

INSTALL THE PRISM REMOTE UNIT

This section tells you how to install a Prism Remote Unit (PRU). If the PRU is already installed and you need to add one or more RF Modules, go to ["Install the RF Module\(s\)" on page 86](#).

PLANNING FOR A PRISM REMOTE UNIT INSTALLATION

Before you unpack the PRU, you should first plan for where it will be mounted and collect the tools and supplies that are required to mount the PRU and then connect it to a Prism system.



Installation of the Prism Remote Unit may proceed separately from the installation of the corresponding Host Unit.

Mounting Plans

The PRU has a low-profile design that requires minimal real estate for installation. The basic dimensions and weights of the PRU are listed in [Table 20 on page 35](#) and [Table 19 on page 35](#).

The PRU should be mounted on a utility pole, mast, or on a flat surface. A Mounting Bracket ships with each Remote. Installation consists of securing the bracket to the mounting surface (wood, concrete, or steel) and then hanging the unit from the bracket. the PRU should only be mounted in a restricted access location.

Before mounting the PRU, make sure that the following requirements are met; observe all cautions and warnings listed in ["Mounting Cautions" on page 30](#).

- The PRU must
 - be installed only in a restricted-access location
 - must be located as specified in the system design plan (not documented here). If a system design plan has not been prepared, consult with the Technical Support for Wireless Products team for assistance (see ["DCCS Global Technical Support" on page 123](#)).
 - must have ready access to the specified AC or DC power source.
- If you mount the PRU in a horizontal position, you must mount it at a slight angle, with the top of the PRU chassis angled higher than the bottom, which creates a slope that allows water or snow to run off the PRU chassis. If it is mounted indoors, no slope required.
- If you mount the PRU in an upside-down horizontal position (i.e., a ceiling mount), attach safety leashes that can support the weight of a fully populated chassis (see [Table 19 on page 35](#)).
- The site chosen must
 - conform to all local codes; required permits must be obtained prior to mounting a PRU
 - comply with the unit environmental specifications
 - be open to free air space on the bottom (cable entry end), the top, the front, and both sides
 - allow adequate clearance at the bottom of the PRU to provide access for attaching cables and for viewing the LED indicator
 - provide 18 inches (45.7 cm) of clearance on the front and both sides of the PRU to allow doors to be opened for service and to allow free air circulation
 - can bear the size and weight of the PRU enclosure, see [Table 19 on page 35](#) and [Table 20 on page 35](#)

Table 19. Prism Remote Unit Weights ⁽¹⁾

PRU Model		Unpopulated	Populated
Single-Bay	Pounds	65	83
	Kilograms	29	38
Dual-Bay	Pounds	81	117
	Kilograms	37	53
Tri-Bay	Pounds	97	151
	Kilograms	44	68
Quad-Bay	Pounds	116	188
	Kilograms	53	85
<p>1 Unpopulated" weight includes the SeRF Module and the Solar shields, which are always present. "Populated" weight is the weight of the chassis that has the SeRF Module and RF Modules installed.</p>			

Table 20. Prism Remote Unit Enclosure Dimensions ⁽¹⁾

PRU Model		Height	Width ⁽²⁾	Depth	See...
Single-Bay	Inches	25.2	12.2	11.2	Figure 9 on page 36
	Centimeters	64	30.99	28.45	
Dual-Bay	Inches	33.2	12.2	11.2	Figure 10 on page 37
	Centimeters	84.3	30.99	28.45	
Tri-Bay	Inches	41.2	12.2	11.2	Figure 11 on page 38
	Centimeters	104.6	30.99	28.45	
Quad-Bay	Inches	52.4	12.2	11.2	Figure 12 on page 39
	Centimeters	133.10	30.99	28.45	
<p>1 To have adequate clearance to open the PRU chassis door, allow a minimum of 18 inches at the left, right and front of each PRU.</p> <p>2 Dimension for width includes the mounting brackets.</p>					

[Figure 9 on page 36](#) through [Figure 12 on page 39](#) provide the spacing dimensions for bands and bracket mounting bolts.

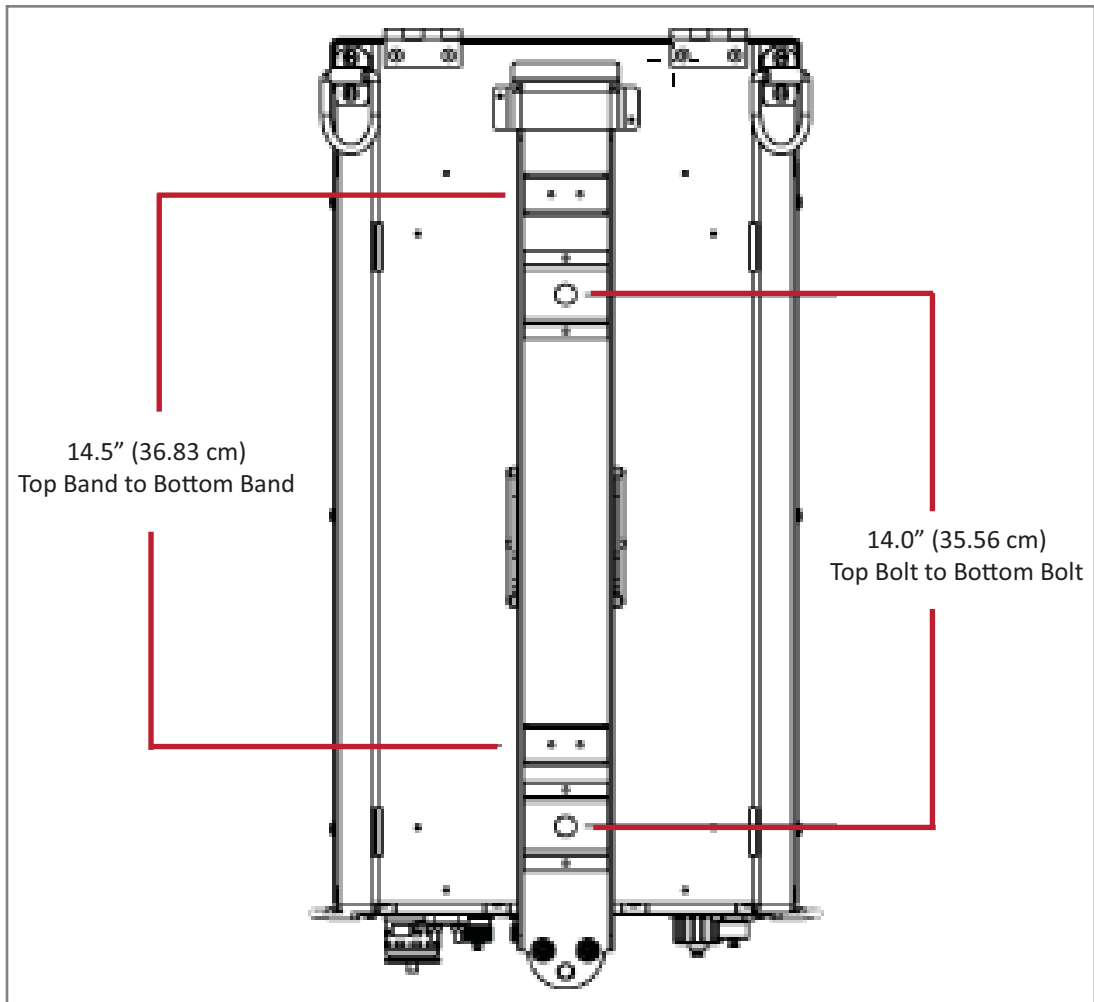


Figure 9. Mounting Dimensions for Single-Bay PRUs

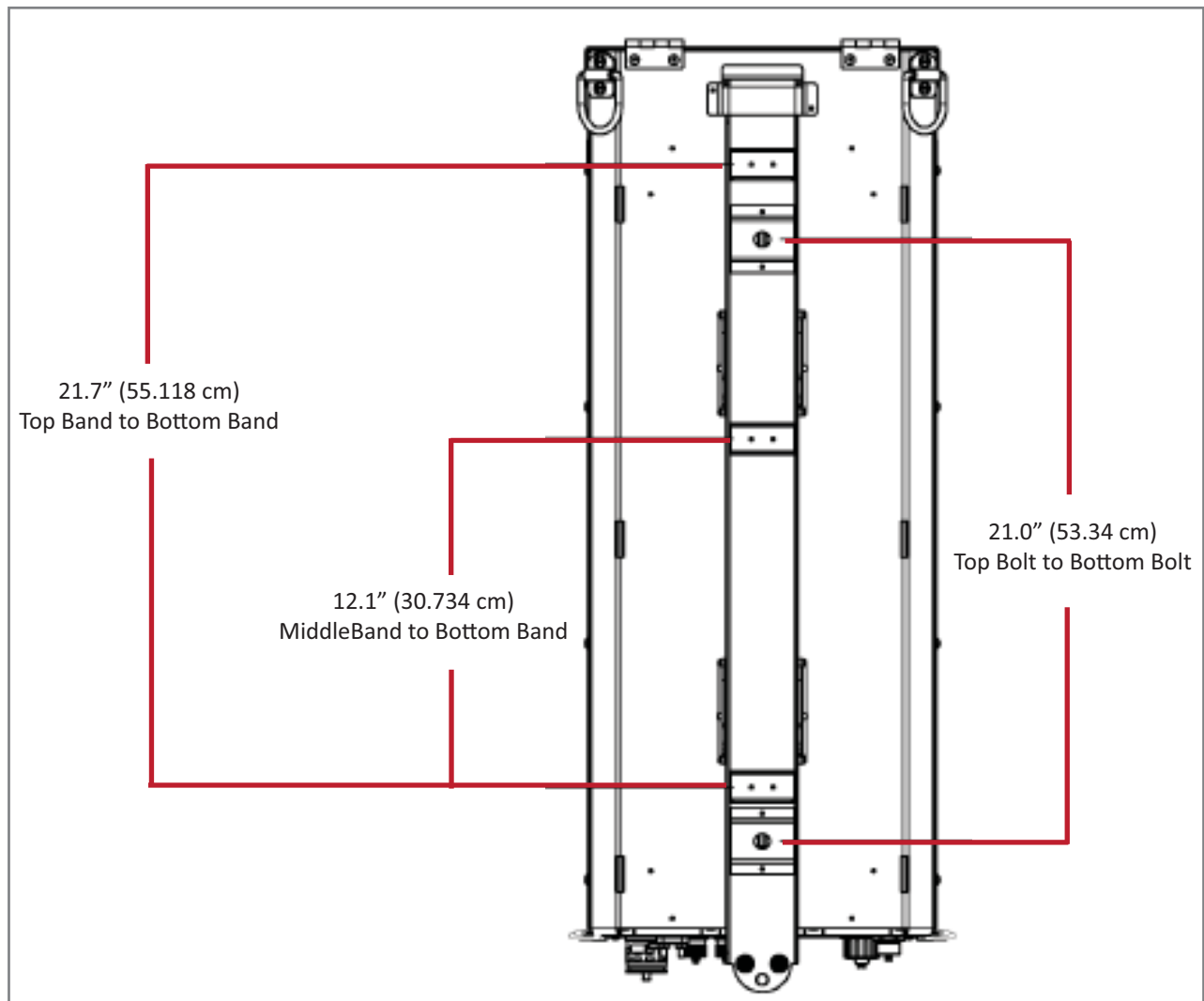


Figure 10. Mounting Dimensions for Dual-Bay PRUs

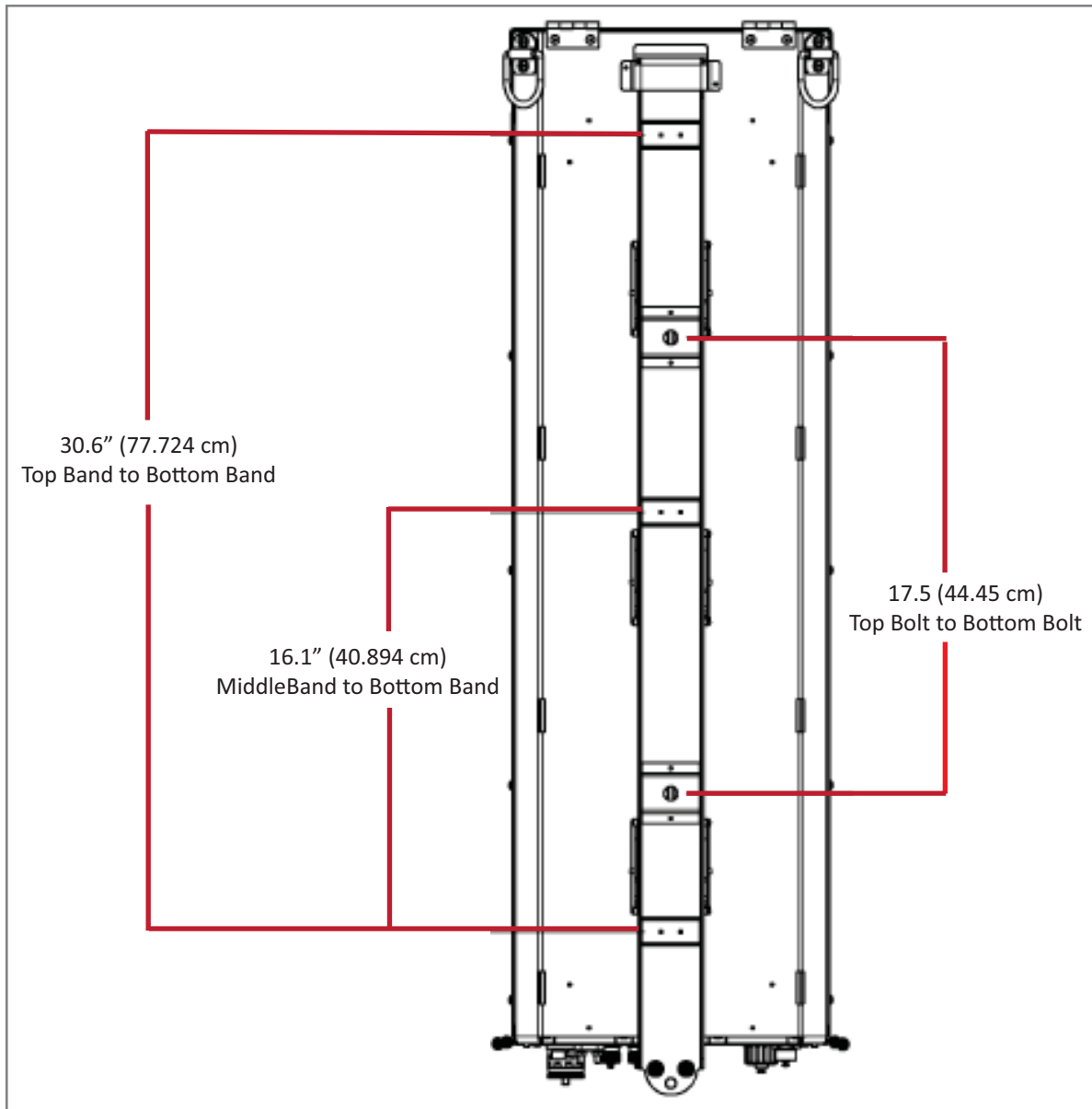


Figure 11. Mounting Dimensions for Tri-Bay PRUs

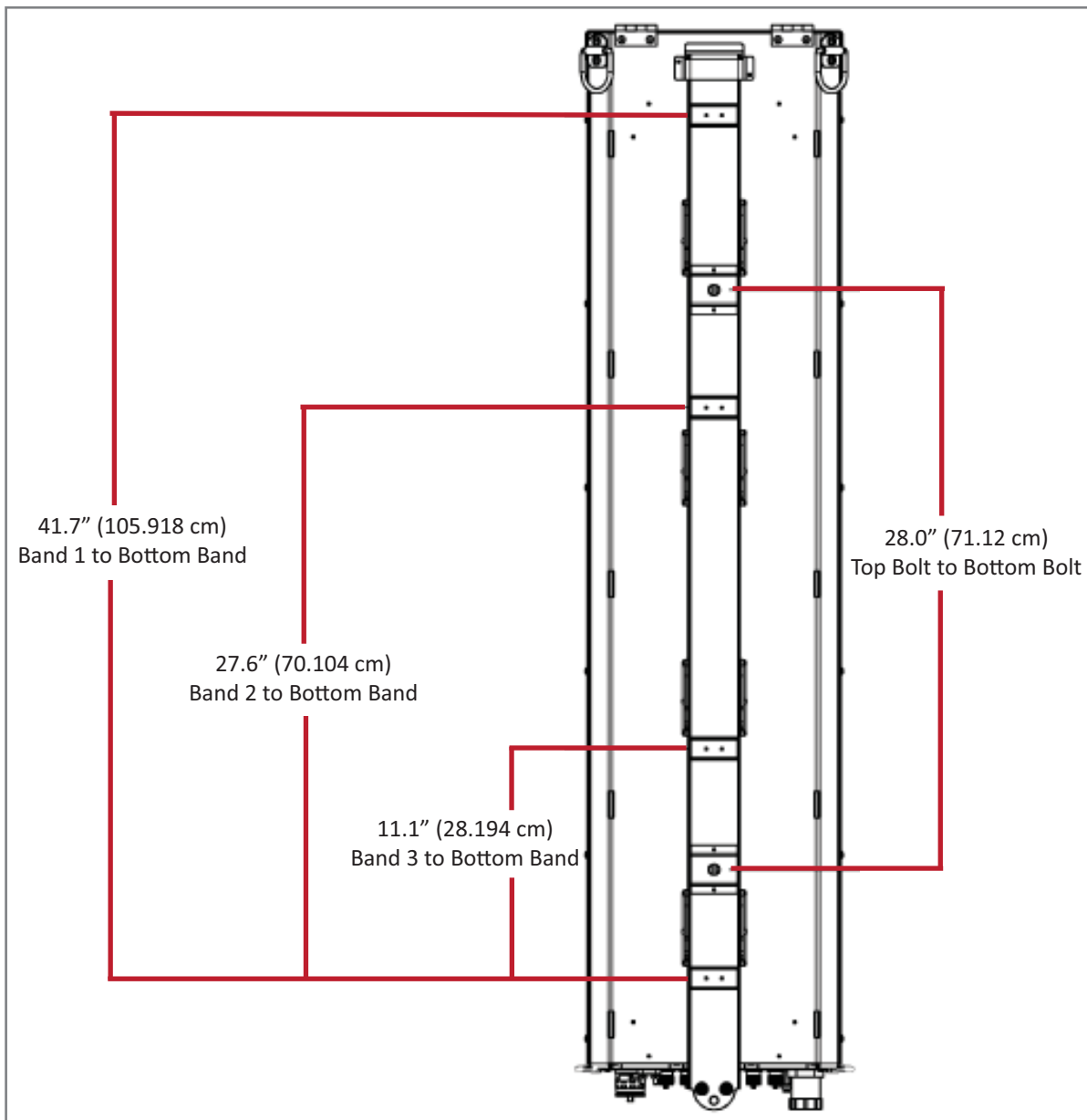


Figure 12. Mounting Dimensions for Quad-Bay PRUs

Installation Tools and Supplies

The tools and any additional materials required for install and mount the PRU are dependent on the mounting location.

Tools Required for All Mounting Methods

The Mounting Bracket ships with the PRU—it secures the PRU to its packing crate. All installations require at least one each of the following, which must be provided by the installer:

- tape measure
- pencil or other marking device
- 3/8-inch Flat-Blade screwdriver
- lifting equipment for PRU.

Additional Tools and Supplies Required for Steel-Pole Mounting

When mounting the PRU to a steel pole, in addition to the supplies listed in "[Tools Required for All Mounting Methods](#)" on page 40 the following supplies are needed:

- one hammer, ≥ 16 -ounces
- one Strap Tensioning/Clamping Tool (Uline Model No. H-1273, or equivalent)
- [Table 21](#) shows the number of stainless-steel straps and stainless-steel buckles required for each PRU type, in which you must have the same number of buckles as straps.
 - Use 1/2-inch to 3/4-inch 201, 301, 304 or 316 Stainless-Steel Strapping with a minimum tensile strength of 1500 pounds (Uline Model No. S-11329, or equivalent).
 - Use Stainless-Steel Buckles designed specifically for the above-mentioned strapping (Uline Model No. S-11331, or equivalent).

Table 21. Required Stainless-Steel Bands for Steel-Pole Mounting

CommScope Catalog Number	Number of Bands Required for Installation
FP4-XXXXX0021XXRU - Quad-Bay Remote	4
FP3-XXXXX0021XXRU - Tri-Bay Remote	3
FP2-XXXXX0021XXRU - Dual-Bay Remote	
FP1-XXXXX0021XXRU - Single-Bay Remote	2

Additional Tools and Supplies Required for Wood-Pole Mounting

When mounting the PRU to a wood pole, in addition to the supplies listed in "[Tools Required for All Mounting Methods](#)" on page 40, the following supplies are needed:

- one electric drill, 1/2-inch or larger
- one 1/2-inch drill bit
- two 1/2-inch square-head through-bolt or equivalent that is long enough to extend through the utility pole
- two 1/2-inch square nut or equivalent
- two 1/2-inch square washer
- one or more appropriately-sized wrenches for through-bolts
- one adjustable wrench

Additional Tools and Supplies Required for Flat-Surface Mounting

- one electric drill, 1/2-inch or larger
- one 5/8-inch wrench
- two 1/2-inch flat washers
- two 1/2-inch lock washers
- for masonry wall installations only:
 - two 1/2 x 1 1/2-inch hex bolts for masonry wall installations
 - two 1/2-inch concrete wall anchors for masonry wall installations
 - two 3/4-inch masonry drill bit (for masonry wall installations)
- for wood-framed wall installations only:
 - one 3/4-inch pressure-treated plywood, sized to accommodate the PRU (see [Table 20 on page 35](#))
 - fasteners for securing 3/4-inch plywood to wall
 - one 9/16-inch standard drill bit
 - two 1/2 x 1-inch hex bolts
 - two 1/2-inch Tee Nuts

Tools and Supplies Required to Connect a PRU

The installation hardware provided with a PRU is listed below.

