F-Drive RX
Installation Manual

Part Number: 7148M2150 Rev: B

Released: 2025-09

Table of Contents

Introduction

The F-Drive RX LED driver solution provides a modular, centralized approach for controlling LED luminaires. The F-Drive RX is an enclosure that holds up to 10 low-voltage output cards, providing power and data to multiple circuits per card. By maintaining remote, easy access to the output cards and power supplies, LED-based systems can be easily installed and serviced, while ensuring critical components are readily accessible to support staff.

Document Conventions

This document uses the following conventions to draw your attention to important information.

Note: *Notes are helpful hints and information that is supplemental to the main text.*

CAUTION: ***A Caution statement indicates situations where there may be unwanted consequences of an action, potential for data loss or an equipment problem.***

WARNING: A Warning statement indicates situations where damage may occur, people may be harmed, or there are serious or dangerous consequences of an action.

WARNING: RISK OF ELECTRIC SHOCK! This warning statement indicates situations where there is a risk of electric shock.

All ETC documents are available for free download from the ETC website (etcconnect.com).

Email the Tech Comm team (TechComm@etcconnect.com) with comments about this manual.

Help from ETC Technical Services

If you have questions that are not answered by this document, try the ETC support website (support.etcconnect.com) or the ETC website (etcconnect.com). If none of these resources are sufficient, contact the ETC office nearest you (etcconnect.com/contactETC). Emergency technical support 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.

Safety

The F-Drive RX is intended for professional use only. **Read the entire manual before using this equipment.**

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Do not use outdoors.
- Do not let power supply cords touch hot surfaces.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than intended use.
- To reduce the risk of fire and overheating, make sure all connections are tight.

SAVE THESE INSTRUCTIONS

Note: *See NFPA 70 2020 National Electrical Code table 725.144 for cable bundling limitations that apply to all F-Drive RX Class 2 output cables, such as the maximum number of four-pair cables in a bundle. For more information, see the* F-Drive RX Wiring Reference Guide.

Dry locations only. Pour emplacements secs seulement.

Do not connect two or more F-Drive Power Supplies (FD-RX-RPSU-56/2800 or FD-RX-RPSU-56/1800) in parallel.

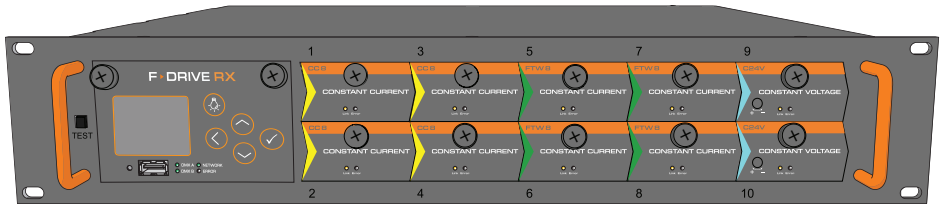
NOT SUITABLE FOR USE IN DAMP OR WET LOCATIONS.

DO NOT INSTALL OUTPUT CONDUCTORS LONGER THAN 100 m.

Certified to CSA C22.2 No. 141, Emergency lighting equipment. Appareil d'éclairage de secours.

Chapter 1

Overview



F-Drive RX Enclosure

Features

- Local configuration via full-color user interface.
- Front-mount USB 2.0 port for easy configuration management.
- Hot-swappable output cards.
- RJ45 output connectors.
- Dual RJ45 to terminal adapters (C24V Card only) for constant-voltage loads and higher gauge/existing 1–2.5 mm^2 (18–12 AWG) wire.
- Powered by 56 VDC input from an external power supply.
- Up to 2800 W output.
- Power with individual control.
  - Up to 80 channels of constant current control.
  - Up to 40 channels of constant voltage control.
- Dual DMX512 control inputs.
- Network port for sACN.
- Emergency input for remote triggering of output channels.
- Each output can be configured to be included or excluded from the emergency configuration.
- 24 VDC pass-through for connection to downstream sense equipment.
- Compatible with S-Box for extended support of Navis 50 White and Fade to Warm luminaires and low-voltage luminaires by other manufacturers.
- Compatible with B-Box for wiring loads in star topology.

Overview of a Non-Emergency System

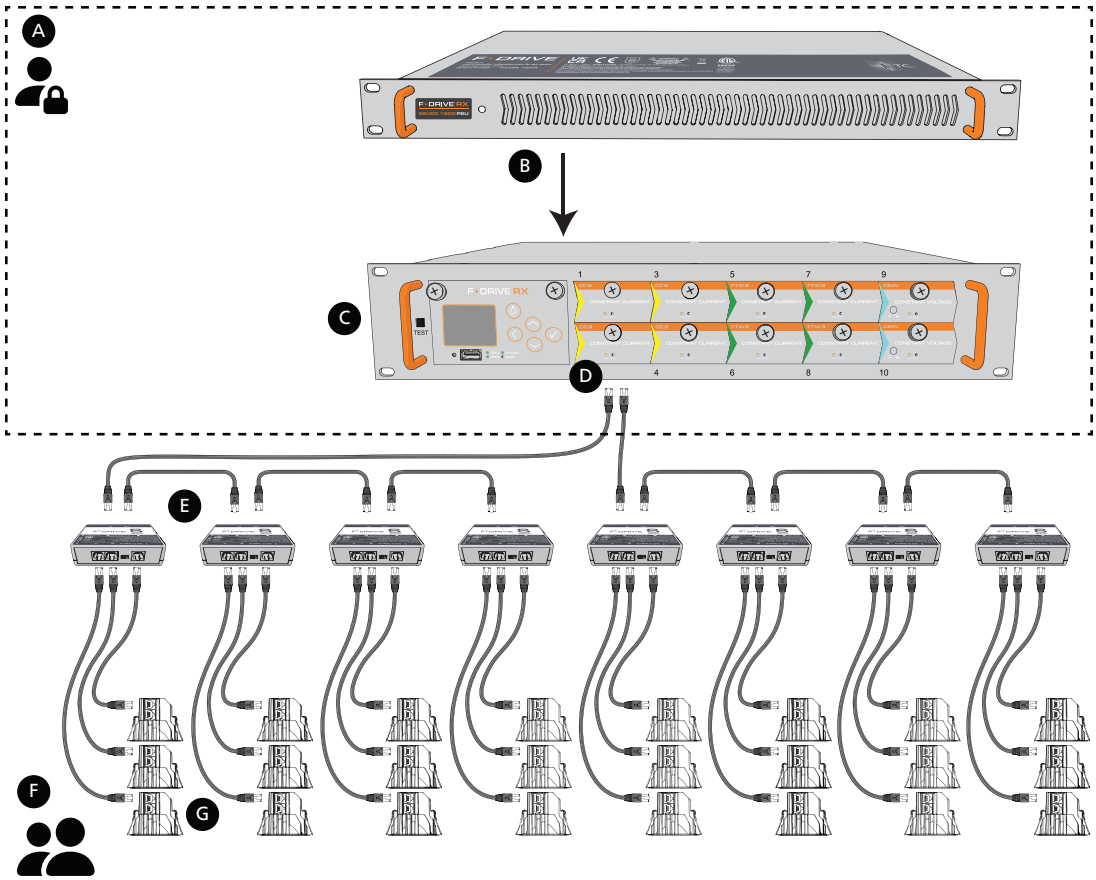


Figure 1. F-Drive RX, see Table 1 below for descriptions of each labeled item.

A	Serviceable area
B	56 VDC power from • F-Drive RX Power Supply (shown) or • FD-RX-PSU-MW-FRAME four-bay frame with FD-RX-PSU-MW-56/3200 power supply modules (not shown)
C	F-Drive RX
D	Output card slot 2. This example shows a CC 8 Card.
E	Eight FD-SBOX-R (optional, not compatible with C24V Card)
F	Public space
G	Luminaires or loads. In this example there are 24 Navis 50 luminaires, three per channel (requires FD-SBOX-R).
Note: The illustration is not drawn to scale. For clarity, the illustration only shows loads connected to one of the ten output cards (output card slot 2).	

Table 1. Descriptions of the labeled items in Figure 1

The illustration above is an example of a non-emergency installation. See *Figure 2 on page 16* for an illustrated example of an emergency system.

System Components

A non-emergency F-Drive RX system consists of the following:

- One or more F-Drive RX drivers (*Figure 1*, *C* on *page 8*).
- One 56 VDC external power supply per F-Drive RX driver:
  a. F-Drive RX Power Supply, (*Figure 1*, *B* on *page 8*). See *Documentation for Compatible ETC Products on page 48*.
  b. FD-RX-PSU-MW-FRAME four-bay frame and FD-RX-PSU-MW-56/3200 power supply modules (not shown in *Figure 1 on page 8*). Each four-bay frame houses up to four power supply modules to power up to four F-Drive RX drivers. See *Install MEAN WELL 56 VDC Power Supplies on page 49*.
- Up to ten F-Drive RX output cards for each F-Drive RX enclosure. An eight-channel CC 8 Card is shown as an example in *Figure 1*, *D* on *page 8*.
- Compatible luminaires or loads, see *Compatible ETC Luminaires on page 10*.

Accessories

- B-Boxes (optional, not shown in Figure 1):
  - See *Use FD-BBOX-4T to Connect Lighting by Other Manufacturers on page 33*.
  - See *Use FD-BBOX-4R to Connect F-Drive-Compatible White or Fade to Warm Luminaires on page 34*.
  - See *Use FD-BBOX-4M to Connect ArcSystem Pro One-Cell Luminaires on page 35*.
- S-Boxes (optional, shown in Figure 1):
  - See *Use FD-SBOX-T to Connect Lighting by Other Manufacturers on page 33*.
  - See *Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires on page 35*.
- F-Drive safety kit (not shown in Figure 1): required for use with FD-RX-PSU-MW-FRAME four-bay frames. See *Safety Kits on page 54*.

Compatibility with Loads from Other Manufacturers

The F-Drive RX supports a wide variety of constant-current and constant-voltage loads. Determining compatibility between these loads and the F-Drive RX is an important step toward ensuring the success of a project.

Full specifications are available in the datasheet at the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation).

- C24V Card: 24 VDC constant voltage loads, up to 65 W per channel, 240 W total per output card. See *C24V Card on page 11* for more information.
- CC 8 Card: 200–700 mA constant current loads, up to 32.5 W per channel, 240 W total per output card. See *CC 8 Card on page 12* for more information.
- See *Connecting to Loads by Other Manufacturers on page 31*.

Search the LED Dimming Compatibility Database (etcconnect.com/compatibility) to see if your load is compatible. If your load is not in the compatibility database, follow the instructions at the link above to contact the ETC Applications Engineering department to arrange for compatibility testing.

Compatible ETC Luminaires

Luminaires That Are Compatible with the CC 8 Card

See *Documentation for Compatible ETC Products on page 48* for luminaire installation instructions.

- ArcSystem Navis 50 White
- ArcSystem Navis 100 White
- Source Four Mini LED for F-Drive and Source Four Mini LED Plus for F-Drive
- Irideon FPZ for F-Drive and Irideon FPZ Plus for F-Drive
- Irideon WLZ for F-Drive and Irideon WLZ Plus for F-Drive
- ArcSystem Pro One-Cell Standard White or Fade to Warm using FD-BBOX-4M
- ArcSystem Pro One-Cell Small White or Fade to Warm using FD-BBOX-4M
- ArcSystem Pro One-Cell Micro White using FD-BBOX-4M

Note: *The CC 8 Card cannot provide enough current to power ArcSystem Pro One-Cell* ***High Output*** *luminaires at their maximum capability.*

Note: *Due to performance differences, ETC recommends that you do not mix Navis 100 Fade to Warm and Navis 50 Fade to Warm luminaires in the same wiring run.*

Luminaires That Are Compatible with the FTW 8 Card

See *Documentation for Compatible ETC Products on page 48* for luminaire installation instructions.

- ArcSystem Navis 50 Fade to Warm
- ArcSystem Navis 100 Fade to Warm

Output Cards

F-Drive RX output cards are available for a variety of low-voltage load types. Output cards are sold separately.

CAUTION: ***Do not coil excess Category-type cable.***

Note: *F-Drive RX output cards are not compatible with the F-Drive R12. F-Drive R12 output cards are not compatible with F-Drive RX.*

Note: *F-Drive RX supports output cards and luminaires up to 2800 W total.*

C24V Card

The C24V Card is designed for use with 24 VDC constant-voltage loads.

The front face of a C24V Card

Output: Adjustable 24–27 VDC (+/-5%) constant voltage (see *Adjust the Output of the C24V Card on page 41*).

Output Channels: Channels 1–4 on the provided F-Drive RX RJ45/Terminal 4 - CV Adapter. See *Dual RJ45 to Terminal Adapter on page 11*.

Loads: 24 VDC loads

Maximum Load: 65 W per channel, 240 W total per output card

Model Number: FD-RX-OC-C24V

Part Number: 7148K1033

Label Chevron Color: Light blue

Dual RJ45 to Terminal Adapter

Each C24V Card kit ships with a F-Drive RX RJ45/Terminal 4 - CV Adapter (ETC part number 7148K1035) that accepts 1–2.5 mm^2 (18–12 AWG) wires.

CAUTION: ***Possible damage to equipment. Failure to tighten the two screws that secure the F-Drive RX RJ45/Terminal 4 - CV Adapter to the backplane of the F-Drive RX may lead to intermittent connection between the load and the F-Drive RX.***

See *Install the F-Drive RX RJ45/Terminal 4 - CV Adapter on page 32*.

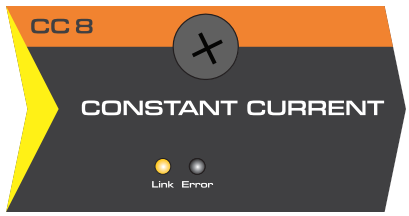
Load Capacity

CAUTION: ***Do not exceed any Class 2 limits stated by the manufacturer of the load.***

See *Connecting to Loads by Other Manufacturers on page 31*.

CC 8 Card

The CC 8 Card is designed for use with 200–700 mA constant current loads, including Navis White luminaires and most ArcSystem Pro One-Cell White luminaires.



The front face of a CC 8 Card

Output: Adjustable 200–700 mA constant current per channel. The default output is 200 mA (see *Configure the CC 8 Card on page 41*).

Output Channels:

- Channels 1–4 on RJ45 output A
- Channels 5–8 on RJ45 output B

Loads:

- 200–700 mA constant current loads
- See *Luminaires That Are Compatible with the CC 8 Card on page 10*.

Maximum Load: 32.5 W per channel, 240 W total per output card

Model Number: FD-RX-OC-CC8

Part Number: 7148K1031

Label Chevron Color: Yellow, matches Navis White luminaire face and cap labeling

Note: *The CC 8 Card cannot provide enough current to power ArcSystem Pro One-Cell* ***High Output*** *luminaires at their maximum capability.*

Load Capacity of the CC 8 Card

CAUTION: ***Setting the F-Drive CC 8 Card to output more current than the manufacturer recommends for the loads may reduce the lifetime or cause damage to the loads. See Configure the CC 8 Card on page 41.***

CAUTION: ***Do not exceed any Class 2 limits stated by the manufacturer of the load.***

See *Connecting to Loads by Other Manufacturers on page 31*.

