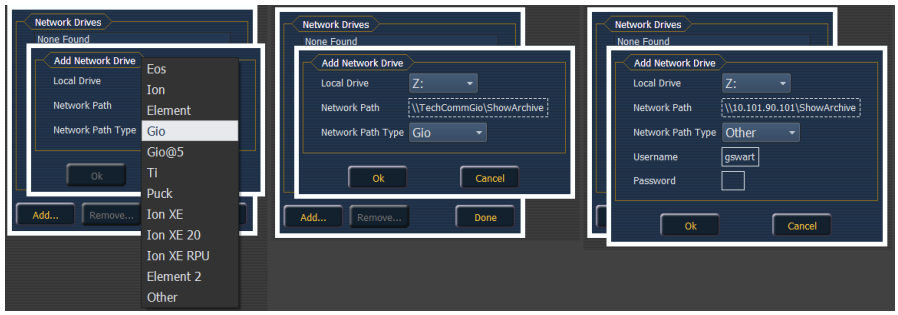


Upgrades the firmware for single-port Gadgets and consoles with I/O cards that have a phone remote connection. All other devices can use the **Firmware Update** window below.

When you first open the I/O Downloader, it will look for the connected console. This may take several seconds. Once the console is found, the downloader will search for the needed files. If it finds the file, it will list it and you can click **{Download}**. If it doesn't find the file, you can use **{Browse}** to look for the needed file and selected it. Once finished, click **{Exit}**.

{Network Drives...}

Allows you to select an alternative show file storage location on another console or computer. After setting this location, it will appear as an option within the save and open dialogs in Eos.



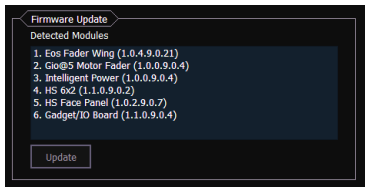
In the **{Network Drives...}** dialog box, there is a **{Add}** button for mapping a network drive. In the Add Network Drive dialog box, select the drive letter that is appropriate, the network path, and the path type. The network path can use either the IP Address or the Device Name. (Example: \\10.101.90.101\ShowArchive or \\YourDeviceName\ShowArchive) The network path type should match the device. If Other is selected, you will have additional fields to fill out for Username and Password.

{Shared Folders...}

Allows you to see if any folders are currently being shared by the console. You can select the folder and click **{Don't Share}** if you no longer want to share the folder. By selecting **{Don't Share}** here, you will also uncheck the box for sharing the show file archive in **ECU > Settings > General >** *Share Show / Media / Model Archive*.

Firmware Update

The firmware update window will display any detected devices that use firmware and may require an update. Devices that need to be updated will display in red.



When a device is selected, the **{Update}** button will display in yellow if the device can be updated using this window. This includes devices that do not currently need to be updated. If the button is grayed out, the device can not be updated using this window.

Note: *Windows 7 consoles must be power-cycled after a firmware update. This is not necessary for consoles running Windows 10.*

Buttons

RPU Face Panel Buttons

This area is for configuring the buttons on the front of a RPU or RVI. Clicking on a button will open a dialog window for selecting what type of button, macro, hardkey, or none, you wish to assign.

If hardkey is selected, a list of the various hardkeys on your console will be available to select from. If macro is selected, a macro number can be entered. Selecting none will assign no action to the selected button.

{Import} allows you to import a RPU/RVI button configuration file. **{Export}** allows you to export a RPU or RVI button configuration file. **{Restore Defaults}** will restore the factory defaults for the RPU or RVI buttons.

Face Panel Buttons

This area is for configuring the customizable hardkeys on the Eos Ti, Gio, and Gio @ 5 face panels.

Clicking on a button will open a dialog window for selecting what type of button, macro, hardkey, or none, you wish to assign.

If hardkey is selected, a list of the various hardkeys on your console will be available to select from. If macro is selected, a macro number can be entered. Selecting none will assign no action to the selected button.

{Import} allows you to import a button configuration file. **{Export}** allows you to export a button configuration file. **{Restore Defaults}** will restore the factory defaults for the buttons

RFR

This screen is used for setting up the Net3 Radio Focus Remote (RFR) to work with Eos.

Note: *These settings need to match between the console and the RFR.*

High Frequency Channel

The frequency that the RFR is using. There are 1-12 channels.

Network ID

The Network ID is a separate digital channel on a single high frequency (HF) setting. There are 1-99 IDs available.

Appendix

Copyright and Regulatory 1009

Copyright and Regulatory

Art-Net™ Designed by and Copyright Artistic Licence

Apex 5, 10, and 20, Apex Remote Processor, Eos Remote Interface, and Windows 10-based Ion Xe, Ion Xe20, Ion Xe RPU, Gio@5, and Element 2

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Contains Model: 9260NGW

Contains FCC TX ID: PD99260NG

Canada IC:1000M-9260NG

Japan

RF:003-170125

TEL:D170079003

South Korea

MSIP-CRM-INT-9260NGW

WARNING: This device contains a lithium battery. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

CAUTION: ***Power cord must be connected using an earth ground connection.***

A fuse is included for additional protection. Fuse ratings can be found on the rear panel of your console.

CAUTION: ***For continued protection against risk of fire, replace only with same type and rating of fuse.***

VORSICHT: ***Um weiterhin gegen Brandrisiko geschützt zu sein, ersetzen Sie die Sicherung nur mit einer Sicherung gleichen Typs und den gleichen Nennwerten.***

ATTENTION: ***Pour ne pas compromettre la protection contre les risques d'incendie, remplacer par un fusible de même type et de mêmes caractéristiques nominales.***

ETCnomad Puck

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Contains Model: AX200NGW

Contains FCC TX ID: PD9AX200NG

Canada IC:1000M- AX200NG

Japan

RF:003-190022

TEL:D190021003

South Korea

R-C-INT-AX200NGW

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4250M1210-3.3.6 Rev A Released 2026-03