Option B: Fiber Pass-Through Connector

**NOTE:** 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 55

- 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 65.

NOTE: The graphic 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:

1 Obtain an environmentally hardened fiber cable terminated with LC connectors. The outside diameter of the cable jacket must be between .035" and .63".

2 Complete the installation steps in "Unpack and Inspect the Prism Remote Unit and Components" on page 39 through "Connect a Network Cable to the PRU Chassis" on page 53.

3 Remove connector plug only from the Fiber 1 connector, unless multiple fiber cables are needed.

NOTE: Do not remove the dust cover from the Fiber 2 connector until directed to do so.
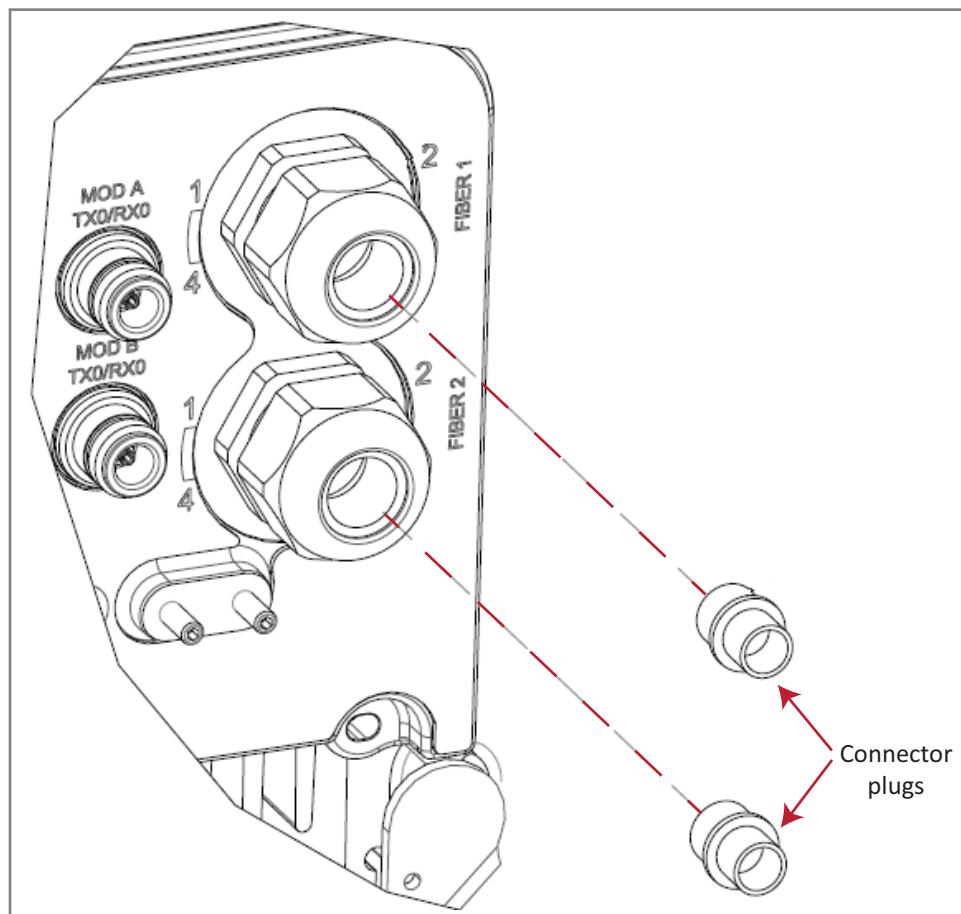
4 Insert the Fiber Optic cable, terminated with LC connectors, through the Fiber 1 Connector.

AC or DC PRU
(The Fiber 1 and Fiber 2 connectors are in the same
location for both the AC- and DC-powered PRUs.)
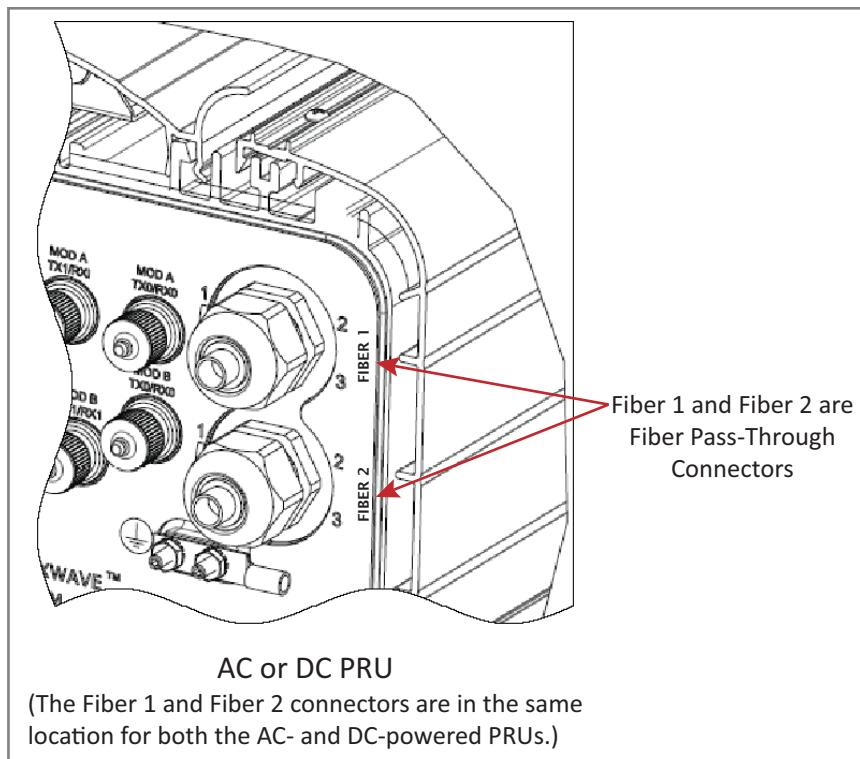
5 Clean all LC connectors following industry approved procedure.

6 Refer to one of the following graphics to connect the LC connectors to the SFP:

- for standard configurations, see
- for WDM Pass-Through configurations, see .
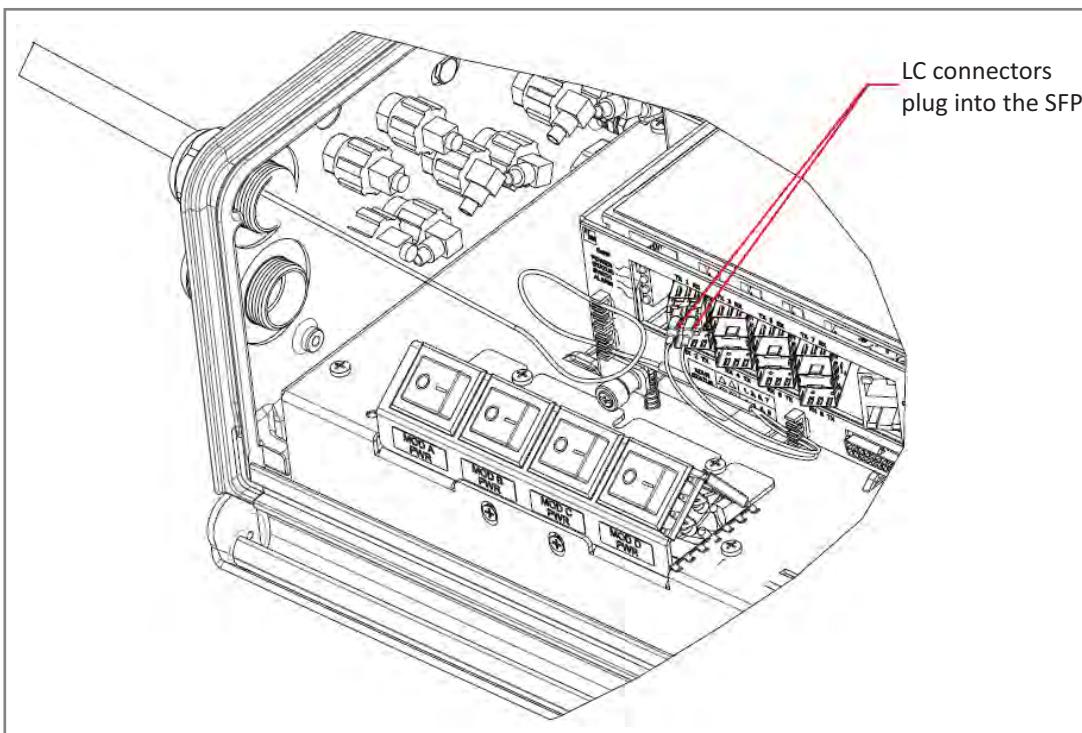
**Figure 15.** Connect LC Connector to SFP—Standard Configuration
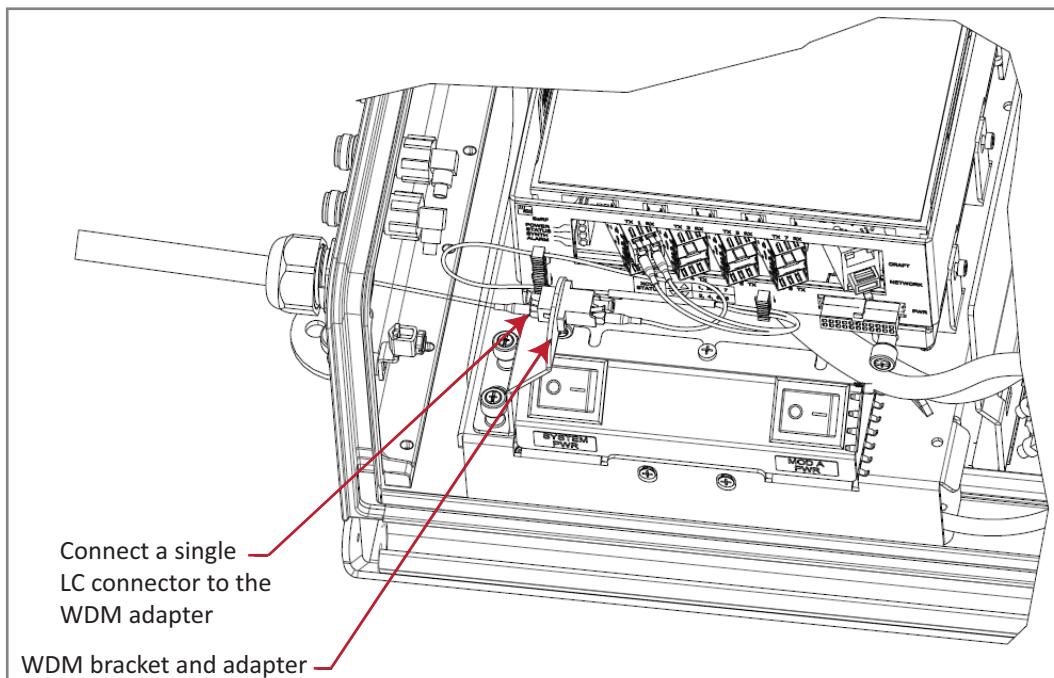
Figure 16. Connect LC Connector to SFP—WDM Pass-Through Configuration

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

Strain-relief lug
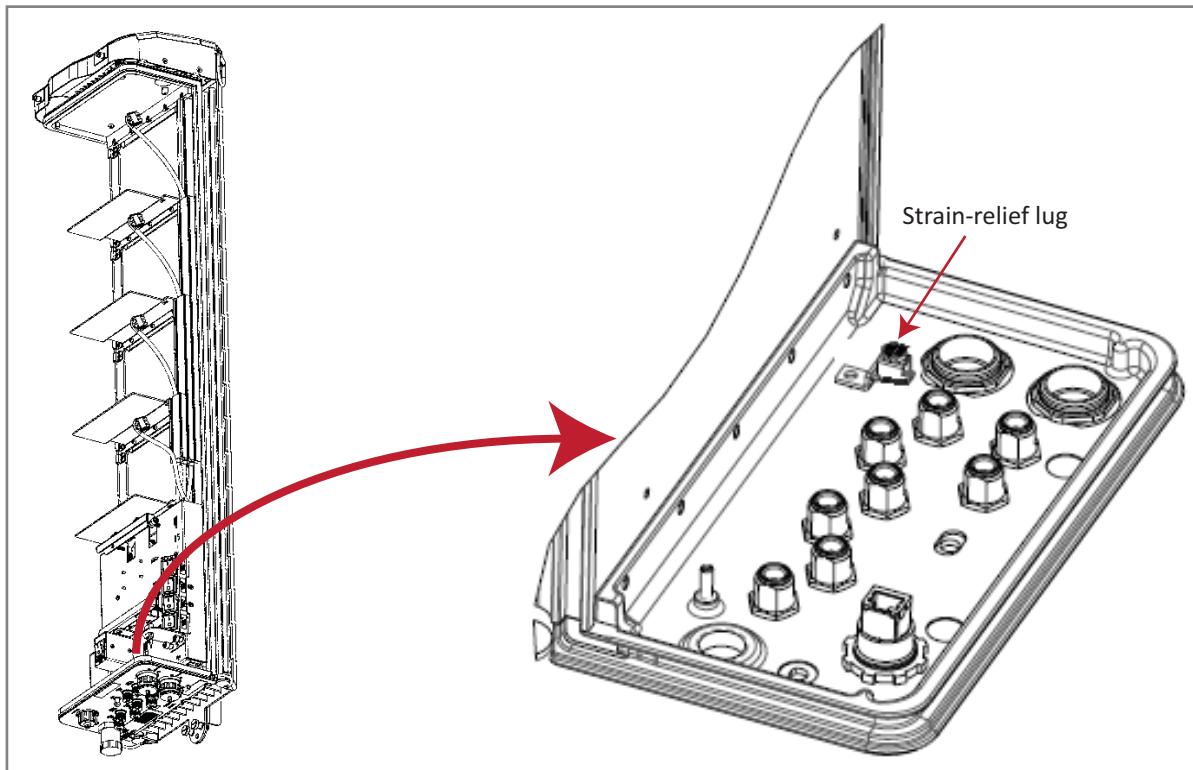
8 Tighten the external dome nut of the Pass-Through Connector around the Fiber Optic cable—torque the dome nut to 44 in-lbs plus or minus 4 in-lbs.

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 61 through Step 10 on page 64 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 62.

12 Return to the main installation process and continue at "Connect the Antenna Cable" on page 69.

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

NOTE: 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 55**

- 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 61**.

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

NOTE: 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:

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

Fiber 1

Fiber 2

Bottom of Quad-Bay PRU with ProAx Connectors
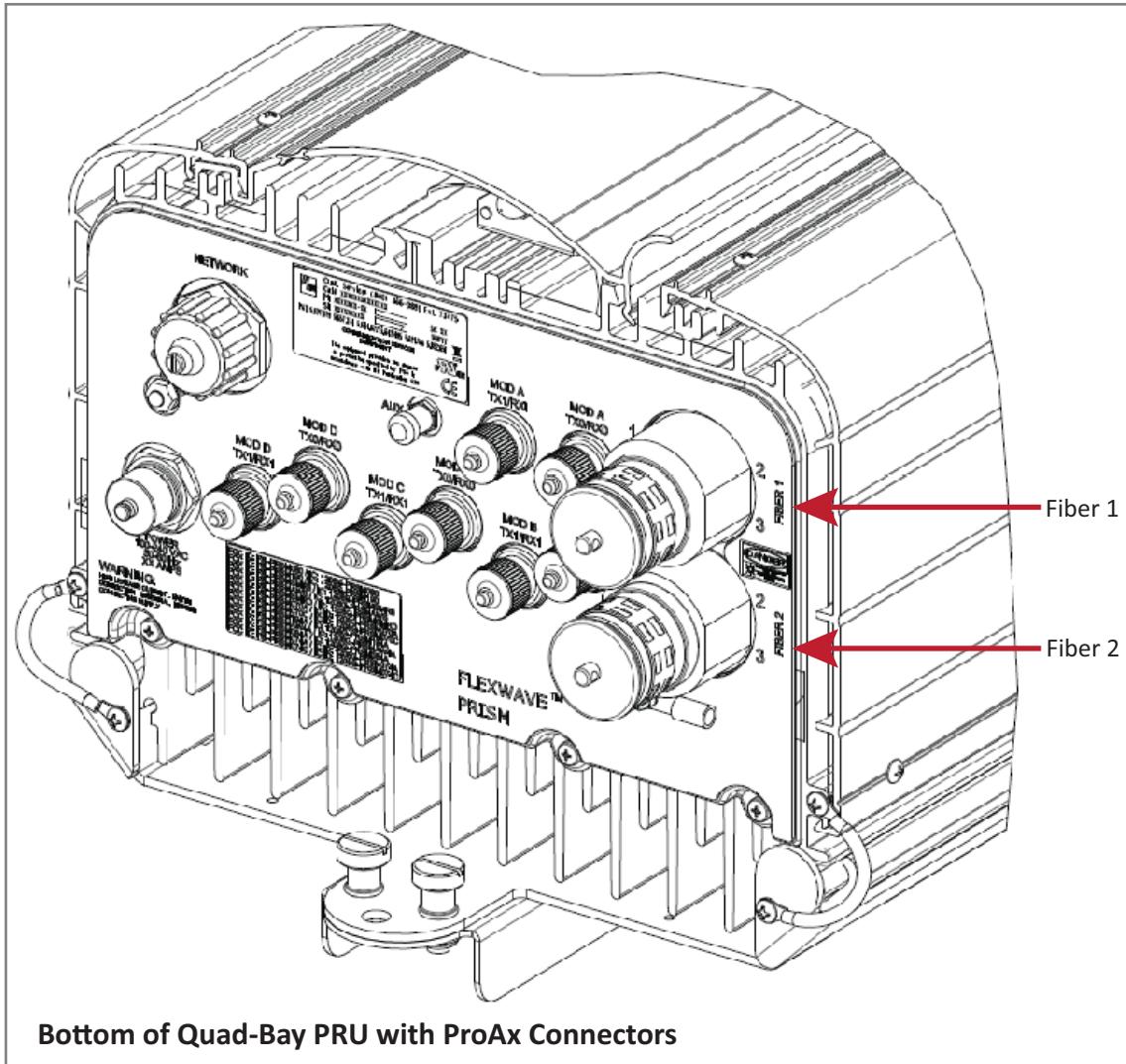
2   Remove the dust cap from the fiber cable BX5 connector (FIBER 1).