Connect 24 Luminaires with FD-SBOX-R

The CC 8 Card can support up to 24 Navis 50 White luminaires using two daisy chains of four FD-SBOX-R with three luminaires connected to each FD-SBOX-R, illustrated in *Figure 1 on page 8*. See *Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires on page 35*.

Connect 8 Luminaires in 2 Daisy Chains

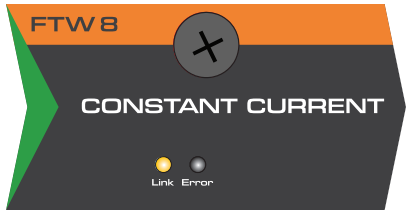
The CC 8 Card can support up to eight of all luminaires listed at *Luminaires That Are Compatible with the CC 8 Card on page 10*, in two daisy chains of four, directly connected to the two RJ45 outputs of the CC 8 Card.

Connect 8 Luminaires in Star Topology

The CC 8 Card can support up to eight of all luminaires listed at *Luminaires That Are Compatible with the CC 8 Card on page 10* in two groups of four connected in star topology through a FD-BBOX-4R. See *Connect F-Drive-Compatible Luminaires in a Daisy Chain on page 34*.

FTW 8 Card

The FTW 8 Card is designed for use with Navis Fade to Warm luminaires.



The front face of a FTW 8 Card

Output: Constant current configurable to Navis 100 FTW (450 mA) or Navis 50 FTW (700 mA) per channel. The default configuration is for Navis 100 FTW. See *Configure the FTW 8 Card on page 42*.

Output Channels:

- Channels 1–4 on RJ45 output A
- Channels 5–8 on RJ45 output B

Loads: See *Luminaires That Are Compatible with the FTW 8 Card on page 10*.

Maximum Load: 32.5 W per channel, 240 W total per output card

Model Number: FD-RX-OC-FTW8

Part Number: 7148K1030

Label Chevron Color: Green, matches Navis Fade to Warm luminaire face and cap labeling

Luminaire Capacity of the FTW 8 Card

Note: *Fade to Warm performance may vary between Navis 50 Fade to Warm luminaires connected directly to an FTW 8 Card and Navis 50 Fade to Warm luminaires connected through S-Boxes. Plan your installation with all Navis 50 Fade to Warm luminaires directly connected to an FTW 8 Card or all Navis 50 Fade to Warm luminaires connected through S-Boxes for best performance.*

Connect 24 Luminaires with FD-SBOX-R

The FTW 8 Card can support up to 24 Navis 50 Fade to Warm luminaires in two daisy chains of four FD-SBOX-R with three luminaires connected to each FD-SBOX-R, similar to *Figure 1 on page 8*. See *Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires on page 35*.

Connect 8 Luminaires in 2 Daisy Chains

The FTW 8 Card can support up to eight of all luminaires listed at *Luminaires That Are Compatible with the FTW 8 Card on page 10* in two daisy chains of four directly connected to the two RJ45 outputs of the FTW 8 Card.

Connect 8 Luminaires in Star Topology

The FTW 8 Card can support up to eight of all luminaires listed at *Luminaires That Are Compatible with the FTW 8 Card on page 10* in two groups of four connected in star topology through a FD-BBOX-4R. See *Connect F-Drive-Compatible Luminaires in a Daisy Chain on page 34*.

Chapter 2

Overview of an Emergency System

The F-Drive RX is UL924 Listed.

Install the F-Drive RX in a location that is accessible by qualified personnel for testing of the emergency operation.

Note: *Installation must follow all national and local codes for electrical equipment.*

Note: *Normal and emergency wiring cannot be contained in the same conduit according to NEC 700.10(B). See* *Identify, Separate, and Protect Emergency Circuits on page 19*.

Required Double Conversion UPS

An emergency system containing an F-Drive RX requires a 3000 W double-conversion uninterruptible power supply (UPS). The maximum transition time from when the emergency state is activated to when the outputs are at emergency levels is 1000 ms.

F-Drive RX Power Supplies or FD-RX-PSU-MW-FRAME four-bay frames with FD-RX-PSU-MW-56/3200 power supply modules may be used in emergency systems as long as they are supplied by a double-conversion UPS.

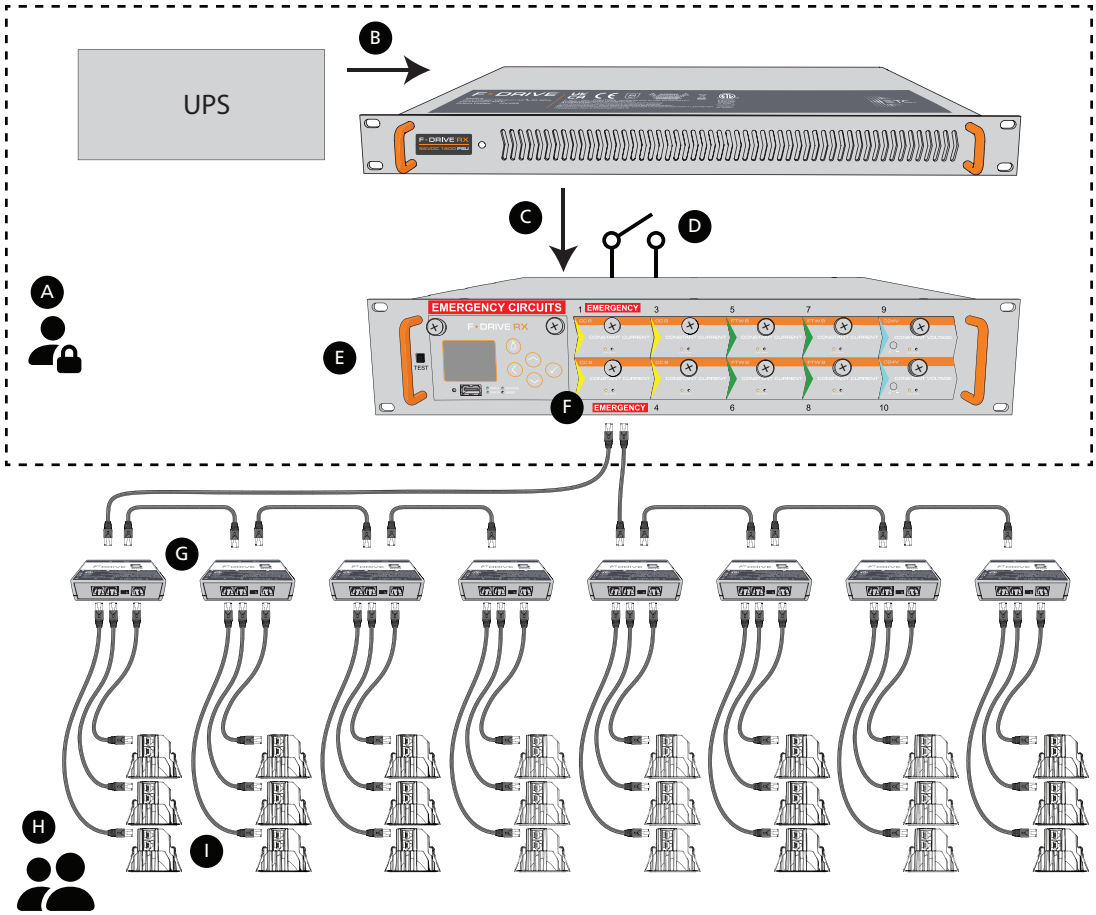


Figure 2. F-Drive RX in an emergency system. See Table 2 below for item descriptions.

A	Serviceable area
B	Double-conversion uninterruptible power supply (UPS)
C	56 VDC power from an F-Drive RX Power Supply (shown) or FD-RX-PSU-MW-FRAME with FD-RX-PSU-MW-56/3200 power supply modules (not shown)
D	Maintained contact closure (wet or dry, normally open or normally closed, see *Emergency Connector on page 17*)
E	F-Drive RX
F	An output card slot with an "EMERGENCY" label on the enclosure near the output card (front and back). This illustration shows a CC 8 Card. **The output card can be connected to any directly controlled luminaires (DCLs).**
G	Eight FD-SBOX-R (optional, not compatible with C24V Card)
H	Public space
I	24 Navis 50 luminaires, three per channel (requires FD-SBOX-R).
Note: The illustration is not drawn to scale. Loads are only illustrated connected to one of the ten output cards for clarity.	

Table 2. Descriptions of the labeled items in Figure 2

System Components

An F-Drive RX emergency system consists of the following:

- An upstream double-conversion uninterruptible power supply (UPS) (*Figure 2*, *B* on *page 16*).
- One 56 VDC external power supply per F-Drive RX driver:
  - F-Drive RX Power Supply (*Figure 2*, *C* on *page 16*).
  - FD-RX-PSU-MW-FRAME four-bay frame and FD-RX-PSU-MW-56/3200 power supply modules (not shown in *Figure 2*). Each four-bay frame houses up to four power supply modules to power up to four F-Drive RX drivers.
- A device to provide a maintained, wet or dry, normally-open or normally-closed contact closure input to the F-Drive RX emergency input (*Figure 2*, *D* on *page 16*).
- One or more F-Drive RX enclosures (*Figure 2*, *E* on *page 16*).
- At least one F-Drive RX output card for each F-Drive RX enclosure. A CC 8 Card is shown as an example in *Figure 2*, *F* on *page 16*.
- Directly controlled luminaires (DCLs) for all output cards containing emergency circuits (see *Compatible ETC Luminaires on page 10*). *Figure 2*, *I* on *page 16* shows 24 Navis 50 luminaires connected to a single CC 8 Card through eight FD-SBOX-R (*Figure 2*, *G* on *page 16*).

Accessories

- B-Boxes (optional, not shown in Figure 2):
  - See *Use FD-BBOX-4T to Connect Lighting by Other Manufacturers on page 33*.
  - See *Use FD-BBOX-4R to Connect F-Drive-Compatible White or Fade to Warm Luminaires on page 34*.
  - See *Use FD-BBOX-4M to Connect ArcSystem Pro One-Cell Luminaires on page 35*.
- S-Boxes (optional, shown in Figure 2):
  - See *Use FD-SBOX-T to Connect Lighting by Other Manufacturers on page 33*.
  - See *Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires on page 35*.
- F-Drive safety kit (not shown in Figure 2): required for use with FD-RX-PSU-MW-FRAME four-bay frames. See *Safety Kits on page 54*.

Emergency Connector

The F-Drive RX supports emergency lighting control bypass in the following ways:

- F-Drive RX accepts input from a maintained contact closure. Two contact closure types are compatible:
  - A dry contact closure powered by the F-Drive RX 24 VDC emergency output.
  - An externally-powered (wet) +24 VDC contact closure (+/- 5% tolerance).
- F-Drive RX can be configured for normally-open or normally-closed operation.

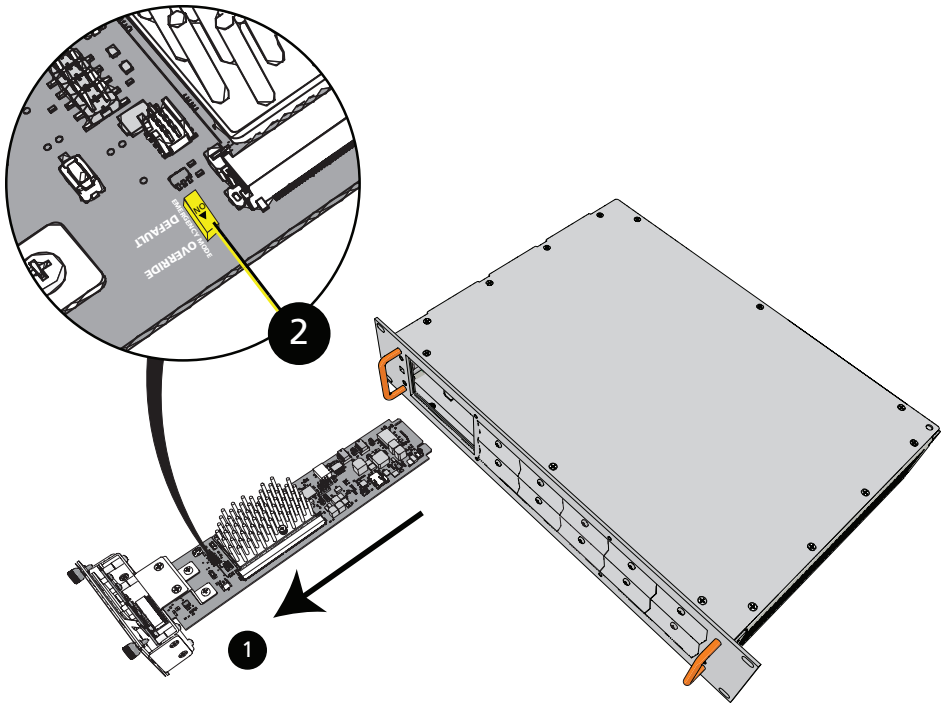
For more information, see *Wire the Emergency Connector on page 27*.

Advanced Control Card Emergency Mode Switch

There is an emergency mode switch located on the Advanced Control Card, visible when you remove the Advanced Control Card from the enclosure.

The position of the emergency mode switch affects what happens when a contact input triggers the active emergency state and what happens when you push and hold the test button:

- "DEFAULT":
  - All configured **Emergency Outputs** are driven to their configured **Emergency Levels**. See **Rack Setup** > **Emergency Setup** in the *F-Drive RX Configuration Manual*.
  - All outputs that are configured as **--** (Off) in **Emergency Outputs** will turn off if **Load Shedding** is **On** or will continue normal operation if **Load Shedding** is **Off**. See **Rack Setup** > **Emergency Setup** in the *F-Drive RX Configuration Manual*.
- "OVERRIDE" (ON):
  - All outputs of all output cards go to 100%.
  - Any configured **Emergency Levels**, **Emergency Outputs**, or **Load Shedding** are ignored.



F-Drive RX Driver with *1*, Advanced Control Card and *2*, emergency mode switch

To access the emergency mode switch:

1. Loosen the two thumb screws securing the Advanced Control Card to the F-Drive RX and remove the Advanced Control Card.
2. Set the emergency mode switch.
3. Replace the Advanced Control Card and tighten the two thumb screws to secure it in place.

For more information about **Emergency Outputs** and **Emergency Level**, see the *F-Drive RX Configuration Manual*. See *Emergency Operation and Test on page 47* for more information about the test button.

Identify, Separate, and Protect Emergency Circuits

If the F-Drive RX will be connected to circuits designated for Class 2 emergency power, National Electrical Code section 700.11 requires that you identify, separate, and protect the emergency circuits.

See National Electrical Code section 700.11 for full details and exceptions.