- One 15-foot (4.6m) AC Power Cable, that is included with the PRU
- One of the following, which is purchased separately from the PRU:
 - ProAx cable assembly for legacy PRUs using a ProAx Connector
 - HMFOC Cable Assembly for HMFOC Connector
 - Fiber Pass-Through Cable Assembly (provided by installer)



The hardware used to package the PRU for shipment is not intended for installations of a PRU and should be kept with the Prism Remote Unit packaging. Do not use the shipping hardware when installing a PRU.

Additional hardware or tools required to connect a PRU to a Prism system is listed below.

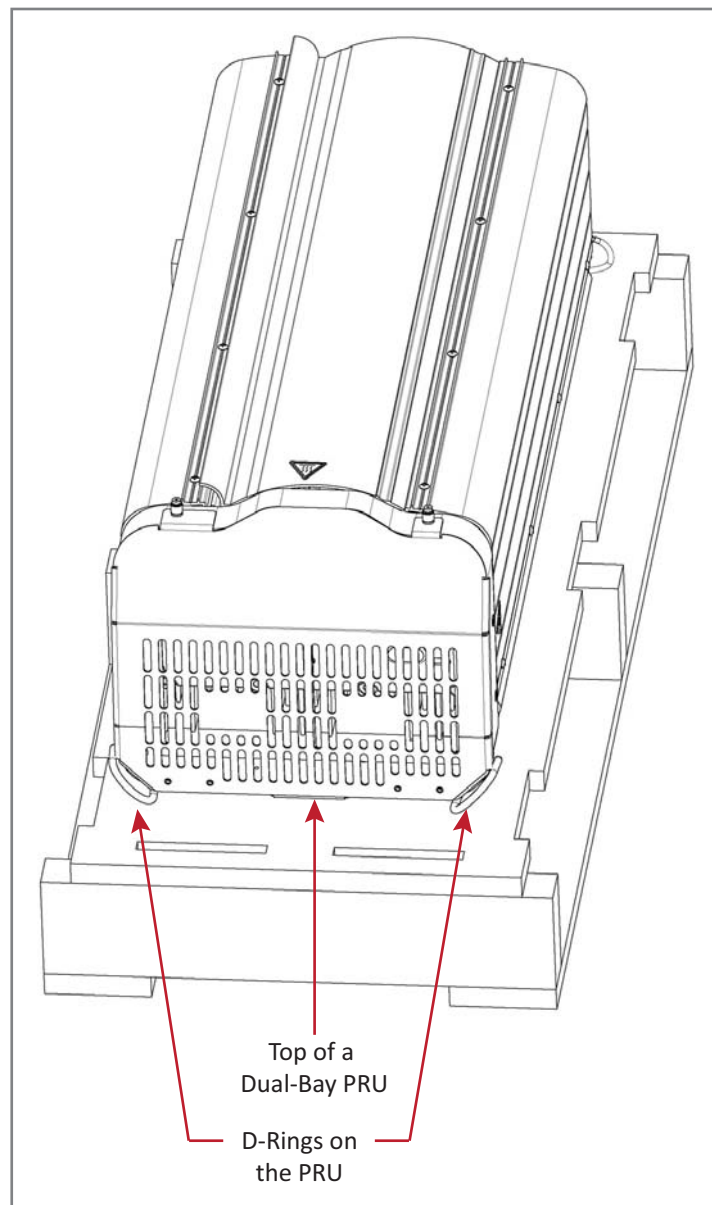
- Electro-Static Discharge (ESD) wrist strap
- Socket Wrench and 3/8-inch Deep Socket
- Wire cutters
- Wire stripper
- 9/64-inch Allen™ wrench (dual-slot RF Module installations only)
- 42MM wrench capable of 44 in-lb torque (the recommended N-Connector torque is 8 in-lb)
- Phillips screw driver capable of 18 in-lb torque
- N-Type male connectors
- Tool kit for attaching N-Type connectors to coaxial cable
- Fiber cleaning kit
- #6 AWG (4 mm) copper wire and splice
- Tools, Junction box, conduit, fasteners, connectors, and wire to install an exterior AC circuit
- RJ-45 connector (if making a permanent external network cable connection)
- For DC-powered PRUs, an 8 AWG or 6 AWG, 3- or 4-conductor power cable rated for outdoor use, with the following requirements.
 - The wire colors must be green, red, and black.
 - The cable diameter must be .71 to .98 inches.
 - If a 4-conductor power cable is used, the extra conductor can be snipped off before installation.
 - If using 6 AWG wire, the installer must provide and use #10 stud size, 6 AWG ring terminals.

UNPACK AND INSPECT THE PRISM REMOTE UNIT AND COMPONENTS

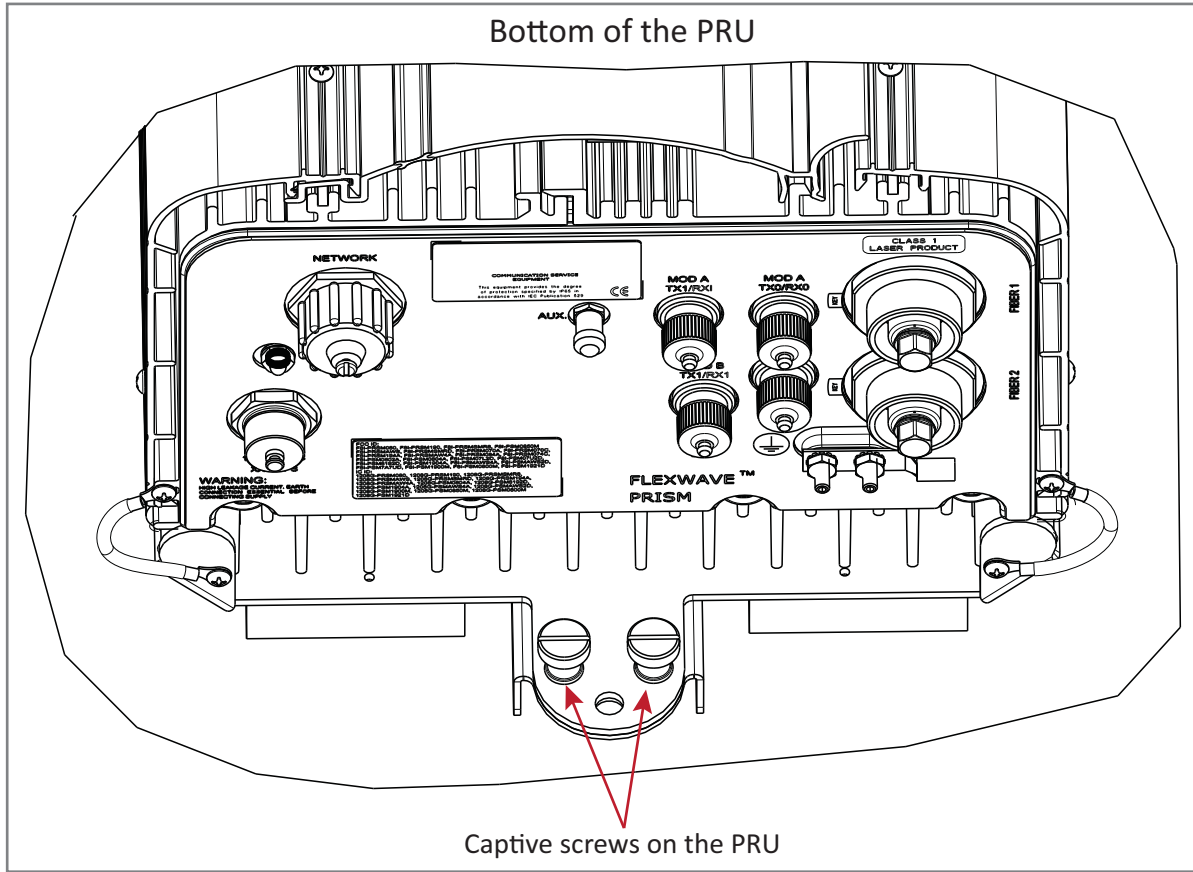
- 1 Inspect the exterior of the shipping container(s) for evidence of rough handling that may have damaged the components in the container.
- 2 Check the contents for damage and verify with the packing slip.

If damage is found or parts are missing, file a claim with the commercial carrier and notify CommScope Customer Service (see ["DCCS Global Technical Support" on page 123](#)). Save the damaged cartons for inspection by the carrier.

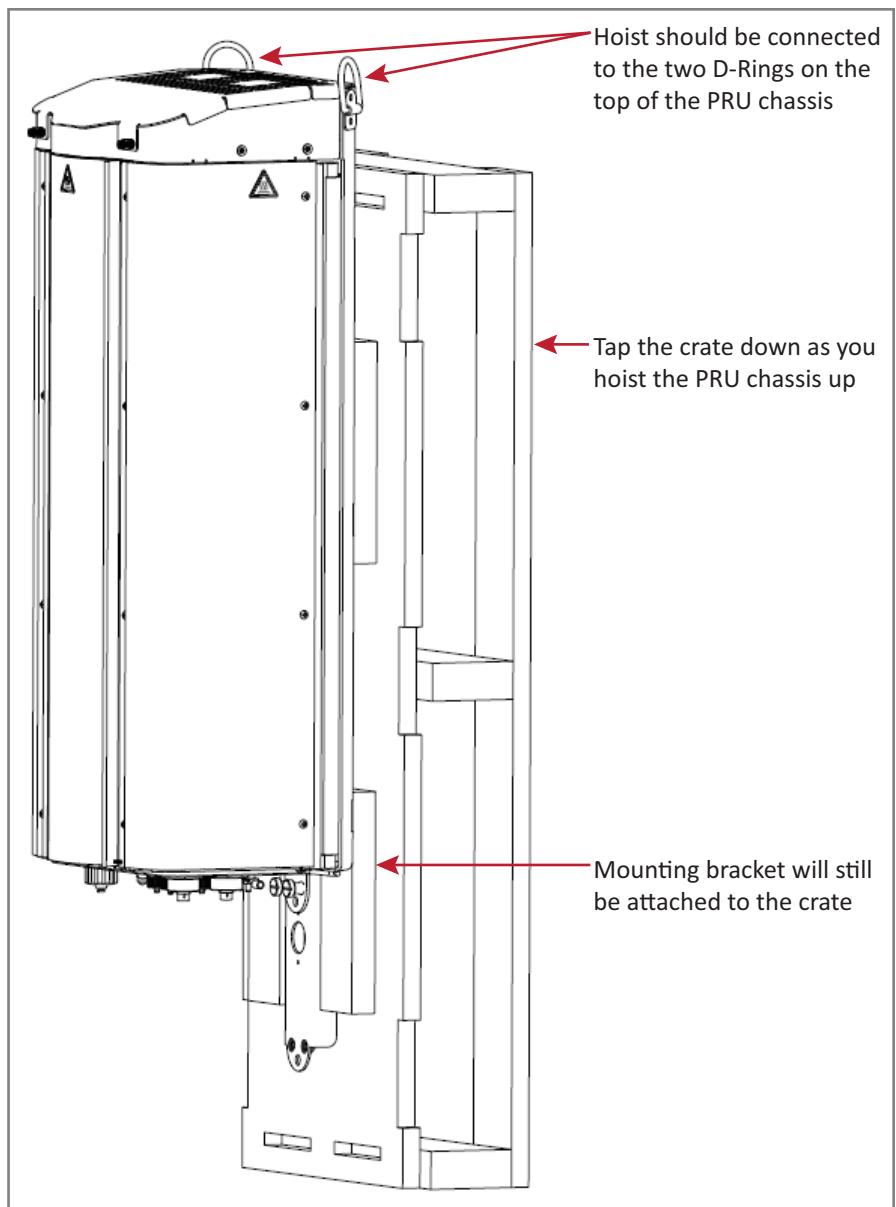
- 3 Unpack the PRU.
 - a Remove the power cable and any other ship-a-long items from either side of the PRU.
 - b Connect a hoist to the two D rings at the top of the PRU.



- c Loosen the two captive screws at the bottom of the PRU.



- d Hoist the PRU to an upright position and tap the crate downwards to separate the PRU from the Mounting Bracket.
- e Remove the Mounting Bracket from the crate:
 - i Unscrew two bolts and remove the Mounting Bracket from the crate.
 - ii Save the Mounting Bracket for field installation.
 - iii Save the two bolts and empty shipping crate for use should the equipment require shipment.



The crate used to ship the Fullband Remote Unit and the two bolts used to fasten the Mounting Bracket to the shipping crate are not intended for use for when mounting the PRU in the field.

MOUNT THE PRISM REMOTE UNIT

The PRU may be attached to a utility pole, a mast, or on a solid flat surface. Installation consists of securing the bracket to the mounting surface and then hanging the PRU from the bracket. The bracket may be attached to a variety of surfaces such as wood, concrete, or steel.

This guide provides the information you need to install and use the FlexWave Prism Remote Mounting Kit.

To ensure a safe installation, follow the steps in this document in the following order:

- 1 Gather required tools and supplies as described in ["Installation Tools and Supplies" on page 40](#).
- 2 Follow the guidelines in ["Mounting Plans" on page 34](#) to decide the best place to install and mount the PRU.
- 3 Familiarize yourself with the ["Mounting Cautions" on page 30](#).

Mounting Methods

Four installation methods are provided, proceed to the correct procedure for your installation environment:

- ["Steel Pole Installation Using Steel Banding" on page 47](#)
- ["Pole Mount Installation Using Bolts" on page 50](#)
- ["Wood-Framed Wall Mounting Procedure" on page 51](#)
- ["Masonry Wall Mounting" on page 53](#)

Steel Pole Installation Using Steel Banding



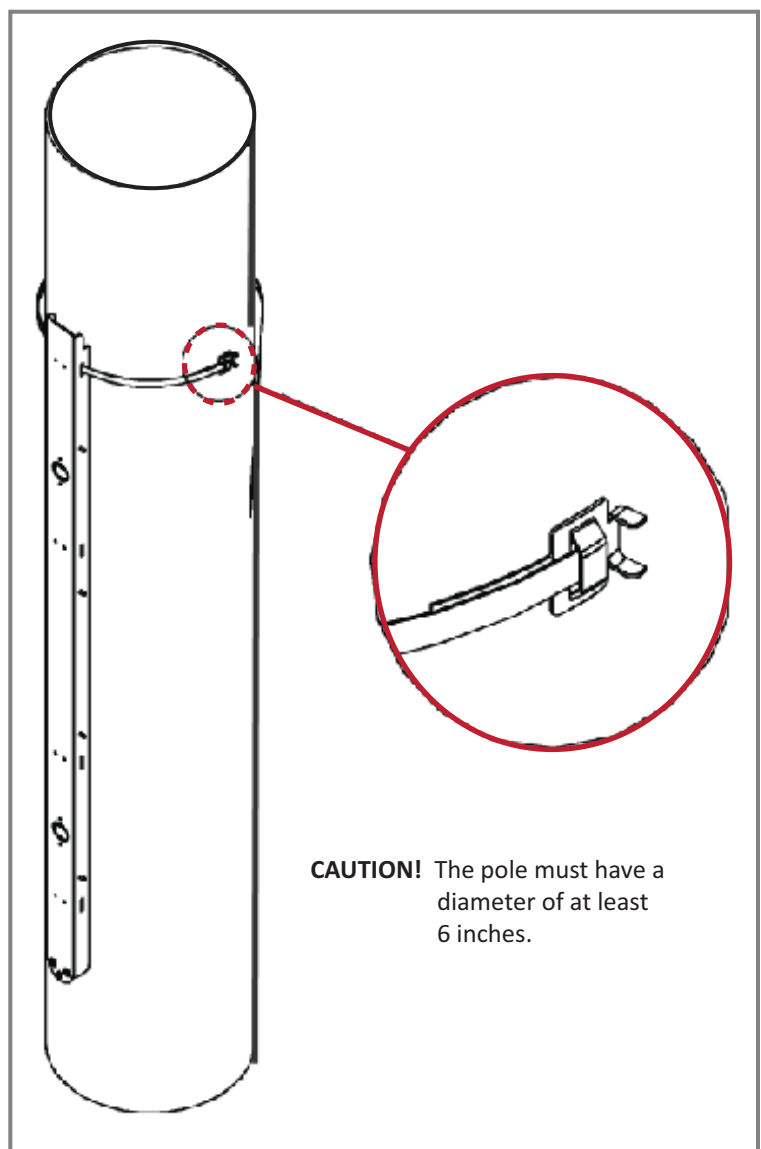
Always wear safety goggles when working with metal banding and when using tensioning tools.



This section describes how to secure a PRU to a steel pole using steel bands. In high earthquake risk areas, CommScope advises in addition to banding, bolts should be used redundantly to ensure mechanical mounting capable of surviving severe seismic activity. Typical areas where this attachment method are suggested are Earthquake Risk Zone 4, per Bellcore GR-63-CORE, section 4.4.1.1. If you have application specific questions, consult the Wireless Technical Assistance Center (TAC) for technical assistance (see ["DCCS Global Technical Support" on page 123](#)). For information on bolting, see ["Pole Mount Installation Using Bolts" on page 50](#).

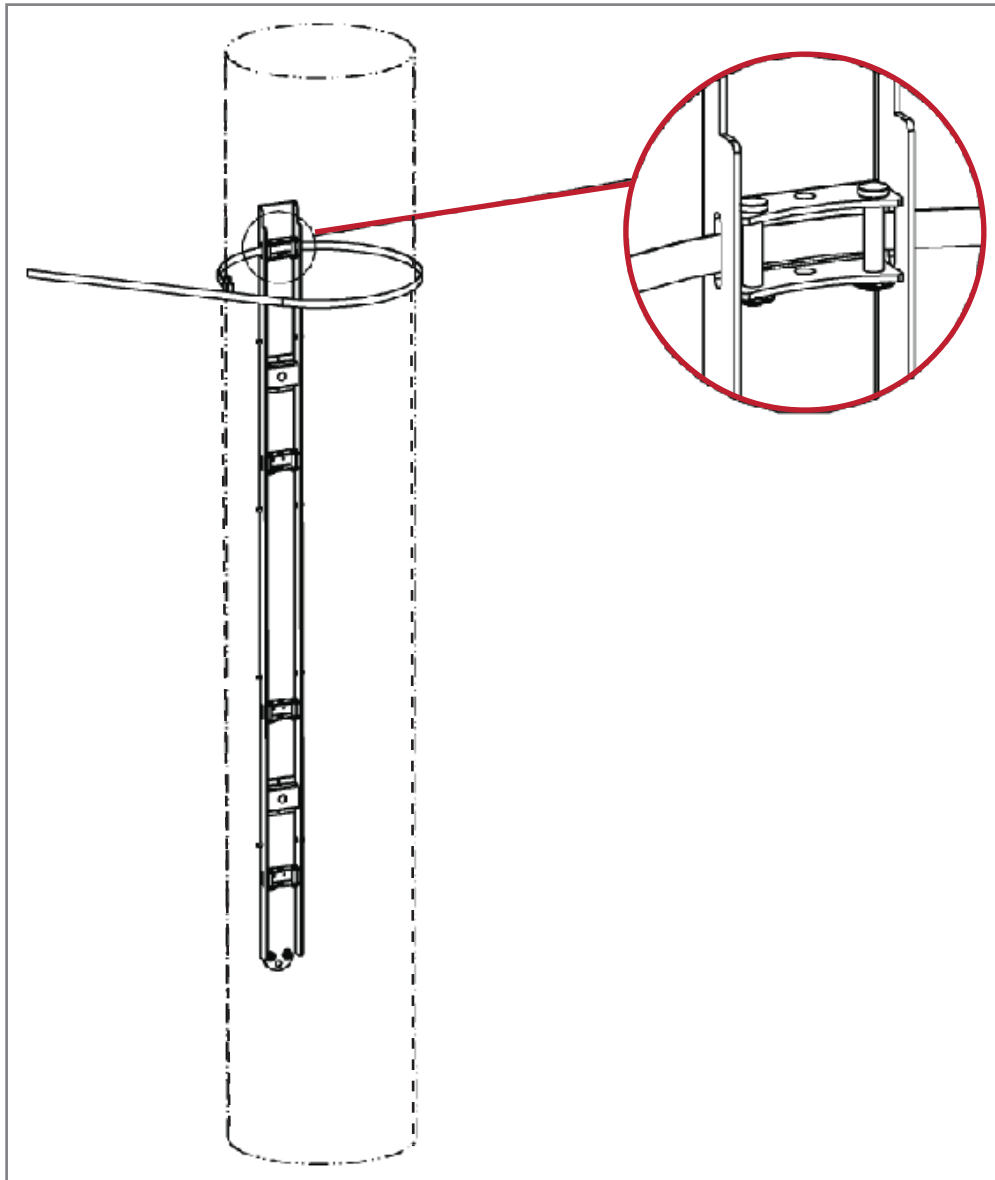
Stainless-steel bands are used to secure the Mounting Bracket to a metal pole or mast that cannot be pierced with a screw or bolt. The number of bands to be used is dependent on the configuration of the PRU as described in [Table 21 on page 40](#).

- 1 Refer to ["Mounting Cautions" on page 30](#) before beginning this process.
- 2 Locate the Mounting Bracket provided with the PRU Mounting Kit and obtain the tools and supplies listed in ["Tools Required for All Mounting Methods" on page 40](#) and ["Additional Tools and Supplies Required for Steel-Pole Mounting" on page 40](#).