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.

Shaded area is the Alignment Key for the BX5 cable connector

Fiber 1 is a ProAx connector that comprises 4 BX5 connectors

BX5 Cable connector
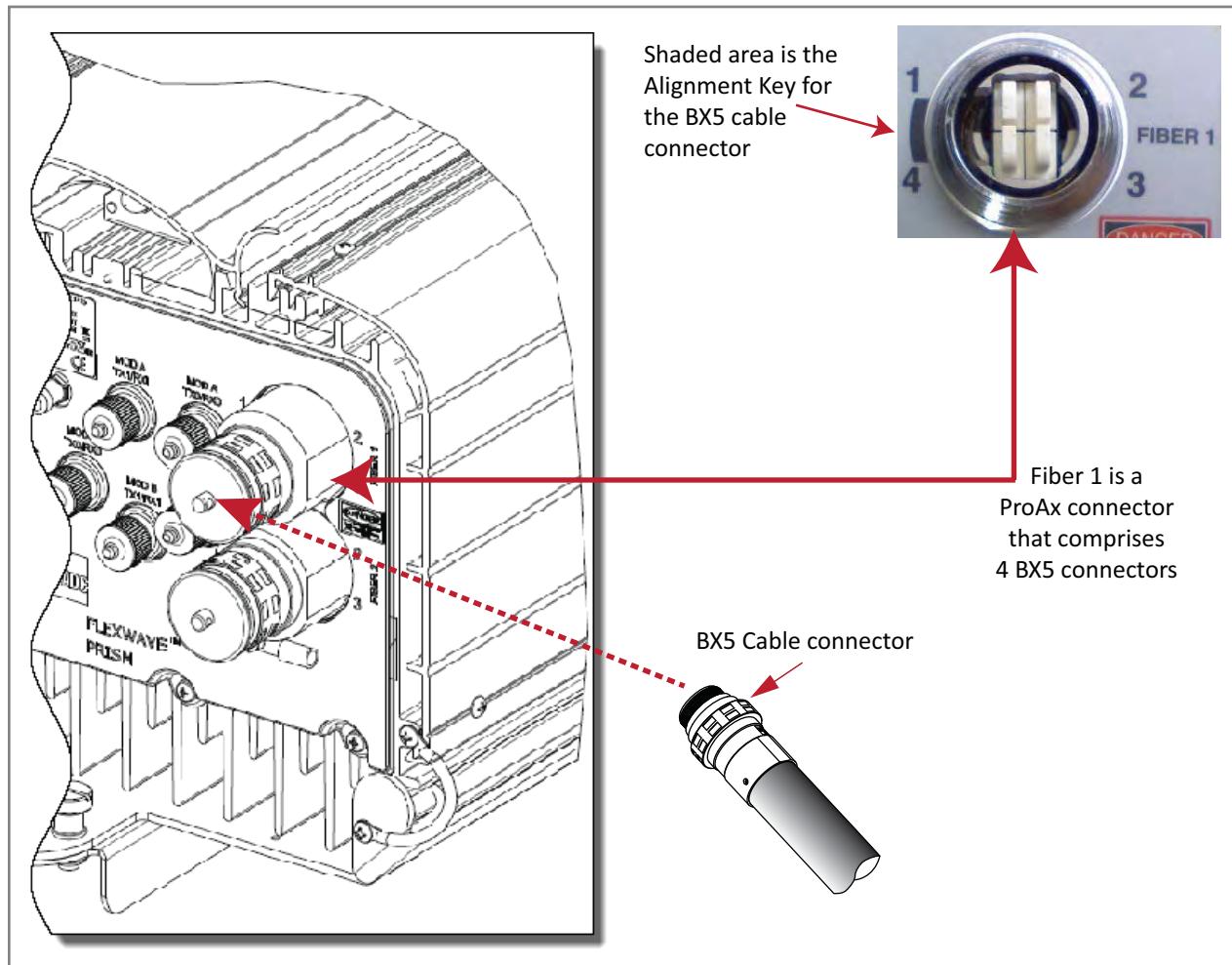
5 Route the fiber cable from the underside of the PRU to the OSP box. Observe the fiber numbers and their positions in the quad cable connector as shown below. The fibers at the other end of the fiber cable are numbered with the same numbering scheme.
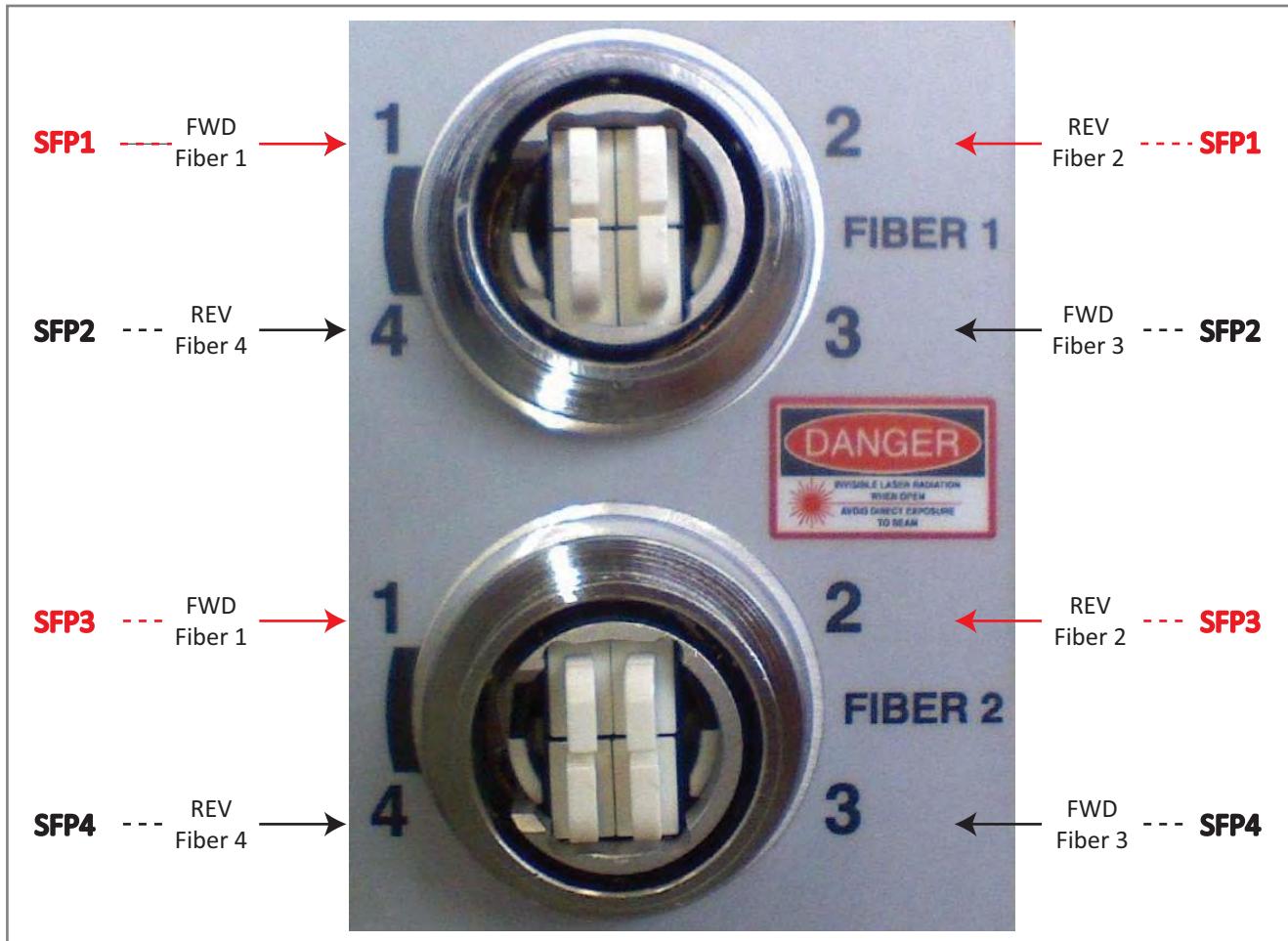
6 Secure fiber cable in place following local practices.

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 69.

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).

CAUTION! **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.

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.

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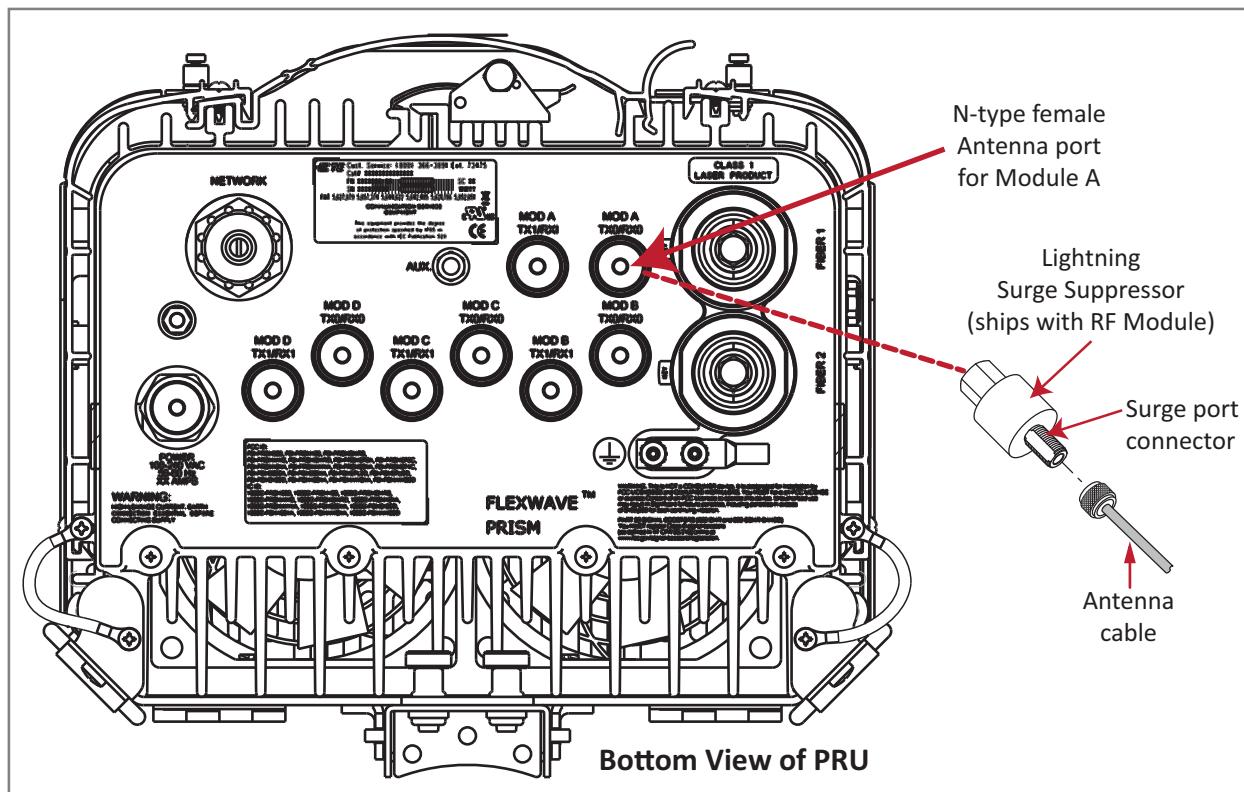
3 Connect a lightning surge suppressor to the antenna port; torque to 8 ±1 in-lbs to ensure full connection.

NOTE: Lightening surge suppressor(s) ship with every RF Module. If the RF modules are populated in the PRU from the factory, the lightening surge suppressors are in the Prism shipping crate. If the RF Module is shipped individually, the lightening surge suppressor is shipped within the RF Module shipping container.

4 If the PRU has a 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 108.

5 Ensure that the chassis ground wire is installed correctly (see "Ground the PRU Chassis" on page 52). 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.

CAUTION! 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.

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 70
- "Option 2: Connect the DC Power Wiring" on page 73.

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.

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

> **NOTE:** **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 119).**

Use the following procedure to install the AC power wiring:

1 Locate the AC power cable that is provided separately with the PRU.

2 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.

3 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.

> **NOTE:** **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.**

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

Remote enclosure

AC power cable

AC power junction box

AC power wires routed to circuit breaker panel

> **NOTE:** **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.**

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

5 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.

Female-End View
2 Green

1 White

3 Black

Alignment key

M16 Connector
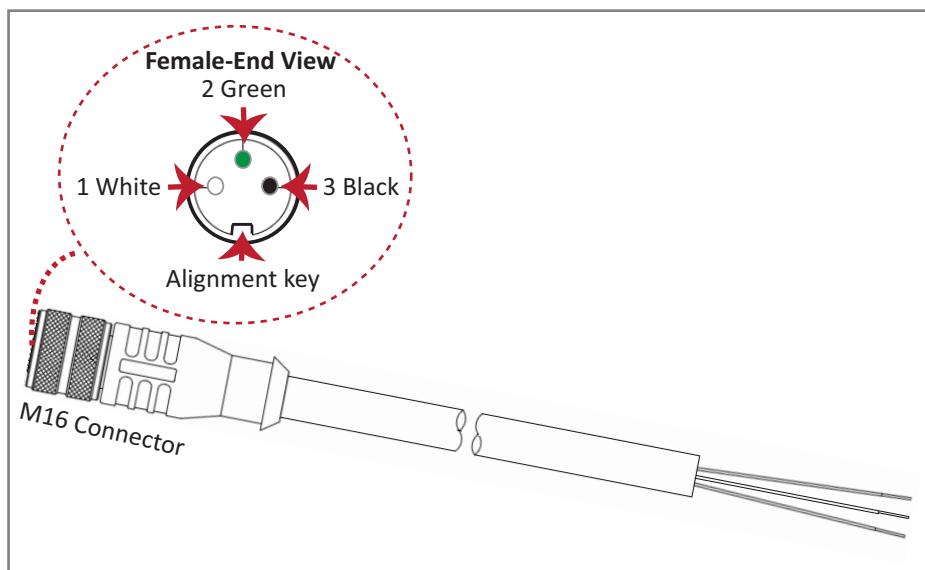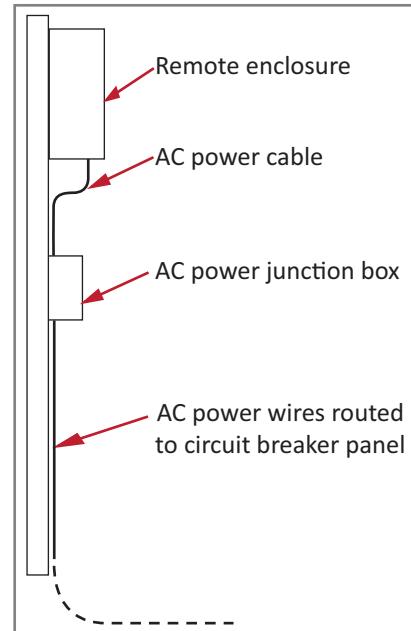
6 At the AC box, connect the AC power supply load wires to a circuit breaker or fuse.

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

7 Connect the ground wire to an approved earth ground.

8 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.

9 When testing is complete, place the circuit breaker in the OFF position.

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

CAUTION! **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.**

11 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.

**12** Tighten the coupling nut on the power connector.

Coupling nut

Power cable

Bottom of PRU
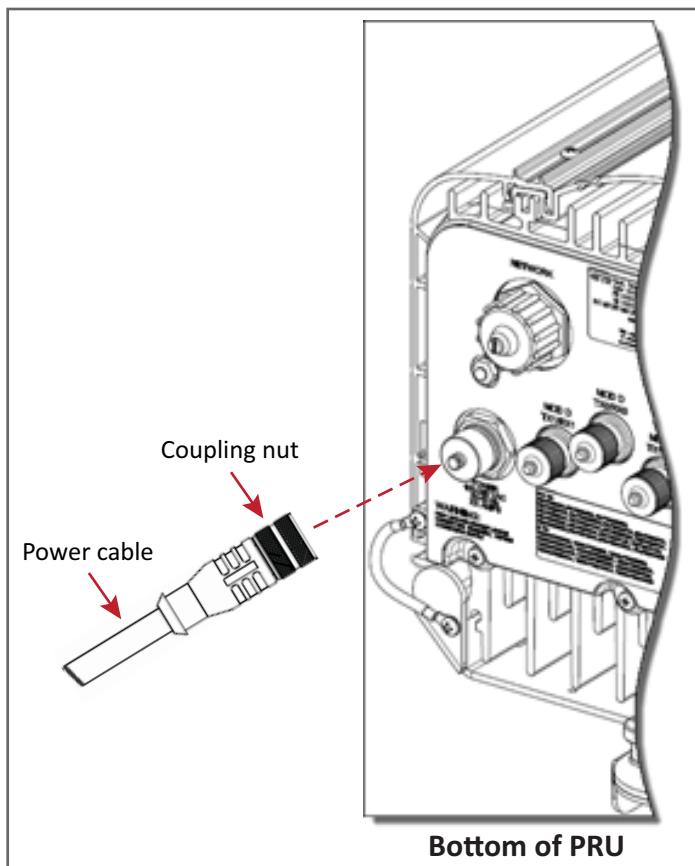
Option 2: Connect the DC Power Wiring

NOTE: **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 119**).**

1 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 must be between .71-inch to .98-inch in diameter.
- 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.