Identify

- Identify the F-Drive RX that contains emergency circuits by applying the large "EMERGENCY CIRCUITS" label. See *Emergency Circuits Labels on page 26*.
- Identify the cable, cable tray, or raceway containing emergency circuits.

Separate

- Install all emergency circuits on dedicated F-Drive RX output cards. An output card must not contain both emergency and non-emergency circuits. See **Emergency Setup** in the *F-Drive RX Configuration Manual*.
- Separate Class 2 emergency circuits from all other Class 2 circuits using a nonconductive sleeve or nonconductive barrier.
- ETC recommends vertical clustering of multiple emergency output cards in an F-Drive RX enclosure. See *Figure 4 on page 26* for an example.

Protect

- Install all Class 2 emergency circuits in a raceway, armored or metal-clad cable, or cable tray.

Chapter 3

Prepare to Install the F-Drive RX

Review the following information before installing the F-Drive RX.

Installation Requirements

- Ambient operating temperature 0°C–40°C (32°F–104°F), 20%–90% non-condensing humidity.
- Dry locations only.
- The F-Drive RX requires 2U of space in a 19-inch equipment rack. The rack must support the weight of the F-Drive RX plus up to ten output cards and any power supplies and accessories.
- The F-Drive RX is a 56 VDC input product that requires an external power supply for operation.
- Emergency systems require an upstream Double Conversion UPS.
- Emergency systems require a contact closure device to use as input to the F-Drive RX emergency input.

Clearance Requirements

CAUTION: ***To reduce risk of fire, do not install closer than 3 inches to cabinet wall.***

ATTENTION : ***Pour réduire le risque d'incendie, ne pas installer à moins de 3 pouces du mur de l'armoire.***

Refer to the *F-Drive Power Supply Installation Guide* or *Install MEAN WELL 56 VDC Power Supplies on page 49* for power supply clearance considerations.

Voltage Drop

Voltage drop along load wiring is an important consideration for constant-voltage loads. Voltage drop calculations vary by project and are based on the type, length, and gauge of wire. The C24V Card has an adjustable dial on the front of the output card to set the 24–27 VDC (+/-5%) output. Measure the voltage at the load and adjust the dial to achieve 24 VDC at the load. Contact a qualified electrician and refer to the following resources for more information:

- *Adjust the Output of the C24V Card on page 41*
- *F-Drive RX Wire and Terminal Specifications on page 23* for recommended wire gauges

Power Disconnect Device

Before installation, make sure you have an accessible input power disconnect device installed between the input power source and the F-Drive RX.

WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before installation, maintenance, cleaning, or any other system modification could result in serious injury or death.

AVERTISSEMENT : RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Négliger de débrancher toutes les sources d'alimentation du système avant l'installation, l'entretien, le nettoyage ou toute autre modification du système peut causer des blessures graves ou la mort.

De-energize main feed to F-Drive Power Control products and follow appropriate Lockout/Tagout procedures as mandated by NFPA 70E. It is important to note that electrical equipment such as breaker panels can present an arc flash hazard if improperly serviced. This is due to the high amounts of short-circuit current available on the electrical supply to this equipment. Any work must comply with OSHA Safe Working Practices.

WARNING: RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.

AVERTISSEMENT : RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.

Inspect the Shipment

Before you begin installation, check your shipment and confirm that it arrived complete and undamaged.

1. Check the shipping container for physical damage.
   - If you find damage, document it to help with a claim against the shipper.
2. Inspect the order for completeness.
   - Check the box contents received against the packing list to ensure that your order is complete.
   - If you discover a problem with the contents of the shipment, contact ETC. See *Help from ETC Technical Services on page 5*.

F-Drive RX ships with the control card (ETC part number 7148A2003) installed and with blanks covering the slots for the output cards.

Note: *All output cards and accessories are packaged separately.*

Parts and Tools

The following supplies are required, but not provided:

- #2 Phillips screwdriver
- Precision flatblade screwdriver
- Wire stripping and cutting tool
- Wire ties

Rack-Mount Safety

The F-Drive RX and F-Drive RX Power Supply or FD-RX-PSU-MW-FRAME four-bay frame install into a standard 19-inch rack.

- Elevated Operating Ambient Temperature: If the F-Drive RX is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may elevate above the room ambient temperature. Do not operate the device in an enclosed environment above 40°C (104°F).
- Reduced Air Flow: When installing the F-Drive RX in an equipment rack, the rack must be vented and have adequate airflow to maintain an operating temperature below 40°C (104°F).
- Mechanical Loading: The F-Drive RX must be installed in a rack in a horizontal flat orientation to ensure even mechanical loading in the rack, avoiding hazardous or dangerous loading conditions.
- Circuit Overloading: When installing the F-Drive RX in an equipment rack, consider the connection of the equipment to the rack or power source to avoid overloading the rack circuit or supply wiring. Consider the rack or power distribution in the equipment rack during installation.
- Reliable Grounding: Maintain reliable grounding of the rack-mounted equipment. Give particular attention to any supply connections other than direct connections to the branch circuit (for example, the use of power strips).

F-Drive RX Wire and Terminal Specifications

Terminal/Connector		Wire Range/Specifications	Strip Length	Torque
Power Input		Use provided DC power harness: 2.4 m (8 ft) of 8 AWG (ETC part number 7148B7002)	11 mm (7/16 in)	
Ground/Earth		Use provided ground/earth harness: 61 cm (2 ft) of 8 AWG (ETC part number 7148B7003)		
DMX A and DMX B, IN and THRU three-pin connectors		Belden 9729 or equivalent or Cat5e (or better) 0.2 mm^2 (24 AWG) or larger conductors.	See wiring instructions included with the termination kit (ETC part number 4100A1023).	
Emergency three-pin connector		1–2.5 mm^2 (18–12 AWG) Follow class 2 wiring methods. Use the pluggable connector provided in the emergency termination kit (ETC part number 7148K1015).	6 mm (1/4 in)	None
Network		Cat5e (or better) 0.2 mm^2 (24 AWG) or larger conductors. Terminate to T568B standard.		
RJ45 connectors (1–10A and 1–10B)	CC 8 Card output FTW 8 Card output	You must use 0.25 mm^2 (23 AWG) or larger conductors in Category-type cable. Terminate to T568B standard.		
F-Drive RX RJ45/Terminal 4 - CV Adapter	Included with the C24V Card Two pins per output channel (eight pins total per output card)	1–2.5 mm^2 (18–12 AWG)	6 mm (1/4 in)	0.4–0.5 N·m (3.5–4.4 in-lb)

CAUTION: ***Do not coil excess Category-type cable.***

Install a Power Supply

Each F-Drive RX requires a 56 VDC power supply. ETC offers two options:

- The F-Drive RX Power Supply, which houses a single power supply to power a single F-Drive RX driver. See the *F-Drive Power Supply Installation Guide* on the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation).
- The FD-RX-PSU-MW-FRAME four-bay frame and FD-RX-PSU-MW-56/3200 power supply modules. See *Install MEAN WELL 56 VDC Power Supplies on page 49*.

Chapter 4

Install the F-Drive RX

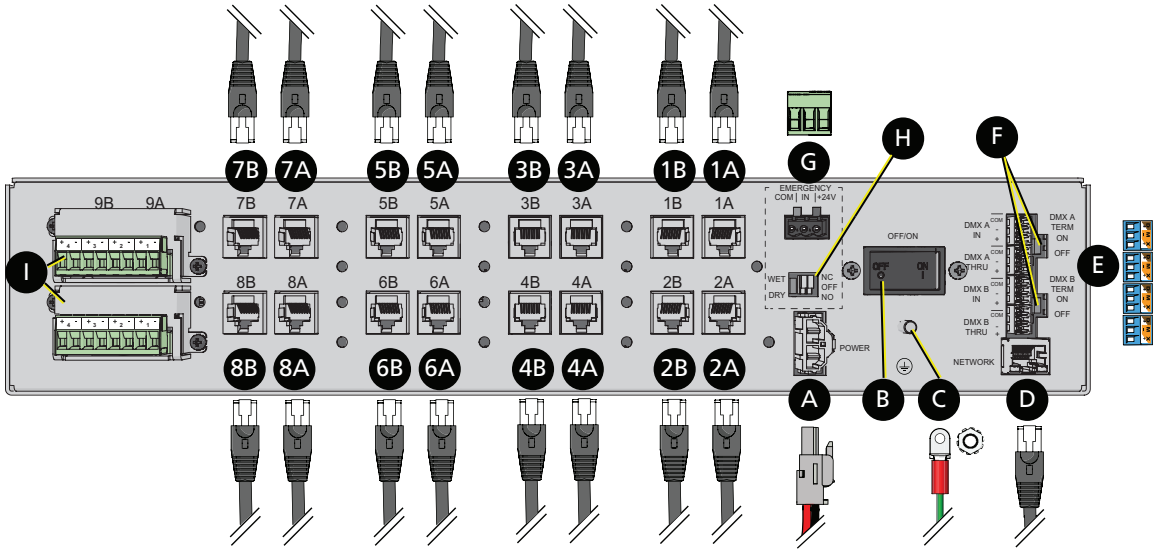


Figure 3. Rear view of F-Drive RX, see Table 3 for descriptions of each labeled item.

A	56 VDC power input. Use the DC power harness (included, ETC part number 7148B7002).
B	Breaker
C	Ground/earth stud, connect to ground harness with lock-nut (included, ETC part numbers 7148B7003 and HWM1656).
D	Network connection, network cable not included.
E	DMX A and DMX B receptacles. Use connectors from the DMX termination kits (four included, ETC part number 4100A1023).
F	DMX A and DMX B termination switches
G	Emergency receptacle (see *Wire the Emergency Connector on page 27*). Use the connector from the emergency termination kit (included, ETC part number 7148K1015).
H	Emergency connector configuration switches: WET/DRY and NC/OFF/NO (see *Emergency Configuration Switches on page 28*)
I	C24V Cards with dual RJ45 to terminal adapters (included) occupying slots 9 and 10. See *Install the F-Drive RX RJ45/Terminal 4 - CV Adapter on page 32*.
Outputs 1A–8A	Channels 1–4 of a CC 8 Card or FTW 8 Card, connect to Category-type cable* (not included). Outputs 9 and 10 in Figure 3 are occupied by dual RJ45 to terminal adapters for C24V Cards (Figure 3, *I*).
Outputs 1B–8B	Channels 5–8 of a CC 8 Card or FTW 8 Card, connect to Category-type cable* (not included). Outputs 9 and 10 in Figure 3 are occupied by dual RJ45 to terminal adapters for C24V Cards (Figure 3, *I*).
*If you are installing ETC luminaires with RJ45 input, you must use 0.25 mm^2 (23 AWG) or larger conductors in Category-type cable. Not all Category-type cables meet this requirement.	

Table 3. Descriptions of the labeled items in Figure 3

Rack-Mount the F-Drive RX

Secure the F-Drive RX into the 19-inch rack using the hardware provided. See *Rack-Mount Safety on page 22*.

Connect the DC Power Input

F-Drive RX ships with a 2.4 m (8 ft) DC power harness with a plug on one end and bare ends on the other (ETC part number 7148B7002). Connect the plug end of the harness to the F-Drive RX power input receptacle (*Figure 3*, *A* on *page 24*) and terminate the bare ends of the harness to the plug that you received with your F-Drive RX Power Supply. See the *F-Drive Power Supply Installation Guide* for more detailed termination instructions.

If you are installing an FD-RX-PSU-MW-FRAME four-bay frame, see *Wire the DC Power Output on page 58* to install a safety kit on the output terminals of the FD-RX-PSU-MW-FRAME where you will terminate the bare ends of the DC power harness.

Connect Ground/Earth

The F-Drive RX has a ground/earth stud (*Figure 3*, *C* on *page 24*). ETC provides a 0.6 m (2 ft) harness of 8 AWG insulated wire with a ring terminal on one end and a bare end on the other and an M5 k-lock nut with the F-Drive RX for connection to ground/earth (ETC part numbers 7148B7003 and HWM1656). Follow all local and national codes.

Terminate DMX In and Thru

DMX is installed in a daisy-chain topology and includes one pair of wires (Data + and Data -) plus an ISO ground (common). F-Drive RX includes DMX termination kits (ETC part number 4100A1023).

1. Follow the DMX termination kit instructions provided with the product to terminate the control wiring.
2. Insert the prepared connector into the "DMX A IN" receptacle on the back of the F-Drive RX.
3. Optionally, terminate DMX thru to the next device in the DMX data run. Up to 32 DMX devices can be daisy-chained together per data run.
   a. Prepare a cable according to the instructions provided with the included termination kit.
   b. Insert the connector with wires terminated into the "DMX A THRU" receptacle on the back of the F-Drive RX.
4. Terminate DMX data signal for the last DMX device in the data run by setting the termination switch next to the DMX receptacle to "ON". All other devices in the data run maintain the factory default termination switch setting: "OFF".
5. Repeat these steps for "DMX B IN" and "DMX B THRU" as needed.

Emergency Circuits Labels

Large Emergency Circuits Label

The F-Drive RX ships with a large "EMERGENCY CIRCUITS" label for application to the front of the F-Drive RX enclosure only if the F-Drive RX is connected to circuits designated for emergency power, in accordance with NEC Article 700 or an equivalent applicable installation code.

If the F-Drive RX will be connected to circuits designated for emergency power, apply the large "EMERGENCY CIRCUITS" label to the front of the enclosure as shown (Figure 4, *A*). The large "EMERGENCY CIRCUITS" label shall be applied to the F-Drive RX enclosure in a location that will be visible after installation.

Small Emergency Labels

The F-Drive RX ships with a sheet of 24 small "EMERGENCY" labels. Apply these labels:

- To the front of the F-Drive RX enclosure, next to all output cards connected to emergency circuits (Figure 4, *B*). Do not cover the slot number (1–10) or F-Drive RX serial number.
- To the back of the F-Drive RX enclosure, next to all outputs connected to emergency circuits (Figure 4, *C*).

Note: *Do not place an emergency label directly on the face of an output card. Output cards can be installed in any slot, and the purpose of the emergency labels is to alert you to the location of emergency output circuits connected to the slot on the backplane.*

ETC recommends clustering emergency circuits on designated output cards and installing the output cards in vertically-adjacent locations in the F-Drive RX (as shown in Figure 4) in order to facilitate identification, separation, and protection of emergency circuits. See *Identify, Separate, and Protect Emergency Circuits on page 19*.