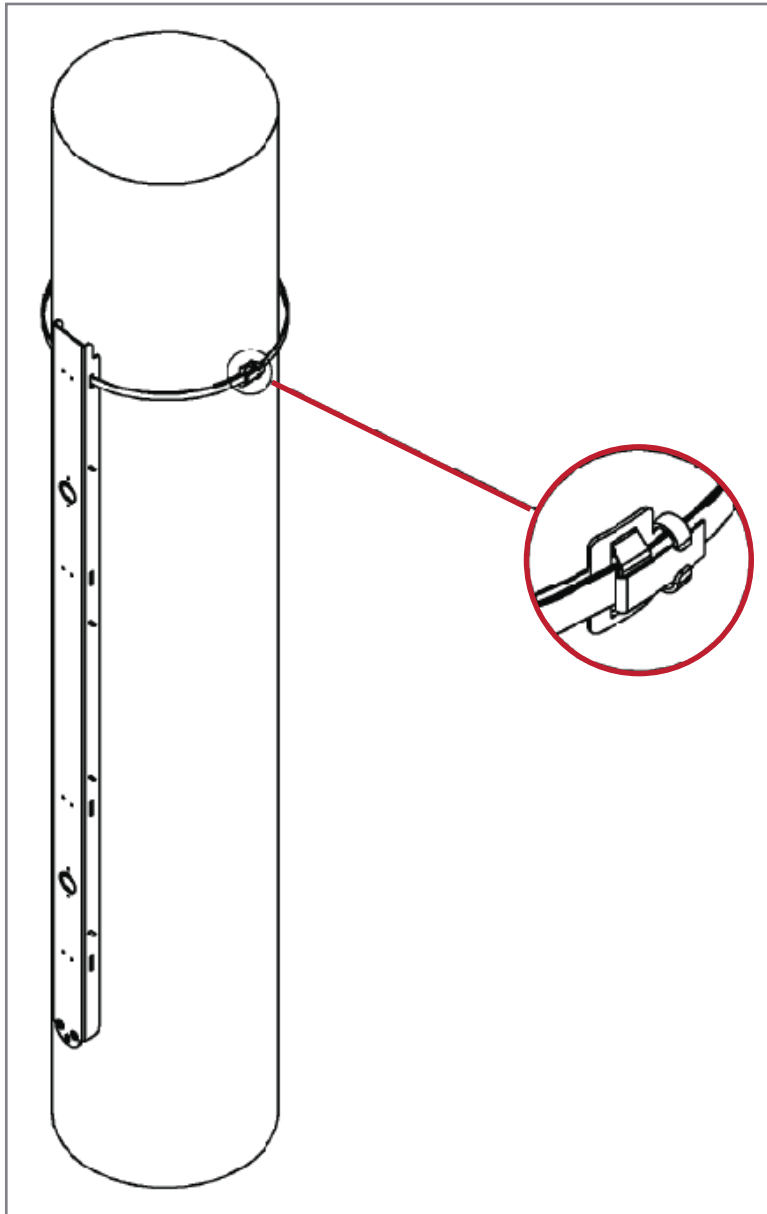
- 3 Slide a buckle on the band and secure by doubling over under buckle, as shown in the illustration below, or as instructed in manufacturer's instructions.

Bands should pass through each slot of the Mounting Bracket, from top to bottom, ensuring the band passes over the top of the pins, as shown below, and again through the buckle.



- 4 Wrap the band around pole once more, passing through the slots in the Mounting Bracket and over pins, and again through buckle. Double banding is critical to generate maximum radial compression of banding to pole and Mounting Bracket.
- 5 Follow specific manufacturer's instructions for tensioning bands to recommended levels.
- 6 Roll tool over, bending band over itself at exit from the buckle, as shown above, or as instructed in the manufacturer's instructions to temporarily secure tensioned band.
- 7 Cut band using tensioning tool as instructed in the manufacturer's instructions.

- 8 Clinch band stub in place by hammering down buckle ears, as shown below.



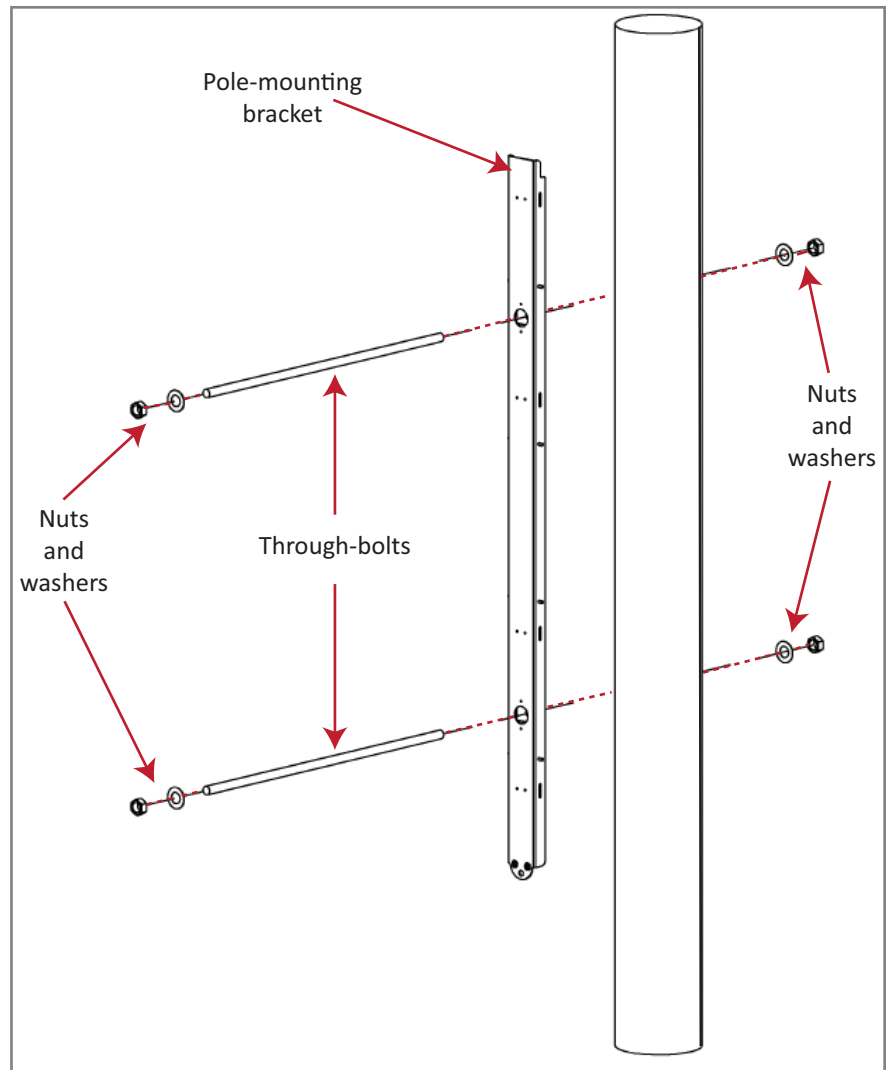
- 9 Repeat [Step 3 on page 48](#) through [Step 8](#) for each remaining banding slot of the Mounting Bracket.
- 10 Hang the PRU from the Mounting Bracket as shown in "[Installing a PRU on the Mounting Bracket](#)" on [page 55](#).

Pole Mount Installation Using Bolts



This section describes how to secure a PRU to a wood pole using bolts. In high earthquake risk areas, CommScope advises in addition to bolting, banding should be used redundantly to ensure mechanical mounting capable of surviving severe seismic activity. Typical areas where this attachment method are suggested are Earthquake Risk Zone 4, per Bellcore GR-63-CORE, section 4.4.1.1. If you have application specific questions, consult the Wireless Technical Assistance Center (TAC) for technical assistance (see "[DCCS Global Technical Support](#)" on page 123). For information on banding, see "[Steel Pole Installation Using Steel Banding](#)" on page 47.

- 1 Refer to "[Mounting Cautions](#)" on page 30 before beginning this process.
- 2 Locate the Mounting Bracket provided with the PRU Mounting Kit and obtain the tools and supplies listed in "[Tools Required for All Mounting Methods](#)" on page 40 and "[Additional Tools and Supplies Required for Wood-Pole Mounting](#)" on page 41.
- 3 Establish where the Mounting Bracket will be mounted on the pole and then determine the location of the bracket mounting bolts on the pole and mark hole locations on pole.
- 4 Drill a 1/2-inch hole (equal to diameter of through-bolt) into the utility pole at the points marked in [Step 3](#).
- 5 Secure the bracket to the utility pole using two through-bolts, washers, and nuts as shown in the following illustration, and then tighten the nuts securely.
- 6 Follow the steps in "[Installing a PRU on the Mounting Bracket](#)" on page 55.



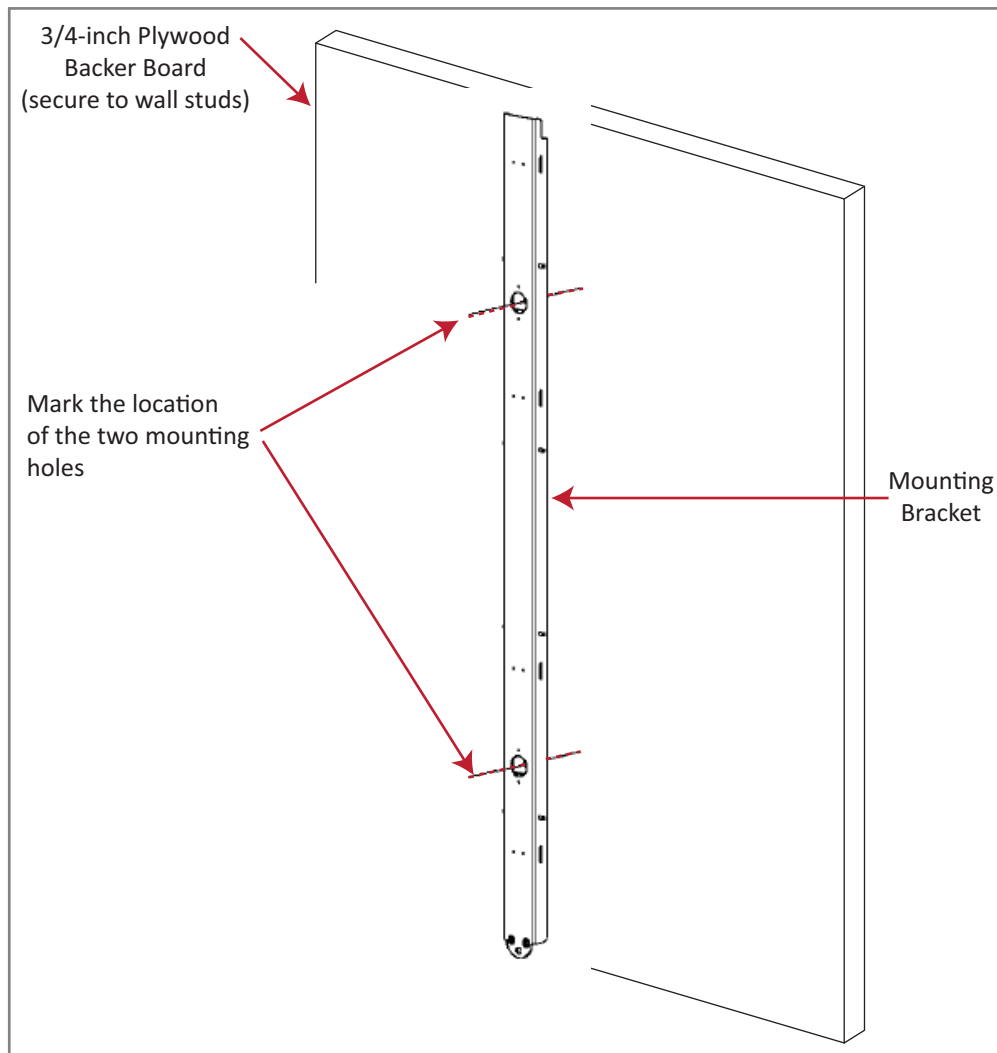
Wood-Framed Wall Mounting Procedure

- 1 Refer to "Mounting Cautions" on page 30 before beginning this process.
- 2 Locate the Mounting Bracket provided with the PRU Mounting Kit.
- 3 Obtain the tools and supplies listed in "Tools Required for All Mounting Methods" on page 40 and "Additional Tools and Supplies Required for Flat-Surface Mounting" on page 41.
- 4 Obtain plywood with a minimum thickness of 0.75-inches (19.0 cm) to be used as a backer board.



If the PRU is installed in an area in which there may be moisture, use pressure-treated plywood.

- 5 Cut the pressure-treated plywood to the correct size to accommodate the PRU being installed (see dimensions in [Table 20 on page 35](#)).
- 6 To avoid a hazardous condition, firmly secure the backer board to the interior framing of the wall.
- 7 Hold the Mounting Bracket up to the wall and mark the location of the Mounting Bracket's two mounting holes on the plywood backer:

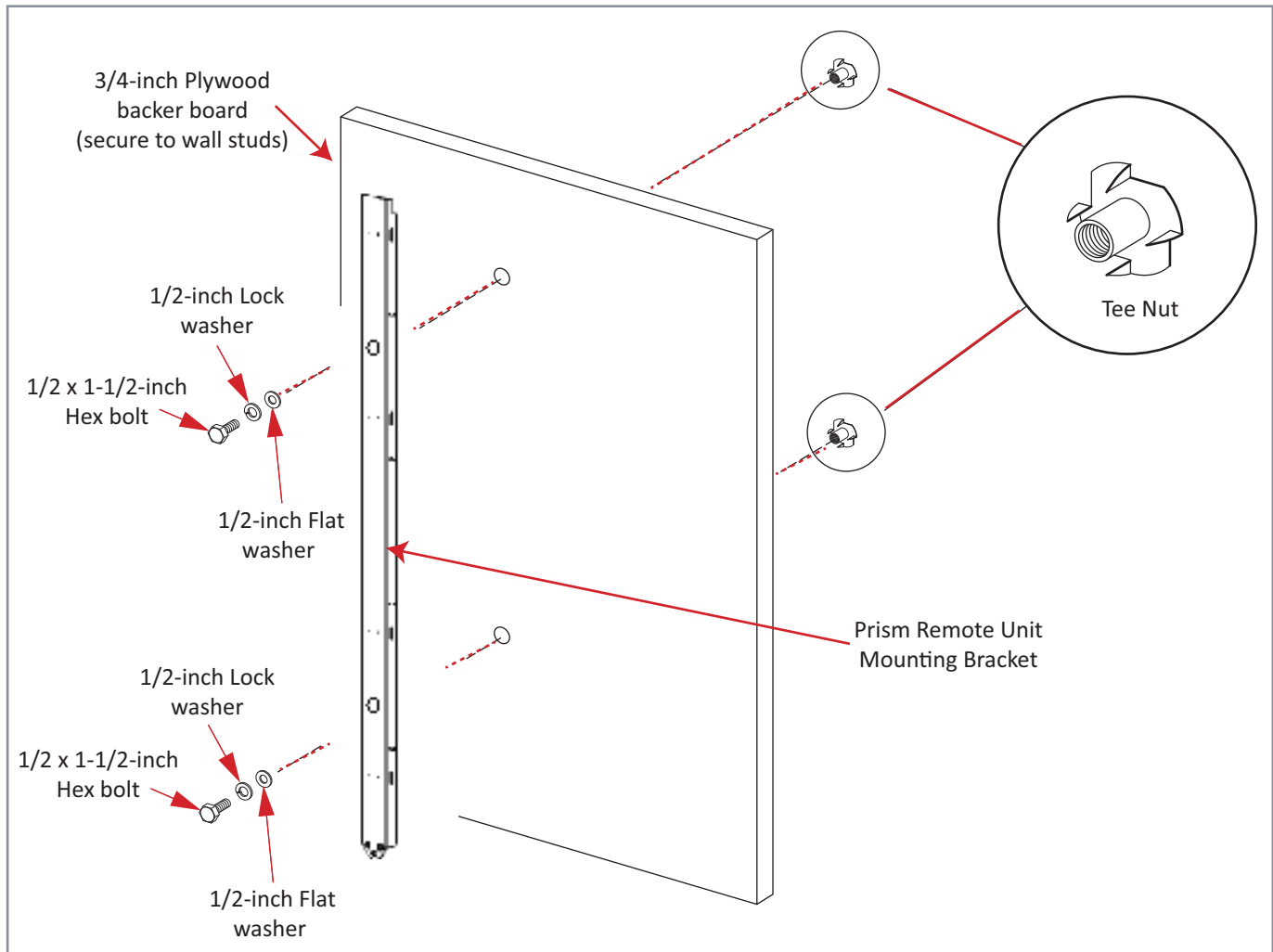


- 8 Drill 9/16-inch holes in the plywood backer at the hole positions marked in [Step 7](#).

- 9 Refer to the following figure and do the following:
 - a From the side of the backer that will face the wall, drive a 1/2-inch Tee Nut into each drilled hole.
 - b Mount the plywood backer on the wall and firmly secure it to the wall's interior studs.
 - c Locate the two 1/2 x 1-inch hex bolts and place a 1/2-inch lock washer and 1/2-inch flat washer on each bolt and then secure the Mounting Bracket to the plywood backer using the assembled bolts and washers.



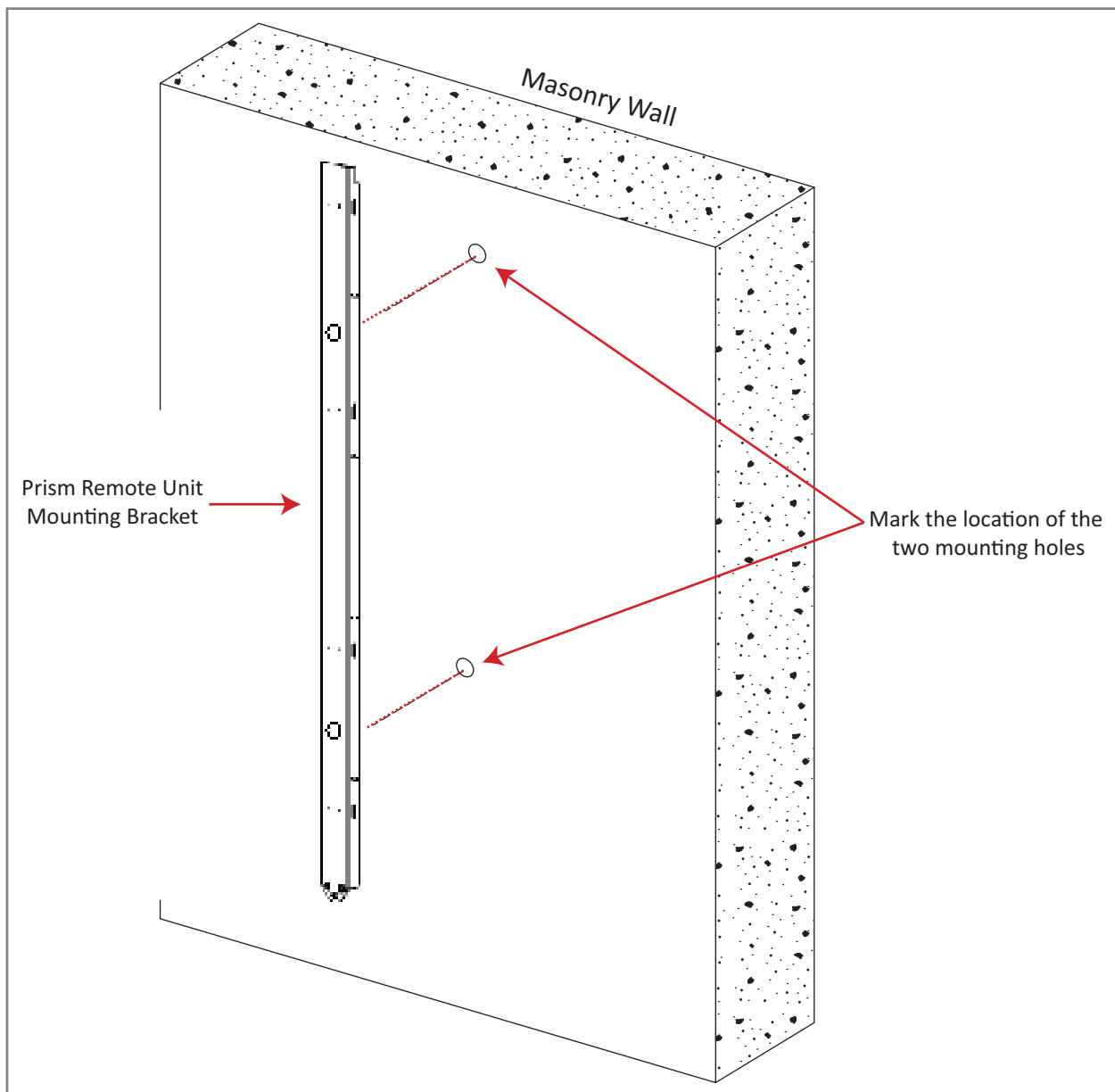
If plywood backer board or supporting wall is not smooth or does not provide a flat mounting plane for the PRU, add 1/2-inch flat washers between the Mounting Bracket and the mounting surface as required to prevent the PRU from twisting or distorting when secured to the mounting surface.