2 Remove the cable-gland plug from the bottom of the PRU chassis:
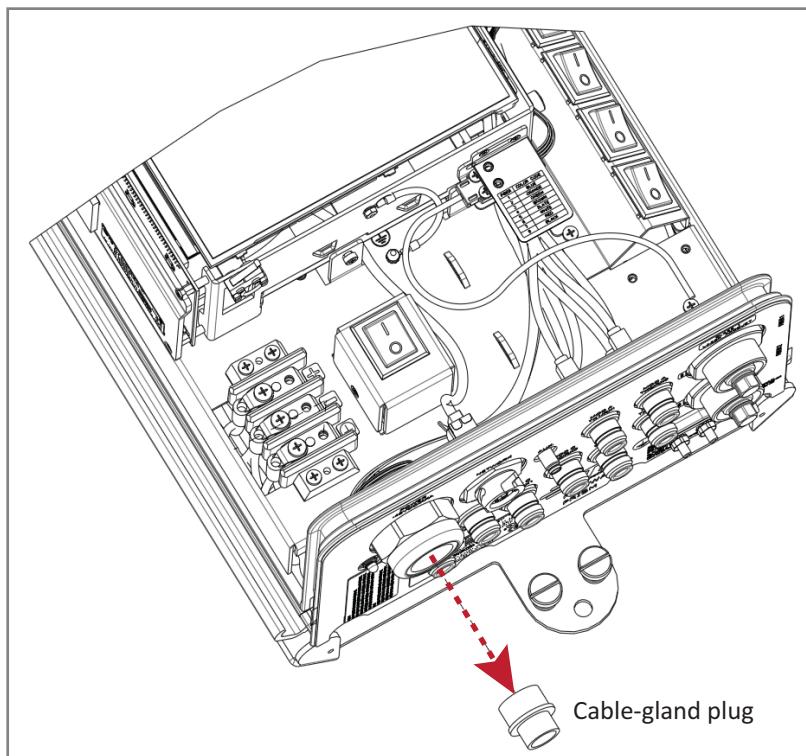
Cable-gland plug

3 Disconnect the ring terminals from the power-terminal block:
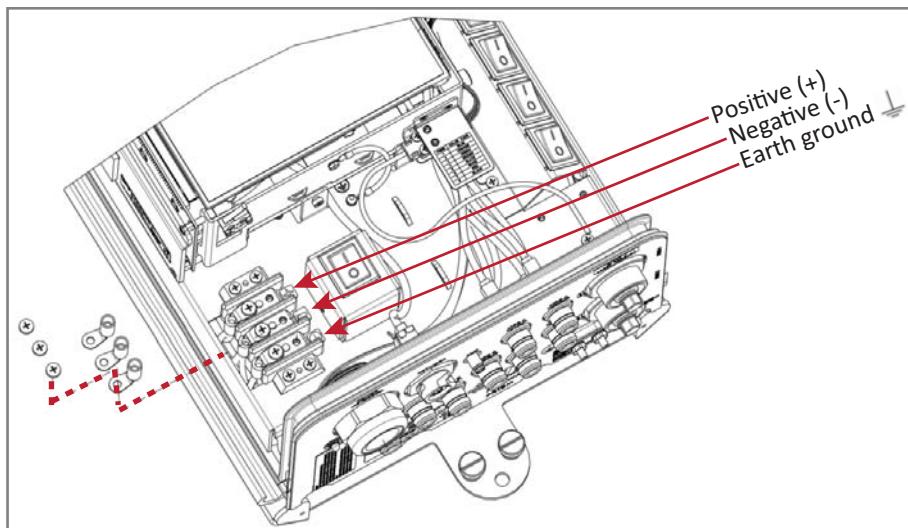
4 Connect the DC power cable to the PRU.
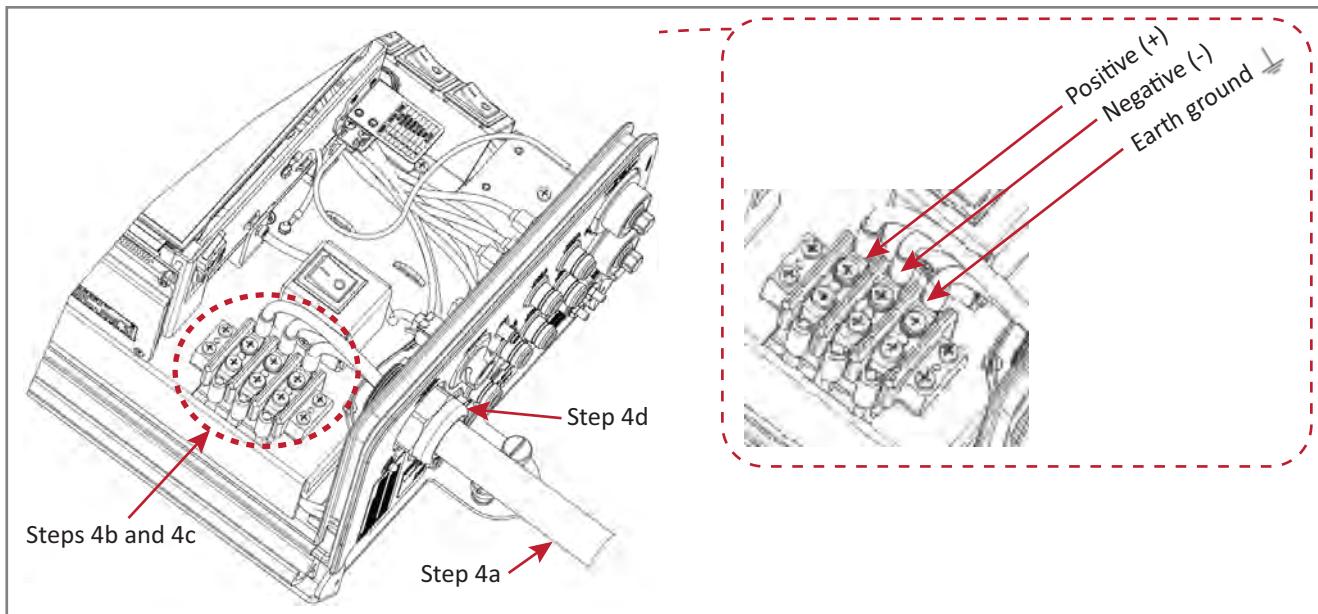
    a   Route the end of the DC power cable with the three conductors through the open cable-gland connector on the bottom of the PRU.

    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 plan**t, 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.

5   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 plan**t, 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.

6   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.

NOTE: **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.**

DETERMINE THE CIRCUIT BREAKER OR FUSE FOR THE PRU

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 22 on page 76 and Table 23 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 22 on page 76	_____Watts
Additional SFPs _____ x 1.25W	_____Watts
RF Module power consumption from Table 23 on page 77	_____Watts
Total Power Consumption	_____Watts

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

Total Watts / Input Voltage = Amps

3 Determine the circuit breaker or fuse size based on local codes and practices.

CAUTION!   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 22 and Table 23 on page 77 and the power-supply efficiencies can be used to estimate the input current for a given PRU configuration. To calculate the input current draw use the following equation:

`Input Current = (Total Power Consumption / 0.80) / 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 22.   *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 23. *Power Consumption by RF Module*

Prism RF Module Description		Power Consumption Per Module	
		Nominal (W) @ 25C	Maximum (W)
Single or Dual SuperDART RF Module	20W 1900 PCS, 20W 2100AWS, 700 LTE	Non-Diversity	299	368
	40W 700 LTE	Non-Diversity	299	368
	40W 1900 PCS, 40W 2100 AWS (Dual AMPs)	Non-Diversity	568	706
	10W GSM900 (Includes EGSM, PGSM, APAC, GSM)	Non-Diversity	299	337
		Diversity	321	359
	15.8W GSM1800	Non-Diversity	299	337
		Diversity	321	359
	15.8W 2100UMTS	Non-Diversity	299	337
		Diversity	321	372
HDM RF Modules	40W 850 Cell SISO HDM	SISO - Non-Diversity	249	315
	40W 1900 PCS SISO HDM	SISO - Non-Diversity	249	315
	40W 2100 AWS SISO HDM	SISO - Non-Diversity	249	315
	20W 700 MIMO LTE HDM (LABC or uC)	MIMO - Non-Diversity	250	330
	20W 1900 PCS MIMO HDM	MIMO - Non-Diversity	250	330
	20W 2100 AWS MIMO HDM	MIMO - Non-Diversity	250	330
	20W 1900 PCS MIMO HDM	MIMO - Non-Diversity	250	330
	20W 800 SMR MIMO HDM	MIMO - Non-Diversity	250	330
	20W 850 Cell MIMO HDM	MIMO - Non-Diversity	250	330
	20W 850/1900 HDM	Dual HDM - Non-Diversity	250	330
	20W 700 LABC/700 uC Dual HDM	Dual HDM - Non-Diversity	250	330
	20W 800/1900 HDM	Dual HDM - Non-Diversity	250	330
	20W 1900/2100 HDM	Dual HDM - Non-Diversity	250	330
	20W 2500 TDD Low HDM	MIMO - Non-Diversity	250	330
	20W 2500 TDD High HDM	SISO - Non-Diversity	175	230
Classic DART RF Module	20W 1900 PCS or 2100 20W AWS	Non-Diversity	292	358
		Diversity	314	381
	6.5W 800/900 ESMR	Non-Diversity	195	196
	40W 850 Cell	Non-Diversity	299	368
	20W 850 CELL	Non-Diversity	271	327
		Diversity	293	350

(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 a Uninterrupted Power Supply (UPS). The AUX Connector pins are shown in Figure 17.

NOTE: 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.

Pin #	Contact	Color	Alarm Input
1	NO/NC	Brown	Major External Alarm Input
2	CO	White	
3	NO/NC	Blue	Minor External Alarm Input
4	CO	Black	
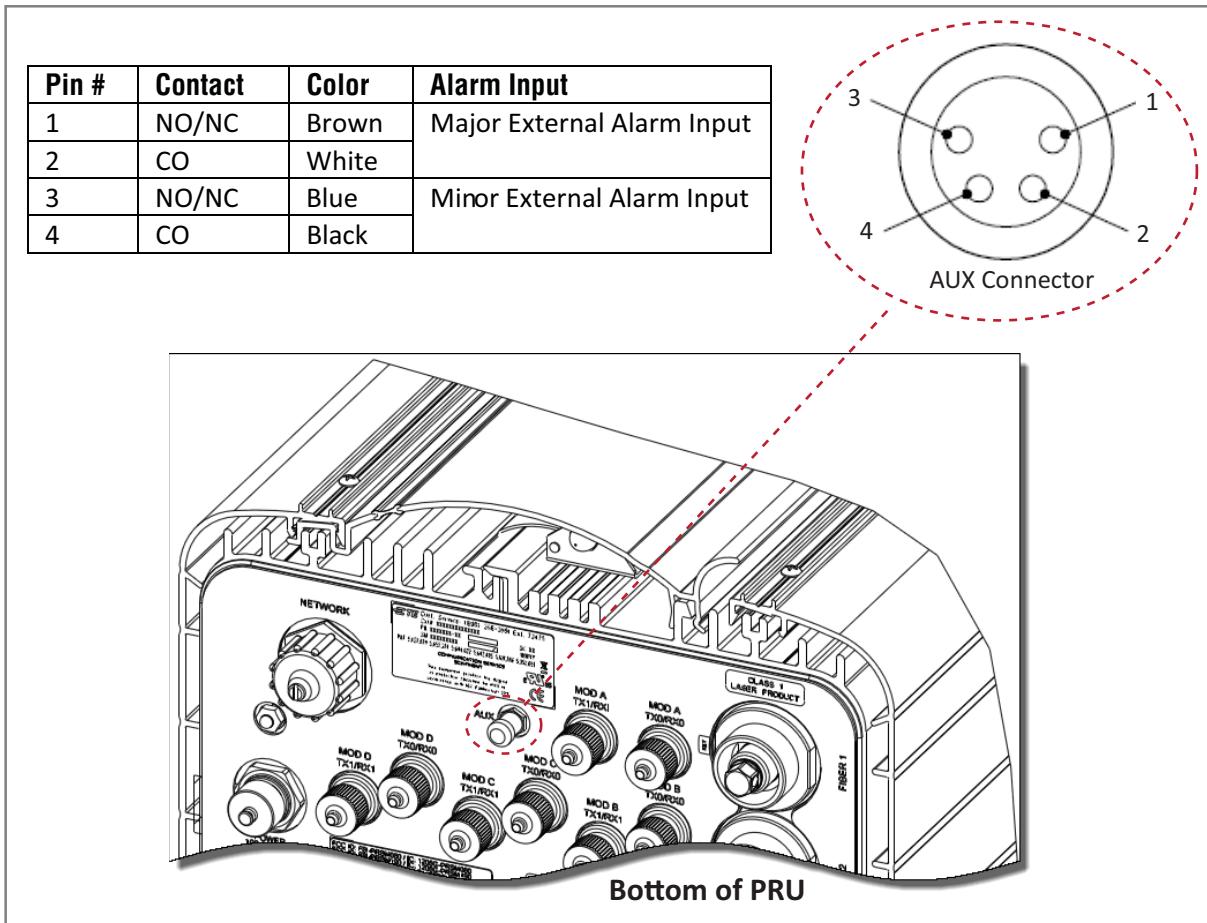
Figure 17. AUX Connector Pin Orientation

NOTE: 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.
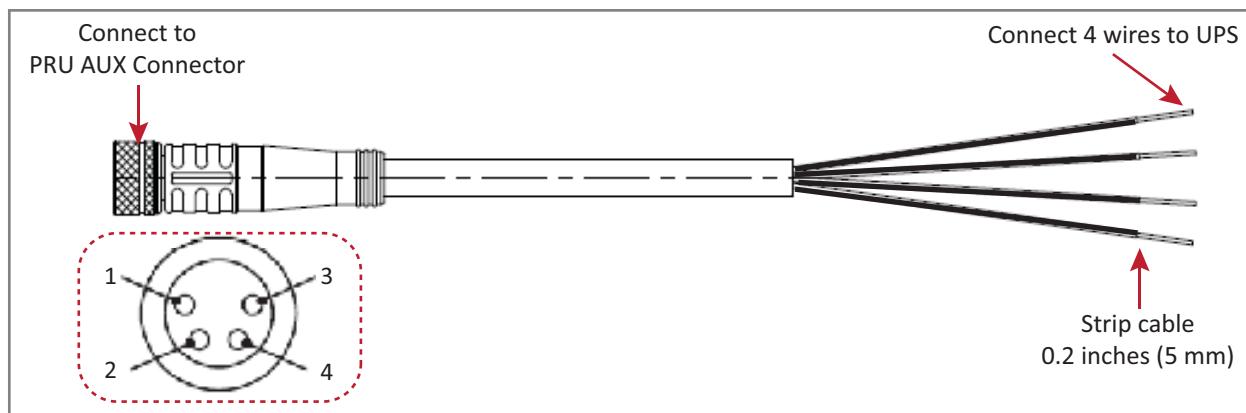

Figure 18. 4-Wire picofast 26 AWG Cable

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.

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

INSTALL THE RF MODULE(S)

The following sections guide you through the installation of an RF Module into a Remote Unit chassis. The process to install the four different types of RF Modules is basically the same; however, differences are noted and should be followed.

NOTE: In the following steps, the RF cables and connectors are referred to as MOD N TX0/RX0 and as MOD N TX1/RX1 where N equals A, B, C, or D.

NOTE: When installing RF Modules, populate the RF Modules from highest frequency band to lowest within the Remote Unit chassis. Likewise for power output, populate from the bottom bay to the top; higher output to lower output. That is, for a deployment with 2100 40W, 1900 40W, 850 20W and 700 20W MIMO, install the RF Modules as follows:

- **2100 40W RF Module in Bay A**
- **1900 40W RF Module in Bay B**
- **850 20W RF Module in Bay C**
- **700 20W MIMO RF Module in Bay D.**

SAFETY PRECAUTIONS

CAUTION!   This is restricted access equipment and only qualified service personnel should service and operate this equipment using appropriate tools.

CAUTION!   Wet conditions increase the potential for receiving an electrical shock when installing or using electrically-powered equipment. To prevent electrical shock, never install or use electrical equipment in a wet location or during a lightning storm.

CAUTION!   Always allow sufficient fiber length to permit routing of patch cords and pigtails without severe bends. Fiber optic patch cords or pigtails may be permanently damaged if bent or curved to a radius of less than 2 inches (5.1 cm).

CAUTION!   Exterior surfaces of the Prism Remote Unit may be hot. Use caution during servicing.

CAUTION!   Service personnel must confirm that the perimeter gasket and door-to-door gaskets are in place when closing the Remote Unit doors after servicing.

CAUTION!   This equipment uses a Class 1 Laser according to FDA/CDRH rules. Laser radiation can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical transceiver of any digital unit or exposure to laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating transceiver or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.