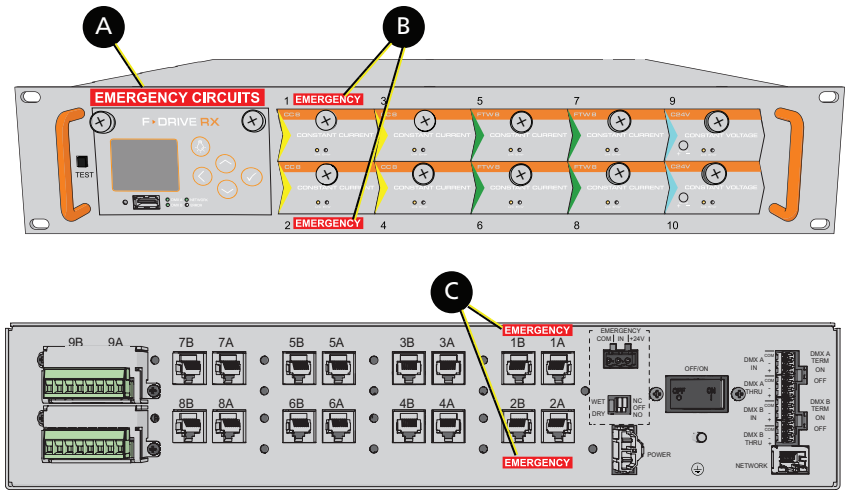


Figure 4. F-Drive RX. *Top*, front view with *A*, large "Emergency Circuits" label and *B*, small "EMERGENCY" labels applied; *bottom*, back view with *C*, small labels applied.

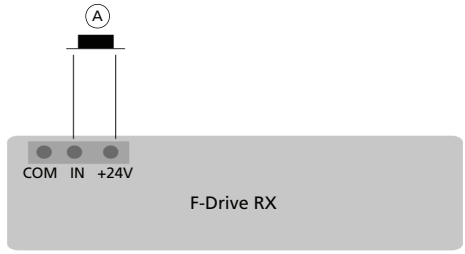
In this example, all outputs of the CC 8 Cards installed in slots 1 and 2 are designated for emergency circuits and are clustered together (RJ45 outputs 1A, 1B, 2A, and 2B).

Wire the Emergency Connector

A three-pin pluggable connector is provided in the emergency termination kit (ETC part number 7148K1015) for connection to the emergency input/output. Follow the directions below according to the type of contact you are using.

Non-Isolated (Dry) Contact

1. Strip 6 mm (1/4 in) of insulation from the two contact input wires.
2. Locate the three-pin connector from the emergency termination kit (ETC part number 7148K1015, included).
3. Using a precision screwdriver, loosen the "IN" terminal and the "+24V" terminal.

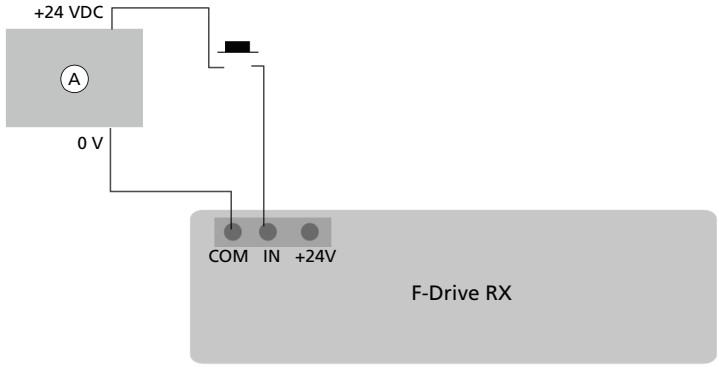


F-Drive RX with *A*, a dry contact input

4. Insert one wire into the "IN" terminal. Using the precision screwdriver, tighten the screw firmly onto the wire.
5. Insert one wire into the "+24V" terminal. Using the precision screwdriver, tighten the screw firmly onto the wire.
6. Plug the connector into the three-pin "EMERGENCY" header on the back of the F-Drive RX. See *on page 28*.

Isolated (Wet) Contact (+24 VDC Signal)

1. Strip 6 mm (1/4 in) of insulation from the two contact input wires.
2. Locate the three-pin connector from the emergency termination kit (ETC part number 7148K1015, included).
3. Using a precision screwdriver, loosen the "COM" terminal and the "IN" terminal.

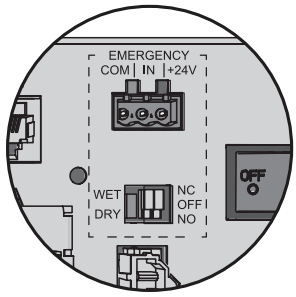


F-Drive RX with wet contact input powered by *A*, an external power supply unit

4. Insert the common wire into the "COM" terminal. Using the precision screwdriver, tighten the screw firmly onto the wire.
5. Insert the +24 VDC wire into the "IN" terminal. Using the precision screwdriver, tighten the screw firmly onto the wire.
6. Plug the connector into the three-pin "EMERGENCY" header on the back of the F-Drive RX. See *on page 28*.

Emergency Configuration Switches

The emergency configuration switches are located on the back of the F-Drive RX enclosure near the three-pin contact input labeled "EMERGENCY".



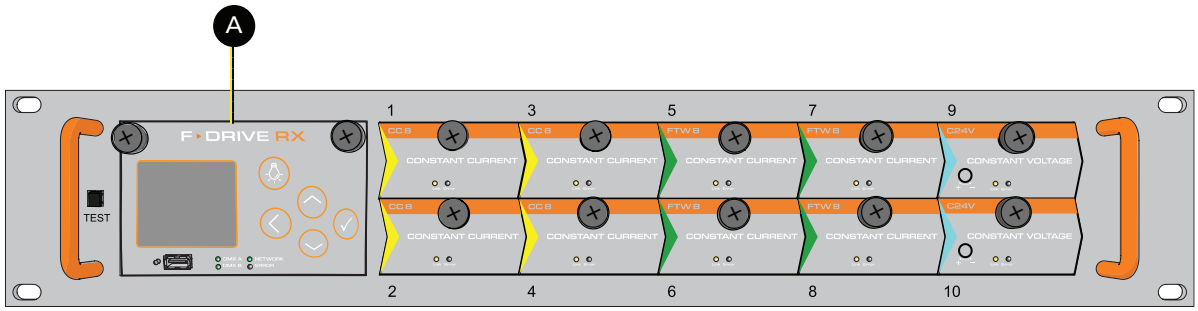
F-Drive RX emergency switches

See *Advanced Control Card Emergency Mode Switch on page 18* and **Emergency Setup** in the *F-Drive RX Configuration Manual* for more about emergency functionality.

Switch	Position	Contact Action	Function
WET/DRY	WET		"COM" on the three-pin emergency connector is isolated to allow the use of an externally-powered contact closure. Use "COM" and "IN" to connect the contact closure.
	DRY		"+24V" on the three-pin emergency connector can be used to power an external contact closure. Use "+24V" and "IN" to connect the contact closure. "COM" is connected to the F-Drive RX common.
NC/OFF/NO	NC (normally closed)	close	The F-Drive RX is in normal state and outputs return to normal DMX control.
		open	The F-Drive RX is in the emergency state and outputs are driven to the configured emergency state and level.
	OFF		Emergency behavior is disabled for the F-Drive RX.
	NO (normally open)	open	The F-Drive RX is in normal state and outputs return to normal DMX control.
		close	The F-Drive RX is in the emergency state and outputs are driven to the configured emergency state and level.

Chapter 5

Install F-Drive RX Output Cards



F-Drive RX, front view; *A*, Advanced Control Card; Driver cards are labeled 1–10 on the front of the enclosure.

WARNING: RISK OF ELECTRIC SHOCK! Working inside the F-Drive with power applied exposes you to the possibility of dangerous currents and voltages.

AVERTISSEMENT : RISQUE DE CHOC ÉLECTRIQUE! Travailler à l'intérieur du F-Drive lorsqu'il est alimenté vous expose à la possibilité de courants et de tensions dangereux.

CAUTION: ***Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.***

ATTENTION : ***Des tensions dangereuses sont présentes. Pour réduire le risque de choc électrique et de danger pour la santé personnelle, suivez les instructions.***

CAUTION: ***Static electricity can damage F-Drive components like control cards and output cards. To avoid damage, keep all static-sensitive devices in their static-protective bags until you are ready to install them. Use anti-static safety precautions during installation.***

CAUTION: ***When installing cards, make sure to insert the card in the card guides in the slot. Do not force a card into a slot. Misalignment of cards may cause damage to the card or the backplane board inside the F-Drive.***

F-Drive RX output cards and the Advanced Control Card are hot-swappable, which means they can be installed and replaced while the F-Drive RX is powered on.

1. Using a Phillips screwdriver, remove the screw securing the blank plate that covers the output card slot.
   - Leave blank plates in place over empty output card slots until you are ready to install an output card.
   - Save any plates and screws that you remove and install them over empty card slots as needed.
2. Align the output card with the card guides inside the F-Drive RX.
3. Gently slide the card into the slot until its card edge connector is seated on the backplane.
4. Tighten the thumb screw on the front of the output card to secure it in place.

Mismatched Cards

CAUTION: ***When replacing cards with the power on, make sure to install the same type of card as the card that you removed.***

If you change an output card in a F-Drive RX slot to a different type (mismatch), it will cause a "Slot 'Y', Driver Card Type Mismatch" error on the UI. See "Errors" in the F-Drive RX Configuration Manual for more information about this error.

Connect Luminaires to the Output Cards

F-Drive RX has two RJ45 outputs for each CC 8 Card or FTW 8 Card. The C24V Card ships with a F-Drive RX RJ45/Terminal 4 - CV Adapter (ETC part number 7148K1035) for use with constant-voltage loads

See the *F-Drive RX Wiring Reference Guide* on the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation) for wiring examples, considerations, and recommendations.

CAUTION: ***Do not coil excess Category-type cable.***

Note: *See NFPA 70 2020 National Electrical Code table 725.144 for cable bundling limitations that apply to all F-Drive RX Class 2 output cables, such as the maximum number of four-pair cables in a bundle. For more information, see the* F-Drive RX Wiring Reference Guide.

Note: *If you are installing ETC luminaires with RJ45 input (ArcSystem Navis, Irideon FPZ, Irideon FPZ Plus, Irideon WLZ, Irideon WLZ Plus, Source Four Mini LED, or Source Four Mini LED Plus), you must use 0.25 mm^2 (23 AWG) or larger conductors in Category-type cable.*

Connecting to Loads by Other Manufacturers

The CC 8 Card and the C24V Card support a wide variety of loads. Determining compatibility between these loads and the driver is an important step toward ensuring the success of a project. Search the LED Dimming Compatibility Database (etcconnect.com/compatibility) to see if your load is compatible. If your load is not in the compatibility database, follow the instructions at the link above to contact the ETC Applications Engineering department to arrange for compatibility testing.

Connection Options:

- C24V Card only: Use the F-Drive RX RJ45/Terminal 4 - CV Adapter included with the C24V Card. See *Install the F-Drive RX RJ45/Terminal 4 - CV Adapter on page 32*.
- CC 8 Card only: *Use FD-BBOX-4T to Connect Lighting by Other Manufacturers on page 33*.
- CC 8 Card only: *Use FD-SBOX-T to Connect Lighting by Other Manufacturers on page 33*.

See *Configure the CC 8 Card on page 41* and *Adjust the Output of the C24V Card on page 41* for important details about configuring output cards for constant-current and constant-voltage loads.

CAUTION: ***Do not exceed any Class 2 limits stated by the manufacturer of the load.***

CAUTION: ***Possible damage to equipment. You must configure the output channel of the CC 8 Card to the appropriate output for your luminaire or load before applying power to the luminaire or load. See Configure the CC 8 Card on page 41.***

Install the F-Drive RX RJ45/Terminal 4 - CV Adapter

Note: *The F-Drive RX RJ45/Terminal 4 - CV Adapter is only compatible with the C24V Card.*

One F-Drive RX RJ45/Terminal 4 - CV Adapter is included with every C24V Card. You can also order an F-Drive RX RJ45/Terminal 4 - CV Adapter separately (ETC part number 7148K1035).

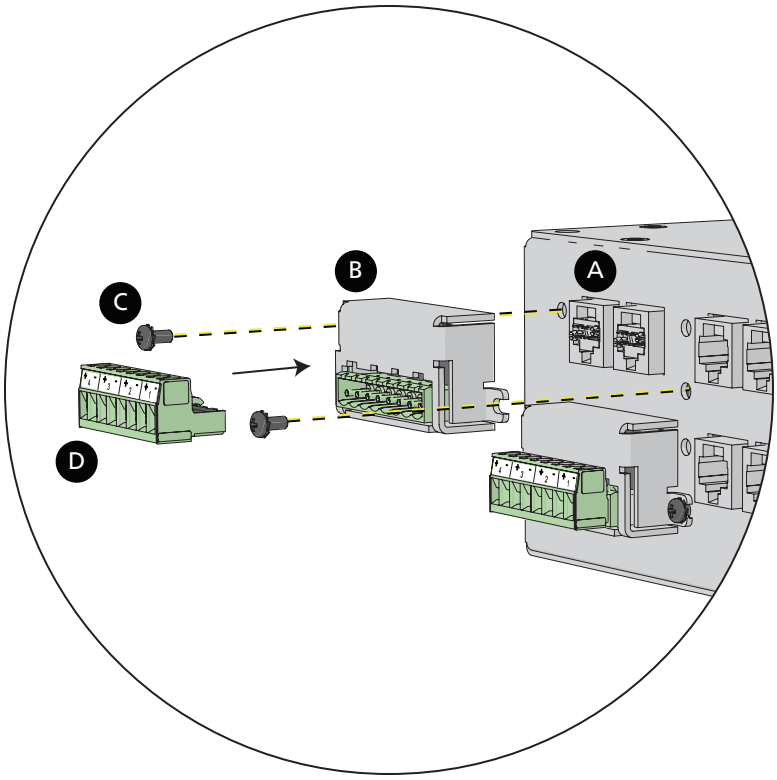


Figure 5. Detail view of the back of the F-Drive RX with dual RJ45 to terminal adapters on the outputs of two card slots. See the instructions below for descriptions of labeled items.

The C24V Card includes a F-Drive RX RJ45/Terminal 4 - CV Adapter (Figure 5, *B*) with a labeled, eight-pin, pluggable connector (Figure 5, *D*) and screws (Figure 5, *C*) for installation to the back of the F-Drive RX slot (Figure 5, *A*) where the C24V Card is installed.

CAUTION: ***Possible damage to equipment. Failure to tighten the two screws that secure the F-Drive RX RJ45/Terminal 4 - CV Adapter to the backplane of the F-Drive RX may lead to intermittent connection between the load and the F-Drive RX.***

1. Install a C24V Card in one slot of the F-Drive RX.
2. Use a Phillips screwdriver the two screws (Figure 5, *C*) provided with the C24V Card to install the F-Drive RX RJ45/Terminal 4 - CV Adapter (Figure 5, *B*) on the back of the F-Drive RX behind the slot where the C24V Card is installed (Figure 5, *A*).
3. Wire the pluggable connector (Figure 5, *D*) following the pinouts on the label.
4. Insert the pluggable connector into the F-Drive RX RJ45/Terminal 4 - CV Adapter.

Use FD-BBOX-4T to Connect Lighting by Other Manufacturers

FD-BBOX-4T takes a single four-channel RJ45 output from a CC 8 Card and provides four separated two-pin output channels. You can connect two FD-BBOX-4T per CC 8 Card.