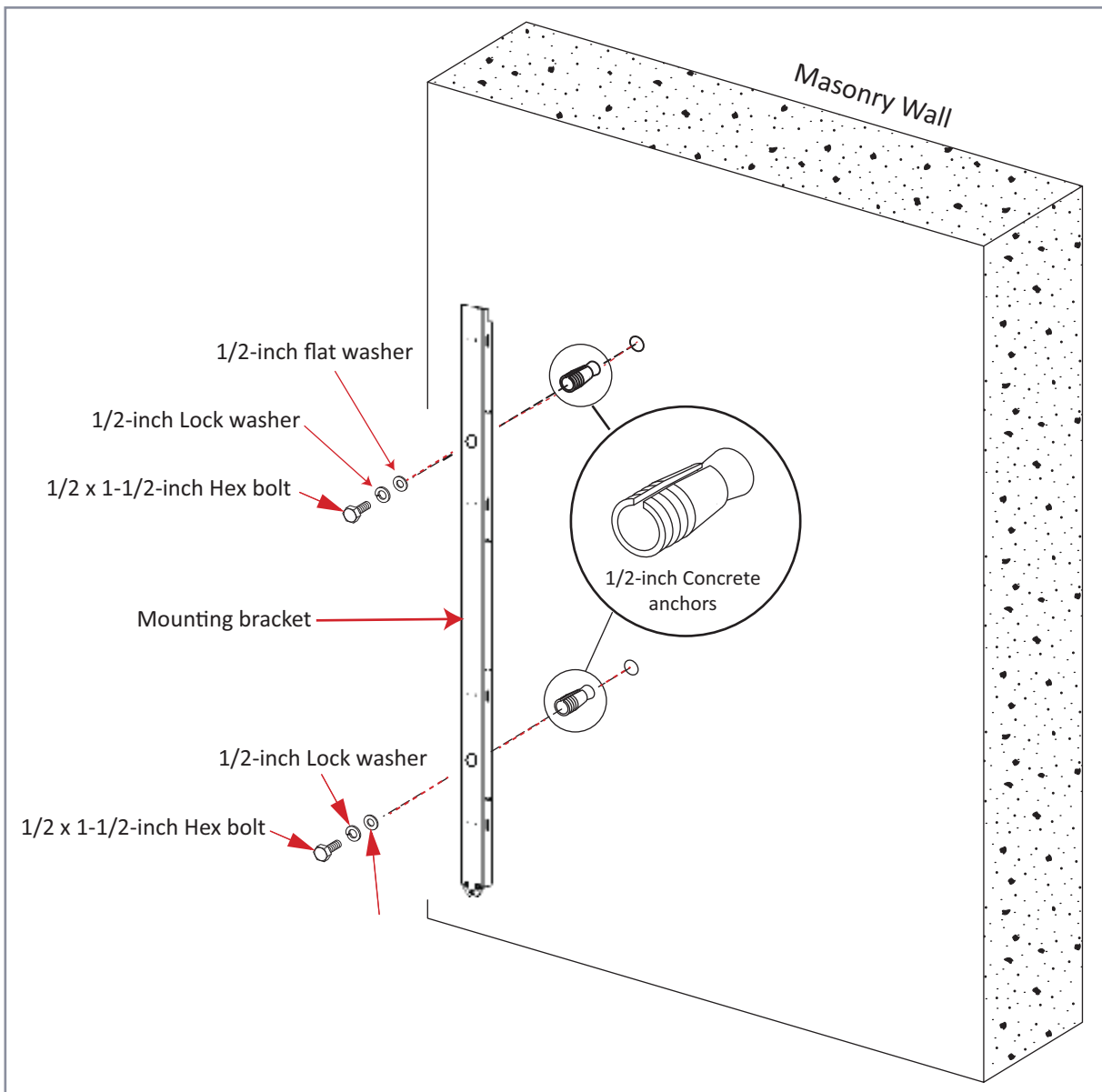
- 10 Hang the PRU from the Mounting Bracket as shown in "[Installing a PRU on the Mounting Bracket](#)" on page 55.

Masonry Wall Mounting

- 1 Refer to "Mounting Cautions" on page 30 before beginning this process.
- 2 Locate the Mounting Bracket provided with the PRU Mounting Kit.
- 3 Obtain the tools and supplies listed in "Tools Required for All Mounting Methods" on page 40 and "Additional Tools and Supplies Required for Flat-Surface Mounting" on page 41.
- 4 Verify that concrete anchors to be used are designed for 1/2-inch bolts.
- 5 Hold the Mounting Bracket in position on the wall.
- 6 Using a pencil, mark the location of each of the Mounting Bracket's two mounting holes on the wall. When mounting the PRU on a masonry surface, locate the mounting anchors as close as possible to the center of any bricks or blocks, especially the upper anchors.



- 7 Refer to anchor manufacturer's technical data to ensure proper drill diameter to be used, and then drill holes in the wall at the locations marked in [Step 6](#).
- 8 Refer to the following figure and do the following:
 - a Set the anchors in the wall.
 - b Locate the two 1/2 x 1-1/2-inch mounting bolts and place a 1/2-inch lock washer and 1/2-inch flat washer on each bolt.
 - c Place the Mounting Bracket over the two anchors. Thread a 1/2 x 1-1/2-inch mounting bolt (with installed washers) into each one of the anchors. Tighten bolts until secure.



- 9 Hang the PRU from the Mounting Bracket as shown in ["Installing a PRU on the Mounting Bracket"](#) on page 55.

Installing a PRU on the Mounting Bracket

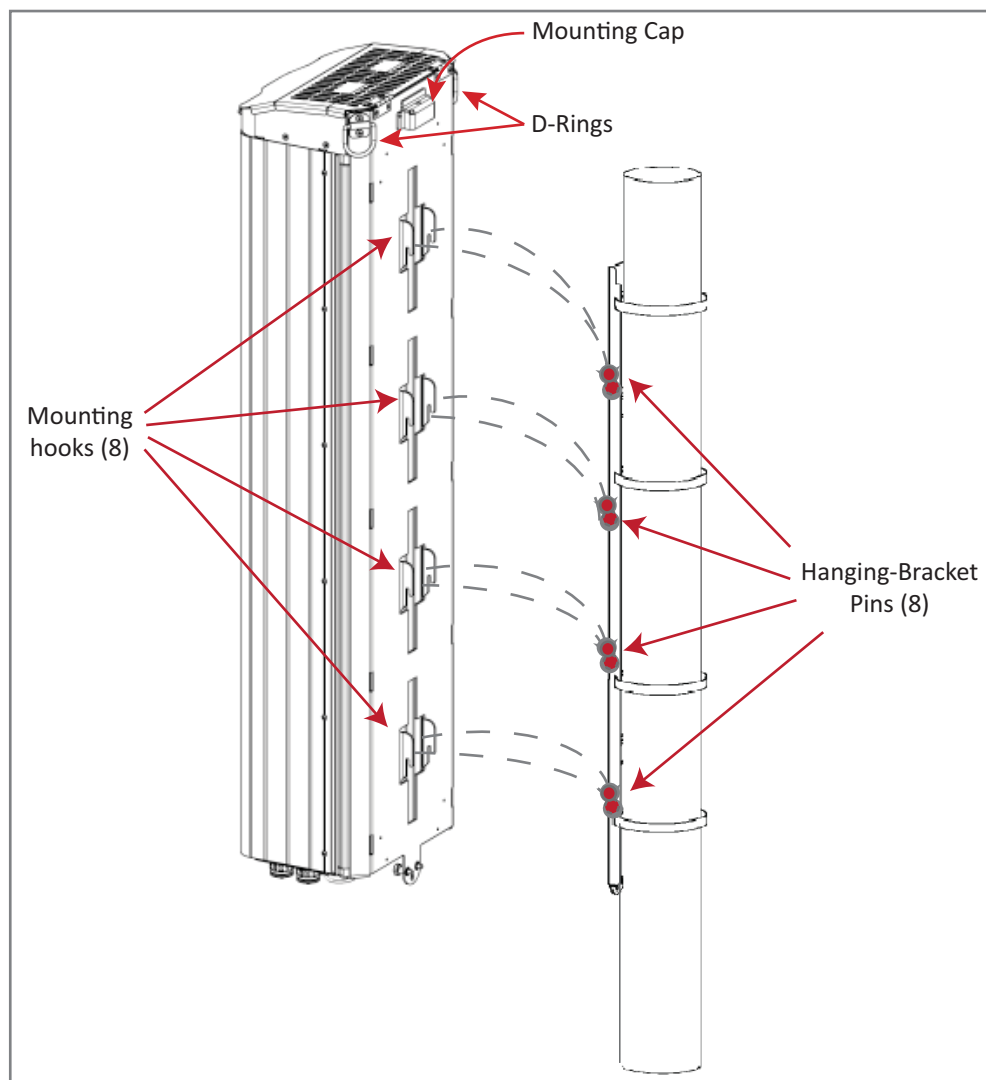
The basic procedure to hang a PRU on a Mounting Bracket is the same. The illustrations in this procedure, however, show a pole-mount installation.

- 1 Refer to "[Mounting Cautions](#)" on page 30 before beginning this process.
- 2 Use the D-Rings on the top of the PRU to hoist the PRU into position for attachment to the Mounting Bracket.



To avoid damage to the PRU and to avoid personal injury, use appropriate lifting equipment.

- 3 Mate the mounting hooks on the back of the PRU with the 8 horizontal hanging-bracket pins on the Mounting Bracket as shown below.
- 4 Lower the PRU until the Mounting Cap on the top of the PRU is snug against the top of the Mounting Bracket.



- 5 Use the flat-blade screwdriver to secure the two captive fasteners on the bottom of the PRU to the Mounting Bracket.

GROUND THE PRU CHASSIS

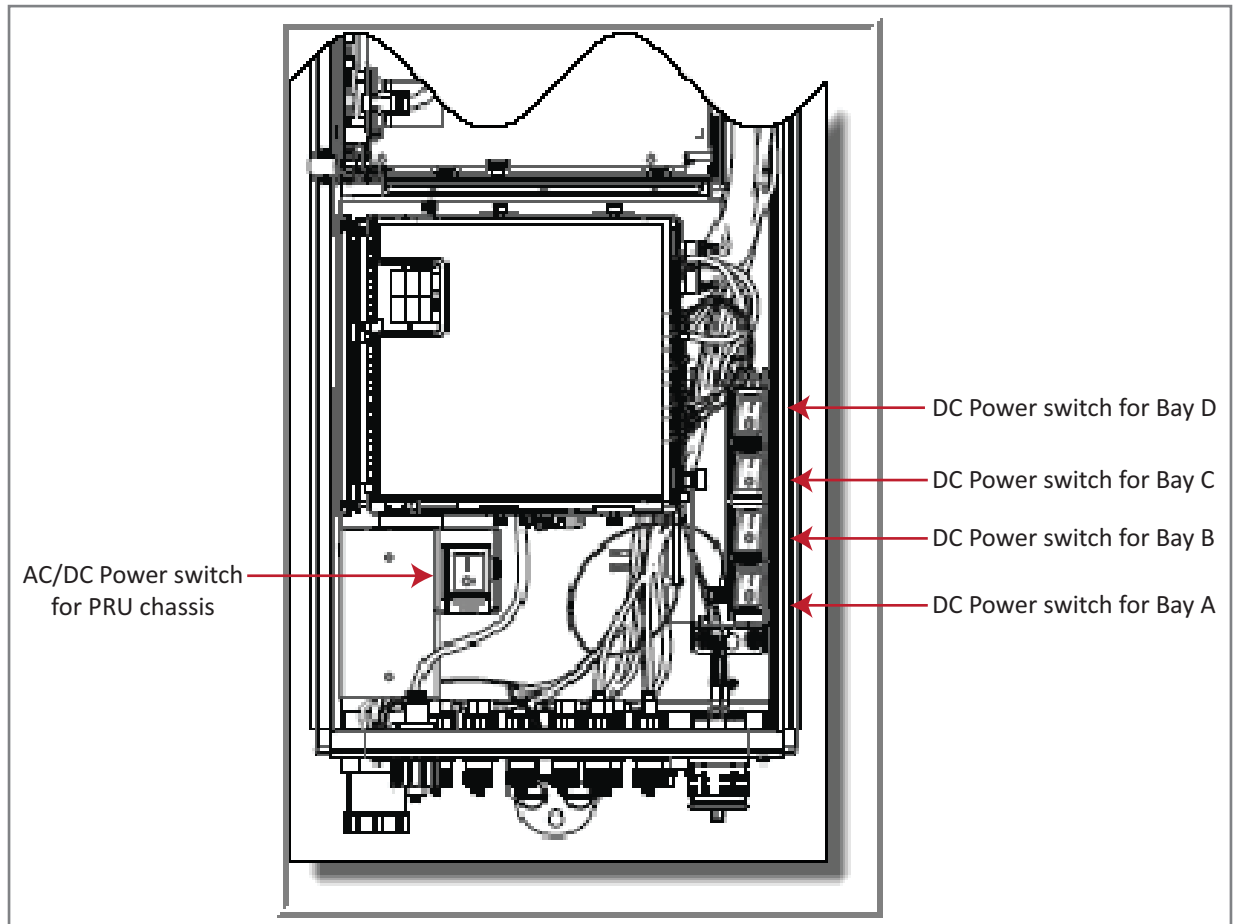


Avoid sharp bends in the ground wire.

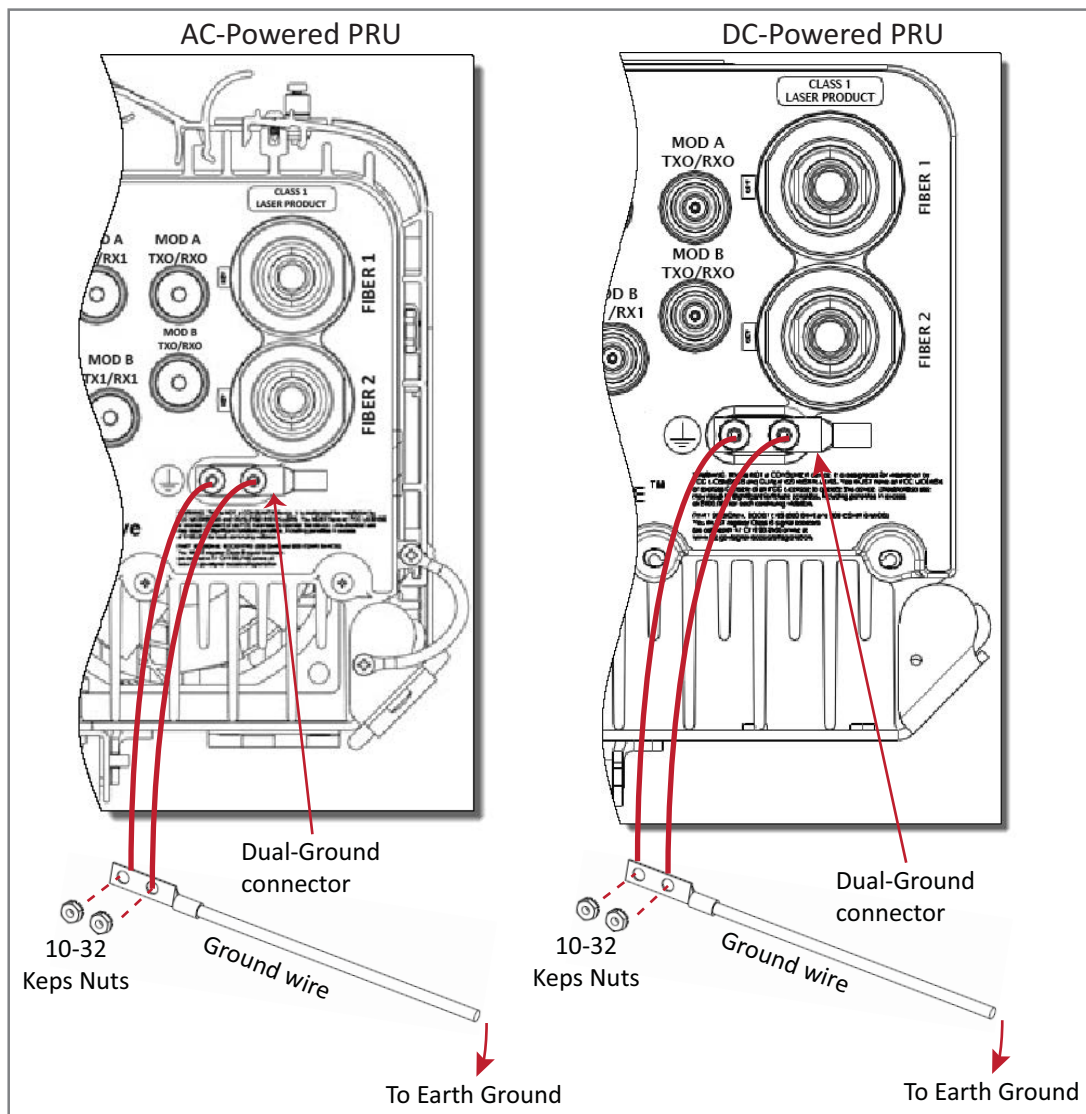


For proper and safe equipment operation, use a #6 copper wire terminated with the provided ring terminal to link the PRU to an earth-ground source.

- 1 Ensure that the AC/DC Power switch to the PRU chassis and the DC power switch to all RF Module bays are in their OFF position.



- 2 Locate a #6 AWG (4 mm) copper grounding wire long enough to reach an approved earth ground.
- 3 Use a socket wrench with a 3/8-inch deep socket to remove the two 10-32 Keps Nuts from the Dual-Ground connector on the bottom of the PRU.
- 4 Secure the ring terminal end of the grounding wire to the ground studs on the unit using the two 10-32 Keps Nuts removed in [Step 3](#), and then torque the nuts to 18 in-lbs \pm 1 in-lb.
- 5 Route the free end of the grounding wire to an approved earth ground source.
- 6 Cut the ground wire to length and connect it to the earth ground source as specified by local code or practice.



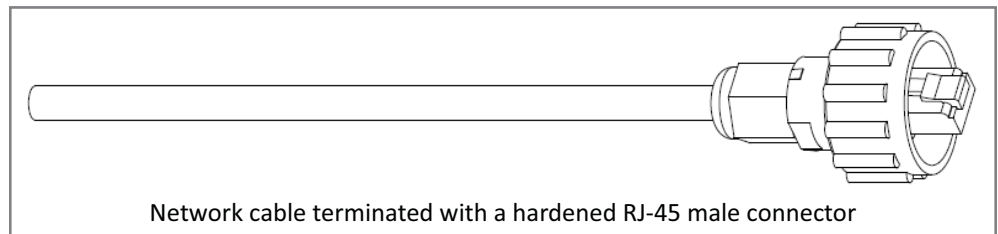
CONNECT A NETWORK CABLE TO THE PRU CHASSIS

The PRU provides a Network port that allows communications with the internal processor and access to the Host LAN network. That is, this provides a LAN extension to the Host network. The Network port is 10/100/1000 BASE-T/TX (802.3ab compliant) MDI and requires a minimum of CAT 5 cable.



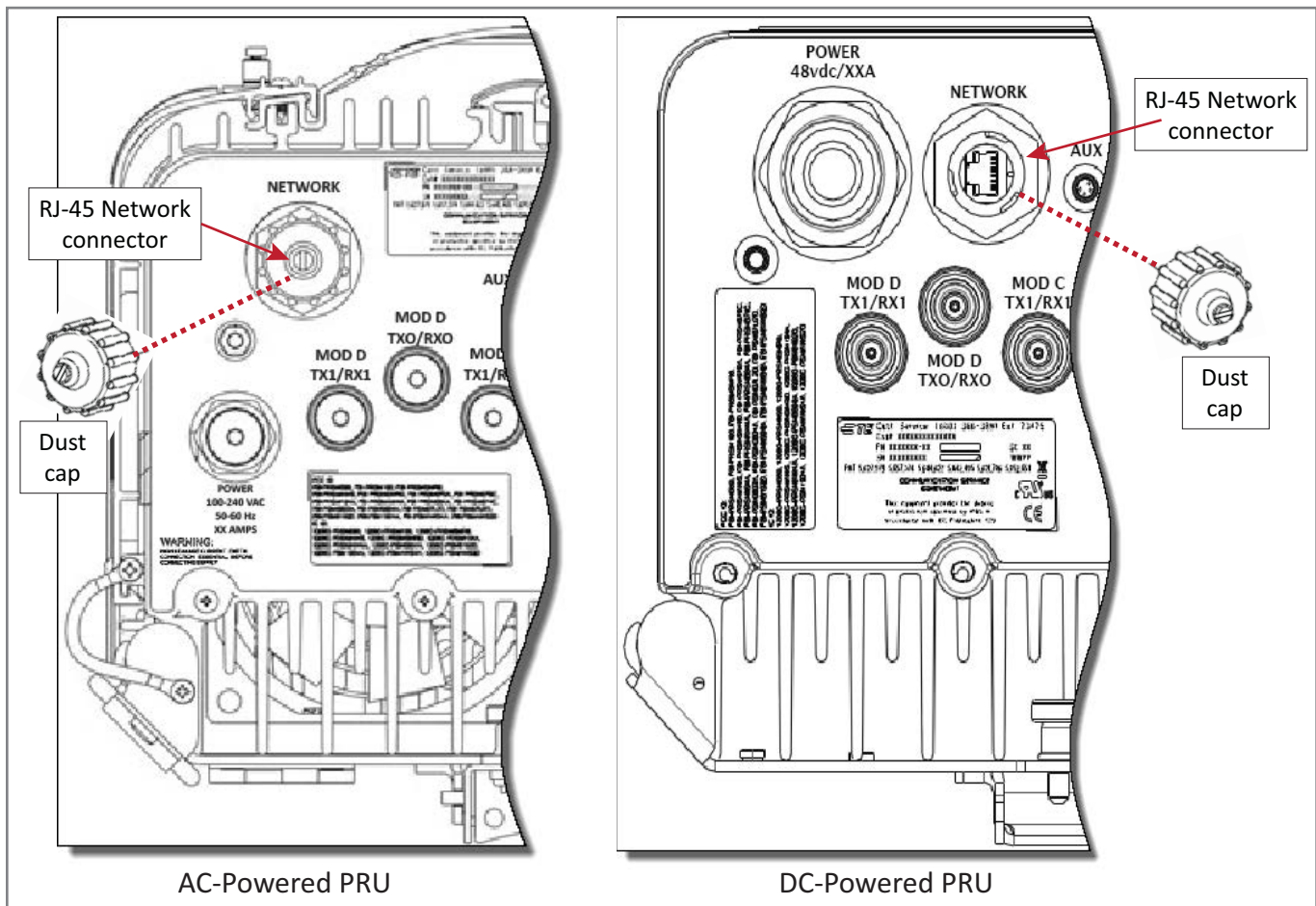
Although the interface might provide GigE, only 100 Mbps is provided for bandwidth between the Host and Remote.