CAUTION!   This system is an RF Transmitter and continuously emits RF energy. Maintain 3 foot (91.4 cm) minimum clearance from the antenna while the system is operating. Wherever possible, shut down the RAN before servicing the antenna.

GUARD AGAINST DAMAGE FROM ELECTRO-STATIC DISCHARGE

CAUTION! **Electro-Static Discharge (ESD) can damage electronic components. To prevent ESD damage, always wear an ESD wrist strap when working with a Prism Remote Unit or when handling any of its components—including the RF Modules. Connect the ground wire on the ESD wrist strap to an earth ground source before touching the Prism Remote Unit or any of its components. Wear the wrist strap the entire time that you work with the Prism Remote Unit and its components.**

CAUTION! **Place Prism RF Modules in anti-static packing material when transporting or storing them.**

UNPACK AND INSPECT THE RF MODULE

1 Inspect the exterior of the shipping container(s) for evidence of rough handling that may have damaged the components in the container.

2 Unpack each container while carefully checking the contents for damage and verify with the packing slip.

3 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 119). Save the damaged cartons for inspection by the carrier.

4 Save all shipping containers for use if the equipment requires shipment at a future date.

CAUTION! **Handle the RF Module with care during installation. Be especially careful to not damage the thermal-interface material (TIM), which is attached to the LPA, DARTs, and/or Motherboard with TX/RX boards. If the TIM is damaged, the LPA can overheat. Before installing the RF Module, check to see if the heatsink material is gouged or cracked. If the TIM is damaged, do not install the RF Module and contact CommScope for assistance (see "DCCS Global Technical Support" on page 119 for contact information).**

CAUTION! **If the thermal-interface material is damaged, the installation and use of the RF Module may void the warranty of the RF Module.**

REMOVE RELEASE LINERS FROM THE RF MODULE

> **NOTE:** Release Liners are present on front and back of new modules.

1 Open the Remote Unit enclosure.

2 Remove release liners, if present, from the thermal pads on the RF Module prior to installing the module into the Remote Unit chassis.

> **CAUTION!** The thermal pads are very sensitive to mishandling—do not nick, scratch, or ding them.

For Single- and Dual-Bay RF Modules, the thermal pads are located as listed below and as shown in Figure 19, which shows a Legacy Dual-Bay 40W RF Module.

- one large pad on the back surface of each Linear Power Amplifier (LPA)
- up to two on the front surface (DARTs)
- one on the left side for the (RDI)
- one on the vector modulator board
- one on the RF power combiner.
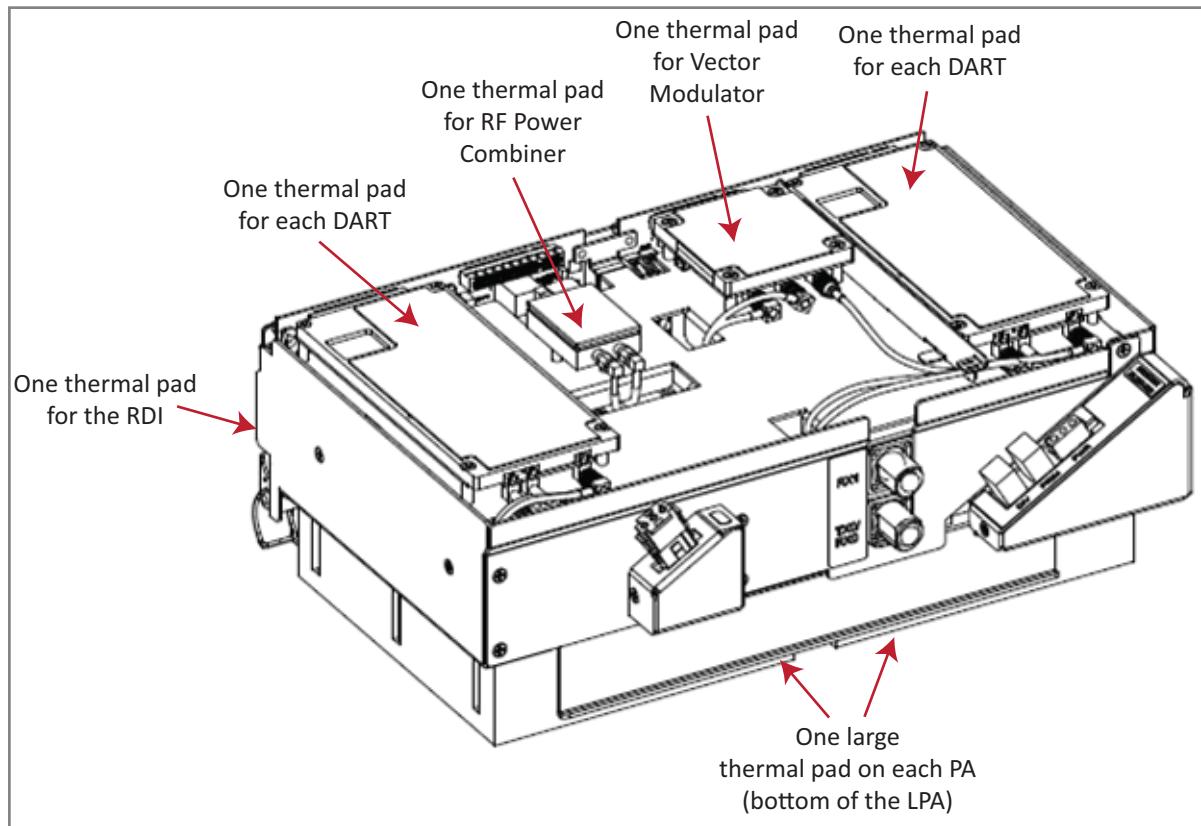
Figure 19. Thermal Pads on a Legacy Dual-Bay 40W RF Module

For HDM RF Modules, the thermal pads are located as listed below and as shown in Figure 20.

- one pad for each Rx and Tx board
- one large pad over the DPM
- one for each Power Amplifier (PA), which is on the bottom of the HDM RF Module.

NOTE: Tx and Rx cards are paired: Tx A ony pairs with Rx A and Tx B only pairs with Rx B.
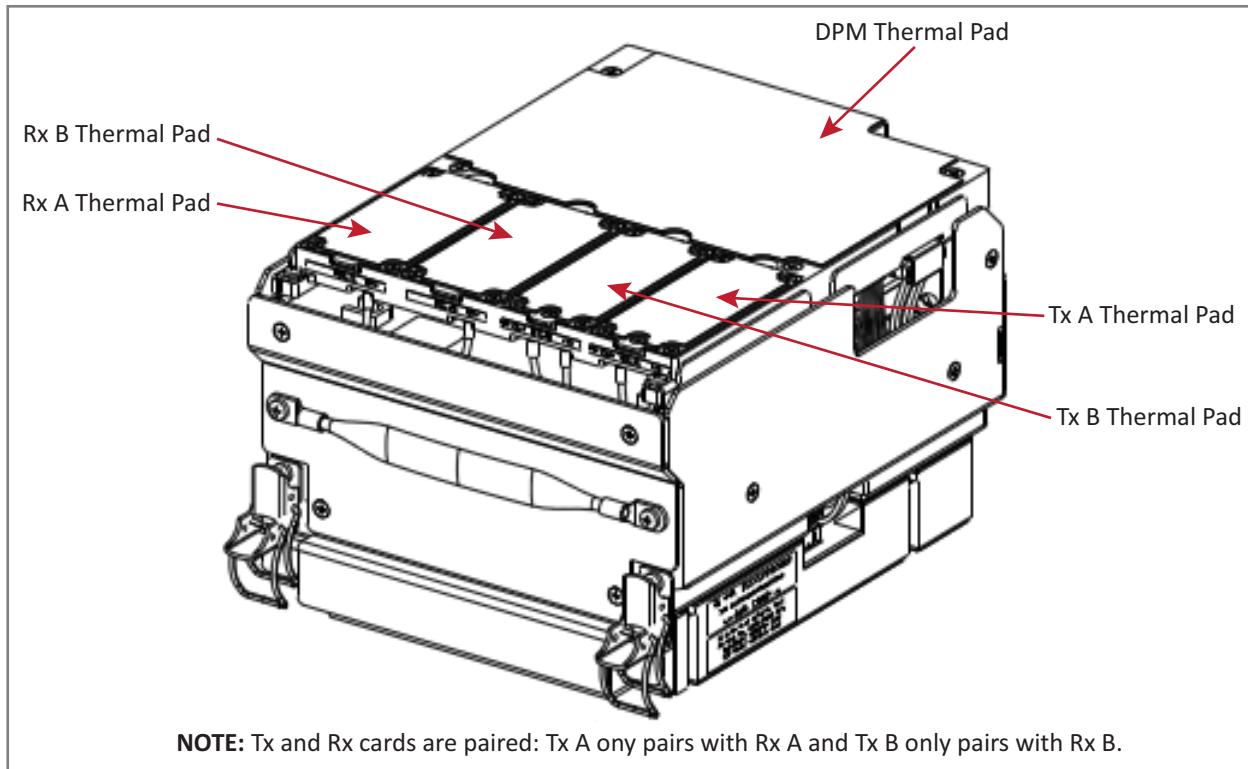
Figure 20. Thermal Pads on an HDM RF Module

CHECK THE DC POWER SWITCH FOR THE MODULE BAY

Ensure that the DC power switch that corresponds to the bay(s) in which the RF Module is to be installed is in the Off position:

DC Power switch for Bay D

DC Power switch for Bay C

DC Power switch for Bay B

DC Power switch for Bay A
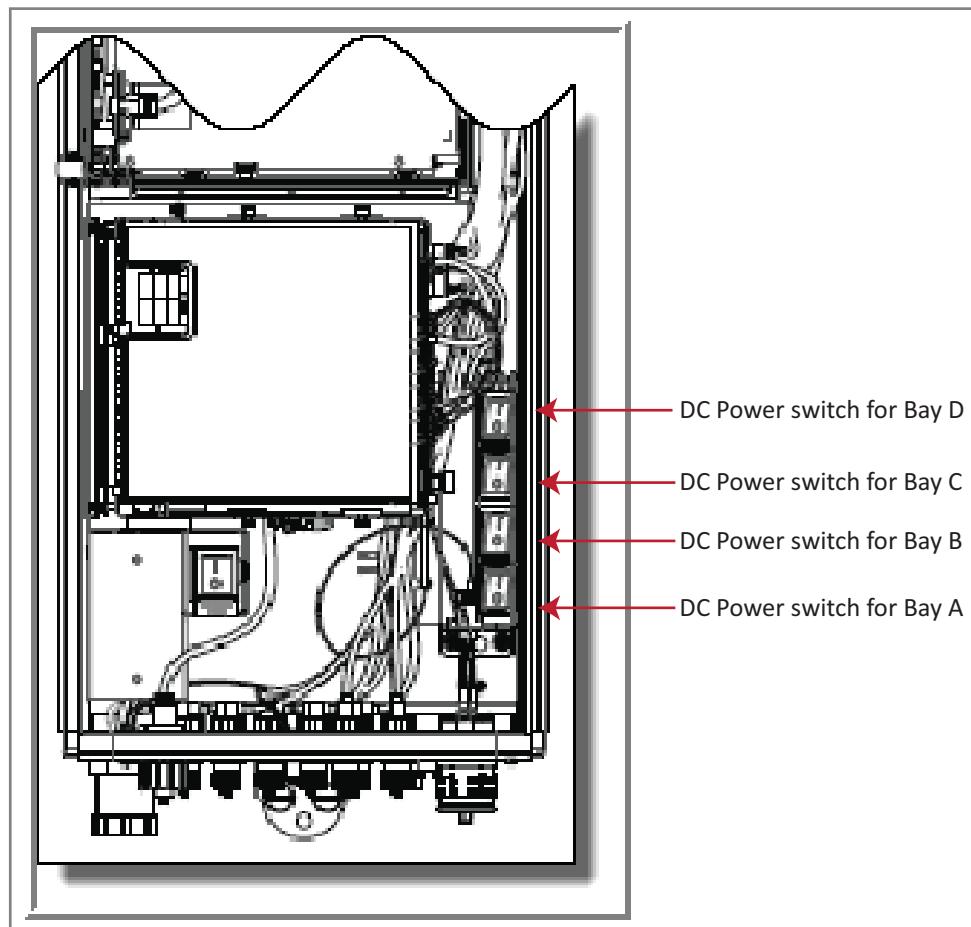
DUAL-BAY MODULES ONLY—REMOVE THE MODULE BAY SHELF

FOR DUAL-BAY RF MODULES ONLY.

If you are installing a Dual-Bay RF Module, you must remove a module bay shelf from the PRU chassis to accommodate the module's size. (For further information, see Table 16 on page 27.)

Remove the shelf as appropriate for the RF Module:

- When installing in the A and B Bays, remove the Module B Bay Shelf.

- When installing in the C and D Bays, remove Module D Bay Shelf.

To remove a Module Bay Shelf:

1 Use a 9/64" Allen™ wrench to remove the three screws that attach the module shelf to the PRU chassis, as shown in the graphic to the right.

2 Discard or store the module shelf and fasteners.

Remove Module D Shelf for Dual-Band Dual-Slot RF Modules

Use 9/64" Allen Wrench to remove the three module-shelf screws

Remove Module B Shelf for Dual-Slot 40W RF Modules
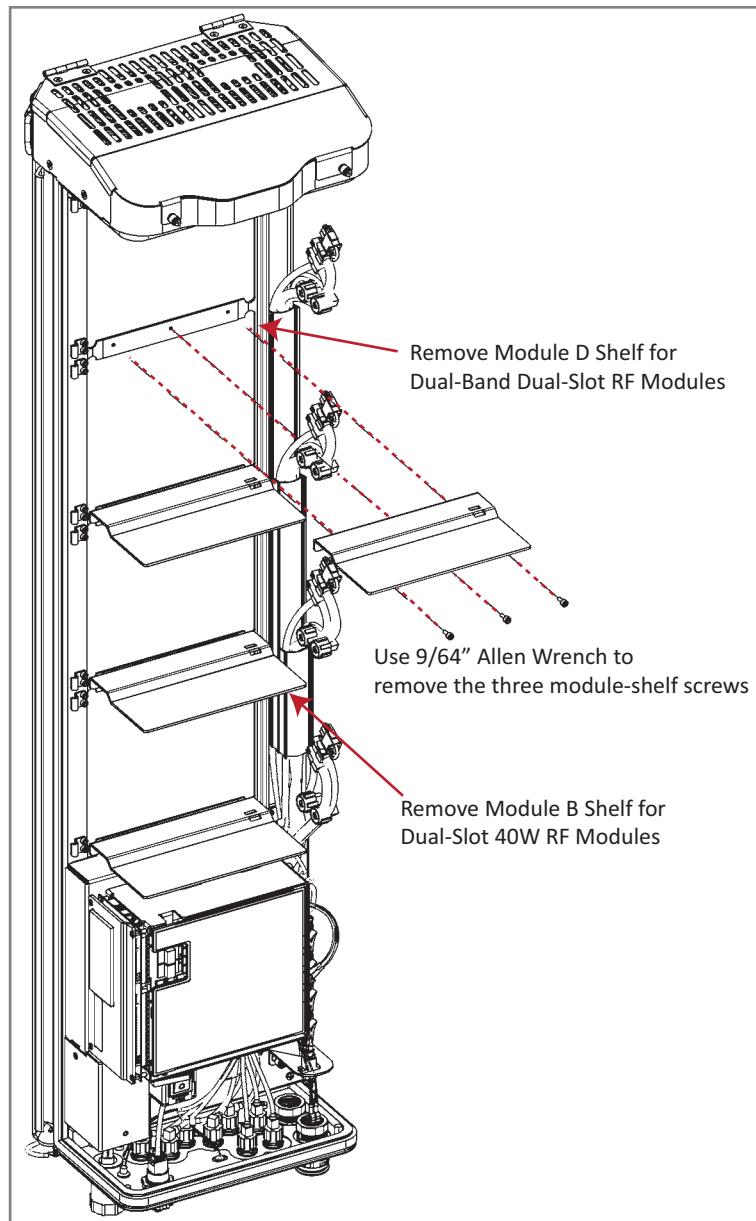
INSTALL THE RF MODULE INTO THE PRISM REMOTE CHASSIS

1   Hold the RF Module so that the DART card(s) face away from the PRU and the Mounting Hook is toward the Receiving flange on the PRU chassis.

NOTE: **Always install RF Modules from the bottom up. Do not skip a bay, as this provides more efficient heat dissipation.**

2   Holding the RF Module at a 45° angle in respect to the rear heatsink, rest the bottom surface of the module on the RF Module shelf, as shown in one of the following graphics, and as applicable to the RF Module.