Note: *B-Box is not compatible with the C24V Card.*

See the *F-Drive B-Box4 Installation Guide* and the *F-Drive RX Wiring Reference Guide* for more information.

Use FD-SBOX-T to Connect Lighting by Other Manufacturers

Note: *S-Box is not compatible with the C24V Card.*

Each FD-SBOX-T:

- Takes a single channel from one RJ45 output on a CC 8 Card.
- Provides three separated, two-pin terminal outputs on the same channel.

Up to four FD-SBOX-T can be in a daisy-chained to provide up to 12 two-pin terminal connections from one RJ45 output on a CC 8 Card, with three two-pin receptacles per channel. You can connect eight FD-SBOX-T per CC 8 Card.

The cable distance of each wiring run must not exceed 100 m (328 ft). See the *F-Drive S-Box Installation Guide* and the*F-Drive RX Wiring Reference Guide* for more information.

F-Drive-Compatible Luminaires with RJ45 Input

See *Compatible ETC Luminaires on page 10* for a list of luminaires.

To connect ArcSystem Pro One-Cell luminaires (which have Molex connectors), see *ArcSystem Pro One-Cell Luminaires on page 35*.

Connection options include:

- *Connect F-Drive-Compatible Luminaires in a Daisy Chain on page 34*.
- *Use FD-BBOX-4R to Connect F-Drive-Compatible White or Fade to Warm Luminaires on page 34*.
- *Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires on page 35*.

CAUTION: ***Possible damage to equipment. Connect only White luminaires to a CC 8 Card. Connect only Navis Fade to Warm luminaires to an FTW 8 Card.***

CAUTION: ***Possible damage to equipment. You must configure the output channel of the CC 8 Card or FTW 8 Card to the appropriate output for your luminaire before applying power to the luminaire. See Configure the CC 8 Card on page 41 or Configure the FTW 8 Card on page 42.***

Note: *Due to performance differences, ETC recommends that you do not mix Navis 100 Fade to Warm luminaires and Navis 50 Fade to Warm luminaires in the same wiring run.*

Note: *F-Drive-compatible luminaires with RJ45 input can be hot-plugged into F-Drive RX output cards while the F-Drive RX is powered.*

Note: *The maximum supported wire length between ETC F-Drive-compatible luminaires and an F-Drive RX is 100 m (328 ft).*

Connect F-Drive-Compatible Luminaires in a Daisy Chain

Up to eight F-Drive-compatible luminaires with RJ45 input can connected to an output card in two daisy-chains of four. The cable distance of the wiring run must not exceed 100 m (328 ft). Refer to the luminaire installation guides and *F-Drive RX Wiring Reference Guide* for full details.

Use FD-BBOX-4R to Connect F-Drive-Compatible White or Fade to Warm Luminaires

You can install F-Drive-compatible White or Fade to Warm luminaires in star topology using a B-Box4 breakout box with RJ45 outputs (FD-BBOX-4R). FD-BBOX-4R takes a single four-channel RJ45 output from a CC 8 Card or FTW 8 Card and provides four separated RJ45 output channels. You can connect two FD-BBOX-4R per output card.The cable distance of each wiring run must not exceed 100 m (328 ft). See the *F-Drive B-Box4 Installation Guide* and the *F-Drive RX Wiring Reference Guide* for more information.

Use FD-SBOX-R to Connect Navis 50 White or Fade to Warm Luminaires

Note: *FD-SBOX-R is only compatible with Navis 50 White and Fade to Warm luminaires. FD-SBOX-R is not compatible with the following luminaires:*

- *Navis 100 (White, Fade to Warm, or RGBW)*
- *Source Four Mini LED or Source Four Mini LED Plus*
- *Irideon FPZ or Irideon FPZ Plus*
- *Irideon WLZ or Irideon WLZ Plus*
- *ArcSystem Pro One-Cell (Standard, Small, or Micro)*

Each FD-SBOX-R:

- Takes a single channel from one RJ45 output on a CC 8 Card or FTW 8 Card.
- Provides three separated RJ45 outputs on the same channel.

Up to four FD-SBOX-R can be daisy-chained to provide connections for up to 12 Navis 50 luminaires from one RJ45 output on a CC 8 Card or FTW 8 Card, with three luminaires per channel. You can connect eight FD-SBOX-R per output card.

The cable distance of each wiring run must not exceed 100 m (328 ft). See the *F-Drive S-Box Installation Guide* and the *F-Drive RX Wiring Reference Guide* for more information.

ArcSystem Pro One-Cell Luminaires

F-Drive-compatible ArcSystem Pro One-Cell luminaires include:

- ArcSystem Pro One-Cell Standard
- ArcSystem Pro One-Cell Small
- ArcSystem Pro One-Cell Micro

The CC 8 Card can drive up to eight ArcSystem Pro One-Cell Standard, Small, or Micro White or Fade to Warm luminaires. See *Configure the CC 8 Card on page 41* to correctly configure the CC 8 Card output current for ArcSystem Pro One-Cell luminaires.

CAUTION: ***Possible damage to equipment. You must configure the output channel of the CC 8 Card to the appropriate output for your luminaire before applying power to the luminaire. See Configure the CC 8 Card on page 41.***

Note: *Maximum supported wire length between ArcSystem Pro One-Cell Standard, Small, and Micro luminaires and F-Drive RX is 100 m (328 ft).*

Use FD-BBOX-4M to Connect ArcSystem Pro One-Cell Luminaires

FD-BBOX-4M takes a single four-channel RJ45 output from the CC 8 Card and provides four separated Molex output channels. You can connect two B-Box4M per CC 8 Card.

See the *F-Drive B-Box4 Installation Guide* and the *F-Drive RX Wiring Reference Guide* for more information.

Record Installed Output Cards

Visit the ETC Professional Services Resources page (etcconnect.com/Support/Professional-Services-Resources.aspx) and download a Load Schedule Template spreadsheet to record details about the installed output cards and loads.

The output card slot labels run 1–10A and 1–10B with odd numbers on the top and even numbers on the bottom. See the illustration at *Install the F-Drive RX on page 24*.

Chapter 6

Power Up and Control

Power Up Procedure

CAUTION: ***Possible damage to equipment. You must configure the output channel of the CC 8 Card or FTW 8 Card to the appropriate output for your luminaire before applying power to the luminaire. See Configure the CC 8 Card on page 41 or Configure the FTW 8 Card on page 42.***

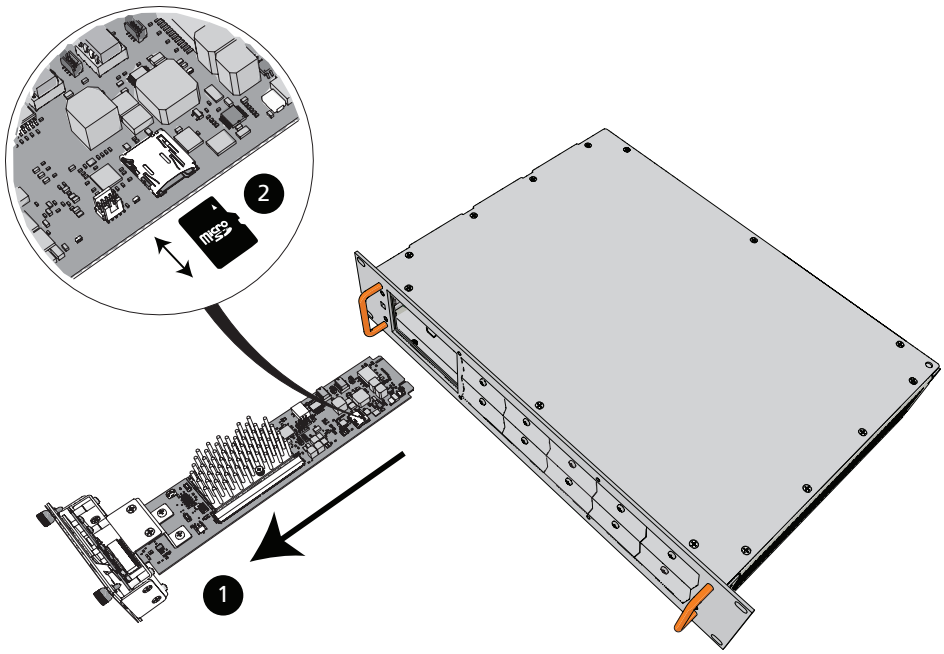
1. Remove the protective film from the front of the Advanced Control Card.
2. Verify that the microSD card is firmly installed in the Advanced Control Card. See *Remove or Insert the microSD Card on page 37*.
3. Check that the breaker on the back of all F-Drive RX drivers is on.
4. If applicable, check that all luminaire or load power switches are on.
5. Check the DMX control source to ensure proper installation and termination per the manufacturer's instructions.
6. Check that all wires are terminated properly and secure in the terminals, if applicable.
7. Apply power at the equipment rack providing power to the external power supplies.
8. Verify that the external power supplies are powered on.
9. Verify LED status on the front of the F-Drive RX. See *Advanced Control Card LED Status Indicators on page 38* and *F-Drive RX Output Card LED Indicators on page 39*.
10. Allocate DMX addresses in ETC Concert software or using the user interface. See *DMX System Control on page 40*.
11. For each CC 8 Card and FTW 8 Card: Use Concert or the user interface to verify that each channel is set to output the correct current for the luminaire. See *Configure the CC 8 Card on page 41* and *Configure the FTW 8 Card on page 42*.
12. If desired, push the [Lightbulb] () twice to Set All Levels. See Output Control > Set All Levels in the *F-Drive RX Configuration Manual*.

Note: *The behavior of the F-Drive RX when the emergency state is active (including when you press the test button) depends on the position of the emergency mode switch (see Advanced Control Card Emergency Mode Switch on page 18), the configuration of the emergency configuration switches (see Emergency Configuration Switches on page 28), and the* ***Emergency Setup*** *configured from the user interface or Concert (see* ***Rack Setup*** *>* ***Emergency Setup*** *in the* F-Drive RX Configuration Manual*).*

Remove or Insert the microSD Card

F-Drive RX includes an industrial, EXT4-formatted, 8 GB microSD card (ETC part number 7148D1101) located on the Advanced Control Card. The microSD card stores the configuration file and the firmware bundle.

The Advanced Control Card is hot-swappable, which means it can be removed and replaced while the F-Drive RX is powered on.



F-Drive RX with *1*, the Advanced Control Card and *2*, the microSD card

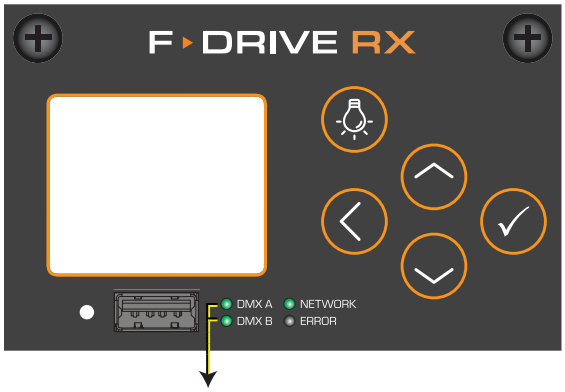
1. Loosen the two thumb screws securing the Advanced Control Card to the F-Drive RX and remove the Advanced Control Card.
2. Remove or insert the microSD card:
   a. To remove: Push the microSD card into the slot to eject it.
   b. To insert: Push the microSD card into the slot until it clicks.
3. Replace the Advanced Control Card and tighten the two thumb screws to secure it in place.

Identify

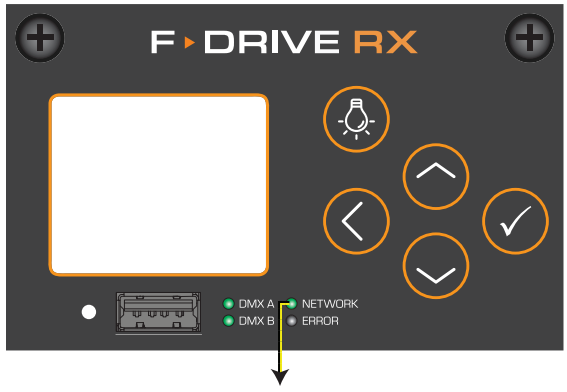
You can send an identify command to individual channels of an output card using ETC Concert or the **[Lightbulb]** (💡) on the user interface. See "The Lightbulb Button" in the *F-Drive RX Configuration Manual* and the F-Drive RX Device Package Help in Concert for more information.

When you send an identify command to a channel, luminaires or loads connected to the channel will blink on and off: 500 ms on, 500 ms off until you stop the identify command.

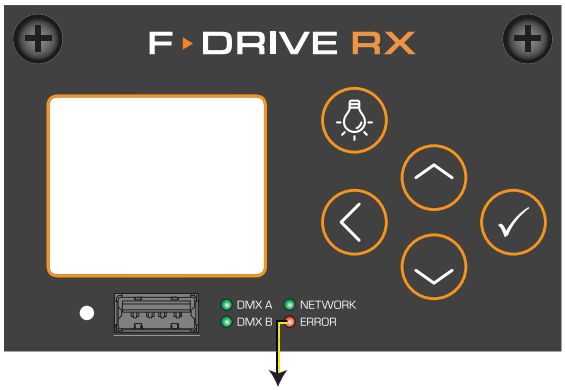
Advanced Control Card LED Status Indicators



Green "DMX A" or "DMX B" LED	
Behavior	**Status or Error**
Off	The port is disabled.
Solid On	DMX data is present and the port is enabled.
Fast Blink (2 Hz)	There is a data error.
Slow Blink (1 Hz)	The port is enabled but no data is present.
Triple Blink	Firmware download is in progress.

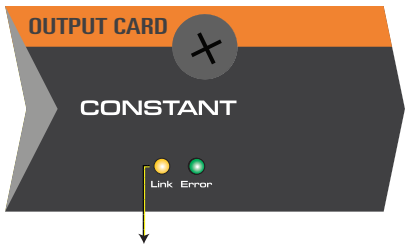


Green "NETWORK" LED	
Behavior	**Status or Error**
Off	Network activity is not present.
Fast Blink	Network activity is present.

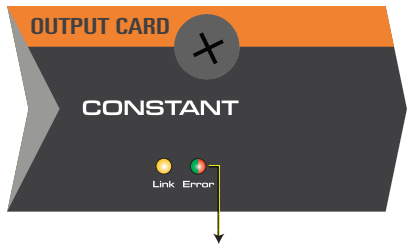


Red "ERROR" LED	
Behavior	**Status or Error**
Off	Normal operation.
Solid On	The emergency state is active, there is an active error, or Set Levels is active. See "Errors" in the *F-Drive RX Configuration Manual*.

F-Drive RX Output Card LED Indicators



Yellow "Link" LED	
Behavior	**Status or Error**
Off	Communication is inactive.
Fast Blink	Communication is active.



Green/Red "Error" LED	
Behavior	**Status or Error**
Off	All outputs are off. There are no active errors.
Green, Solid On	At least one output channel is receiving a control signal.
Red, Solid On	There is an active error. See "Errors" in the *F-Drive RX Configuration Manual*.