The network cable must be terminated with a hardened RJ-45 male connector for connection to the Network port, as shown in the graphic to the right. The maximum cable length is 300 feet (91.4 m).

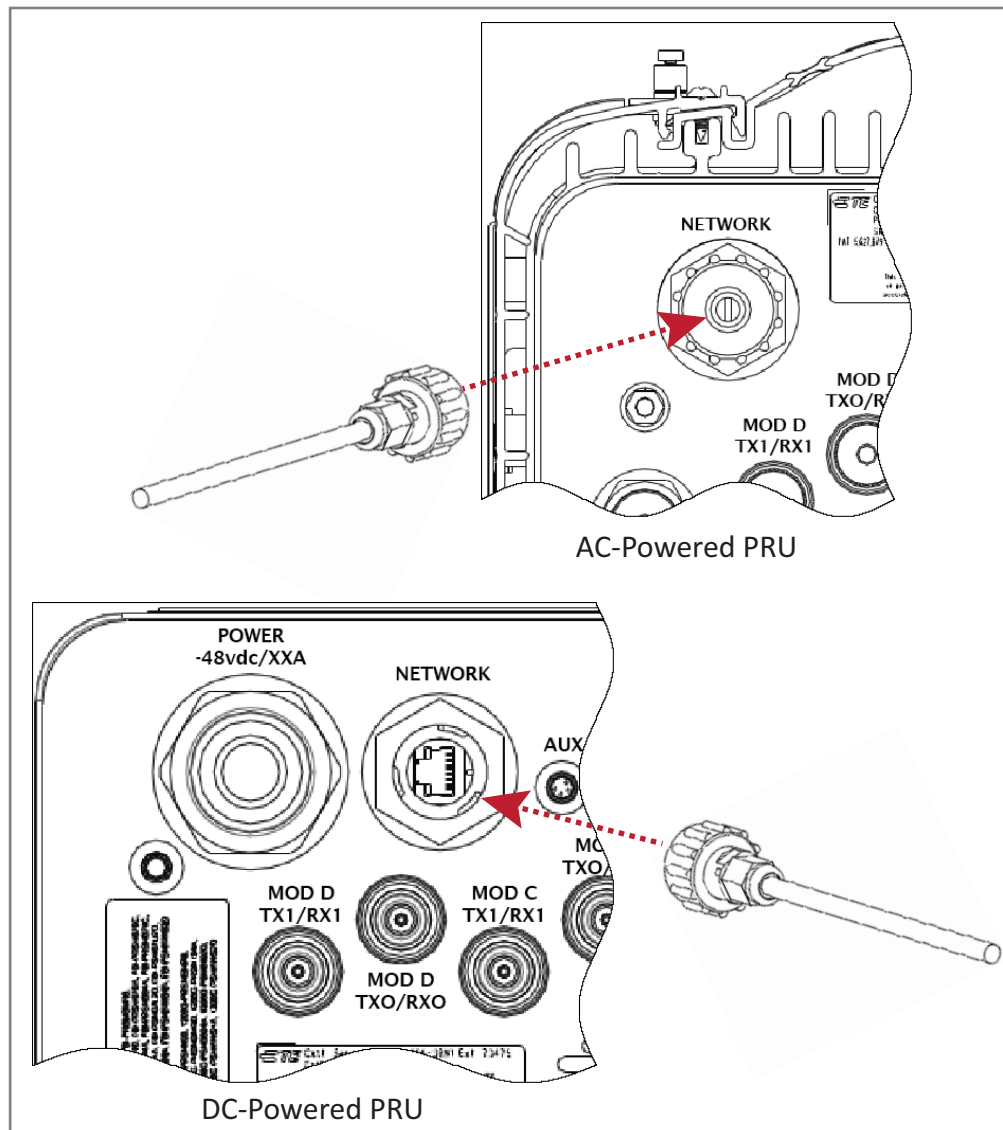


Use the following procedure to install the Network cable:

- 1 Remove the dust cap from the RJ-45 connector located at the bottom of the PRU.



- 2 Route the network cable from the network connection to the underside of the PRU.
- 3 Align the plug end of the RJ-45 cable connector with the RJ-45 port receptacle and then insert the cable plug into the port receptacle.



- 4 Slide the connector nut up to the port until it engages the connector locking mechanism.
- 5 Tighten the connector nut in a clockwise direction (if necessary, use a wrench to grip the connector nut) until it snaps past the indented position and locks into place. It may be necessary to apply 30 to 50 in-lbs (3.4 to 5.6 Nm) of torque to the connector nut to turn it past the indented position.

CONNECT FIBER CABLE TO THE PRU CHASSIS

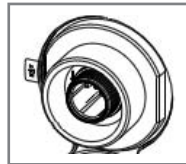
There are three fiber connector options for the Prism Remote Unit; follow the fiber cable installation process that is appropriate for the configuration of the PRU that you are installing:

- ["Option A: Hardened Multi-Fiber Optic Connector" on page 60](#)
- ["Option B: Fiber Pass-Through Connector" on page 66](#)
- ["Option C: ProAx Connector \(Legacy AC-Powered PRUs\)" on page 70.](#)

Option A: Hardened Multi-Fiber Optic Connector

Use the following procedure to install the fiber cables using a Hardened Multi-Fiber Optic Connector. If the PRU that you are installing has a Fiber Pass-Through Connector, follow the procedure in ["Option B: Fiber Pass-Through Connector" on page 66](#). If the PRU that you are installing has a legacy ProAx Connector, follow the procedure in ["Option C: ProAx Connector \(Legacy AC-Powered PRUs\)" on page 70](#).

PRUs now have a Hardened Multi-Fiber Optic Connector (HMFOC), as shown in the picture below.



All PRUs with the HMFOC configuration require the purchase of a Multi-Fiber Optic Cable, such as the one shown below, which allows the PRU to interface with the OSP fiber.

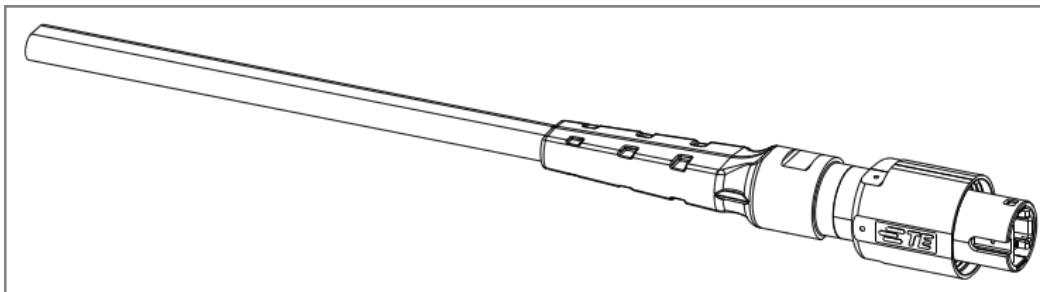


Table 22 identifies how the fibers in the Multi-Fiber Optic Cable correlate to the SeRF SFPs, which come pre-wired from the factory.

Table 22. Multi-Fiber Optic Cable Color Codes

Fiber Connector #	Color	SeRF SFP Connector	Fiber Connector #	Color	SeRF SFP Connector
1	Blue	1 TX	2	Blue	5 TX
1	Orange	1 RX	2	Orange	5 RX
1	Green	2 TX	2	Green	6 TX
1	Brown	2 RX	2	Brown	6 RX
1	Gray	3 TX	2	Gray	7 TX
1	White	3 RX	2	White	7 RX
1	Red	4 TX	2	Red	8 TX
1	Black	4 RX	2	Black	8 RX



Each SFP utilizes a single fiber optic pair. Each SFP can support up to 12 timeslots with up to 75 MHz of bandwidth. Each fiber connector on the PRU contains 4 fiber pairs, supporting the use of 4 SFPs. If additional SFPs are necessary, use the second fiber connector (FIBER 2).

Figure 13 illustrates how the Multi-Fiber Optic Cables used with HMFOC connectors run between the Fiber 1 and Fiber 2 connectors and the SFPs.

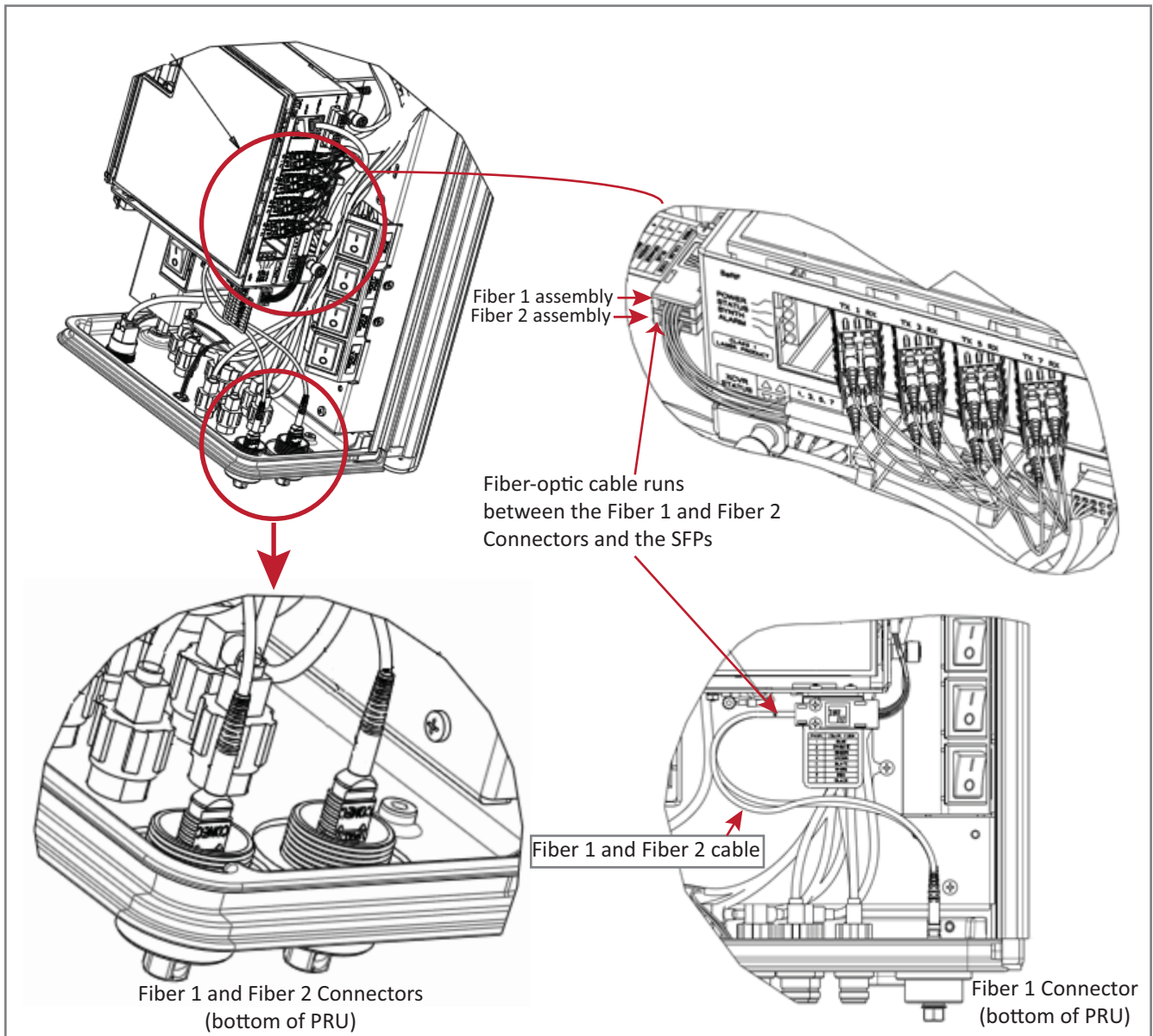


Figure 13. Multi-Fiber Optic Cabling

Figure 14 shows the cabling requirements for Single- and Dual-WDM units.

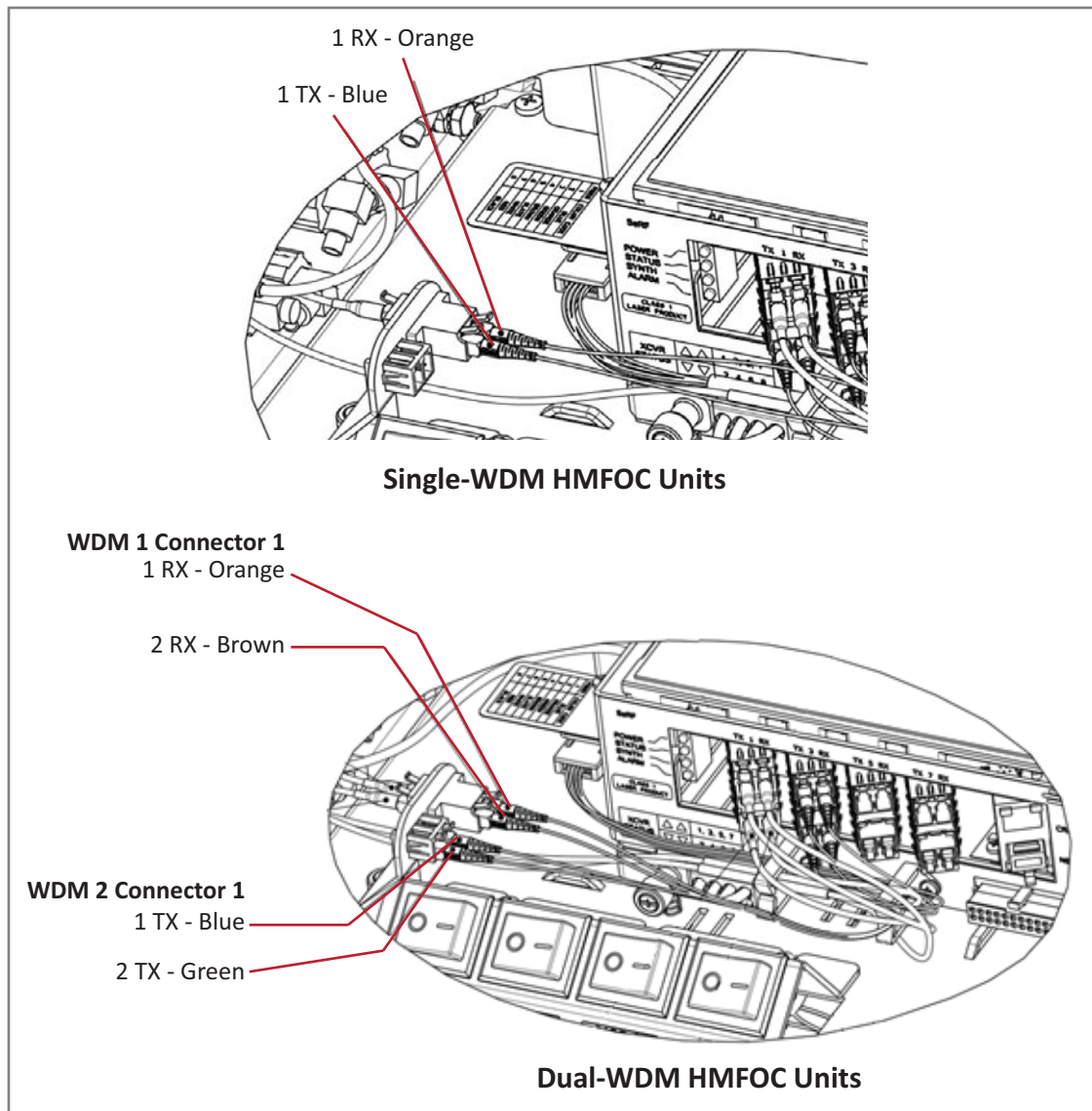


Figure 14. Multi-Fiber Optic Cabling for Single- and Dual- WDM Units

Use the following procedure to install the fiber cables using the HMFOC.

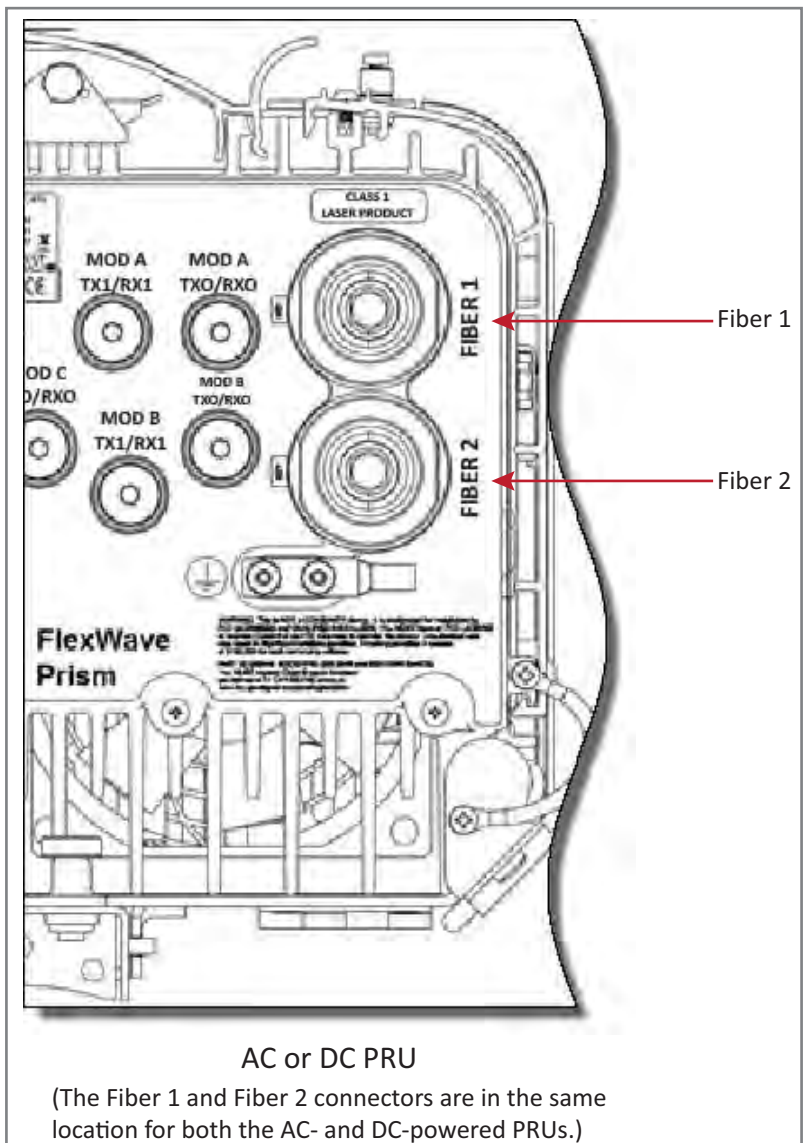


To avoid the risk of equipment damage, ensure that the AC/DC Power switch to the Remote Unit chassis and the DC power switch to all RF Module bays are in their OFF position before connecting or disconnecting coaxial cables; otherwise equipment damage may occur.

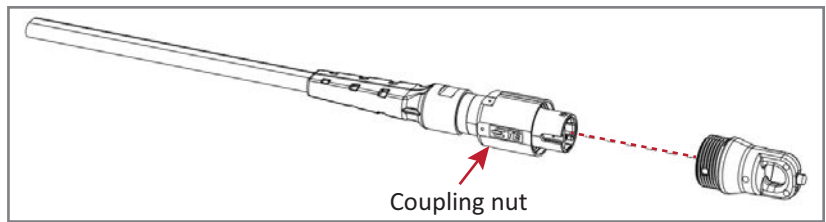
- 1 Use a 7/16" wrench or socket to remove the dust-cover cap from the Fiber 1 connector, located at the bottom of the PRU. You need to turn the cap counter-clockwise for several turns.