- Single-Bay RF Module: Figure 21 on page 86
- HDM RF Module: Figure 22 on page 87
- Dual-Bay RF Module: Figure 23 on page 88
- Legacy Dual-Bay 40W RF Module: Figure 24 on page 89.
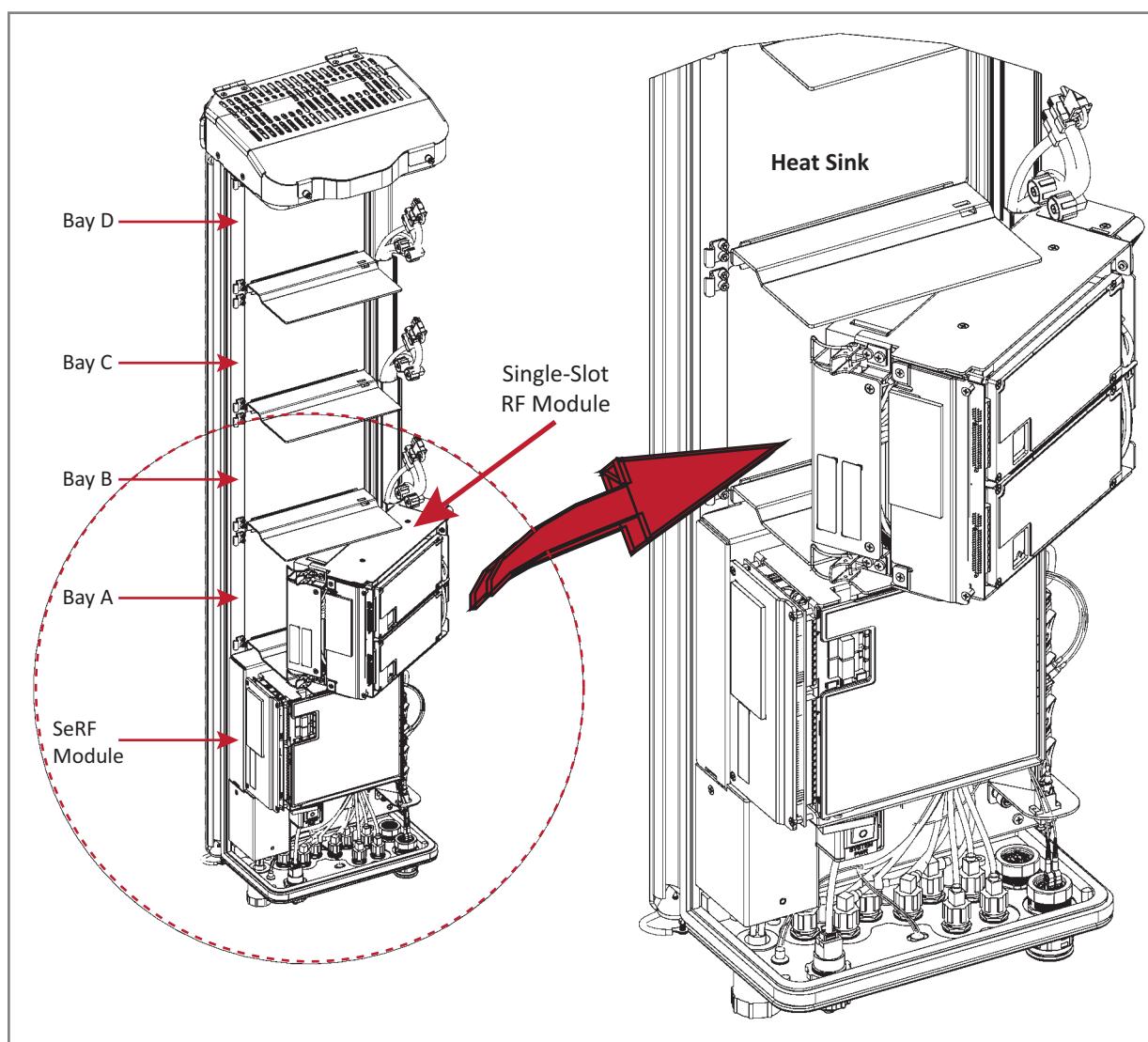
**Figure 21.** Installing a Single-Bay RF Module
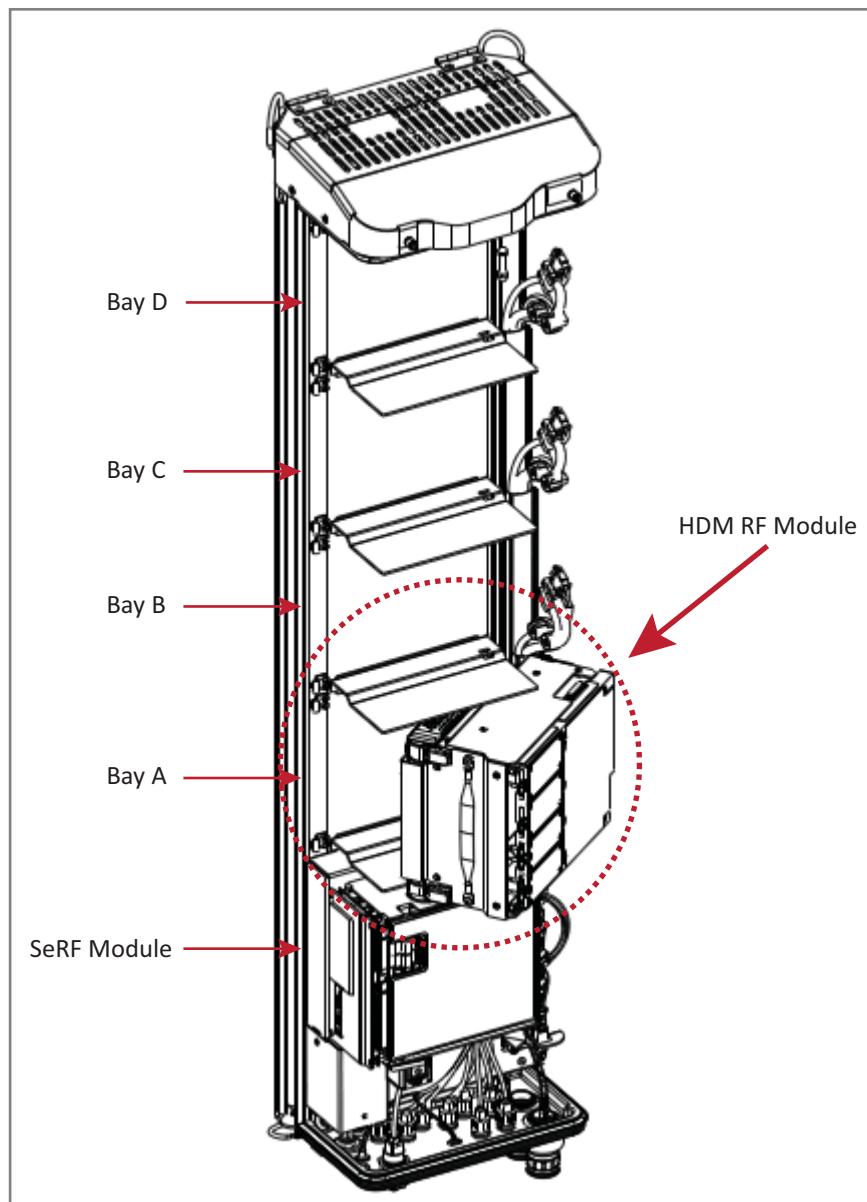
Figure 22. Installing an HDM RF Module
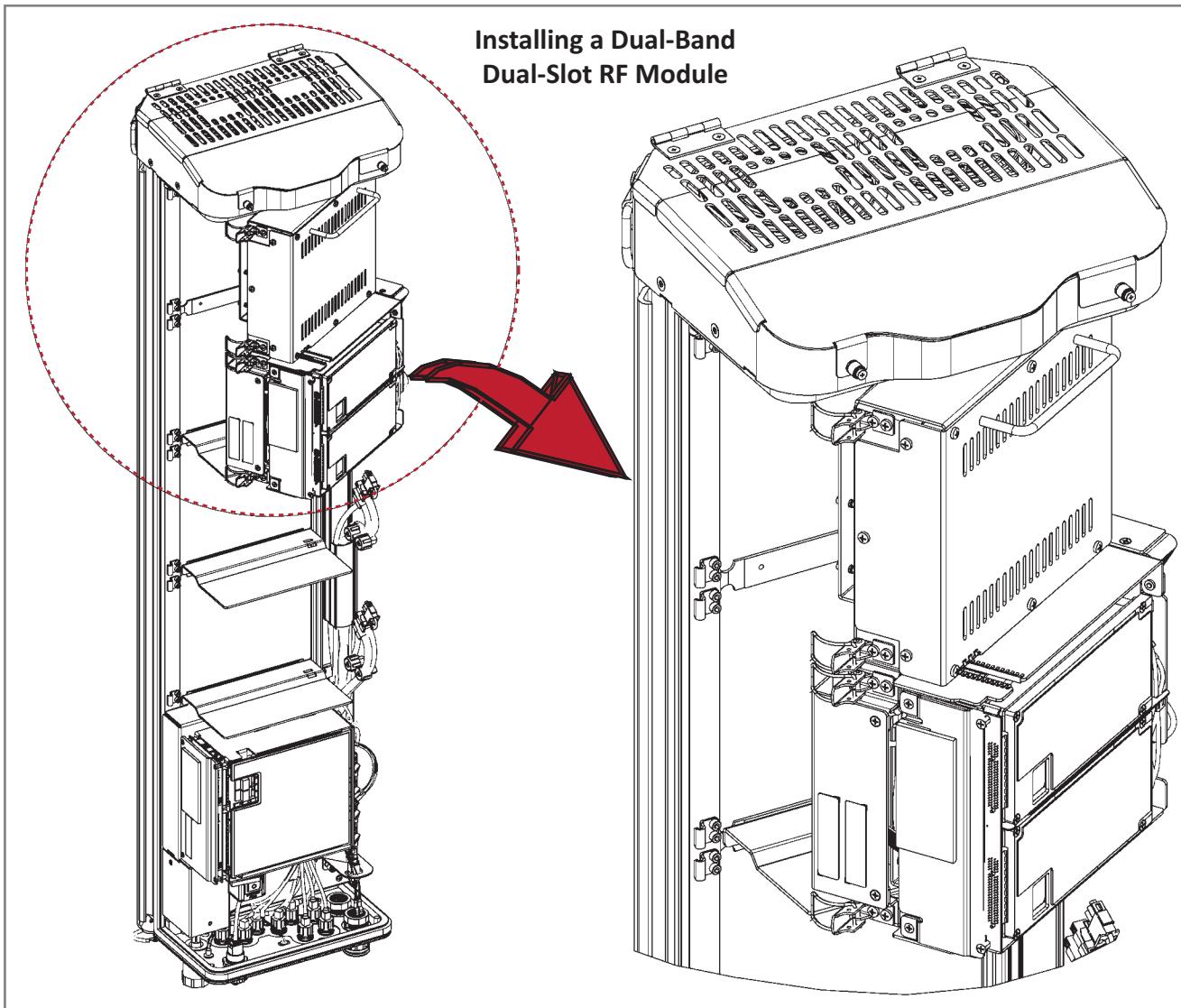
**Figure 23.** Installing a Dual-Bay RF Module
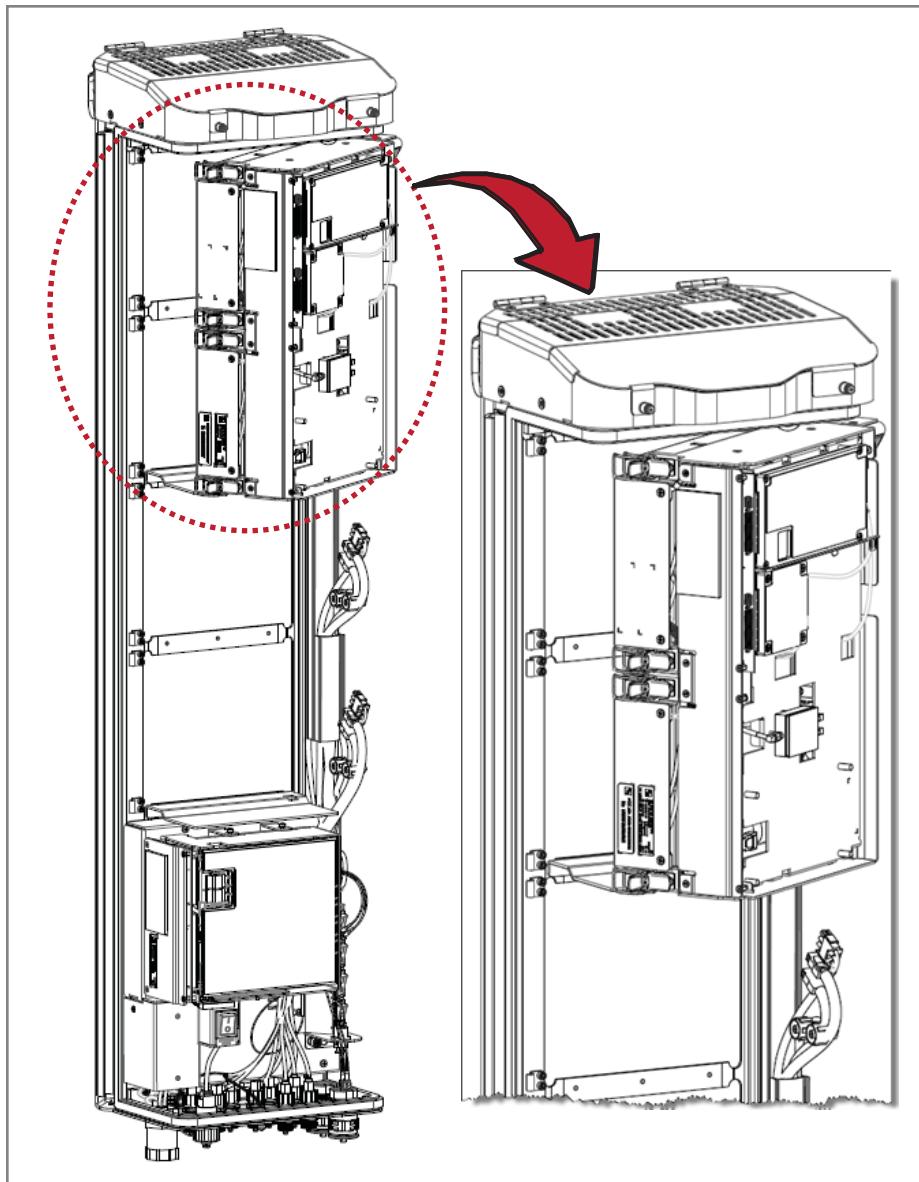
Figure 24. Installing a Legacy Dual-Bay 40W RF Module

3 Align the Mounting Hook on the module with the receiving flange on the PRU heat sink, and then slide the RF Module in toward the flange until it can go no further.

RF Module Mounting hook

Mounting Bracket at back of the PRU

Chassis Receiving flange

(View is looking down into the PRU chassis from the top.)
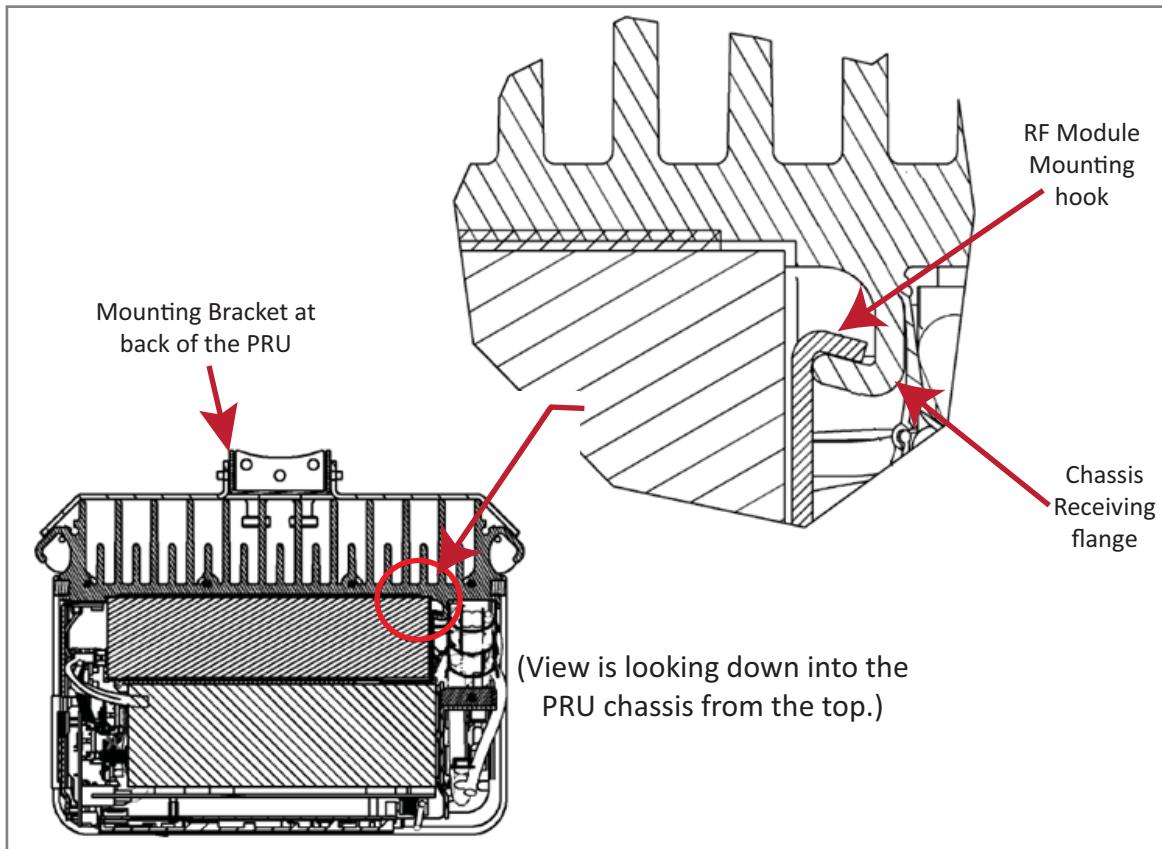
4 Push the left edge of the RF Module back and into the PRU chassis until it can go no further, as shown in the following graphics:

- For Single-Bay RF Modules, see Figure 25 on page 91.
- For HDM RF Modules, see Figure 26 on page 92.
- For Dual-Bay RF Modules, see Figure 27 on page 93, which uses the Legacy Dual-Bay 40W RF Module as an example.