DMX System Control

You can control the F-Drive RX over wired DMX from a lighting console.

- F-Drive products are compliant with DMX 512-A (ANSI E1.11-2008 (R2013)).
- DMX loss behavior is configurable via the user interface or Concert with two options: **Hold Last Look** or **Wait and Fade**.
- DMX Slot Footprint:
  - CC 8 Card: 1 per channel, 8 channels per card
  - FTW 8 Card: 2 per channel, 8 channels per card
  - C24V Card: 1 per channel, 4 channels per card

Note: *The output cards have different DMX footprints. When you first install an output card, or if you relocate an output card to a new slot in an F-Drive RX, you will have to reallocate DMX addresses.*

Navis Luminaire DMX Personalities

Navis Fade to Warm luminaires have two personality options: Intensity and Warm Trim. Navis White luminaires have a single personality: Intensity. The personality is set per output channel.

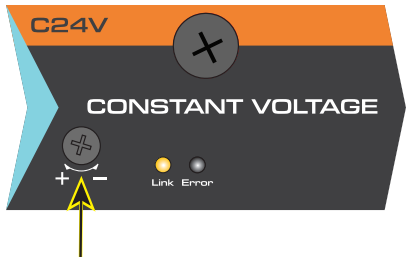
The Warm Trim DMX personality for Fade to Warm luminaires enables you to scale the intensity level at which the Red Shift color temperature changes begin to occur.

DMX Channel	Fade to Warm Luminaires		White Luminaires
	Intensity (default)	Warm Trim	Intensity
1	Intensity	Intensity	Intensity
2		Fade to Warm scaling	

Adjust the Output of the C24V Card

The C24V Card is capable of 24–27 VDC output to compensate for voltage drop along the cable to the load. Follow these steps to adjust the output voltage:

1. Measure the voltage at the load.
2. Use the precision screwdriver to turn the dial on the front of the output card to adjust the output voltage until 24 V is measured at the load.



The front face of a C24V Card with an arrow pointing to the dial used to adjust voltage

Configure the CC 8 Card

CAUTION: ***Setting the driver card to output more current than the manufacturer's recommended fixture driver current may reduce the lifetime of the fixtures or cause damage to the fixtures.***

The F-Drive RX CC 8 Card can output 200–700 mA. Configure the output current using the user interface (see **Output Setup** > **Output Current** in the *F-Drive RX Configuration Manual*) or use ETC Concert to configure the output current for each output channel. Default output current is 200 mA.

ETC Luminaire	Driver Output Current Setting
ArcSystem Navis 50 White	700 mA
ArcSystem Navis 100 White	600 mA
ArcSystem Pro One-Cell Micro White	200 mA
ArcSystem Pro One-Cell Small White or Fade to Warm	600 mA
ArcSystem Pro One-Cell White or Fade to Warm	600 mA
Irideon FPZ for F-Drive or Irideon WLZ for F-Drive	450 mA
Irideon FPZ Plus for F-Drive or Irideon WLZ Plus for F-Drive	700 mA (see note)
Source Four Mini LED for F-Drive	350 mA
Source Four Mini LED Plus for F-Drive	450 mA

Note: *Choose the maximum setting (700 mA) for each output of an F-Drive RX CC 8 Card for best performance with Irideon FPZ Plus or Irideon WLZ Plus luminaires.*

Configure the FTW 8 Card

CAUTION: ***Setting the driver card to output more current than the manufacturer's recommended fixture driver current may reduce the lifetime of the fixtures or cause damage to the fixtures.***

The F-Drive RX FTW 8 Card has two output current settings: Navis 100 FTW (450 mA) or Navis 50 FTW (700 mA). Configure the output current using the user interface (see **Output Setup** > **Output Current** in the *F-Drive RX Configuration Manual*) or use ETC Concert to configure the output current for each output channel. Default output current is Navis 100 FTW (450 mA).

ETC Luminaire	Driver Output Current Setting
ArcSystem Navis 50 Fade to Warm	Navis 50 FTW (700 mA)
ArcSystem Navis 100 Fade to Warm	Navis 100 FTW (450 mA)

Edit Configuration Files

You can edit configuration files using the user interface. You can also edit configuration files offline using ETC Concert software v4.7.3 or later with the F-Drive RX device package and then load them on the F-Drive RX via USB. For more information about configuration and file operations in Concert, select Help from the menu of the Concert application. ETC Concert is available for free download on the ETC Concert page (etcconnect.com/Concert).

Edit Offline and Save Configuration Files to a USB Device

You can edit configuration files offline in ETC Concert with the F-Drive RX device package in Concert 4.7.3 or later, save them to a USB device, and insert the USB device into the front of the F-Drive RX user interface.

Save a Configuration File to a USB Device

1. Insert a USB device in the USB port below the display on the Advanced Control Card user interface. The USB device must be compatible with the processor. See *USB Media on page 43*.
2. Navigate to **File Operations**.
3. Select **Save Config** and press **[Enter]** (✓) .
4. The Save Config screen displays and the default "Filename: F-Drive_1" is selected. You can save your file under a name between F-Drive_1 and F-Drive_16.
5. To select a different filename, press **[Enter]** (✓) . The selection will focus on "F-Drive_#" (where # is a number between 1 and 16).
6. Use **[Up]** (▲) and **[Down]** (▼) to scroll through the list. Press **[Enter]** (✓) to select a filename.
7. Use **[Down]** (▼) to select **Save to USB Media** from the Save Config screen and press **[Enter]** (✓). The dialog will display "Saving File". See **File Operations** > **Save Config** in the *F-Drive RX Configuration Manual*.

Load a Configuration File from a USB Device

1. Insert a USB device in the USB port below the display on the Advanced Control Card user interface. The USB device must be compatible with the processor. See *USB Media on page 43*.
2. Navigate to **File Operations**.
3. Select **Load Config** and press **[Enter]** (✓) .
4. Use **[Up]** (▲) and **[Down]** (▼) to navigate to the desired directory and filename. Configuration files have the file extension ".cfg". Press **[Enter]** (✓) to continue.
5. The screen will display "Filename.cfg was loaded successfully." if the configuration file loaded successfully. See **File Operations** > **Load Config** in the *F-Drive RX Configuration Manual*.

USB Media

The F-Drive RX Advanced Control Card includes a USB type A socket. A USB device is not included and must be purchased separately. Use a compatible USB device (FAT32 format) to save and load backup files of your configuration and to update the F-Drive RX firmware. See **File Operations** in the *F-Drive RX Configuration Manual* for more information about saving and loading configuration files.

Upgrade Firmware

When commissioning a system installation, check all F-Drive family drivers to ensure that the latest firmware is present. If the firmware is not up to date, a qualified ETC technician can upgrade drivers in the field using ETC UpdaterAtor Software and a USB device. For more information on UpdaterAtor, download the *UpdaterAtor Software Quick Guide* for free on the UpdaterAtor web page (etcconnect.com/UpdaterAtor) .

CAUTION: ***Updating firmware causes the F-Drive RX to reboot.***

1. Save the F-Drive RX firmware files to a USB device.
2. Insert the USB device into the USB port below the display on the Advanced Control Card. The USB device must be compatible with the processor. See *USB Media on page 43*.
3. Navigate to **File Operations** on the user interface (see **File Operations** in the *F-Drive RX Configuration Manual*).
4. Press **[Enter]** (✓) to select **Update Firmware**.
5. The Update Firmware screen displays with a notification that the F-Drive RX will reboot. Select **Yes** and press **[Enter]** (✓) to continue.
6. Choose **Load from USB** on the next screen and press **[Enter]** (✓) to continue.
7. Use **[Up]** (▲) and **[Down]** (▼) to navigate to the desired directory of the USB device and press **[Enter]** (✓) to continue.
8. Select a firmware file bundle with the extension **.frw** and press **[Enter]** (✓) to continue.
   - The screen will display "Updating component" followed by the name of the component of the bundle.

Note: *Status panel LEDs may flash while the driver updates its firmware. Do not disconnect power to the F-Drive RX while LEDs are flashing. Firmware upgrade typically takes several minutes, but may vary depending on connected loads.*

Firmware packages have the file extension ".frw" and include the following components:

- Advanced Control Card firmware
- C24V Card firmware
- CC 8 Card firmware
- FTW 8 Card firmware

Chapter 7

Maintenance

WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before installation, maintenance, cleaning, or any other system modification could result in serious injury or death.

AVERTISSEMENT : RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Négliger de débrancher toutes les sources d'alimentation du système avant l'installation, l'entretien, le nettoyage ou toute autre modification du système peut causer des blessures graves ou la mort.

De-energize main feed to F-Drive Power Control products and follow appropriate Lockout/Tagout procedures as mandated by NFPA 70E. It is important to note that electrical equipment such as breaker panels can present an arc flash hazard if improperly serviced. This is due to the high amounts of short-circuit current available on the electrical supply to this equipment. Any work must comply with OSHA Safe Working Practices.

CAUTION: ***RISK OF ELECTRIC SHOCK! Disconnect power before servicing.***

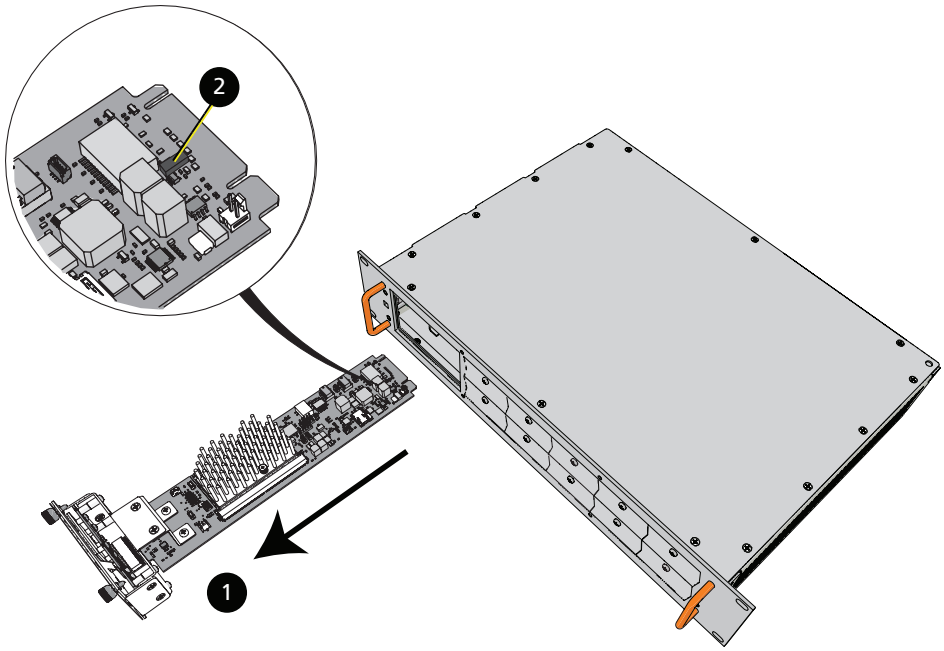
ATTENTION : ***RISQUE DE CHOC ÉLECTRIQUE! Couper l'alimentation avant l'entretien.***

You can remove the F-Drive RX from the equipment rack using the two orange 'U' handles. Contact ETC Technical Services with any service questions.

Advanced Control Card Fuse

CAUTION: ***Disconnect power before replacing fuse. Replace only with same type 0.5 A 125 V fast-acting, size 2-SMD square-end fuse (ETC part number F9022-F).***

As needed, replace the fuse on the Advanced Control Card with a 0.5 A 125 V fast-acting, size 2-SMD square-end fuse (ETC part number F9022-F) only.



F-Drive RX Driver with *1*, Advanced Control Card and *2*, fuse

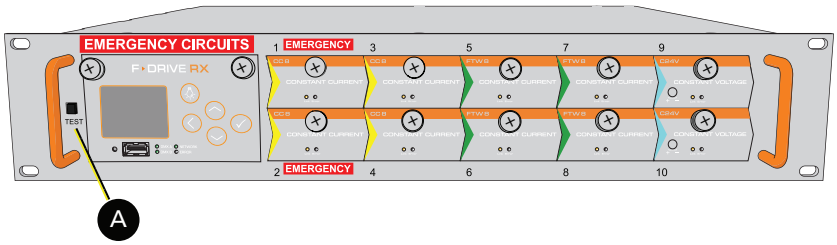
1. Loosen the two thumb screws securing the Advanced Control Card to the F-Drive RX and remove the Advanced Control Card.
2. Remove and replace the fuse.
3. Replace the Advanced Control Card and tighten the two thumb screws to secure it in place.

Note: *The behavior of the F-Drive RX when the emergency state is active (including when you press the test button) depends on the position of the emergency mode switch (see Advanced Control Card Emergency Mode Switch on page 18), the configuration of the emergency configuration switches (see Emergency Configuration Switches on page 28), and the* ***Emergency Setup*** *configured from the user interface or Concert (see* ***Rack Setup*** *>* ***Emergency Setup*** *in the* F-Drive RX Configuration Manual*).*

It is important to test F-Drive RX drivers regularly because they are life safety devices.
NOT SELF-TESTING PER ANSI/NFPA 101 - This equipment is not self-testing in conformance with the Life Safety Code, ANSI/NFPA 101. ANSI/NFPA 101 Life Safety Code requires testing of life safety devices every 30 days.

Press and hold the momentary test button to test the emergency functionality of this device. During the test:

- The user interface will display "EMERGENCY ACTIVE".
- The user interface will be locked.
- Normal control of configured **Emergency Outputs** is disabled.
  - If the emergency mode switch on the Advanced Control Card is set to "DEFAULT":
    - All configured **Emergency Outputs** are driven to their configured **Emergency Levels**. See **Rack Setup** > **Emergency Setup** in the *F-Drive RX Configuration Manual*.
    - All outputs that are configured as **--** (Off) in **Emergency Outputs** will turn off if **Load Shedding** is **On** or will continue normal operation if **Load Shedding** is **Off**. See **Rack Setup** > **Emergency Setup** in the *F-Drive RX Configuration Manual*.
  - If the emergency mode switch on the Advanced Control Card is set to "OVERRIDE" (ON):
    - All outputs of all output cards go to 100%.
    - Any configured **Emergency Levels**, **Emergency Outputs**, or **Load Shedding** are ignored.



F-Drive RX, front view; *A*, test button

Appendix A

Documentation for Compatible ETC Products

In addition to the information provided in the installation documentation listed below, see the *F-Drive RX Configuration Manual* and the *F-Drive RX Wiring Reference Guide* at the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation). All documentation is available in PDF format for free at the ETC website (etcconnect.com).

Luminaires

F-Drive RX output cards are compatible with the ETC luminaires listed below. See the ETC Architectural Luminaires page (etcconnect.com/Products/Architectural-Fixtures) for installation documentation for these luminaires.

