Dell EMC PowerEdge MX7000 Enclosure

Cabling Instruction for –48 V DC Power Supply

Regulatory Model: E44S
Regulatory Type: E44S001
October 2021
Rev. A00

DELL Technologies

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

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About this document

This document describes the requirements, power and safety ground cable wiring instructions for MX7000 systems equipped with a -48V DC power supply.

CAUTION:

- **This installation should only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.**
- **Wire the unit in parallel for source and return safety earth grounding with 2 AWG stranded insulated copper cable only, rated at minimum 105 C.**
- **Protect the –(48–60) V (1 wire) with a branch circuit over current protection rated 100 A for DC with a high interrupt current rating.**
- **Connect the unit to a –(48–60) V DC SELV supply source that is electrically isolated from the AC source.**
- **Ensure that the –(48–60) V DC source is efficiently secured to earth (ground).**
- **Ensure that the MX7000 DC chassis is efficiently secured to earth (ground) at both rear wall grounding locations, using cable created from lug kit #V3NR7.**
- **Incorporate a readily available disconnect device in the field wiring that is suitably approved and rated.**

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Input requirement

- **Supply voltage**: – (48–60) V DC
- **Current consumption**: 83.2 A maximum
- **Kit Contents**:
  1. DC-IN connector (1) per each PSU - Dell Part # PXNKY
     NOTE: Each PXNKY includes 2 pieces of Panduit 2 AWG straight, 2-hole lug # LCC2-14AW-Q, for use in crimping lug to each 2 AWG power input cable (customer provided).
  2. Earth ground lug kit (1) - Dell Part # V3NR7
     NOTE: Each V3NR7 includes 2 pieces of Panduit 2 AWG 90-degree 2-hole lug # LCDN2-14AF-Q and 4 x M6 nuts, for creation of 2 earth-ground cable assemblies to connect to the rear wall.
  3. Rail kit (1) - Dell Part # HC9KX
     NOTE: Each HC9KX includes rail assemblies, strain-relief bar (SRB) assembly, hook-and-loop straps.
- **Required Tools (customer provided)**
  1. Cable stripping tool – Must be capable of supporting 2 AWG stranded copper cable.
     NOTE: Klein cable cutting tool # 63050 can cut 2 AWG cable and can strip insulation from same cable.
  2. Cable cutting tool – Must be capable of cutting 2 AWG stranded copper cable.
  3. Crimping tool – Must be capable of crimping 2 AWG cable lugs to 2 AWG stranded copper cable. Reference Panduit or equivalent catalog for several options of manual or Lithium-Ion battery-operated hydraulic crimpers and dies capable of supporting 2 AWG cable to 2 AWG lug crimping. Panduit catalog lists their die options, as well as alternate vendors - Burndy and Thomas & Betts.
  4. 10 mm socket or wrench (to install or remove M6 nuts within DC-IN connector).
  5. 1.5 mm hex wrench (to install or remove two hex head screws that secures 3 piece DC connector housing).
- **Required cables (customer provided)**
  - UL 10322 - 2 AWG, black, stranded copper cable (–48V DC)
  - UL 10322 - 2 AWG, red, stranded copper cable (V DC return)
  - UL 10322 - 2 AWG, green/yellow (green with yellow stripe), stranded copper cable (safety ground)
  - Heat-shrink tubing that fits over 2 AWG stranded cable
  - Ring terminals – as required for connecting chassis cables to DC power source and to earth ground

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Assembling the -48V DC power input connector and cables

About this task

NOTE: This product is intended to be used in CBN (Common Bonding Network) applications.

NOTE: Each MX7000 chassis requires 2 earth-ground cable assemblies.

Steps

1. Install the chassis into the rack by using rails, and then attach the strain-relief bar. For more information, see the *Rail Installation Guide* shipped with rail kit.

   NOTE: Due to weight of the 2 AWG DC power cable assemblies, it is highly recommended to attach the strain-relief bar to the rear chassis bracket mounts.