CAUTION! **Make sure the RF Module is seated correctly in the Module shelf. Incorrect alignment of the RF Module can cause the RF Module to fail due to overheating.**

- **The front edge of the RF Module should be parallel with the shelf above it.**

- **The Mounting Hook on the RF Module should be fully engaged with the Receiving flange on the Remote Unit chassis.**

- **An incorrectly seated RF Module makes closing the Prism door difficult. If you later cannot shut the Remote Unit door, verify that the RF Module is installed correctly.**

Single-Slot
RF Module

Push the RF Module
back into the chassis
until it can go no further.
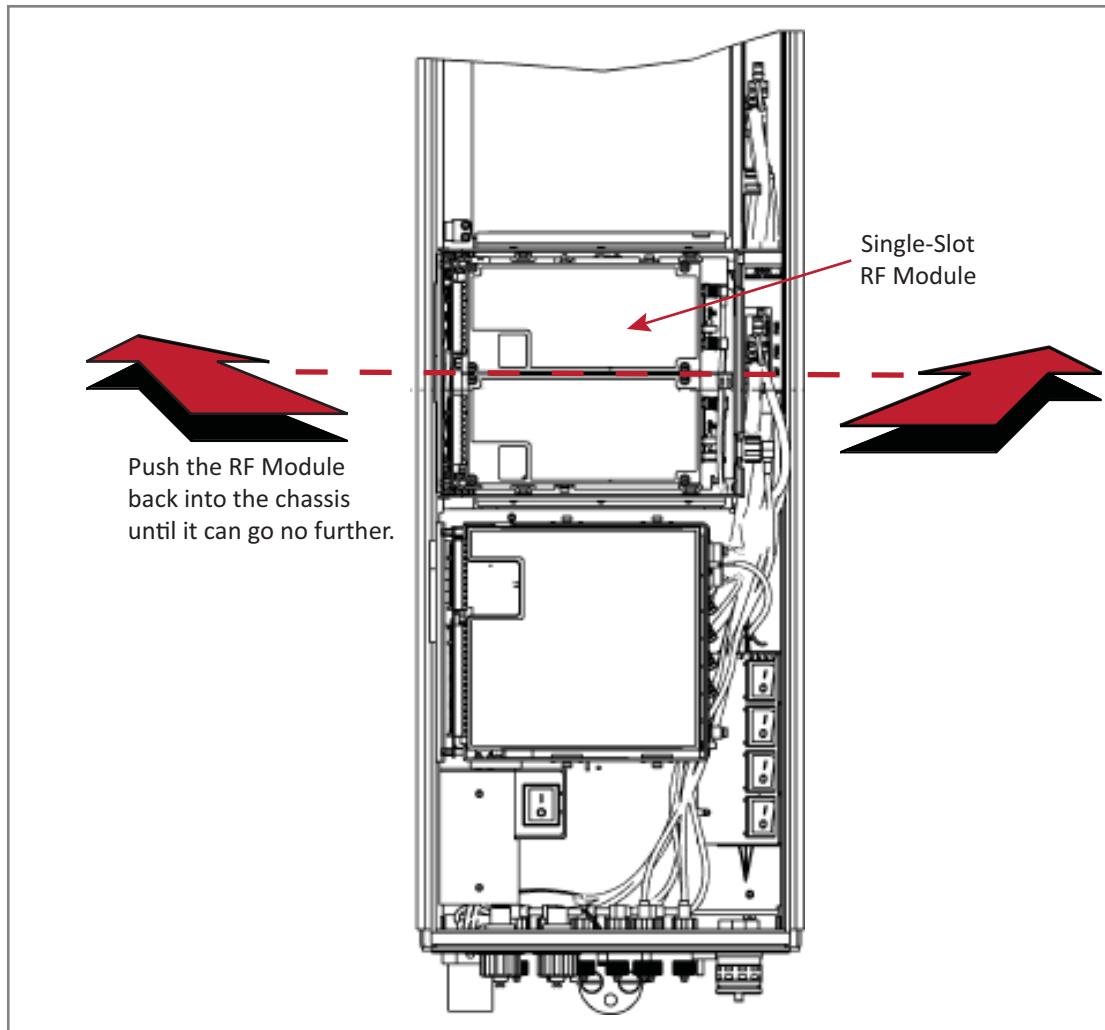
Figure 25. Seating a Single-Bay RF Module

HDM
RF
Module

Push the HDM RF Module
back into the chassis
until it can go no further.
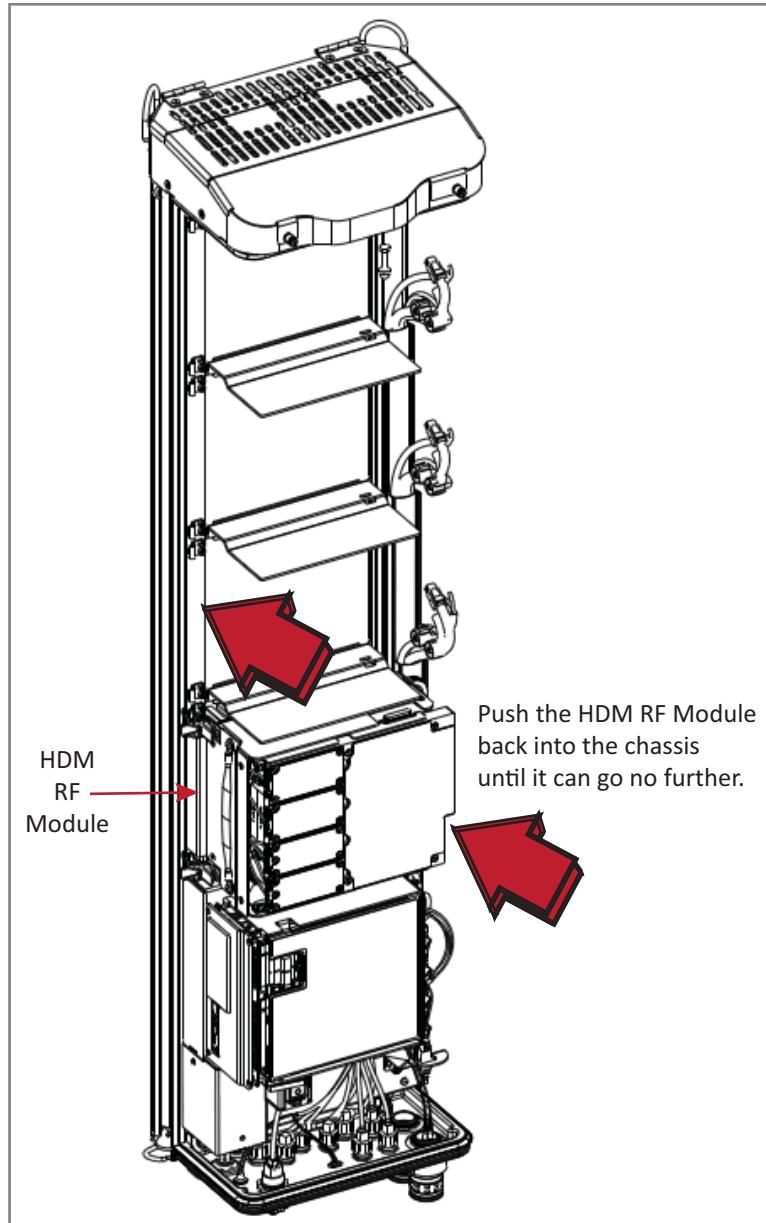
Figure 26. Seating an HDM RF Module

Push the RF Module back into the chassis until it can go no further.
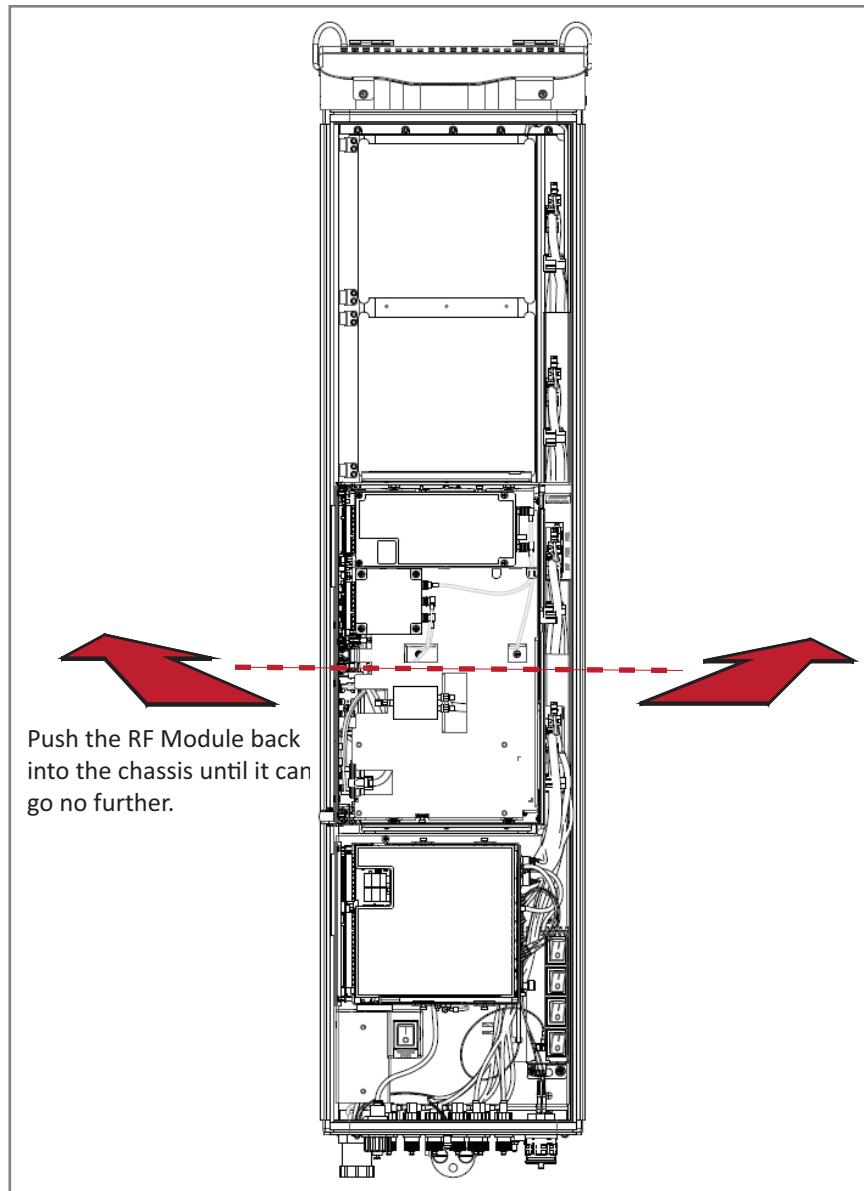
Figure 27. Seating a Dual-Bay RF Module

SECURE RF MODULE LATCHES

To secure the module latches on the left side of the RF Module, do one of the following, as appropriate for the RF Module being installed:

- "Connect Latches on Single-Bay and HDM RF Modules" on page 94
- "Connect Latches on Dual-Bay RF Modules" on page 95.

Connect Latches on Single-Bay and HDM RF Modules

For Single-Bay and HDM RF Modules, secure two latches, as shown in Figure 28.

Two latches on Single-Slot RF Modules

Two latches on HDM RF Modules
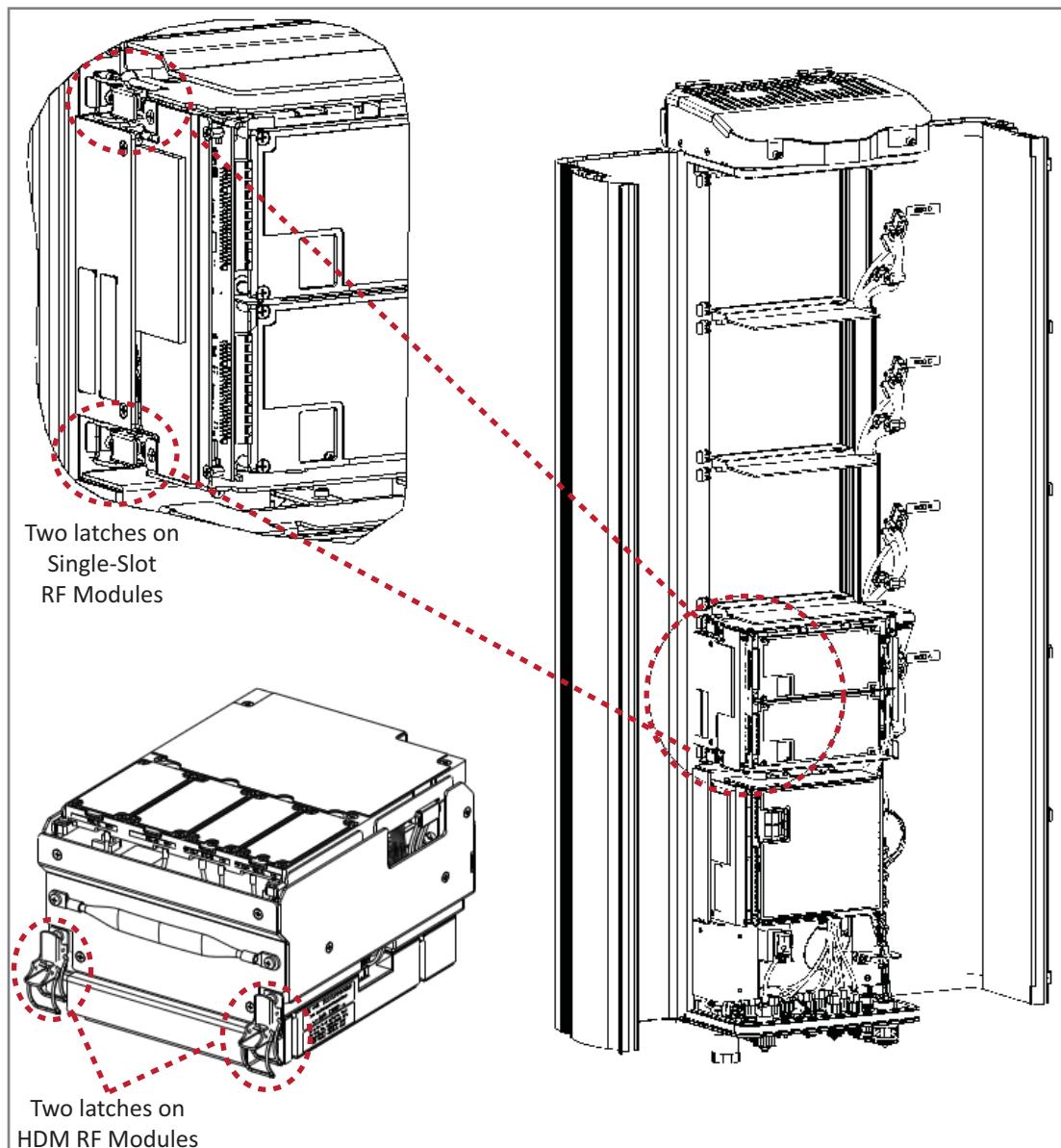
Figure 28. Latches on Single-Bay and HDM RF Modules

Connect Latches on Dual-Bay RF Modules

For Dual-Bay RF Modules, secure four latches, as shown in Figure 29.

Four latches
in a
Dual-Band
Dual-Slot
RF Module
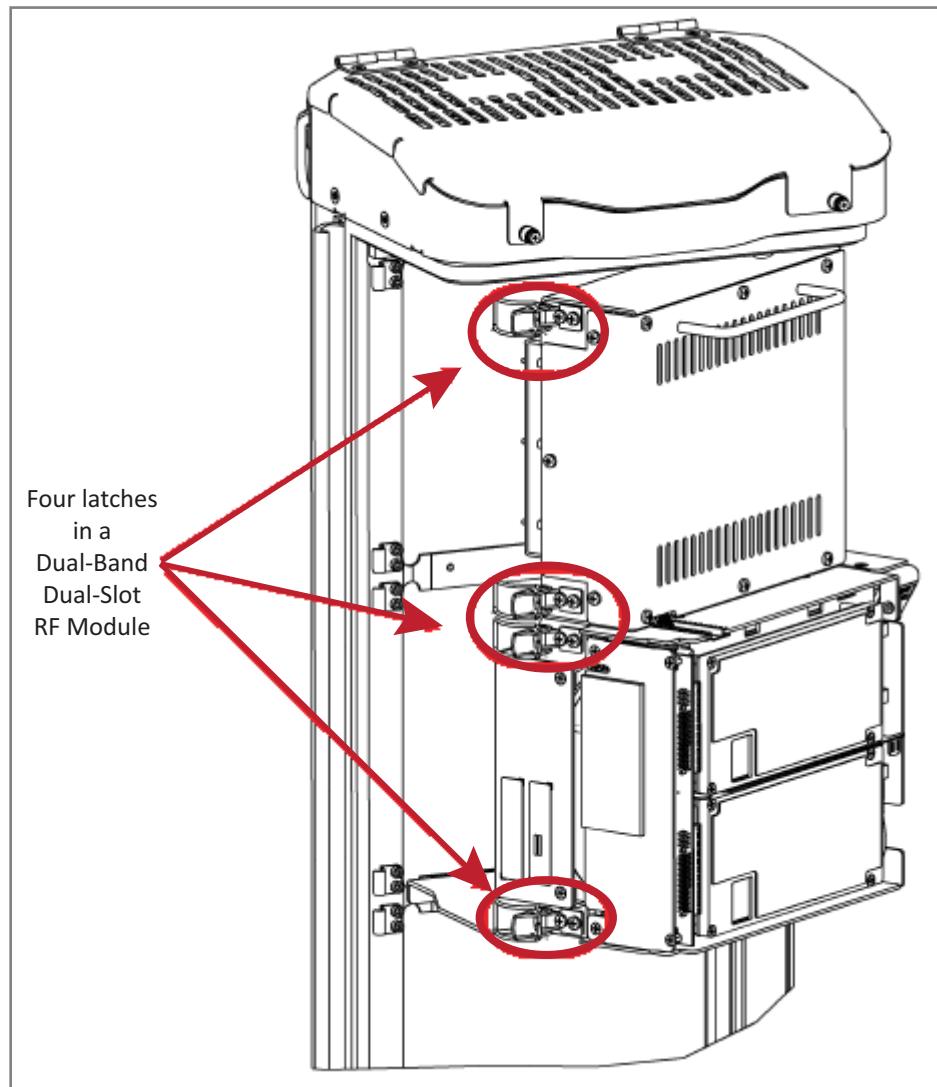
Figure 29. Dual-Bay RF Module Latches

Latches on Legacy Dual-Bay 40W RF Modules

For Legacy Dual-Bay 40W RF Modules, secure four latches, as shown in Figure 30.