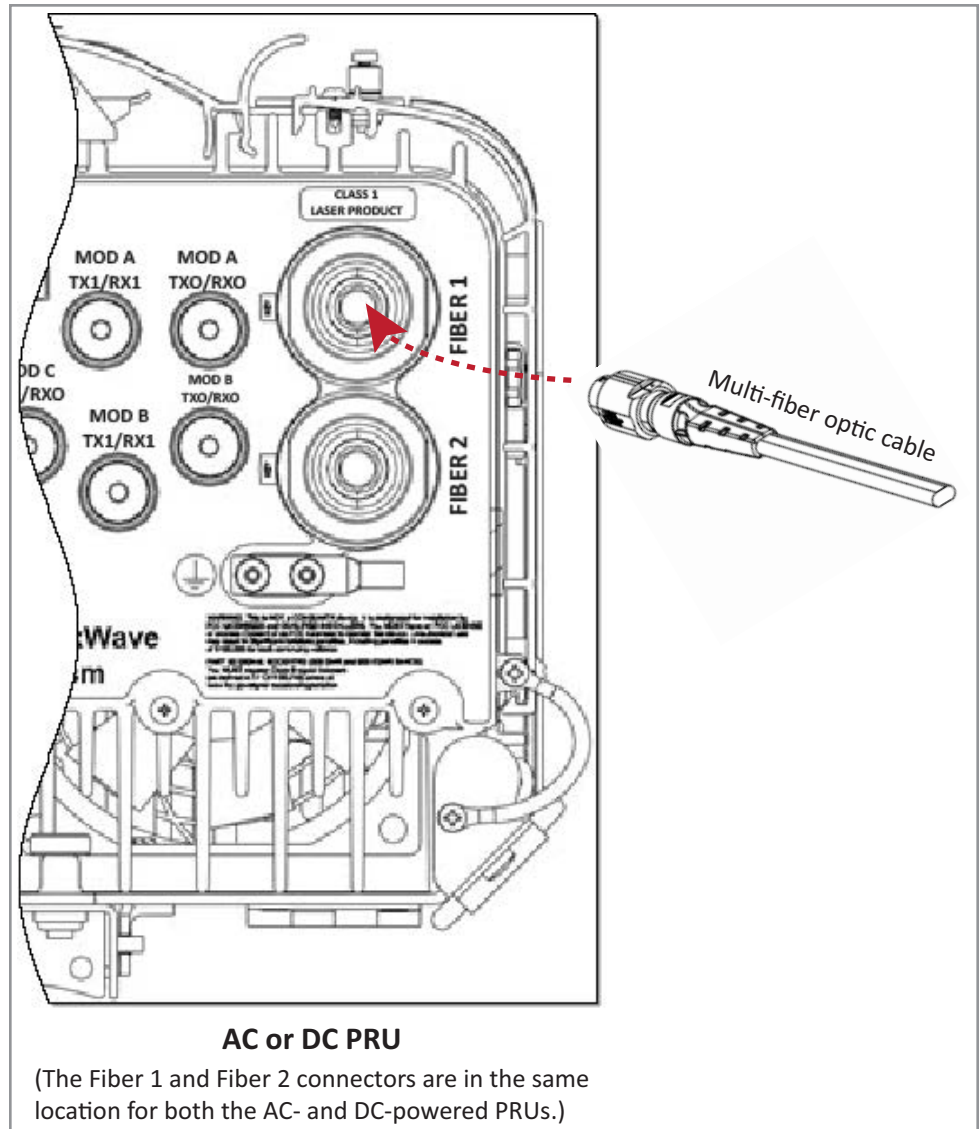
Do not remove the dust cover from the Fiber 2 connector until directed to do so.



- 2 Rotate the coupling nut of the Multi-Fiber Optic cable counter-clockwise to remove its dust-cover cap, as shown in the graphic to the right.
- 3 Clean the Multi-Fiber Optic cable connector using industry approved cleaning procedures.
- 4 Clean the Fiber 1 port using industry approved cleaning procedure.



- 5 Insert the Multi-Fiber Optic cable into the FIBER 1 connector; refer to the introductory material for this section for information on cabling requirements.
 - a Align the plug end of the cable with the key as indicated on the overlay for the FIBER 1 connector, as shown to the right.
 - b Use a 9/16" wrench to rotate the coupling nut clockwise; tighten to 2-4 in-lbs.



- 6 Route the Multi-Fiber Optic cable from the underside of the PRU to the OSP box.
- 7 Secure fiber cable in place following local practices.
- 8 If necessary, complete [Step 1](#) through [Step 7](#) to add a second Multi-Fiber Optic cable to the FIBER 2 connector.
- 9 Continue to ["Connect the Antenna Cable"](#) on page 74.

Option B: Fiber Pass-Through Connector



Use the following procedure to install the fiber cables using a Fiber Pass-Through Connector.

- If the PRU that you are installing has a Hardened Multi-Fiber Optic Connector, follow the procedure in ["Option A: Hardened Multi-Fiber Optic Connector"](#) on page 60
- If the PRU that you are installing has a legacy ProAx Connector, follow the procedure in ["Option C: ProAx Connector \(Legacy AC-Powered PRUs\)"](#) on page 70.



The graphics shown in this procedure depict an AC-powered PRU. However, the Fiber 1 and Fiber 2 connectors on a DC-powered PRU are in the same location and use the same procedure as the AC-powered PRU to install fiber cables using a Fiber Pass-Through Connector.

Use the following procedure to install the fiber cables using the ProAx connector:

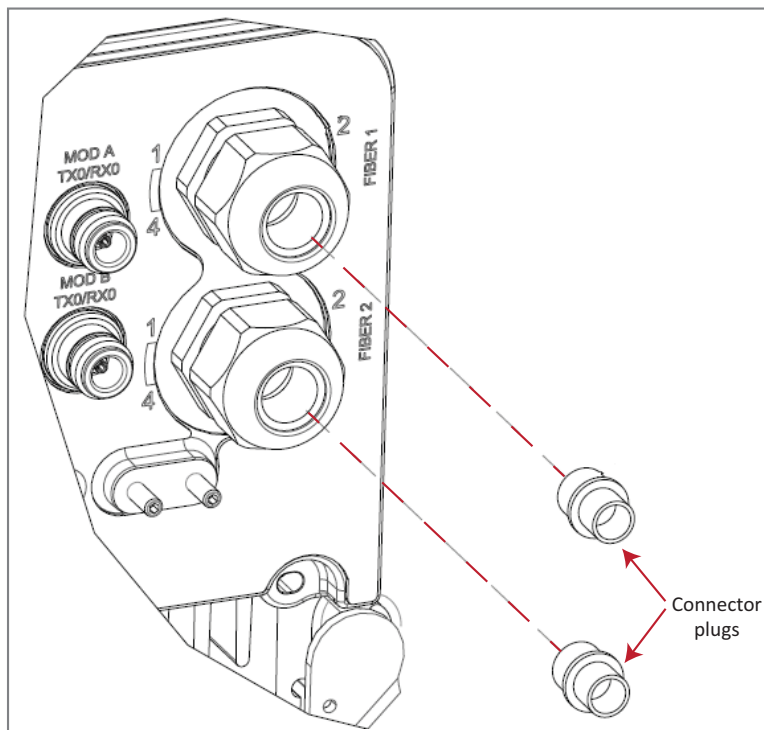


To avoid the risk of equipment damage, ensure that the AC/DC Power switch to the Remote Unit chassis and the DC power switch to all RF Module bays are in their OFF position before connecting or disconnecting coaxial cables; otherwise equipment damage may occur.

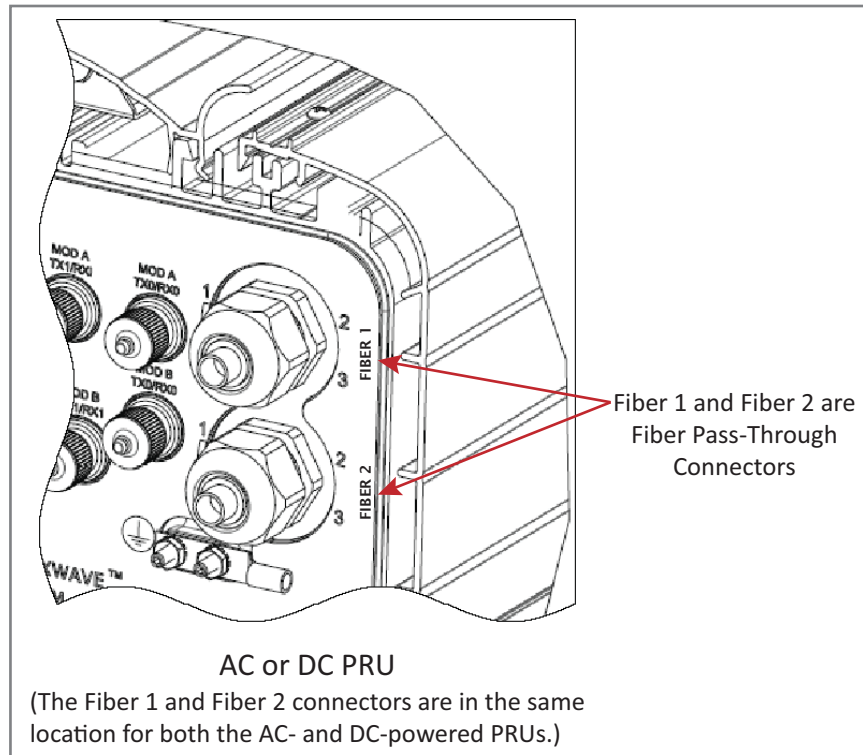
- 1 Obtain an environmentally hardened fiber cable terminated with LC connectors. The outside diameter of the cable jacket must be between .035 and .63 inches.
- 2 Complete the installation steps in ["Unpack and Inspect the Prism Remote Unit and Components"](#) on page 43 through ["Connect a Network Cable to the PRU Chassis"](#) on page 58.
- 3 Remove connector plug only from the Fiber 1 connector, unless multiple fiber cables are needed.



Do not remove the dust cover from the Fiber 2 connector until directed to do so.



- 4 Insert the Fiber Optic cable, terminated with LC connectors, through the Fiber 1 Connector.



- 5 Clean all LC connectors following industry approved procedure.
- 6 Refer to one of the following graphics to connect the LC connectors to the SFP:
 - for standard configurations, see [Figure 15 on page 68](#)
 - for WDM Pass-Through configurations, see [Figure 16 on page 68](#).

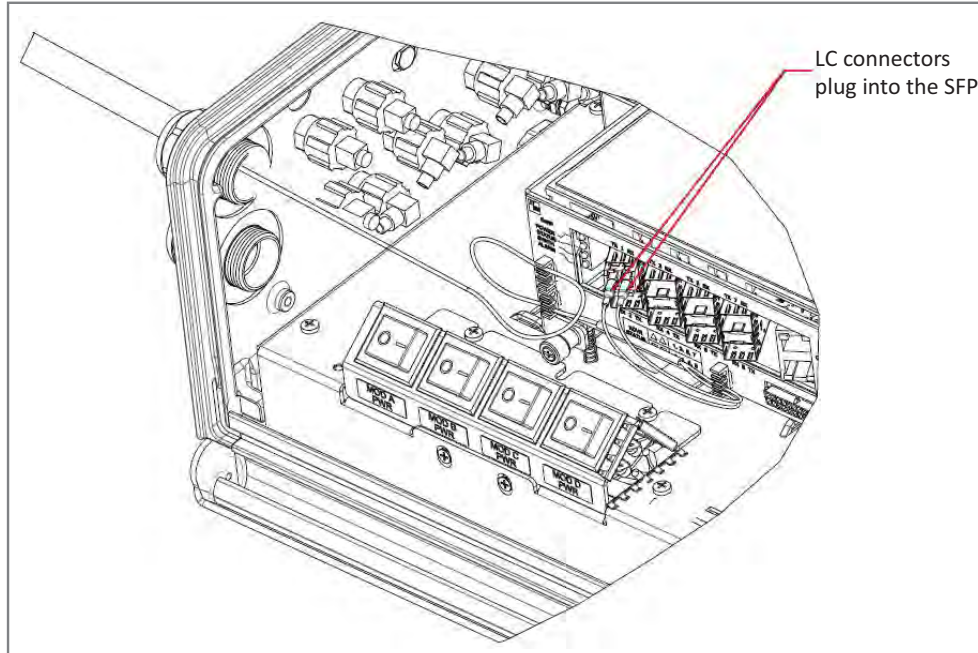


Figure 15. Connect LC Connector to SFP—Standard Configuration

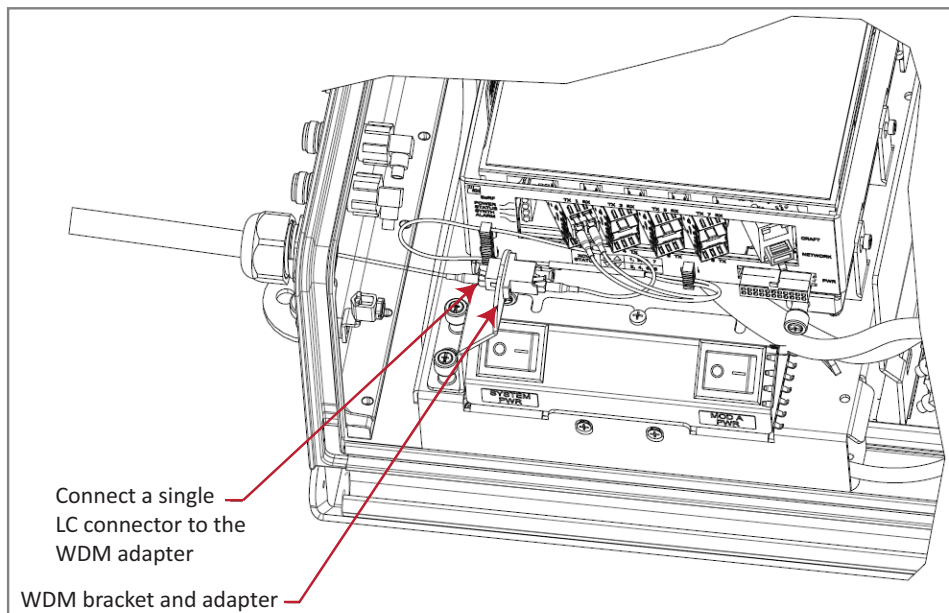
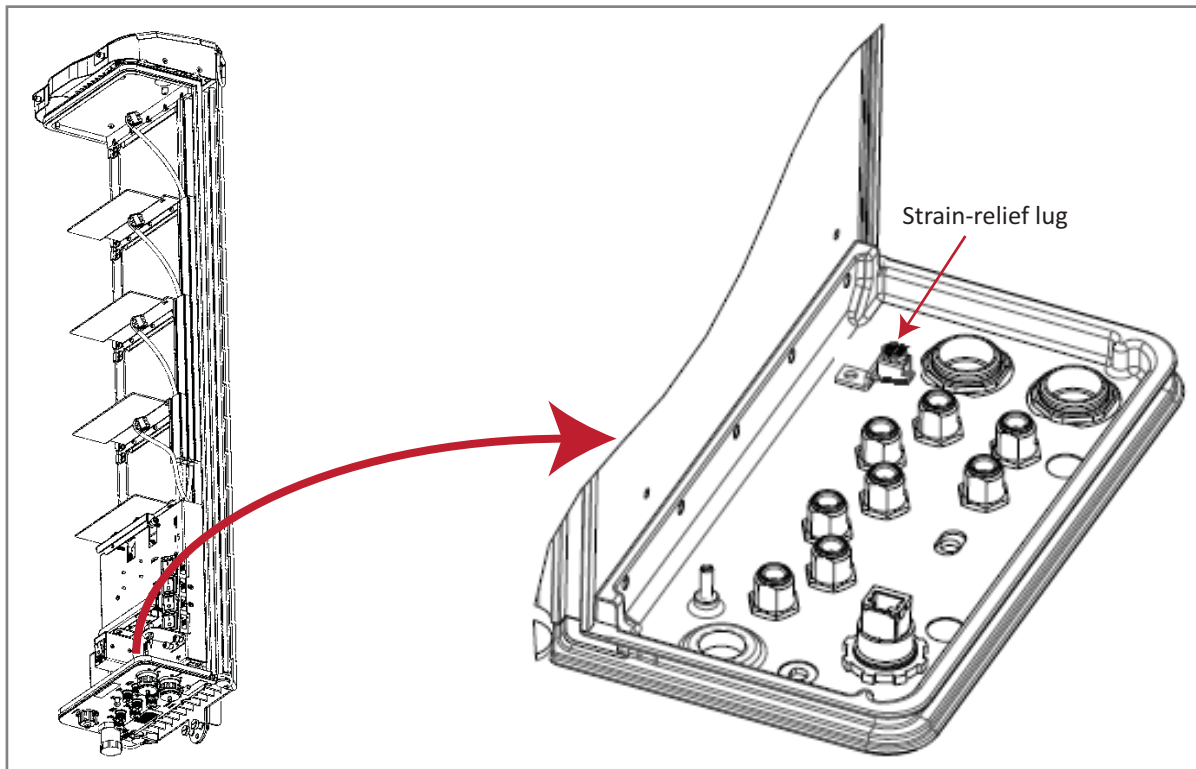


Figure 16. Connect LC Connector to SFP—WDM Pass-Through Configuration

- 7 Attach the strength member from the Fiber Optic cable to the Strain-Relief lug on the inside bottom of the PRU.



- 8 Tighten the external dome nut of the Pass-Through Connector around the Fiber Optic cable—torque the dome nut to 44 in-lbs plus or minus 4 in-lbs.
- 9 Route the fiber cable from the underside of the PRU to the OSP box.
- 10 Follow local practices to secure the fiber cable in place.
- 11 (Optional) One SFP supports up to 12 timeslots with 75 MHz of bandwidth. If a second fiber cable assembly is required (for example, your Prism system has three SFPs to handle up to 280 MHz of RF bandwidth), complete [Step 3 on page 66](#) through [Step 10 on page 69](#) to add the second fiber cable assembly, only this time, connect to the Fiber 2 connector located at the bottom of the PRU as shown in [Step 4 on page 67](#).
- 12 Return to the main installation process and continue at "[Connect the Antenna Cable](#)" on page 74.

Option C: ProAx Connector (Legacy AC-Powered PRUs)



Use the following procedure to install the fiber cables using a legacy ProAx Connector.

- If the PRU that you are installing has a Hardened Multi-Fiber Optic Connector, follow the procedure in "[Option A: Hardened Multi-Fiber Optic Connector](#)" on page 60
- If the PRU that you are installing has a Fiber Pass-Through Connector, follow the procedure in "[Option B: Fiber Pass-Through Connector](#)" on page 66.



The ProAx Connector will become obsolete effective 31 May 2013, and will not be used in PRUs manufactured after 31 May 2013.



DC-powered PRUs do not have a ProAx connector option.

A PRU with the ProAx Connector configuration requires the purchase of a ProAx cable assembly for the Prism to interface with the OSP fiber. The fiber cable connector is a BX.5 four-port fiber connector, as shown in the following picture:

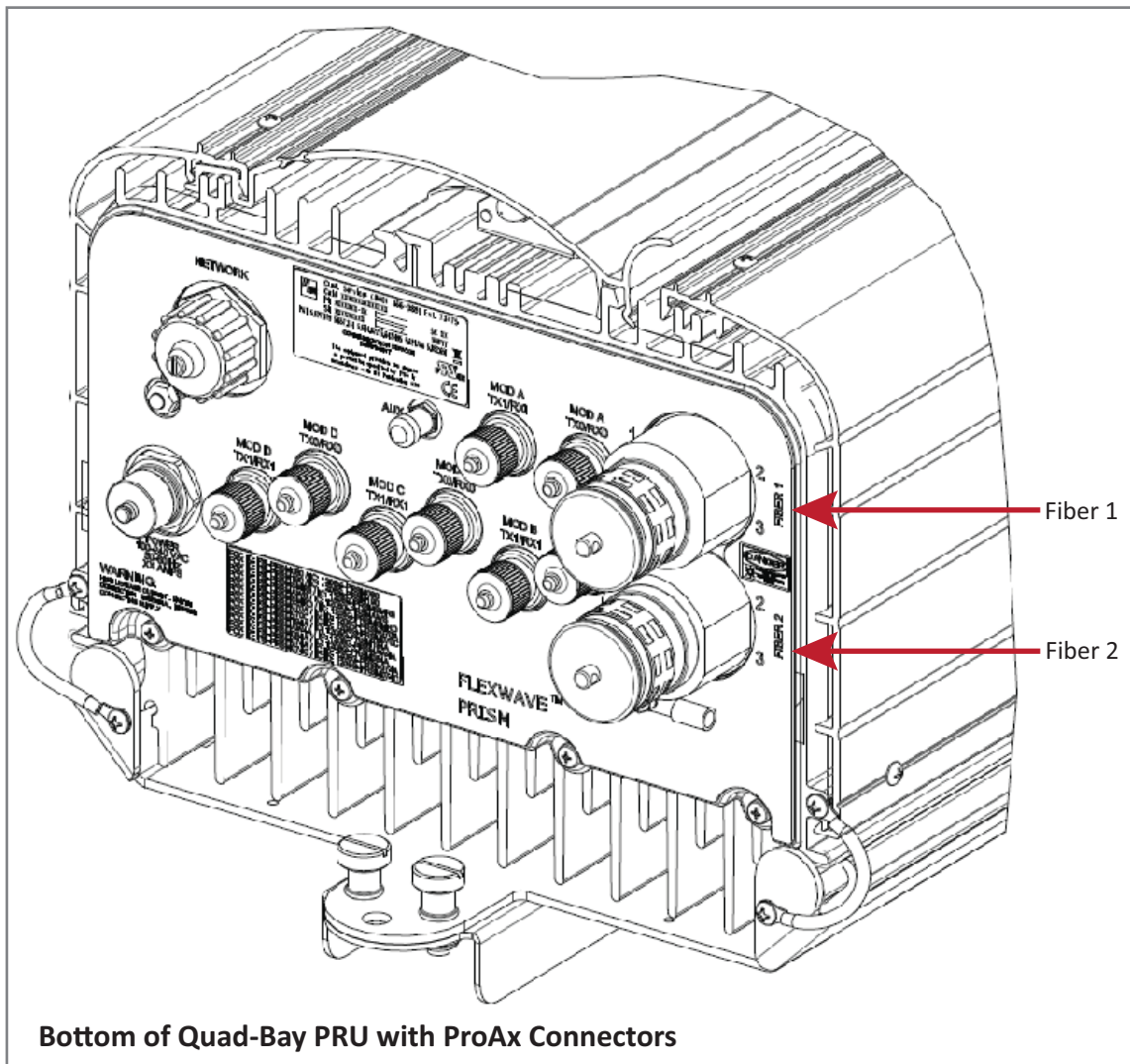


Use the following procedure to install the fiber cables using the ProAx connector:



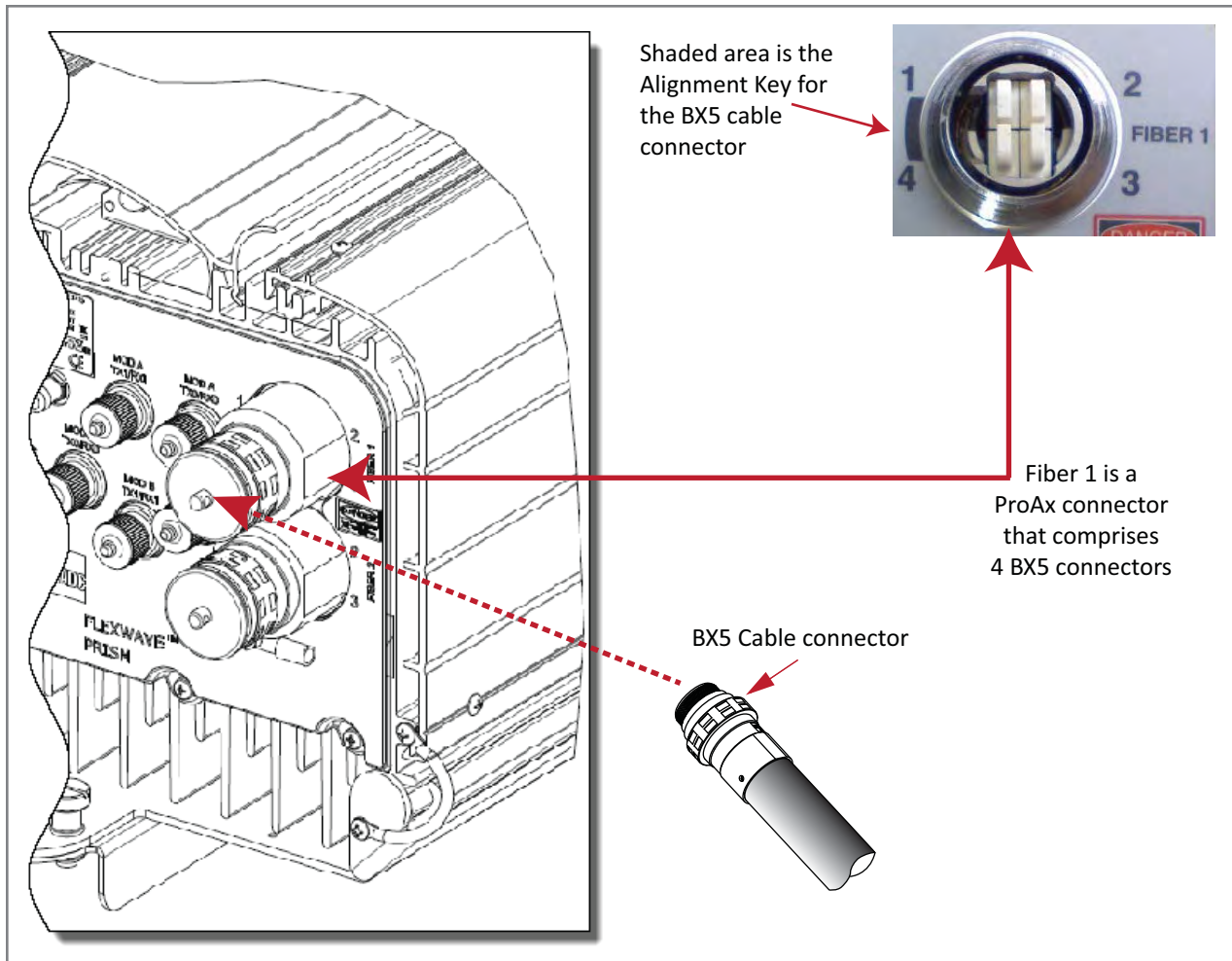
To avoid the risk of equipment damage, ensure that the AC/DC Power switch to the Remote Unit chassis and the DC power switch to all RF Module bays are in their OFF position before connecting or disconnecting coaxial cables; otherwise equipment damage may occur.

- 1 Remove ProAx connector dust cover located at the bottom of the PRU.

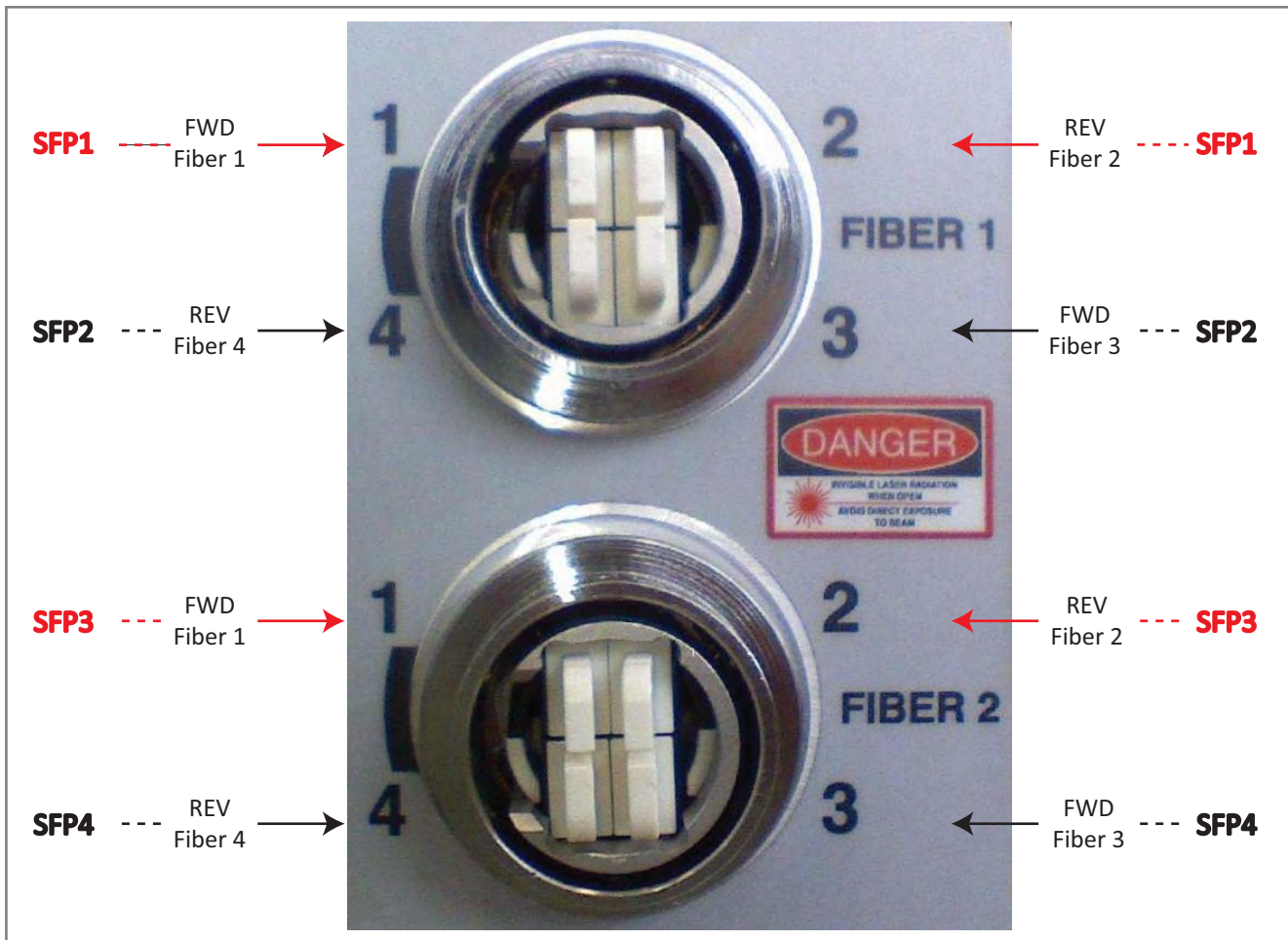


Bottom of Quad-Bay PRU with ProAx Connectors

- 2 Remove the dust cap from the fiber cable BX5 connector (FIBER 1).
- 3 Clean all fiber connectors following industry approved procedure.
- 4 Align the plug end of the BX5 cable connector with the BX5 port receptacle and then insert the cable plug into the port receptacle as shown below, and then slide the strain relief boot over the connector.




- 5 Route the fiber cable from the underside of the PRU to the OSP box. Observe the fiber numbers and their positions in the quad cable connector as shown below. The fibers at the other end of the fiber cable are numbered with the same numbering scheme.



- 6 Secure fiber cable in place following local practices.
- 7 One SFP equals 12 timeslots with 75 MHz of bandwidth. If a second fiber cable assembly is required (for example, your Prism system has three SFPs to handle up to 280 MHz of RF bandwidth), complete [Step 1](#) through [Step 6](#) to add the second fiber cable assembly, only this time, connect to the Fiber 2 ProAx connector located at the bottom of the PRU as shown in [Step 1](#).
- 8 Return to the main installation process and continue at "[Connect the Antenna Cable](#)" on page 74.


CONNECT THE ANTENNA CABLE

Coaxial antenna cables must be routed from the antenna to the PRU. The cables must be terminated with an N-Type male connector for connection to the PRU antenna port or the lightning surge suppressor (accessory, required anytime the antenna is mounted in an area in which the antenna is susceptible to a lightning strike).

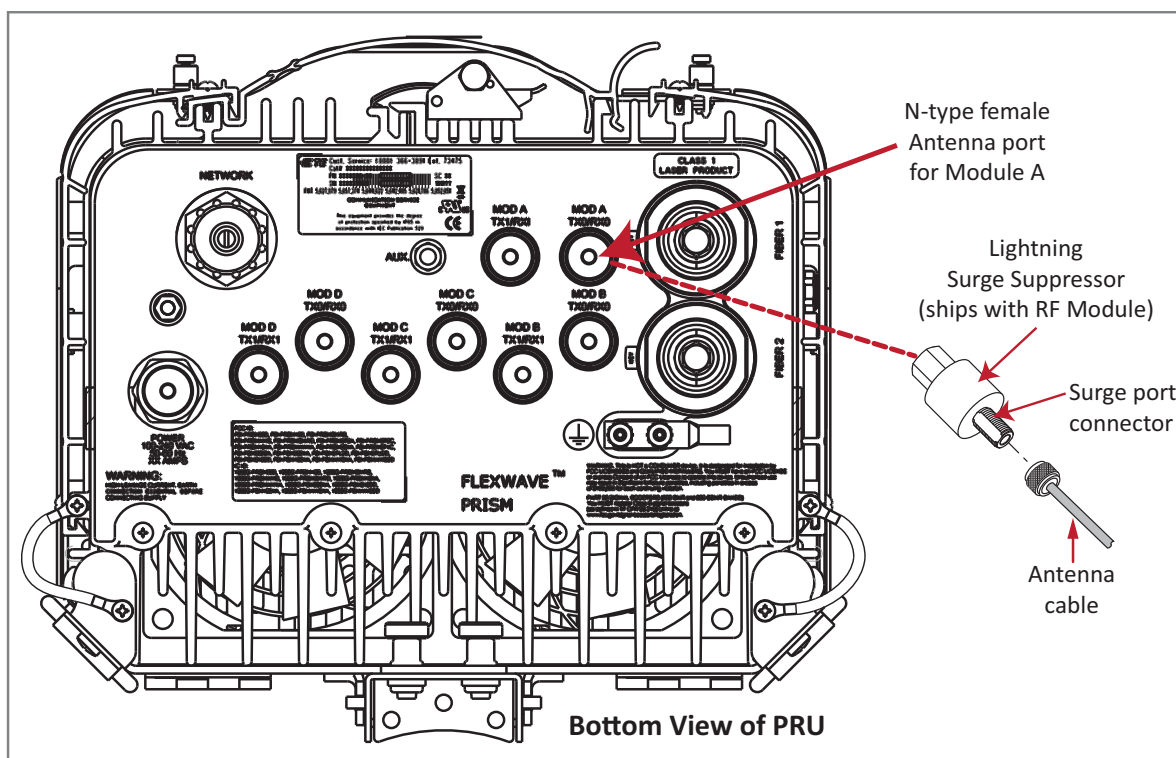
-  **The antenna(s) used for this transmitter must be fixed-mounted on (outdoor/indoor) permanent structures. RF exposure compliance is addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of 47 CFR. 1.307(b)(3).**

Use the following procedure to install the antenna cable(s). This procedure requires that you connect cable to one Antenna connector at a time.

- 1 Refer to "[Understanding RF Cable Rules](#)" on page 26 to understand the relationship between antenna numbers and Remote RF modules; this information makes sure you connect the Antenna connectors correctly.

-  **To avoid the risk of equipment damage, ensure that the AC/DC Power switch to the Remote Unit chassis and the DC power switch to all RF Module bays are in their OFF position before connecting or disconnecting coaxial cables; otherwise equipment damage may occur.**

- 2 Remove the dust cap from an N-type female Antenna connector located on the underside of the unit, as shown below. If you need to install cables to more than one Antenna connector, start in the rear and work forward, applying the correct torque as you make each connection. Working from the rear port out provides you with the space you need to apply the correct torque.



- 3 Connect a lightning surge suppressor to the antenna port; torque to 8 ± 1 in-lbs to ensure full connection.



The lightning surge suppressor is included in the RF Module's shipping container. Lightning surge suppressor(s) are required anytime the antenna is mounted in an area in which the antenna is susceptible to a lightning strike.

- 4 If the PRU has a Dual 20W SMR800 / PCS1900 RF Module (FWP-441T841MOD), you must install a FlexWave Notch Filter (FWP-SPRINTFILTER) between the PRU and the antenna to provide protection from spurious emissions in the Public Safety band below 861.35 MHz and the Cellular band above 869.5 MHz. For information on how to install a Notch Filter, go to "[FlexWave Notch Filter \(FWP-SPRINTFILTER\)](#)" on page 114.
- 5 Ensure that the chassis ground wire is installed correctly (see "[Ground the PRU Chassis](#)" on page 56). For maximum protection, the system ground wire must be attached to a low impedance ground system.
- 6 Route the coaxial antenna cable from the antenna to the underside of the PRU.
- 7 Cut the antenna cable to the required length and terminate with an N-type male connector.
- 8 Connect the antenna cable to the lightning surge suppressor or to the antenna port; apply 15 in-lbs (1.7 Nm) of torque.



The antenna cable connections must be weather proofed (sealed) for outdoor installations.

- 9 Repeat the [Step 2](#) through [Step 8](#) for the remaining antenna cables.

DETERMINE THE CIRCUIT BREAKER OR FUSE FOR THE PRU

Use the information in this section to determine the circuit breaker or fuse that should be installed in the AC circuit breaker box or the DC Power Source Distribution Panel:

- An AC-powered PRU supports power input from a 90 to 240 Vac power supply.
- A DC-powered PRU supports power input from a -40 to -60 Vdc power supply.

Power Consumption

- 1 Calculate the maximum power consumption, which determines the circuit breaker or fuse to use.
 - a Review the PRU order to determine the number of DARTs, number of power supplies, and the number of SFPs. Use this information to find the power consumption from [Table 23](#) and [Table 24 on page 77](#).
 - b Enter the power consumption in the spaces provided below.
 - c Add the Watts and enter the total in the Total Power Consumption field.

SeRF Module power consumption from [Table 23](#) _____ Watts

Additional SFPs ____ x 1.25W _____ Watts

RF Module power consumption from [Table 24 on page 77](#) _____ Watts

Total Power Consumption _____ Watts

- 2 Divide the total Watts by the input Voltage to determine the current (Amperes) requirements:

$$\text{Total Watts} / \text{Input Voltage} = \text{Amps}$$
- 3 Determine the circuit breaker or fuse size based on local codes and practices.



Circuit breaker or fuse size must be 20 Amps or less to protect the internal wiring of the PRU.

Power Consumption Tables

The PRU power supplies are > 80% efficient, both AC and DC versions. The data in [Table 23](#) and [Table 24 on page 77](#) and the power-supply efficiencies can be used to estimate the input current for a given PRU configuration. Use the following equation to calculate the input current draw:

$$\text{Input Current} = (\text{Total Power Consumption} / 0.80) / \text{Input Voltage}$$

For example, for a PRU with 1 SeRF Module, 1 SFP (36W Typical, 38W Max), and a single 20W 850/1900 HDM RF Module (250W Typical, 330 W Max), then the Total Power Consumption would be 286W (Typical) and 368W (Max). Therefore, for a 110VAC input, the current estimate would be 3.25 amps (Typical) and 4.18 amps (Max).

Table 23. *SeRF Module Power Consumption*

SeRF Module	Power Consumption per Module	
	Nominal (W) @ 25C	Maximum (W)
SeRF Module (1 SFP) [add 1.25W for each SFP added]	36	38

Table 24. Power Consumption by RF Module

Prism RF Module Description			Power Consumption Per Module	
			Nominal (W) @ 25C	Maximum (W)
Single or Dual SuperDART RF Module	40W 700 LTE	Non-Diversity	299	368
	10W GSM900 (Includes EGSM, PGSM, APAC, GSM)	Non-Diversity	299	337
		Diversity	321	359
	15.8W GSM1800	Non-Diversity	299	337
		Diversity	321	359
	20W 1900 PCS, 20W 2100AWS, 700 LTE	Non-Diversity	299	368
	40W 1900 PCS, 40W 2100 AWS (Dual AMPs)	Non-Diversity	568	706
	15.8W 2100UMTS	Non-Diversity	299	337
Diversity		321	372	
HDM RF Modules	20W 700 LABC/700 uC Dual HDM	Dual HDM - Non-Diversity	250	330
	20W 700 MIMO LTE HDM (LABC or uC)	MIMO - Non-Diversity	250	330
	20W 800 SMR MIMO HDM	MIMO - Non-Diversity	250	330
	20W 800/1900 HDM	Dual HDM - Non-Diversity	250	330
	20W 850 Cell MIMO HDM	MIMO - Non-Diversity	250	330
	40W 850 Cell SISO HDM	SISO - Non-Diversity	249	315
	20W 850/1900 HDM	Dual HDM - Non-Diversity	250	330
	20W 1900 PCS MIMO HDM	MIMO - Non-Diversity	250	330
	40W 1900 PCS SISO HDM	SISO - Non-Diversity	249	315
	20W 1900/2100 HDM	Dual HDM - Non-Diversity	250	330
	20W 2100 AWS MIMO HDM	MIMO - Non-Diversity	250	330
	40W 2100 AWS SISO HDM	SISO - Non-Diversity	249	315
	20W Dual PCS 1900/2100 AWS-3	Dual HDM - Non-Diversity	250	330
	20W 2100 AWS-3 MIMO	MIMO - Non-Diversity	250	330
	20W 2100 AWS-3 SISO	SISO - Non-Diversity	249	315
	20W 2500 TDD Low HDM	MIMO - Non-Diversity	250	330
	20W 2500 TDD High HDM	SISO - Non-Diversity	175	230
	20W 2500 TDD Low 2496.5-2571.5	SISO - Non-Diversity	175	230
Classic DART RF Module	6.5W 800/900 ESMR	Non-Diversity	195	196
	20W 850 CELL	Non-Diversity	271	327
		Diversity	293	350
	40W 850 Cell	Non-Diversity	299	368
	20W 1900 PCS or 2100 20W AWS	Non-Diversity	292	385
		Diversity	314	381

CONNECT THE POWER WIRING

The PRU supports both AC and DC power. Follow the steps appropriate to your system configuration:

- "Option 1: Connect the AC Power Wiring" on page 78
- "Option 2: Connect the DC Power Wiring" on page 81.

Option 1: Connect the AC Power Wiring

A 15-foot, 3-wire cable with connectors is provided for the AC power connections. The connector end of the cable connects to the AC power port located on the bottom of the unit. The stub end of the cable must be routed to an external junction box (not provided) for permanent connection to the AC power system wiring. If the cable must be terminated with a plug to connect to the AC adapter, the plug must be provided by the installer.

The AC power source must supply between 100 and 240 Vac, 50 or 60 Hz, single-phase power through a circuit breaker or fuse. The AC power cable provides three wire leads for line, neutral, and ground connections. The power cable is rated for indoor or outdoor use and must not be placed within electrical conduit as this will impede the cooling of the cable during usage. The electrical junction box and any conduit, wire, and fittings required must be provided by the installer.



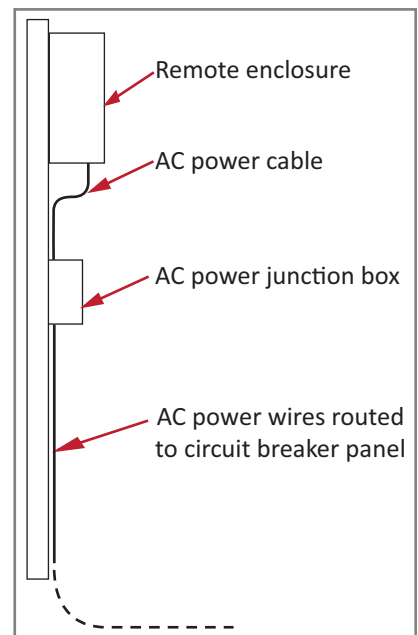
Use extreme caution when working with high voltage AC power. Ensure all power is disconnected before working on power circuits.



All electrical work must comply with local codes and requirements. A locally licensed electrical contractor is best qualified to perform this work. For additional information, consult with the CommScope DCCS Technical Support (see "DCCS Global Technical Support" on page 123).

Use the following procedure to install the AC power wiring:

- 1 Use the information in "[Determine the Circuit Breaker or Fuse for the PRU](#)" on page 75 to ensure that the correct circuit breaker or fuse required for this installation is installed in the circuit breaker panel.
- 2 Locate the AC power cable that is provided separately with the PRU.
- 3 Route the power cable between the AC power port, located on the underside of the PRU and the nearest AC power junction box as shown in the graphic to the right. It may be necessary to install a new junction box if an existing junction box is not available.
- 4 Secure the cable between the AC power port and the AC power junction box per local practice. Leave sufficient slack in the cable to allow it to be easily connected and disconnected from the AC power port.