- *ArcSystem Navis 100 Installation Guide*
- *ArcSystem Navis 50 White and Fade to Warm Installation Guide*
- *Source Four Mini LED (F-Drive) User Manual*
- *Irideon WLZ (F-Drive) User Manual*
- *Irideon FPZ (F-Drive) User Manual*
- *ArcSystem Pro D1 and D2 Series Drivers Installation Guide* for information about ArcSystem Pro One-Cell luminaires

Power Supplies

F-Drive RX Power Supply

The F-Drive RX Power Supply houses a single power supply to power a single F-Drive RX. For more information, see the *F-Drive Power Supply Installation Guide* at the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation).

FD-RX-PSU-MW-FRAME with FD-RX-PSU-MW-56/3200 Power Supply Modules

See *Technical Information from MEAN WELL on page 50*.

Optional Accessories

F-Drive RX output cards are compatible with the accessories listed below. Visit the F-Drive RX documentation page (etcconnect.com/F-DriveRX/Documentation) for installation documentation for these accessories.

- *F-Drive B-Box4 Installation Guide*
- *F-Drive S-Box Installation Guide*

ETC Concert

F-Drive Series drivers can be configured using ETC Concert software. See etcconnect.com/concert for more information.

Appendix B

Install MEAN WELL 56 VDC Power Supplies

The FD-RX-PSU-MW-FRAME rack-mount units are a 1U, low-profile power distribution option for providing 56 VDC power to the ETC F-Drive RX.

The FD-RX-PSU-MW-FRAME rack-mount unit should only be installed by a qualified electrician or service technician.

- One FD-RX-PSU-MW-56/3200 can supply up to 3200 W.
- Four FD-RX-PSU-MW-56/3200 fit in a single FD-RX-PSU-MW-FRAME four-bay frame and can supply up to 12,800 W.
- Two FD-RX-PSU-MW-FRAME four-bay frames can be loaded with eight FD-RX-PSU-MW-56/3200 modules total; when bussed together they can supply up to 25,600 W.

WARNING: Connect this equipment to a non-dimmable power source in order to avoid damage to the equipment's internal power supply and other electrical components. Using a dimmable power source may damage the equipment and will void the warranty.

CAUTION: ***Each FD-RX-PSU-MW-FRAME four-bay frame may require between one and four dedicated power circuits, one per FD-RX-PSU-MW-56/3200 power supply module.***

CAUTION: ***FD-RX-PSU-MW-56/3200 and FD-RX-PSU-MW-56/3200-CE modules are customized for use with F-Drive RX. You must purchase FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE modules from ETC. FD-RX-PSU-MW-56/3200 and FD-RX-PSU-MW-56/3200-CE modules have a label stating that they are configured for 56 V operation.***

ETC Model	ETC Part Number	MEAN WELL Model	Description
FD-RX-PSU-MW-56/3200	PS597	MEAN WELL NCP-3200*	Custom 56 VDC, 3200 W power supply module for ETC, includes power cord.
FD-RX-PSU-MW-56/3200-CE	PS597-CE	MEAN WELL NCP-3200*	Custom 56 VDC, 3200 W power supply module for ETC, includes power cord.
FD-RX-PSU-MW-FRAME	PS599	MEAN WELL DHP-1UT-B	Custom rack-mount four-bay frame for ETC, includes mounting hardware.

* Each custom power supply module includes an AC power cord with fork terminals on one end and wire ferrules on the other. See *Wire the AC Input on page 57* for more information about AC power cords.

Table 4. ETC custom MEAN WELL power supply models and part numbers

Important Accessories

CAUTION: ***You must use the plug with green jumper wires provided by MEAN WELL to electrically connect "ON/OFF" and "+5V-AUX" on CN1 to allow the FD-RX-PSU-MW-FRAME four-bay frame to operate normally; if kept open, there will be no output voltage. See the Remote Control section of the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see Technical Information from MEAN WELL on page 50) . This plug is called the "Remote Control mating wire (CN1)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL.***

Save these important parts that ship with your FD-RX-PSU-MW-FRAME four-bay frame. Each four-bay frame ships with:

- One plug with green jumper wires that must be installed in the CN1 header in order for the four-bay frame to power on. See *Final Installation Steps on page 60*. This is called the "Remote Control mating wire (CN1)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see *Technical Information from MEAN WELL on page 50*) .
- One plug with black and red jumper wires that must be installed in the CN2 header. This is called the "Remote Sense mating wire (CN2)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see *Technical Information from MEAN WELL on page 50*) .
- Power supply blanks to cover unused power supply module bays. Save these blanks if you are not installing four power supply modules in each four-bay frame.
- Hardware including screws for the power supply blanks and rack-mount hardware.

Technical Information from MEAN WELL

For current technical information, view the following MEAN WELL documents.

- MEAN WELL NCP-3200 spec sheet (https://etclink.it/yvY82EBJ)
- MEAN WELL DHP-1UT-B spec sheet (https://etclink.it/H37uYp8M)
- MEAN WELL NCP-3200/DHP-1UT-B(HV) Series Installation Manual (https://etclink.it/cRtYsHDv)

FD-RX-PSU-MW-FRAME Features

- FD-RX-PSU-MW-FRAME four-bay frames fit in an EU or US 19-inch equipment rack.
- Each FD-RX-PSU-MW-FRAME rack-mount unit (four-bay frame) supports up to four FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE custom power supply modules.
- Four FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE custom power supply modules provide up to 12,800 W to a single FD-RX-PSU-MW-FRAME rack-mount unit.
- Safety kits are available from ETC to facilitate DC output wiring and to bus together two rack systems. See *Safety Kits on page 54*.
- Two bussed FD-RX-PSU-MW-FRAME rack-mount units containing eight FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE custom power supplies can provide a maximum of 25,600 W.
- Each FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE power supply module ships with an AC power cord with fork terminals on one end and bare ends on the other. See *Wire the AC Input on page 57* for more information about AC power cords.

FD-RX-PSU-MW-FRAME with Four FD-RX-PSU-MW-56/3200 Custom Modules

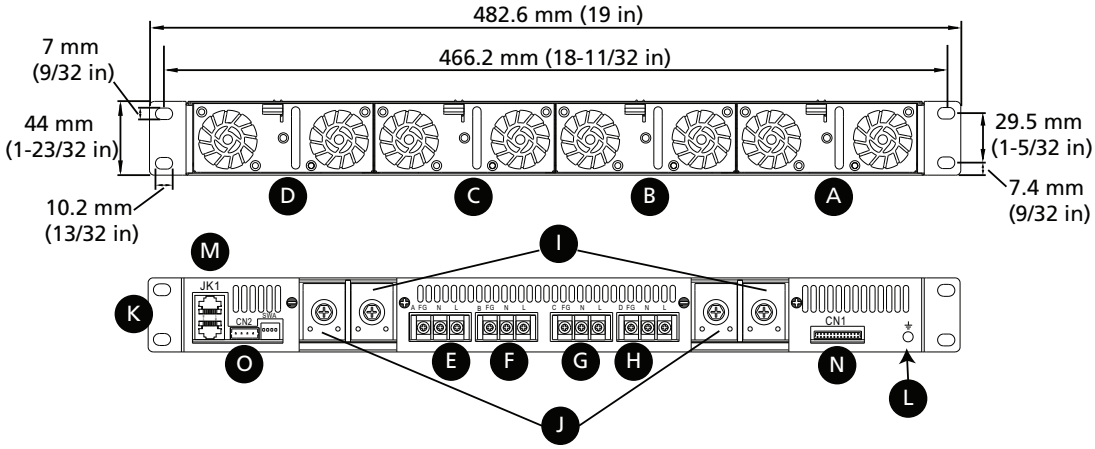


Figure 6. FD-RX-PSU-MW-FRAME front view, *top*; back view, *bottom*. See Table 5 for detailed descriptions of the labeled items.

A	Module A	I	DC output terminals "+"
B	Module B	J	DC output terminals "-"
C	Module C	K	Mounting bracket
D	Module D	L	Ground/Earth stud
E	AC input for module A	M	JK1 ports
F	AC input for module B	N	CN1 port
G	AC input for module C	O	CN2 port
H	AC input for module D		

Table 5. Descriptions of items labeled in Figure 6

FD-RX-PSU-MW-56/3200 Power Derating

The output power of the FD-RX-PSU-MW-56/3200 power supply modules is derated for specific input voltages. For more information, see the MEAN WELL NCP-3200 spec sheet (https://etclink.it/yvY82EBJ) .

Input Voltage	Rated Output Power	Typical AC Current Draw
100 VAC	1600 W	16 A
120 VAC	1900 W	16 A
208 VAC	3200 W	16 A
230 VAC	3200 W	14 A

Clearance

The FD-RX-PSU-MW-FRAME four-bay external power supply frame requires the following clearances:

- The built-in DC fans require 10 cm (4 in) clearance around the ventilation holes after mounting the four-bay frame in the 19-inch equipment rack.
- The power bussing connections on the back of the FD-RX-PSU-MW-FRAME four-bay frame require 20 mm (3/4 in) clearance. Equipment mounted directly above or below a FD-RX-PSU-MW-FRAME four-bay frame must be less than 35 cm (14 in) in depth. See the warning below.

WARNING: RISK OF ELECTRIC SHOCK! Maintain 20 mm (3/4 in) clearance behind the installed MEAN WELL four-bay frame. Equipment mounted above or below a MEAN WELL four-bay frame must be 35 cm (14 in) or less in depth. Equipment with a depth of more than 35 cm (14 in) mounted immediately above or below a MEAN WELL four-bay frame may cause an unsafe electrical connection due to mechanical interference with the power bussing connections.

AVERTISSEMENT : RISQUE DE CHOC ÉLECTRIQUE! Conservez un espace de 20 mm (3/4 po) derrière le châssis du rack MEAN WELL installé. Tout équipement monté au-dessus ou au-dessous d'un rack MEAN WELL doit avoir une profondeur de 35 cm (14 po) ou moins. Tout équipement d'une profondeur de plus de 35 cm (14 po) monté immédiatement au-dessus ou au-dessous d'un rack MEAN WELL peut provoquer une connexion électrique dangereuse en raison d'interférences mécaniques avec les connexions de bus d'alimentation.

Note: *If you are bussing two FD-RX-PSU-MW-FRAME rack systems together, they must be installed vertically adjacent in the equipment rack.*

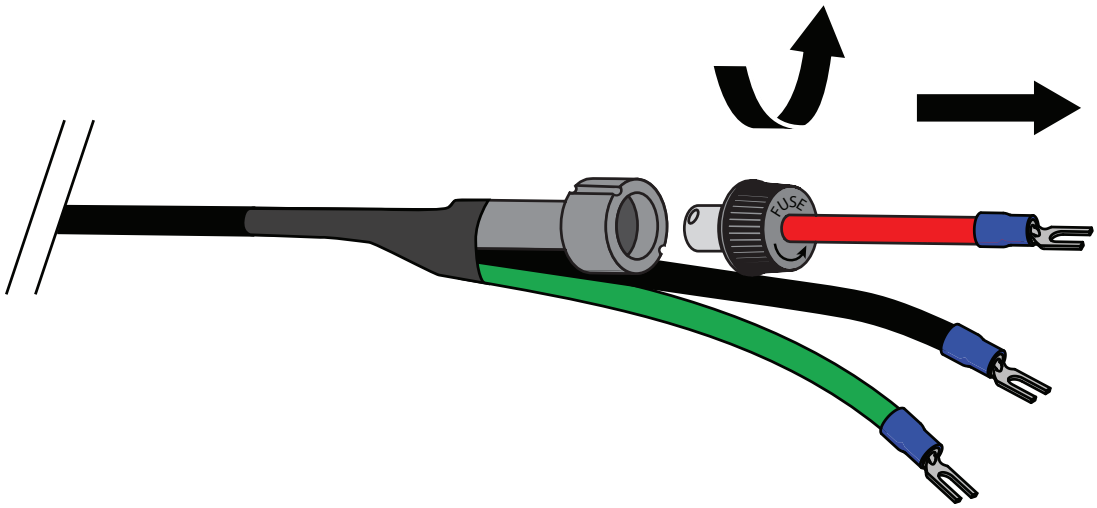
Optional 208 V Fused Power Cord

FD-RPS-IC-208BE (ETC part number 7148B7019) is an optional, fused power cord to connect FD-RX-PSU-MW-56/3200 modules to 208 V power. FD-RPS-IC-208BE must be ordered separately.

Replace the Fuse in a 208 V Fused Power Cord

If necessary, you can replace the fuse in the fuse holder on the FD-RPS-IC-208BE 208 V fused power cord.

1. Disconnect the power cord from the power source.
2. Twist the bayonet-lock knob to open the fuse holder.
3. Replace the fuse with a 250 V, 20 A 3AB fuse (ETC part number F413).
4. Replace the bayonet-lock knob and twist to close and lock the fuse holder.
5. Reconnect the power cord to the power source.



Opening the fuse holder on the FD-RPS-IC-208BE 208 V fused power cord

Safety Kits

ETC offers safety kits for installations with one or two FD-RX-PSU-MW-FRAME rack-mount units.

Note: *The figure below shows a 2U safety kit (FD-RX-SK2). The 1U safety kit (FD-RX-SK1) is similar, using two Phillips-head nylon screws and two hex-head screws provided with the safety kit per pair of terminals.*

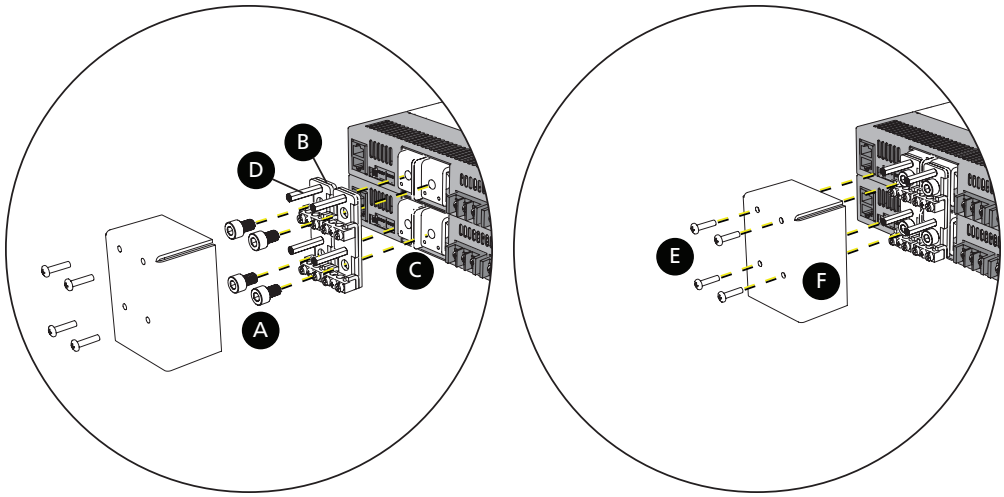


Figure 7. FD-RX-PSU-MW-FRAME partial back view. *Left*, installing a 2U safety kit (FD-RX-SK2) on one pair of terminals. *Right*, installing the safety cover. See Table 6 for detailed descriptions of the labeled items.