2. Strip the insulation from the end of the 2 AWG green / yellow ground cable, exposing approximately 15/16 inches (~24 mm).
3. Cut heat-shrink tubing for each ground cable lug to a length that allows tubing to cover the ground lug barrel ¾ inch (~19 mm) and ground cable ¾ inches. Slide heat-shrink tubing over each 2 AWG cable before crimping lugs (due to width of lug).
4. For the end of the ground cable that attaches to the chassis rear wall – use a manual or hydraulic crimping tool to crimp a 2 AWG 90 degree, 2-hole Panduit LCDN2-14AF-Q lug to the 2 AWG green / yellow insulated copper ground cable.
5. Adjust heat-shrink tubing so that barrel of lug and cable are each covered ¾ inch (19mm). Using a heat gun, shrink tubing over the cable and barrel of lug nut until tight.
6. Attach cable end with 90 degree 2-hole lug to the chassis 2-hole ground studs using 2 pieces of M6 nuts with integrated star washers.
7. For the other end of ground cable, follow the same process using heat-shrink tubing, but instead crimp an appropriate ring terminal and ground as required.

   NOTE: The system shown is for representative purpose only and may not match the actual system that you purchased.

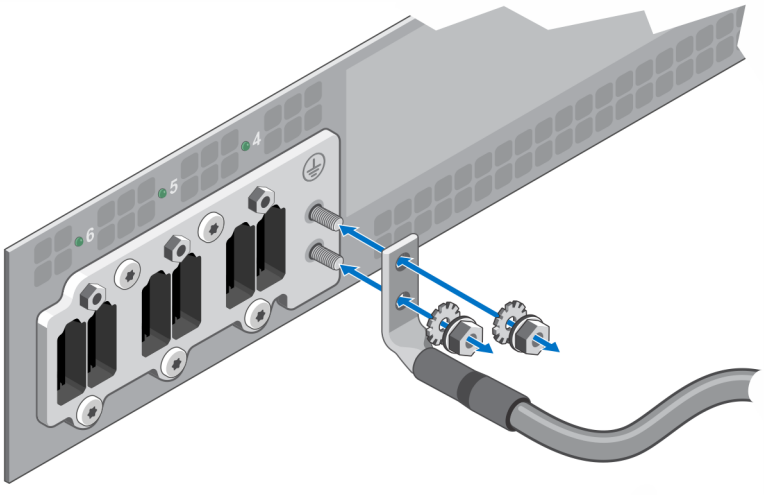

Figure 1. Assembling and connecting the safety ground cable

8. To disassemble DC-IN connector housing to access 2 AWG Panduit lugs embedded within, remove two 1.5 mm hex screws and separate the housing.

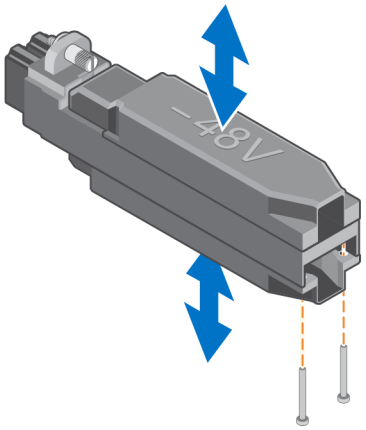

Figure 2. Removing the two 1.5 mm hex screws and separate the housing

9. Use 10 mm socket or wrench to remove four M6 nuts, and then remove two Panduit straight 2-hole lugs to assemble the power cables.
10. Strip insulation 1.25 inches (31.75 mm) from ends of 2 AWG -48V DC red and black stranded power cables.
11. Cut heat-shrink tubing for each power cable to a length that allows tubing to cover the lugs barrel ¾ inch (19 mm) and cable ¾ inch. Slide heat-shrink tubing over each 2 AWG cable before crimping lugs (due to width of lug).
12. Using manual or hydraulic crimper - crimp both 2 AWG Panduit LCC2-14AW-Q lugs provided with each DC-IN connector, to the 2 AWG red and 2 AWG black cables.
13. Adjust the heat-shrink tubing so that barrel of lug and cable are each covered ~¾ inch (19 mm). Using a heat gun, shrink the tubing over the cable and tighten to the barrel of lug.

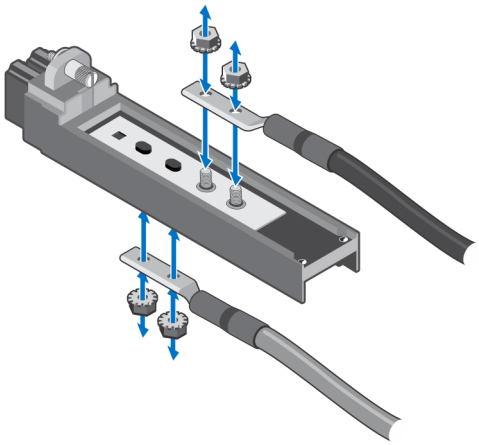

Figure 3. Connecting the -48V and RTN cables with M6 nuts

14. Attach each -48V and RTN cable to its corresponding location in the connector housing.

NOTE:

- Red “RTN” cable always attach to dual studs on bottom of the connector housing marked “RTN”
- Black “-48V” cable always attach to dual studs on top of the connector housing marked “-48V”
- Ensure to center each cable so as to wrap a ferrite clamp, which helps to ease re-assembly of the 3 piece housing by reducing outward tension of the two cables when aligning the three plastic housing components
- -48V and RTN housings are not interchangeable and can only be assembled when in the correct location. The two 1.5 mm screws only attach from the RTN side and threaded one on the -48V side

15. Slide the 3 piece housing components in place, and then using the 1.5 mm hex wrench tighten the screws on the RTN side.

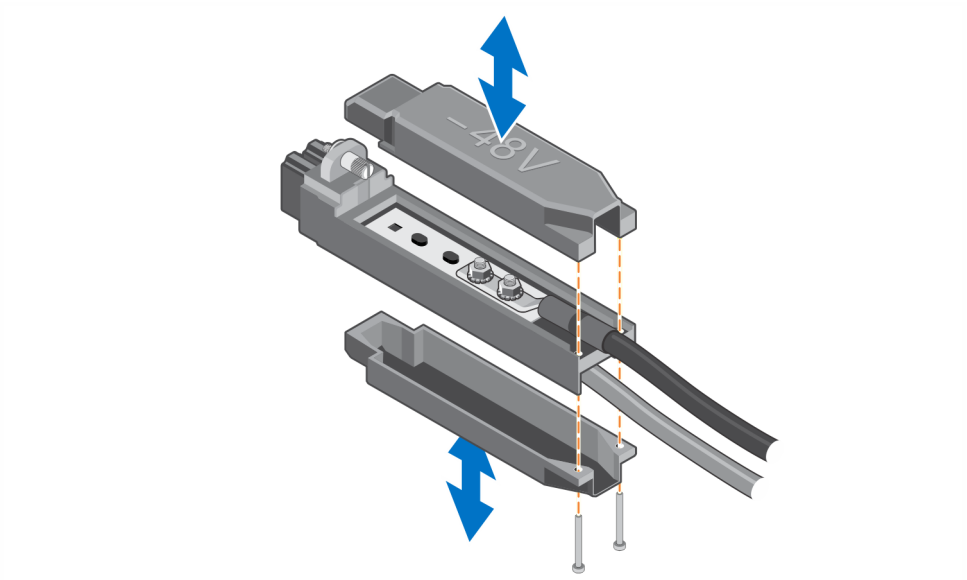

Figure 4. Attaching each -48V and RTN housing, tightening the screws on the RTN side

16. Repeat the same process for each PSU.
17. Connect the other end of the power cable to the DC power source by using appropriate crimping of ring terminal or lugs and heat-shrink tubing.
18. To connect the –48V DC power cable, plug each –48V DC power cable/connector assembly into each receptacle at the rear of the chassis.