Four latches in a
Legacy Dual-Slot 40W
RF Module
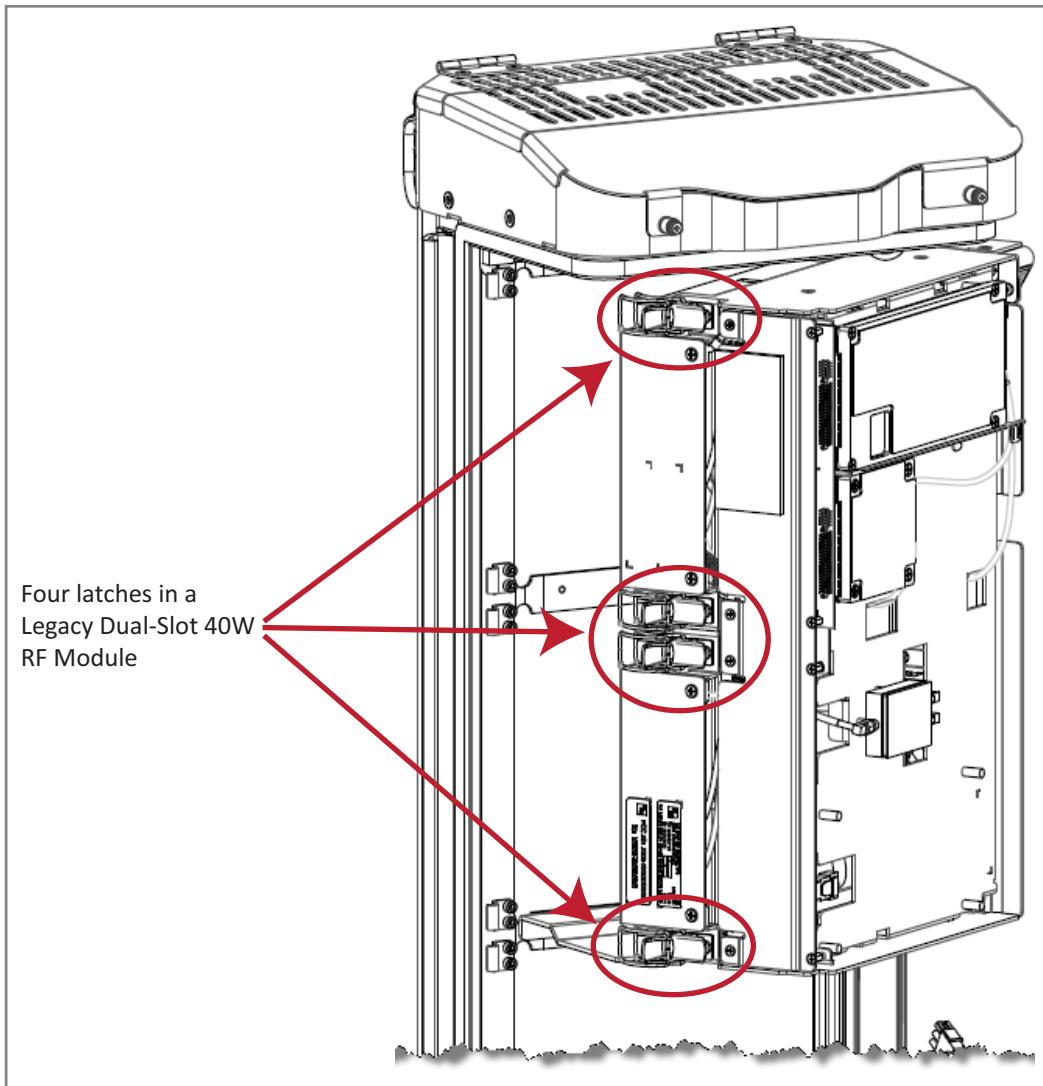
Figure 30. Legacy Dual-Bay 40W RF Module Latches

Verify that the RF Module Mounting Hook is Engaged

Verify that the RF Module Mounting Hook is engaged correctly by pulling the module away from the heat sink. The RF Module should not move. If the RF Module moves during this check, repeat all the steps starting at "Install the RF Module into the Prism Remote Chassis" on page 86 through this step.

CONNECT THE RF MODULE CABLES TO THE PRU CHASSIS

The steps to connect the RF Module cables have been separated into two different procedures; follow the steps that correspond to the RF Module being installed.

- "Connecting Cables in a Single-Bay RF Module Installation" on page 97
- "Connecting Cables in a Dual-Bay RF Module Installation" on page 100.

## Connecting Cables in a Single-Bay RF Module Installation

1 Position the cables so that they are under the right edge of the RF Module, pointing up.

2 Follow the rules listed in "Understanding RF Cable Rules" on page 26.

3 Connect the RF Module cables, in the order shown below. As you work, refer to the graphic that corresponds to the RF Module being installed into a single bay of the PRU: for a Single-Bay RF Module, refer to Figure 31 on page 98, and for an HDM RF Module, refer to Figure 32 on page 99 and Table 24 on page 99.

    a Connect the MOD *N* TX0/RX0 cable to the RF Module (the RF cables and connectors are referred to as MOD *N* TX0/RX0 where *N* equals **A**, **B**, **C**, or **D**).

        i Insert the N-Style Plug of the MOD N TX0/RX0 cable into the TX0/RX0 N-Style Jack of the RF Module.

        ii Turn the coupling nut of the plug clockwise to thread onto the jack and finger-tighten.

        iii Torque coupling nut to 8 ±1 in-lbs to ensure full connection.

NOTE: **Insufficient torque applied to RF Module connections can result in elevated insertion/return loss and higher than normal VSWR reported by the system.**

    b Connect the MOD *N* TX1/RX1 cable to the RF Module (the RF cables and connectors are referred to as MOD *N* TX1/RX1 where *N* equals **B**, **C**, or **D**).

        i If a TX1/RX1 RF Module connection is available, insert the N-Style Plug of the MOD N TX1/RX1 cable into the TX1/RX1 N-Style Jack of the RF Module. If RF Module connection is not available, constrain the MOD N TX1/RX1 cable to accompanying cables using a tie wrap so it cannot be pinched or prevent the Remote Unit door from closing.

        ii Turn the coupling nut of the plug clockwise to thread onto the jack and finger-tighten.

        iii Torque coupling nut to 8 ±1 in-lbs to ensure full connection.

NOTE: **Insufficient torque applied to RF Module connections can result in elevated insertion/return loss and higher than normal VSWR reported by the system.**
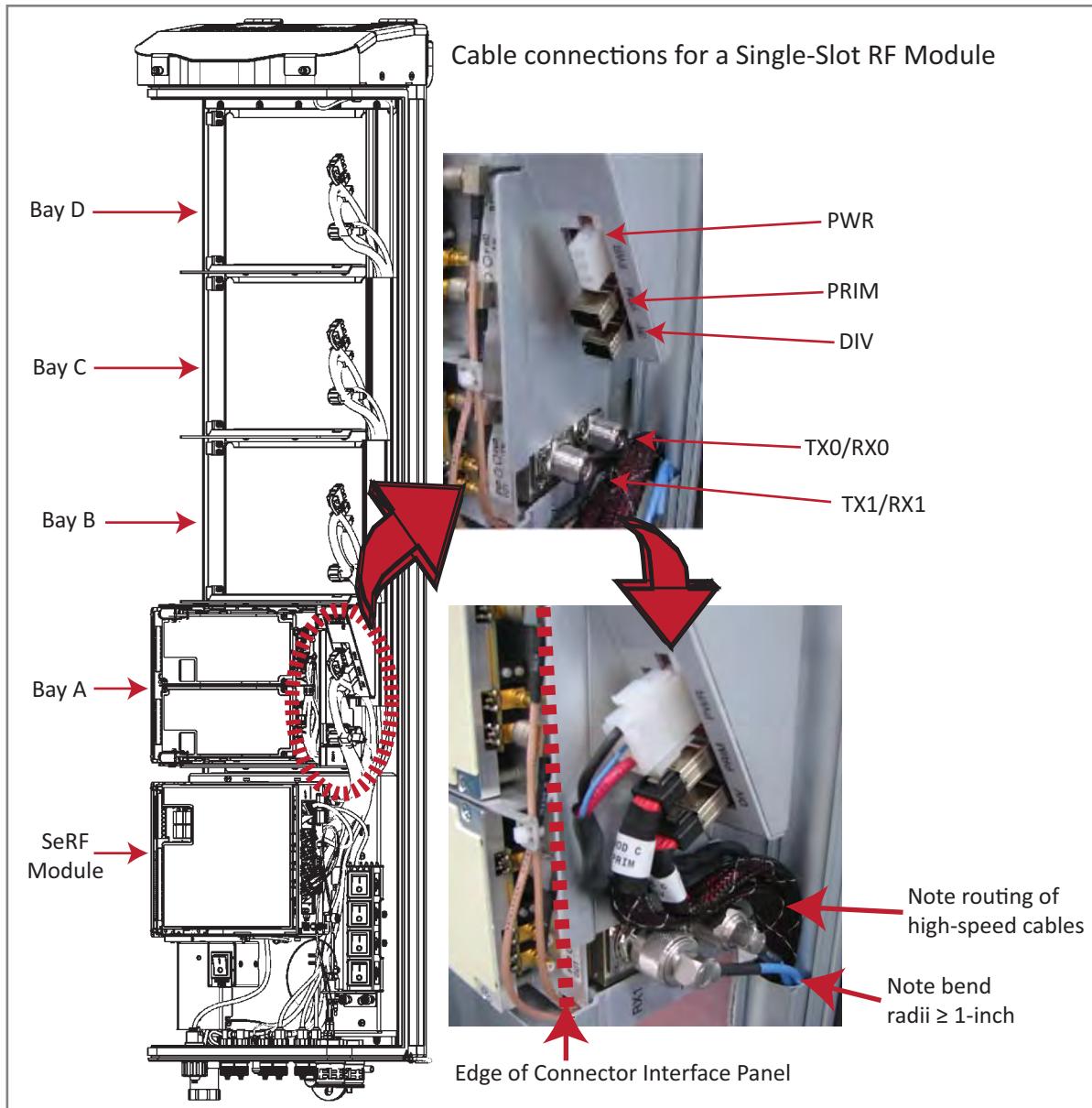
Figure 31. Cable Connections for Single-Bay RF Modules

CAUTION! **Ensure that all cable bends are below the top edge of the Connector Interface Panel as indicated by the dashed line in the preceding figure. Failure to correctly position the cables could inhibit closing the Remote Unit door, which can result in damage to the cables.**

Cable Connections for an HDM RF Module

DATA 0 (PRIM)
DATA 1 (DIV)
POWER
TX1/RX1
TX0/RX0

Cable Connection Notes
• Always connect the Power cable.
• Always connect the two LVDS cables: PRIM and DIV.
• SISO requires one RF cable (TX0/RX0).
• MIMO and Dual-Band require two RF cables
 (TX1/RX1 and TX0/RX0).
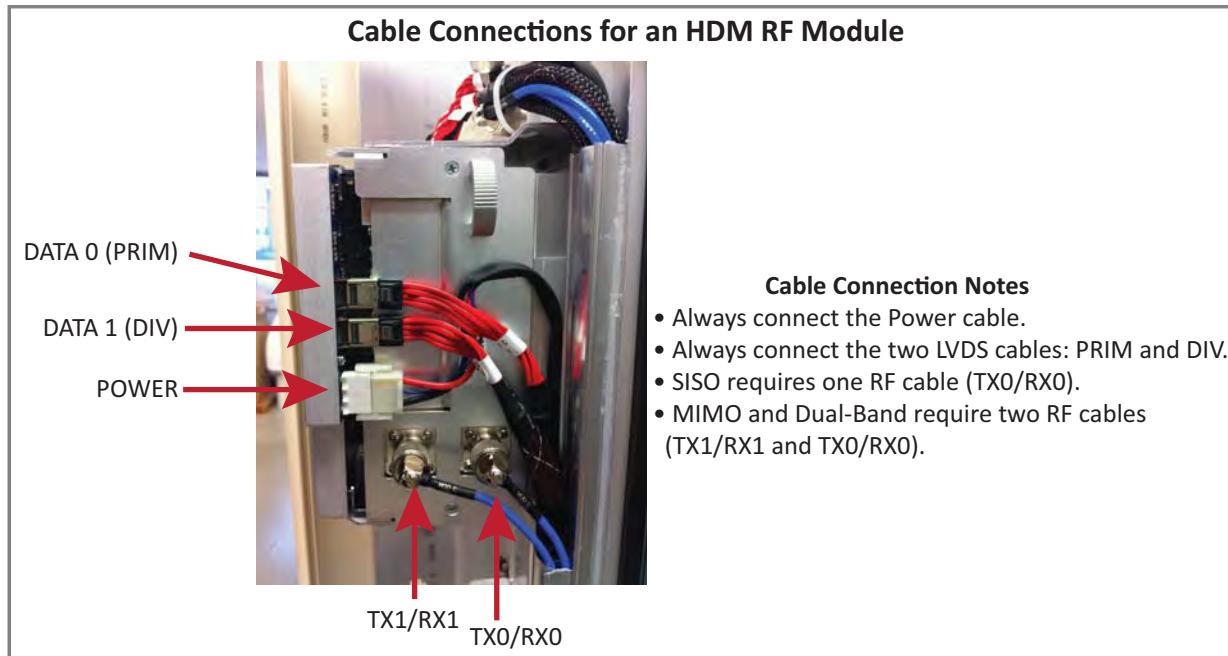
Figure 32. Cable Connections for HDM RF Modules

Table 24 lists how to correctly connect HDM RF Modules to the Antenna ports on the bottom of the Remote Unit.

Table 24. *HDM Antenna Port Mapping*

RF Module Catalog #	Description	TX0/RX0	TX1/RX1
FWP-L4MT000MOD	20W 700 LABC Module, MIMO HDM, Single-Bay	Path 1	Path 2
FWP-U4MT000MOD	20W 700 uC Module, MIMO HDM, Single-Bay	Path 1	Path 2
FWP-L4MTU4MMOD	20W 700 LABC/700uC, Dual, Single-Bay	700 LABC	700 uC
FWP-44MT000MOD	20W 800 MIMO, Single Bay, with two External Filters	Path 1	Path 2
FWP-441T841MOD [1]	20W 800 SMR/ 1900 PCS, Dual RF Module	1900	800
FWP-B4MT000MOD	20W 850 DUAL, MIMO, Single Bay	Path 1	Path 2
FWP-C4MT000MOD	20W 850 Cell/1900 PCS, Dual, Single-Bay	1900	850
FWP-84MT000MOD	20W 1900 PCS Dual MIMO, Single-Bay	Path 1	Path 2
FWP-84MTA4MMOD	20W 1900/2100 Dual, Single Bay	2100	1900
FWP-W4MT000MOD	20W 2300 WCS FDD, MIMO	Path 1	Path 2
FWP-T4MT000MOD-L	20W 2500 TDD Low, MIMO	Path 1	Path 2
FWP-T4ST000MOD-H	20W 2500 TDD High, SISO, 2615-2690	Path 1	NA
FWP-A4MT000MOD	20W HDM AWS Band 4 MIMO, Single-Bay	Path 1	Path 2
(1) A 20W 800 SMR/ 1900 PCS, Dual RF Module RF Module (FWP-441T841MOD) requires a FlexWave Notch Filter (FWP-SPRINTFILTER) between the Remote Unit 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. Information on how to install the Notch Filter is provided in "FlexWave Notch Filter (FWP-SPRINTFILTER)" on page 108.			

c Connect the LVDS Cables to the RF Module—the LVDS cables labeled PRIM and DIV should always either be connected to a RF Module or strain relieved to adjacent cables, as this protects the cable against damage through misplacement. Maintain adequate strain-relief distances from the connection points to the RF Module.

    i Connect the MOD N DIV LVDS Cable to the DIV receptacle of the RF Module by inserting and sliding in until fully seated. Full insertion can be recognized by an audible click as the LVDS Cable Connector locks into the RF Module Receptacle.

    ii Connect the MOD N PRIM LVDS Cable to the PRIM connector, following the same steps as above. Full insertion can be recognized by an audible click as the LVDS Cable Connector locks into the RF Module Receptacle.

    iii Ensure the two LVDS cables are fully seated and latched into their respective receptacles on the RF Module by lightly pulling outward on the connectors. If fully seated and locked into position, the cable connectors will not slide back out.

d Connect the Power cable to the PWR receptacle of the RF Module.

    i Ensure that the DC power switch that corresponds to the bay(s) in which the RF Module is to be installed is in the Off position (see "Check the DC Power Switch for the Module Bay" on page 84).

    i Insert the Power cable into the PWR connector, and slide it in until fully seated. Full insertion can be recognized by an audible click as the Power cable Connector locks into the RF Module Receptacle.

    ii Verify that the Power cable is fully seated by lightly pulling back on it while making sure to not depress the release triggers on the ends of the connector. When fully inserted, the cable should not be able to be removed from the receptacle.