A	Hex-head screws
B	2U bus bar from
C	DC output terminals on FD-RX-PSU-MW-FRAME four-bay frame
D	Threaded standoff
E	Phillips-head nylon screws
F	2U safety cover from
G	2U safety kit RJ45 bussing and termination
H	RJ45 bussing cable (only included in the 2U safety kit [FD-RX-SK2])
I	Install RJ45 PMBus terminators provided with the FD-RX-PSU-MW-FRAME four-bay frame.

For clarity, only one set of terminals of each FD-RX-PSU-MW-FRAME four-bay frame is shown above. The rest of the four-bay frame is omitted from the illustration.

Table 6. Descriptions of items labeled in Figure 7 and Figure 8.

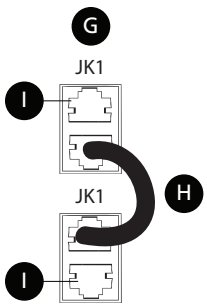


Figure 8. RJ45 bussing for 2U safety kit (FD-RX-SK2) only. See Table 6 for detailed descriptions of the labeled items.

Safety Kit Details

Safety Kit Model	Safety Kit Part Number	Quantity		Quantity of Safety Kit Components		
		FD-RX-PSU-MW-FRAME four-bay frame	F-Drive RX	Ground Harnesses	Bus Bars and Safety Covers	RJ45 Bussing Cables
FD-RX-SK1	7148K1026	1 (1U)	up to 4	1	• Four 1U bus bars • Two 1U safety covers	None
FD-RX-SK2	7148K1027	2 (2U)	up to 8	2	• Four 2U bus bars • Two 2U safety covers	1

- Each ground harness is 61 cm (2 ft) long with 8 AWG insulated wire with a ring terminal on one end and a bare end on the other.
- Each safety cover comes with M4 x 12 mm nylon screws for installation to the standoffs on the bus bars.
- The FD-RX-SK2 RJ45 bussing cable is 30 cm (1 ft).

Install the Power Supply in the Rack

WARNING: Connect this equipment to a non-dimmable power source in order to avoid damage to the equipment's internal power supply and other electrical components. Using a dimmable power source may damage the equipment and will void the warranty.

Before installing equipment in the rack, review *Rack-Mount Safety on page 22*.

WARNING: RISK OF ELECTRIC SHOCK! Maintain 20 mm (3/4 in) clearance behind the installed MEAN WELL four-bay frame. Equipment mounted above or below a MEAN WELL four-bay frame must be 35 cm (14 in) or less in depth. Equipment with a depth of more than 35 cm (14 in) mounted immediately above or below a MEAN WELL four-bay frame may cause an unsafe electrical connection due to mechanical interference with the power bussing connections.

AVERTISSEMENT : RISQUE DE CHOC ÉLECTRIQUE! Conservez un espace de 20 mm (3/4 po) derrière le châssis du rack MEAN WELL installé. Tout équipement monté au-dessus ou au-dessous d'un rack MEAN WELL doit avoir une profondeur de 35 cm (14 po) ou moins. Tout équipement d'une profondeur de plus de 35 cm (14 po) monté immédiatement au-dessus ou au-dessous d'un rack MEAN WELL peut provoquer une connexion électrique dangereuse en raison d'interférences mécaniques avec les connexions de bus d'alimentation.

1. Ensure power to the rack is off.
2. Mount all rack-mount units in a 19-inch equipment rack using the supplied rack-mounting rails.
3. Insert FD-RX-PSU-MW-56/3200 or FD-RX-PSU-MW-56/3200-CE power supply modules into the FD-RX-PSU-MW-FRAME four-bay frames.

Note: *FD-RX-PSU-MW-56/3200 and FD-RX-PSU-MW-56/3200-CE power supplies are factory-calibrated for 56 VDC output. If you find it necessary to calibrate the output of each MEAN WELL power supply for optimal current-sharing, see the* Output Voltage Adjustment *section of the NCP-3200/DHP-1UT-B installation manual. See* *Technical Information from MEAN WELL on page 50*.

Note: *If you are bussing two FD-RX-PSU-MW-FRAME rack systems together, they must be installed vertically adjacent in the equipment rack.*

Connect Ground/Earth

Each FD-RX-PSU-MW-FRAME four-bay frame has a ground/earth stud (*Figure 6*, *L* on *page 51*) for connection to the equipment rack ground/earth. ETC provides a 0.6 m (2 ft) harness of 8 AWG insulated wire with a ring terminal on one end and a bare end on the other with the safety kits for this purpose. Use the nut installed on the stud to install the ring terminal. Follow all local and national codes. See *Safety Kits on page 54* for more information about safety kits.

Wire the AC Input

1. Locate the AC power cord that shipped with your custom power supply module.
   - The AC power cord has fork terminals on one end and wire ferrules on the other.
   - You will need one cable for each power supply module, up to four AC power cords and power supply modules per FD-RX-PSU-MW-FRAME four-bay frame.
   - If you ordered 208 V fused power cords for your power supply modules (model FD-RPS-IC-208BE, ETC part number 7148B7019), you may recycle the power cords that shipped with your power supply modules.
   - One power cord connects to each set of AC input terminals (*E*, *F*, *G*, or *H* in *Figure 6 on page 51*) on the FD-RX-PSU-MW-FRAME four-bay frame.
2. Follow the markings on the FD-RX-PSU-MW-FRAME four-bay frame and secure the fork terminals from the power cord to the AC input terminals for power modules A, B, C, or D, as required.
3. Wire the bare end of the power cord to a power connector of your choice. Follow all national and local codes.

AC Power Cord		Ships with Custom Power Supply Module		Wire	
ETC Model	ETC Part Number	ETC Model	ETC Part Number	Color	Type
	7148B7016	FD-RX-PSU-MW-56/3200	PS597	green	ground
				black	line/hot
				white	common
	7148B7018	FD-RX-PSU-MW-56/3200-CE	PS597-CE	green	earth
				brown	live
				blue	neutral
FD-RPS-IC-208BE	7148B7019	Ordered separately		green	ground
				black	line 1/hot 1
				red	line 2/hot 2 (fused)

Wire the DC Power Output

In order to connect the DC power output of a FD-RX-PSU-MW-FRAME to the power input of an F-Drive RX, you need:

- A safety kit with tin-plated bus bars (see *Safety Kits on page 54*):
  - FD-RX-SK1 for a single FD-RX-PSU-MW-FRAME four-bay frame
  - FD-RX-SK2 for two bussed FD-RX-PSU-MW-FRAME four-bay frames
- The red-and-black DC power wiring harness included with the F-Drive RX. The DC power harness is 2.4 m (8 ft) long with one red wire and one black 8 AWG wire, pre-terminated to an F-Drive RX input plug on one end with bare ends on the other.

1. Ensure power to the rack is off.
2. Use a Phillips screwdriver to remove all screws from the "+" and "-" terminals on each FD-RX-PSU-MW-FRAME four-bay frame.
3. Install bus bars to the "+" terminals of the FD-RX-PSU-MW-FRAME four-bay frames using the hex-head screws provided with the safety kit. See *Safety Kits on page 54*.
   - Install a 1U bus bar if you are installing a single FD-RX-PSU-MW-FRAME four-bay frame (not shown, but similar to *Figure 7*, B on *page 54*).
   - Install a 2U bus bar to the "+" terminals if you are installing two FD-RX-PSU-MW-FRAME four-bay frames, located in adjacent positions in the same equipment rack (*Figure 7*, B on *page 54*).
4. Repeat step 3 for the "-" terminals of the FD-RX-PSU-MW-FRAME four-bay frames.
5. Strip the free end of each wire on all DC power harnesses to 11 mm (7/16 in).
6. Insert the red wire from each DC power harness into a terminal on a positive bus bar.
7. Insert the black wire from each DC power harness into a terminal on a negative bus bar.
8. Tighten the screws securing each bus bar to the terminals and tighten the screws securing each wire into a terminal.
9. Install the safety covers (*Figure 7*, F on *page 54*) to the standoffs (*Figure 7*, D on *page 54*) using the nylon screws provided with the safety kit.
10. Complete the *Final Installation Steps on page 60*.

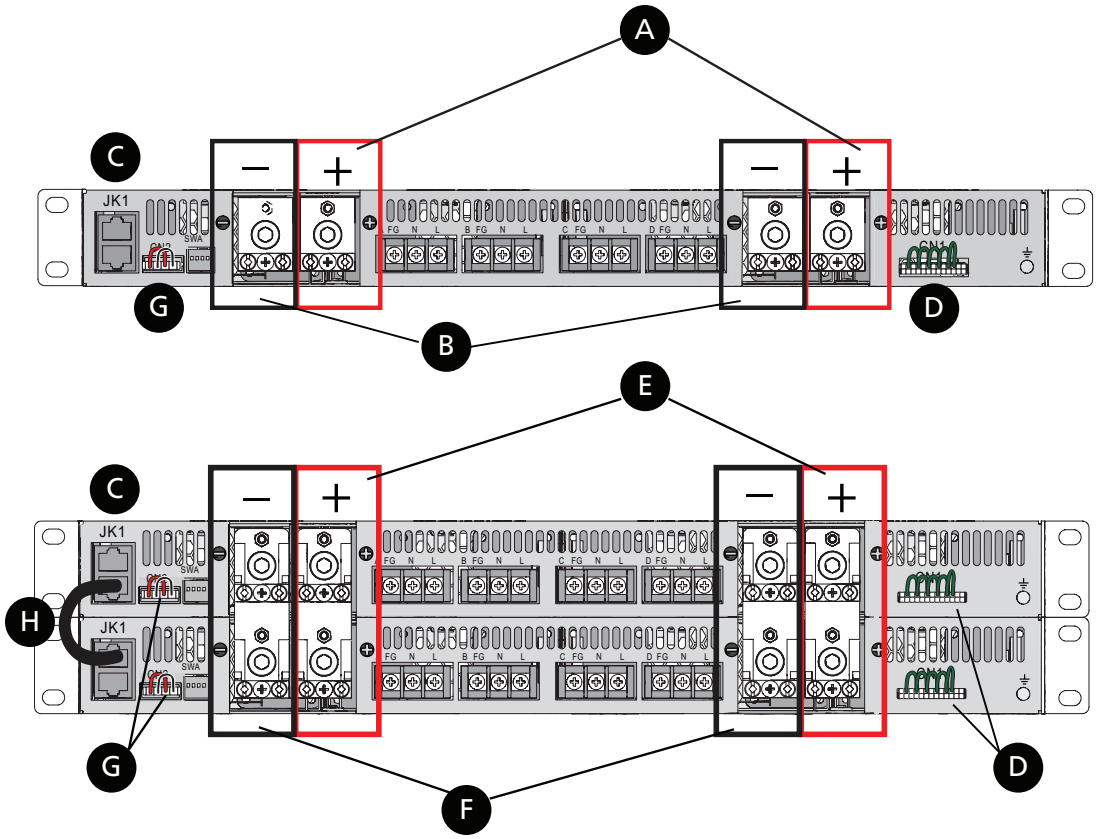


Figure 9. FD-RX-PSU-MW-FRAME back view, *top*; Two FD-RX-PSU-MW-FRAME back view, *bottom*. See Table 7 for detailed descriptions of the labeled items. Safety covers are not shown.

A	1U positive (+) bus bar from FD-RX-SK1: connect red wires from F-Drive RX power harnesses to any terminal.
B	1U negative (-) bus bar from FD-RX-SK1: connect black wires from F-Drive RX power harnesses to any terminal.
C	JK1 ports, left open in the top example because there is only one FD-RX-PSU-MW-FRAME four-bay frame. See *Final Installation Steps on page 60*.
D	CN1 header. Install the plug with green jumper wires provided by MEAN WELL. See *Final Installation Steps on page 60*.
E	2U positive (+) bus bar from FD-RX-SK2: connect red wires from F-Drive RX power harnesses to any terminal.
F	2U negative (-) bus bar from FD-RX-SK2: connect black wires from F-Drive RX power harnesses to any terminal.
G	CN2 header. Install the plugs with red and black jumper wires provided by MEAN WELL. See *Final Installation Steps on page 60*.
H	Install an RJ45 bussing cable when bussing two FD-RX-PSU-MW-FRAME four-bay frames. See *Final Installation Steps on page 60*.
Note: See *Safety Kits on page 54* for information about assembling safety kits.	

Table 7. Descriptions of items labeled in Figure 9

Final Installation Steps

CAUTION: ***You must use the plug with green jumper wires provided by MEAN WELL to electrically connect "ON/OFF" and "+5V-AUX" on CN1 to allow the FD-RX-PSU-MW-FRAME four-bay frame to operate normally; if kept open, there will be no output voltage. See the Remote Control section of the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see Technical Information from MEAN WELL on page 50) . This plug is called the "Remote Control mating wire (CN1)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL.***

Note: *The current-sharing features of the MEAN WELL power supplies in two bussed DHP-1UT-B four-bay frames will not work unless the JK1 ports are connected in parallel. See the* Parallel Operation *section in the NCP-3200/*DHP-1UT-B installation manual *from MEAN WELL (see Technical Information from MEAN WELL on page 50) and the safety kit illustrations on page 54.*

1. Ensure power to the rack is off.
2. Install the safety cover to the standoffs on the bus bars using the provided nylon screws.
3. Install the plug with green jumper wires provided by MEAN WELL to the CN1 header on each FD-RX-PSU-MW-FRAME four-bay frame.
   - This is called the "Remote Control mating wire (CN1)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see *Technical Information from MEAN WELL on page 50*) .
4. Install the plug with red and black jumper wires provided by MEAN WELL to the CN2 header on each FD-RX-PSU-MW-FRAME four-bay frame.
   - This is called the "Remote Sense mating wire (CN2)" in the NCP-3200/DHP-1UT-B installation manual from MEAN WELL (see *Technical Information from MEAN WELL on page 50*) .
5. If you are installing two FD-RX-PSU-MW-FRAME four-bay frames with a 2U safety kit (FD-RX-SK2), connect the JK1 ports on the four-bay frames in parallel using the RJ45 cable provided in the safety kit.
6. Connect the AC power cord for each power supply module to the AC power source.

MEAN WELL DIP Switches and LED Indicators

For information on the DIP switches on the FD-RX-PSU-MW-FRAME four-bay frame and the LED indicators on the FD-RX-PSU-MW-56/3200 and FD-RX-PSU-MW-56/3200-CE power supply modules, view the DHP-1UT-B and NCP-3200 specifications and manuals on the MEAN WELL website. See *Technical Information from MEAN WELL on page 50*.

Appendix C

Compliance

For complete product documentation, including compliance documentation, visit etcconnect.com.

To comply with the requirements of CSA C22.2 No. 250.13, DMX/RDM networks must not have more than 32 device loads per daisy chain. You must terminate the last device on the daisy chain by setting the DMX termination switch to ON. All other devices in the data run should retain the default setting for the termination switch (OFF).

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