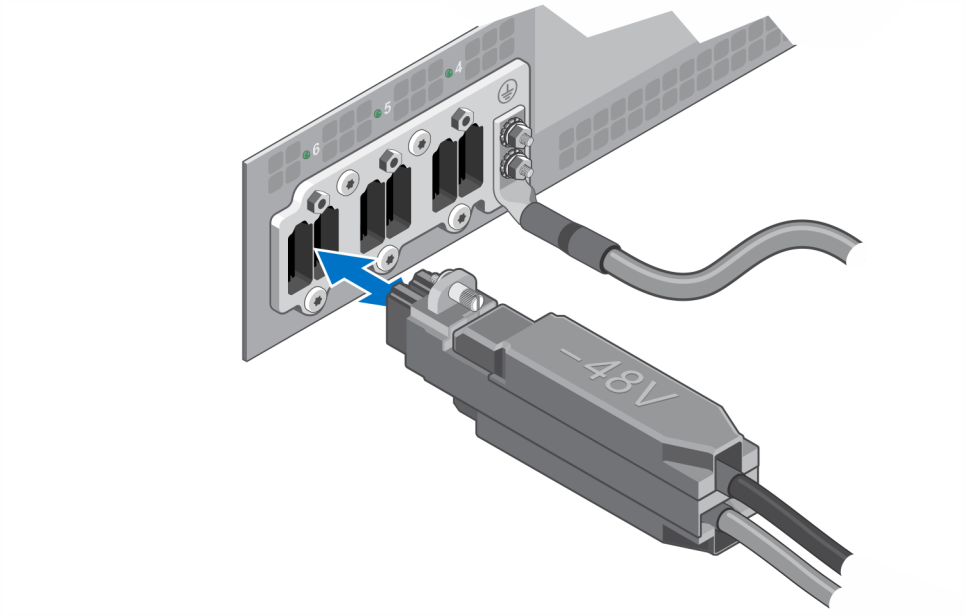

Figure 5. Connect the –48V DC power cable

19. Tighten the threaded screw on the -48V side.

NOTE: The power cable receptacles 1 to 3 are located on the right side, and power cable plugs 4 to 6 are located on the left of the rear view of the chassis. These correspond to the -48V DC PSUs installed from the front of the chassis.

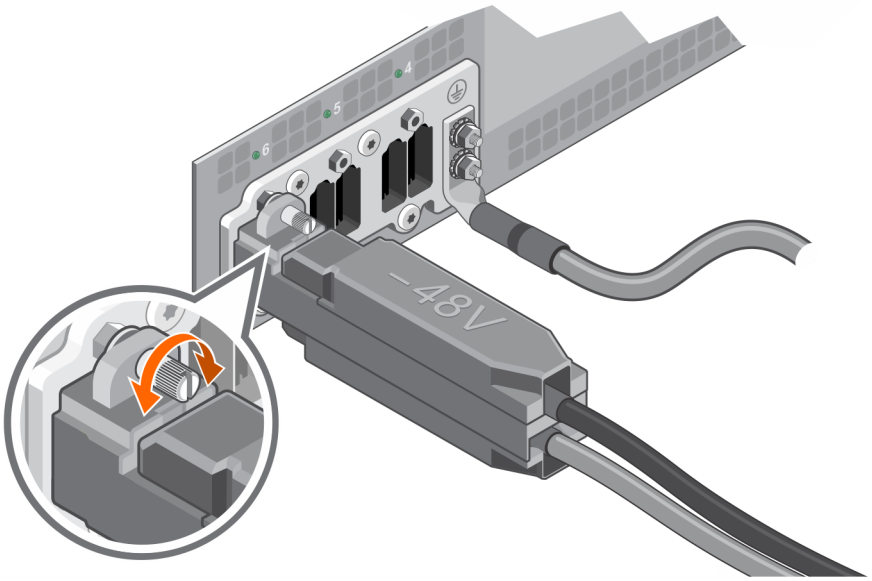

Figure 6. Tighten the threaded screw on the -48V side

20. Open the clamp-on ferrite (like a clam-shell), wrap it around both “-48V” and “RTN” cables.
21. Place the ferrite as close as possible to the strain-relief bar, and then close the ferrite. Ensure the latch snaps into locked position.

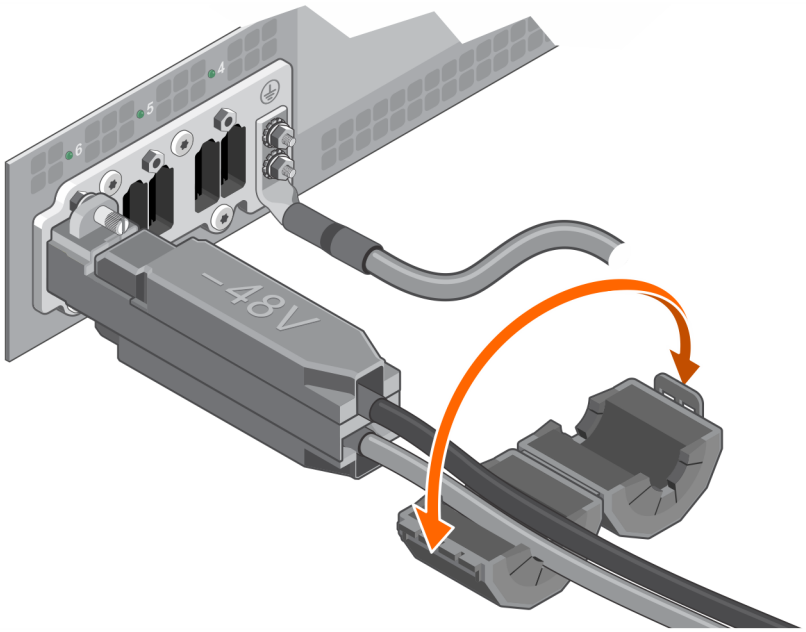

Figure 7. Attaching the ferrite clamp