The power cable is rated for indoor or outdoor use and must not be placed within electrical conduit as this will impede the cooling of the cable during usage. The cable run distance to the AC power source must not exceed 100 feet.

- 5 Install any AC power supply wires that may be required between the AC junction box and the AC circuit breaker box.

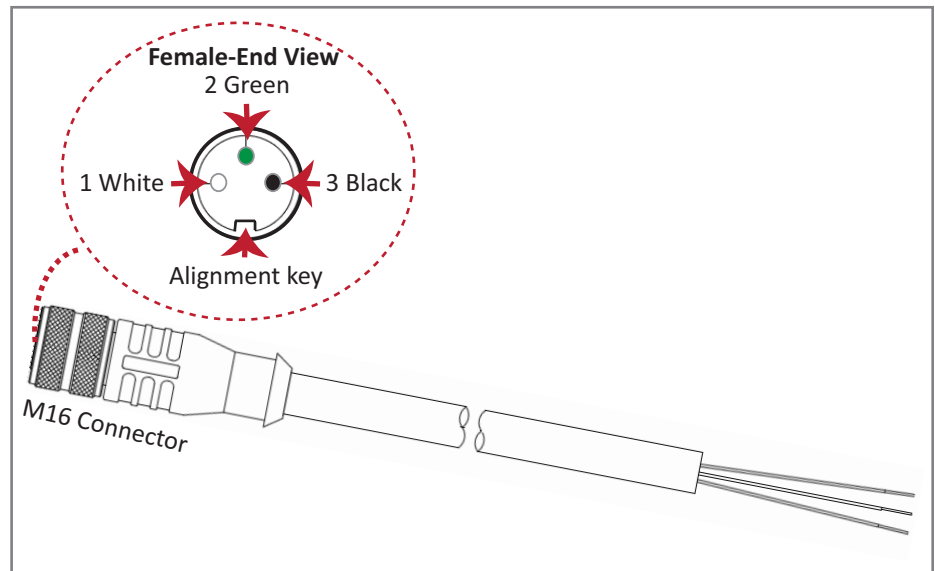


It is recommended that an AC outlet be installed near the PRU for powering tools and test equipment. This outlet must include a GFCI device for protection.



An appropriate disconnect device, as well as branch circuit protection, must be provided as part of the installation.

- 6 Connect the AC power cable wires to the AC power supply wires. Refer to the graphic to the right to identify the color code and wire designations; use the alignment key to ensure that the cable correctly aligns with the connector. If the cable is not aligned correctly with the connector, connector pins may be damaged.
- 7 At the AC box, connect the AC power supply load wires to a circuit breaker or fuse.



For proper and safe equipment operation, an approved earth ground connection must be provided and maintained.

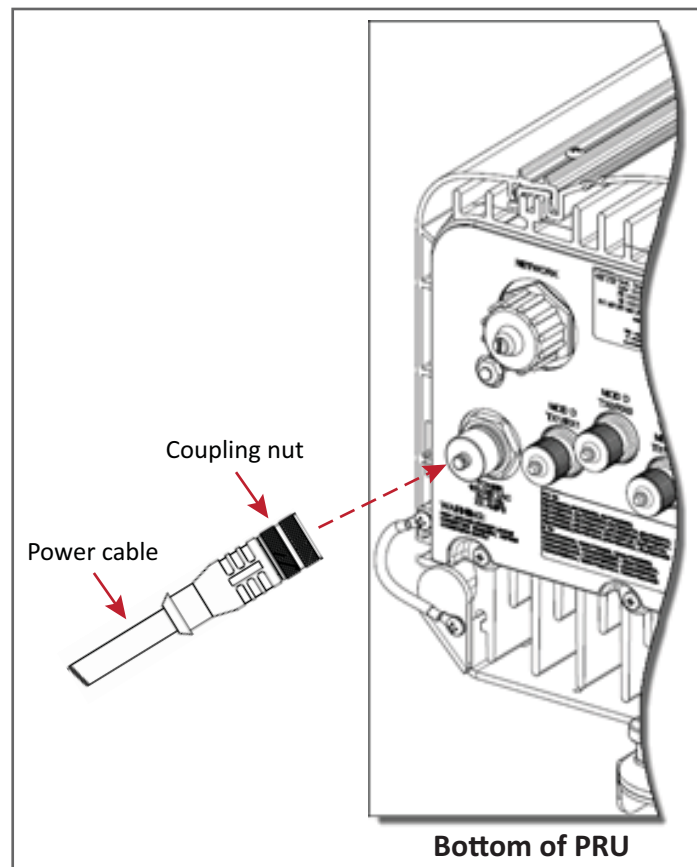
- 8 Connect the ground wire to an approved earth ground.
- 9 Place the circuit breaker in the ON position and then test the connector end of the AC power cable for proper voltage levels and correct polarity.
- 10 When testing is complete, place the circuit breaker in the OFF position.

- 11 Remove the dust cap from the AC power port located on the bottom of the PRU as shown below.



While trying to connect the AC power cable to the PRU AC power port, it is possible for the line terminal on the cable connector to contact the ground pin on the power port. If the AC cable is energized, this will result in a direct short to ground for the AC power. To avoid possible personal injury and equipment damage, always turn the AC power off before connecting the AC power cable to the AC power port.

- 12 Connect the power cable connector to the AC power port; use the alignment key to ensure that the cable correctly aligns with the connector. If the cable is not aligned correctly with the connector, connector pins may be damaged.
- 13 Tighten the coupling nut on the power connector.



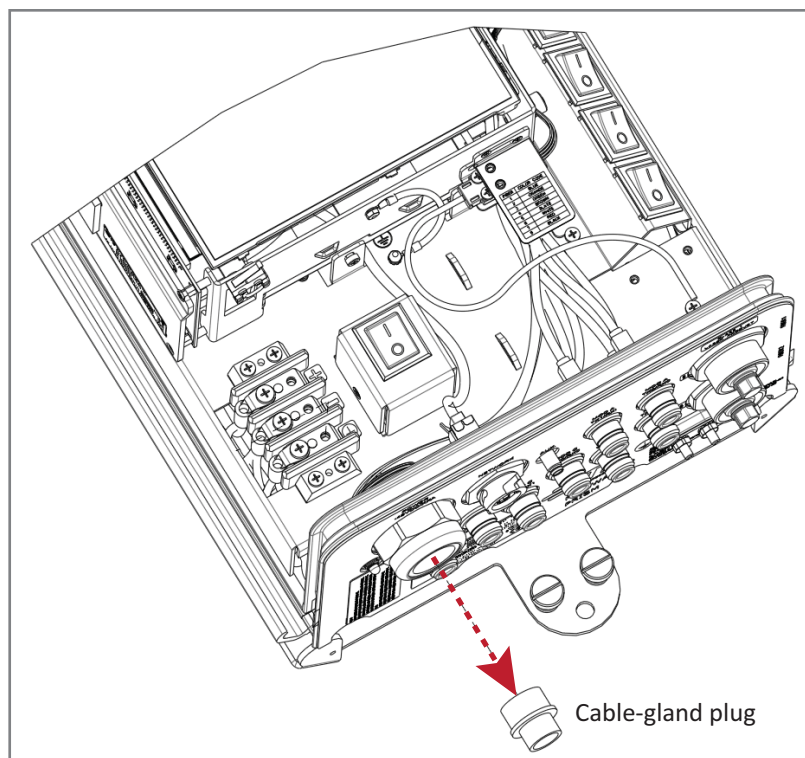
- 14 Do one of the following:
 - If you need to install an RF Module, go to ["Install the RF Module\(s\)"](#) on page 86.
 - If the RF Modules required for this installation are already installed in the PRU, go to ["Power on the RF Module\(s\) and the Prism Remote Unit"](#) on page 111.

Option 2: Connect the DC Power Wiring

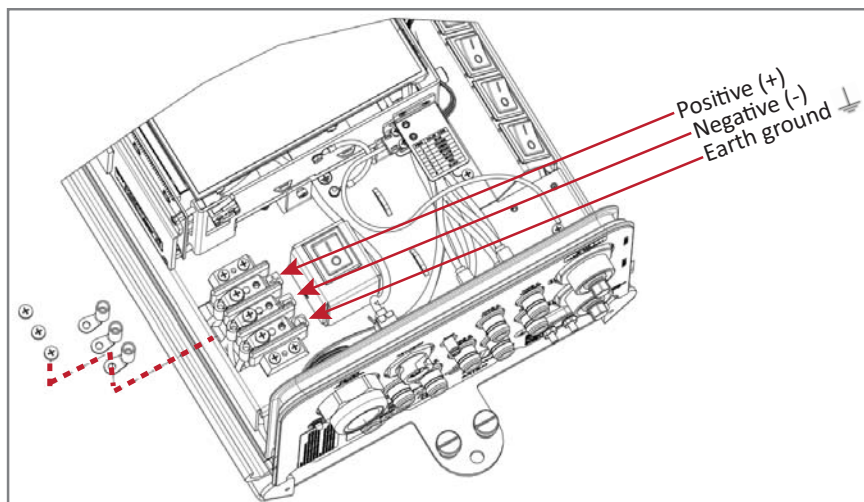


All electrical work must comply with local codes and requirements. A locally licensed electrical contractor is best qualified to perform this work. For additional information, consult with the CommScope Technical Support for Wireless Products team (see "[DCCS Global Technical Support](#)" on page 123).

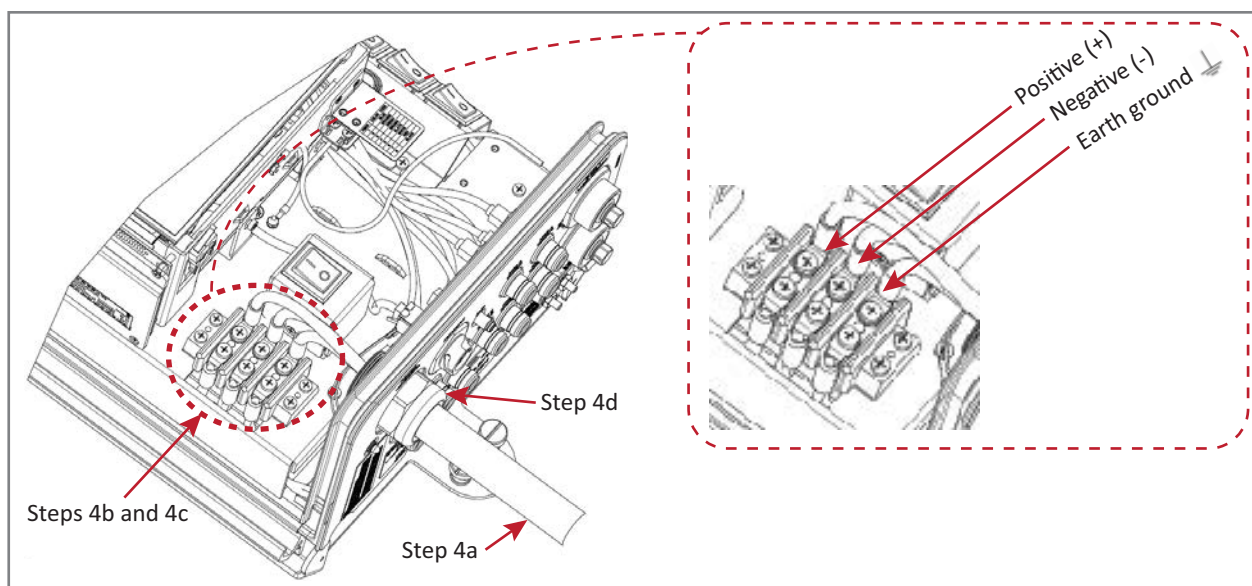
- 1 Use the information in "[Determine the Circuit Breaker or Fuse for the PRU](#)" on page 75 to ensure that the correct circuit breaker or fuse required for this installation is installed in the DC Power Source Distribution Panel.
- 2 Obtain a DC power cable that meets the following requirements:
 - The DC power cable can be 8 AWG or 6 AWG, 3- or 4-conductor power cable rated for outdoor use.
 - The wire colors must be green, red, and black.
 - The cable diameter must be .71 to .98 inches.
 - If a 4-conductor power cable is used, the extra conductor can be snipped off before installation.
 - If using 6 AWG wire, the installer must provide and use #10 stud size, 6 AWG ring terminals.
- 3 Remove the cable-gland plug from the bottom of the PRU chassis:



- 4 Disconnect the ring terminals from the power-terminal block, as shown in the graphic to the right.



- 5 Connect the DC power cable to the PRU.



- a Route the end of the DC power cable with the three conductors through the open cable-gland connector on the bottom of the PRU.
- b Crimp the three conductors to the power ring terminals. The terminal block is labeled as to where each wire should be connected, as described below.
 - **In a typical -48 Vdc plant**, the highest potential is the 0 (ground or return) lead; you therefore:
 - connect the 0 (ground or return) lead to the positive (+) connector (red wire)
 - connect the -48 Vdc lead to the negative (-) connector (black wire)
 - connect the third wire, if provided, to the Earth Ground terminal.
 - **In a +48 Vdc plant**, the highest potential is the +48 lead; you therefore:
 - connect the +48 lead to the positive (+) connector (red wire)
 - connect the 0 potential (ground or return) to the negative (-) connector (black wire)
 - connect the third wire, if provided, to the Earth Ground terminal.
- c Use a Phillips screwdriver to torque the ring terminals to 18 in-lbs.
- d Use a 42 MM wrench to torque the large nut outside the cable gland to 44 in-lbs.

- 6 Connect the wires to the designated terminals on the DC Power Source Distribution Panel. The following connections are typically made:
 - **In a typical -48 Vdc plant**, the highest potential is the 0 (ground or return) lead; you therefore:
 - connect the 0 (ground or return) lead to the positive (+) connector (red wire)
 - connect the -48 Vdc lead to the negative (-) connector (black wire)
 - connect the third wire, if provided, to the Earth Ground terminal.
 - **In a +48 Vdc plant**, the highest potential is the +48 lead; you therefore:
 - connect the +48 lead to the positive (+) connector (red wire)
 - connect the 0 potential (ground or return) to the negative (-) connector (black wire)
 - connect the third wire, if provided, to the Earth Ground terminal.
- 7 Dress and secure the wires to the rack following local practice. Route wiring away from sharp edges and secure in place to prevent chaffing and provide strain relief.



Route all DC input wiring away from any sharp edges and properly secure it in place to prevent chafing and to provide strain relief. Lace the wires to the rack frame.

- 8 Do one of the following:
 - If you need to install an RF Module, go to ["Install the RF Module\(s\)" on page 86](#).
 - If the RF Modules required for this installation are already installed in the PRU, go to ["Power on the RF Module\(s\) and the Prism Remote Unit" on page 111](#).

(OPTIONAL) CONNECT THE PRISM REMOTE UNIT TO A UPS

The four-pin AUX Connector on the bottom of the PRU allows the PRU to be connected to an external device with dry contact connections, such as an Uninterrupted Power Supply (UPS). The AUX Connector pins are shown in Figure 17.



The Normally Open (NO) or Normally Closed (NC) options are configurable in the GUI; see the “Manage Contact Alarms” section of the current EMS System Setup and Provisioning Guide.

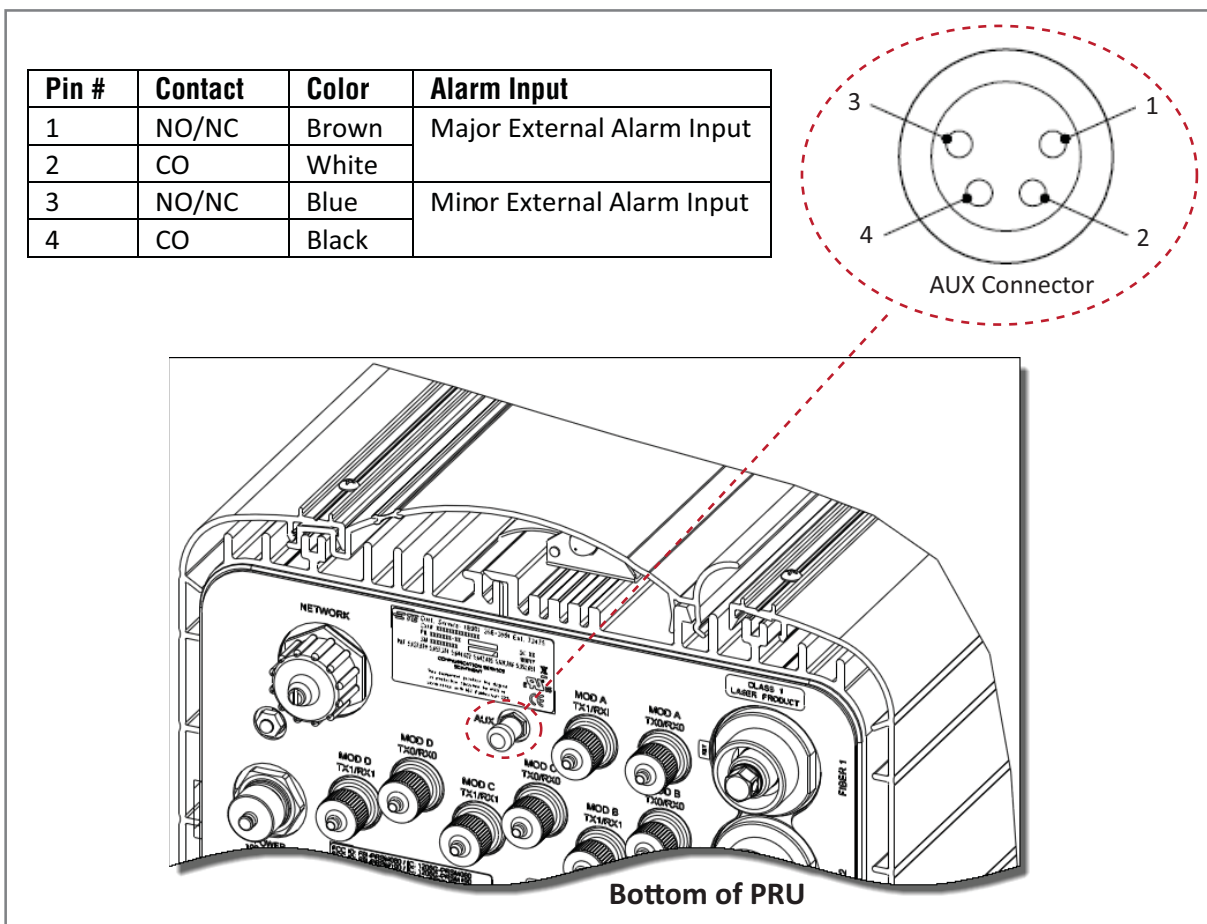


Figure 17. AUX Connector Pin Orientation



The Major/Minor setting of the AUX Connector pins cannot be configured in the Prism 6.x EMS GUI. In Prism 7.x, you can configure the Contact Alarm as Major or Minor (Alarms > Manage Contact Alarms).

A 4-Wire M8 picofast[®] 6- or 10-meter 26 AWG cable is used to connect the PRU to the external device, as shown in [Figure 18](#).

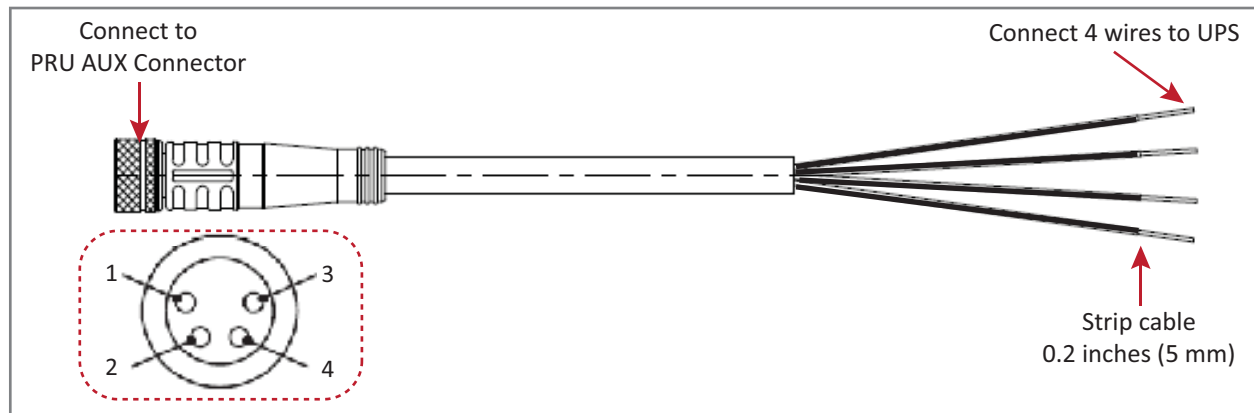


Figure 18. 4-Wire picofast 26 AWG Cable

Do the following to connect a UPS to the AUX Connector on the bottom of the PRU:

- 1 Obtain the required length of 6- or 10-meter picofast cable.
- 2 Orient the coupling fastener on the cable ([Figure 18](#)) with the AUX Connector pins ([Figure 17](#)), and then fasten the cable to the AUX Connector.
- 3 Route the cable from the PRU AUX Connector to the UPS (if not already routed) and then cut to the required length. Allow sufficient slack for dressing and organizing the cable at the external device.
- 4 Strip back the outer cable sheath and insulation to expose the wires at the end of the cable and strip back 0.2 inches (5 mm) of insulation from each wire.
- 5 Connect the alarm wire pairs to the appropriate terminals on the external device.
- 6 Dress and secure cable per standard industry practice.



If necessary, order a Prism AUX 4-wire cable assembly, CommScope part number 1451903.