CAUTION! **Maintain adequate strain relief distances from the connection points to the RF Module.**

4 Repeat all the steps in "Install the RF Module(s)" on page 80 to install other RF Modules.

Connecting Cables in a Dual-Bay RF Module Installation

1 Position the cables so that they are under the right edge of the RF Module, pointing up.

2 Follow the rules listed in "Understanding RF Cable Rules" on page 26.

3 Connect the RF Module cables, working from the bottom connector up, as described below.

As you work, refer to the graphic that corresponds to the RF Module being installed in the Dual-Bay: for a Dual-Bay RF Module, refer to Figure 33 on page 102, and for a Legacy Dual-Bay 40W RF Module, refer to Figure 34 on page 103.

a Connect the MOD *N* TX1/RX1 cable to the N-Style RF connector on the Dual-Bay RF Module (the RF cables and connectors are referred to as MOD *N* TX1/RX1 where *N* equals **B**, **C**, or **D**).

    i Constrain the MOD *N* TX1/RX1 cable of the lower RF Module bay to accompanying cables using a tie wrap so it cannot be pinched or prevent the Remote Unit door from closing.

    ii Connect the MOD *N* TX1/RX1 cable to the TX1/RX1 N-Style Jack of the upper RF Module Bay.

    iii Turn the coupling nut of the plug clockwise to thread onto the jack and finger-tighten.

    iv Torque coupling nut to 8 ±1 in-lbs to ensure full connection.

NOTE: **Insufficient torque applied to RF Module connections can result in elevated insertion/return loss and higher than normal VSWR reported by the system.**

Cable Connections for a Dual-Slot RF Module

Tie wrap

Two N-Type
RF connectors

Factory-installed
RX1 cable

N-Type
RF connector
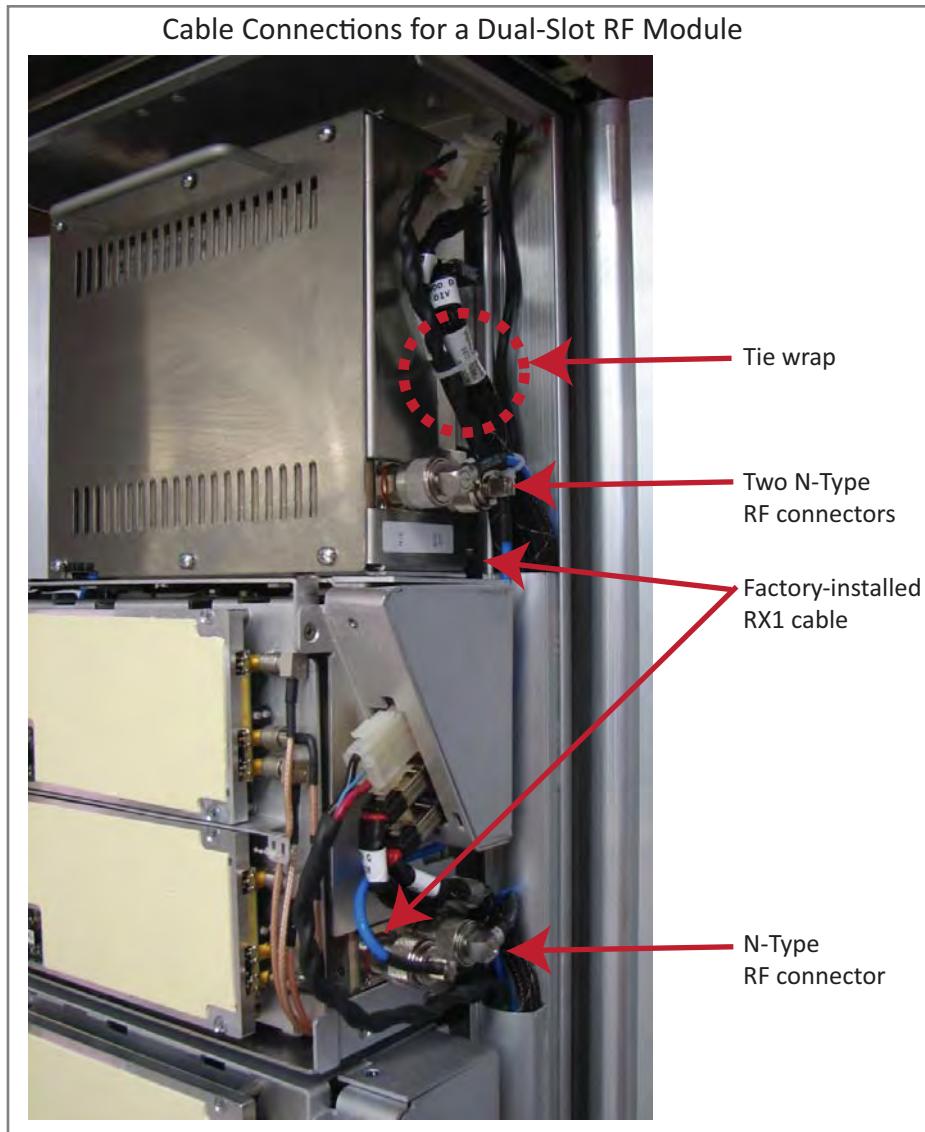
Figure 33. Cable Connections for Dual-Band Dual-Bay RF Modules

Keep cable bends behind the edge of the Connector Interface Panel

Tie wrap around factory-installed RX1 cable
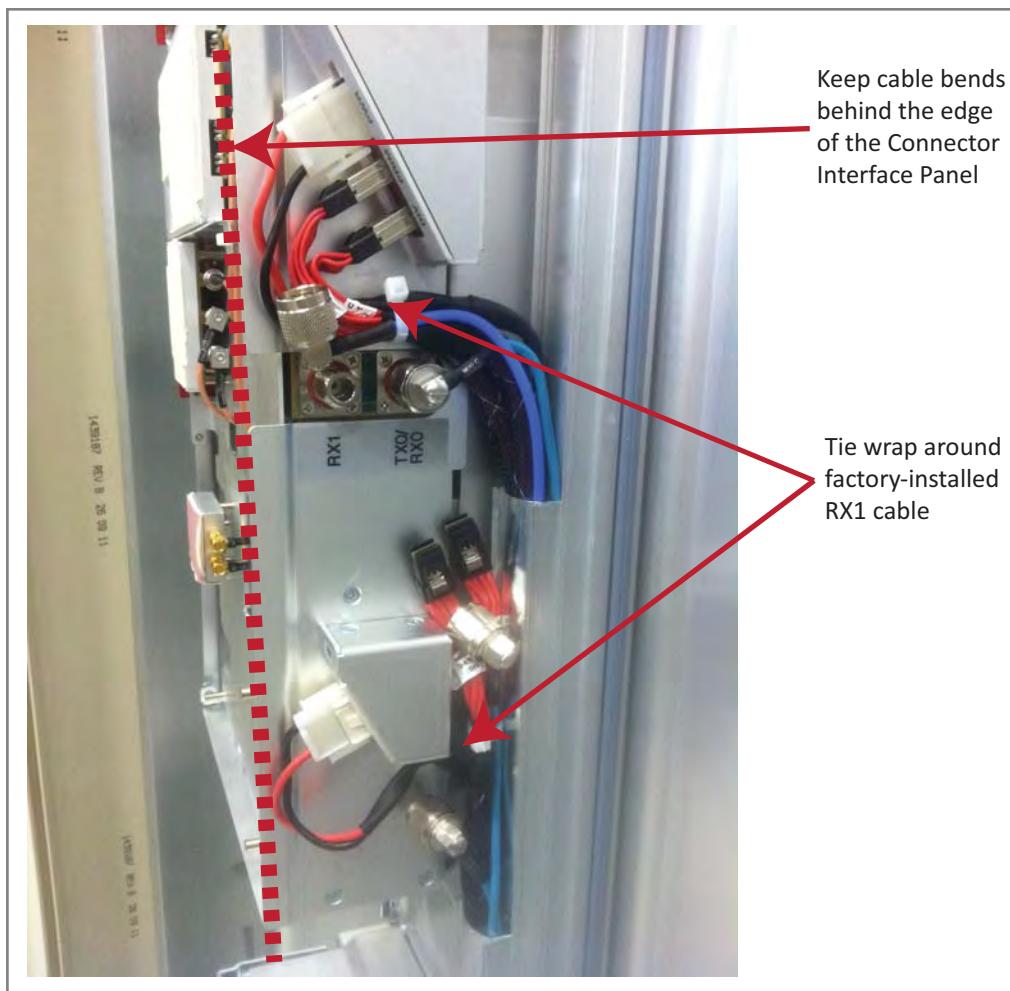
Figure 34. Cable Connections for Legacy Dual-Bay 40W RF Modules

CAUTION! **Ensure that all cable bends are below the top edge of the Connector Interface Panel as indicated by the dashed line in the preceding figure. Failure to correctly position the cables could inhibit closing the Remote Unit door, which can result in damage to the cables.**

b Connect the MOD **N** TX0/RX0 cable to the RF Module (the RF cables and connectors are referred to as MOD *N* TX0/RX0 where *N* equals **A**, **B**, **C**, or **D**).

i Insert the N-Style Plug of the MOD N TX0/RX0 cable into the TX0/RX0 N-Style Jack of the lower RF Module bay. If RF Module connection is not available, constrain the MOD N TX0/RX0 cable to accompanying cables using a tie wrap so it cannot be pinched or prevent the Remote Unit door from closing.

ii Turn the coupling nut of the plug clockwise to thread onto the jack and finger-tighten.

iii Torque coupling nut to 8 ±1 in-lbs to ensure full connection.

NOTE: **Insufficient torque applied to RF Module connections can result in elevated insertion/return loss and higher than normal VSWR reported by the system.**

c Connect the LVDS Cables to the RF Module—the LVDS cables labeled PRIM and DIV should always either be connected to a RF Module or strain relieved to adjacent cables, as this protects the cable against damage through misplacement. Maintain adequate strain-relief distances from the connection points to the RF Module.

  i Connect the MOD N DIV LVDS Cable to the DIV receptacle of the RF Module by inserting and sliding in until fully seated. Full insertion can be recognized by an audible click as the LVDS Cable Connector locks into the RF Module Receptacle.

  ii Connect the MOD N PRIM LVDS Cable to the PRIM connector, following the same steps as above. Full insertion can be recognized by an audible click as the LVDS Cable Connector locks into the RF Module Receptacle.

  iii Ensure the two LVDS cables are fully seated and latched into their respective receptacles on the RF Module by lightly pulling outward on the connectors. If fully seated and locked into position, the cable connectors will not slide back out.

d Connect the Power cable to the PWR receptacle of the RF Module.

  i Ensure that the DC power switch that corresponds to the bay(s) in which the RF Module is to be installed is in the Off position (see "Check the DC Power Switch for the Module Bay" on page 84).

  ii Insert the Power cable into the PWR receptacle of the lower RF Module bay, and slide it in until fully seated. Full insertion can be recognized by an audible click as the Power cable Connector locks into the RF Module Receptacle.

  i Insert the Power cable into the PWR receptacle of the upper RF Module bay, and slide it in until fully seated. Full insertion can be recognized by an audible click as the Power cable Connector locks into the RF Module Receptacle. If the PWR receptacle is not available, constrain the Power cable to accompanying cables using a tie wrap so it cannot be pinched or prevent the Remote Unit door from closing.

  ii Verify that the Power cable is fully seated by lightly pulling back on it while making sure to not depress the release triggers on the ends of the connector. When fully inserted, the cable should not be able to be removed from the receptacle.

**4** Repeat all the steps in "Install the RF Module(s)" on page 80 to install other RF Modules.

POWER ON THE RF MODULE(S) AND THE PRISM REMOTE UNIT

1   If necessary, power up the Remote Unit by turning its AC or DC power switch to On.

2   Ensure that the external Status LED on the bottom of the Remote Unit goes off. (At system startup, the Status LED is red to indicate that the Remote Unit is powering up and that the SeRF processor does not yet control the Remote Unit; the Status LED will remain red for no more than 4 minutes; for further information see "Remote Unit Status LED" on page 10.)

Bottom of an AC-Powered PRU   Bottom of a DC-Powered PRU
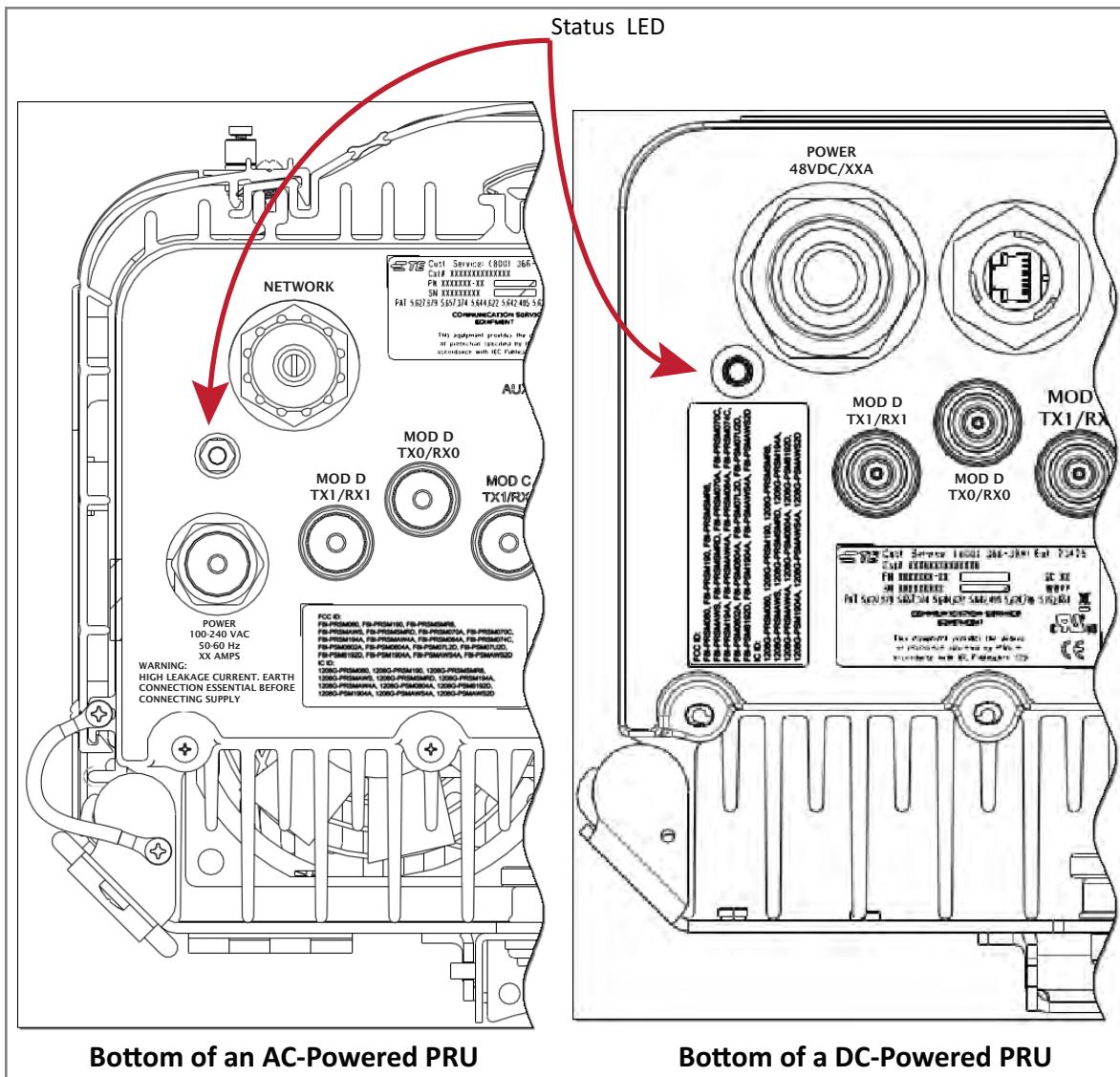
NOTE: The preceding graphic illustrates the Status LED on a Quad-Bay PRU. The Status LED for the Single-Bay, Dual-Bay, and Tri-Bay PRUs is in the same location and functions the same as the Status LED for the Quad-Bay PRU.

3 Follow the rules listed below to toggle the Power switch that corresponds to each RF Module to its ON position.

- For Dual-Band Dual-Bay RF Modules, use the Power switch for the lower module. For example, to power up a Dual-Bay RF Module in combined bays C+D in a Quad-Bay chassis, turn ON DC Power switch for Mod C; leave the DC Power switch for Mod D OFF.

- A Legacy Dual-Bay 40W RF Module uses the Power Supplies in both bays. If the Legacy Dual-Bay 40W RF Module is installed in bays C+D, turn ON the Power switch for Mod C and Mod D.
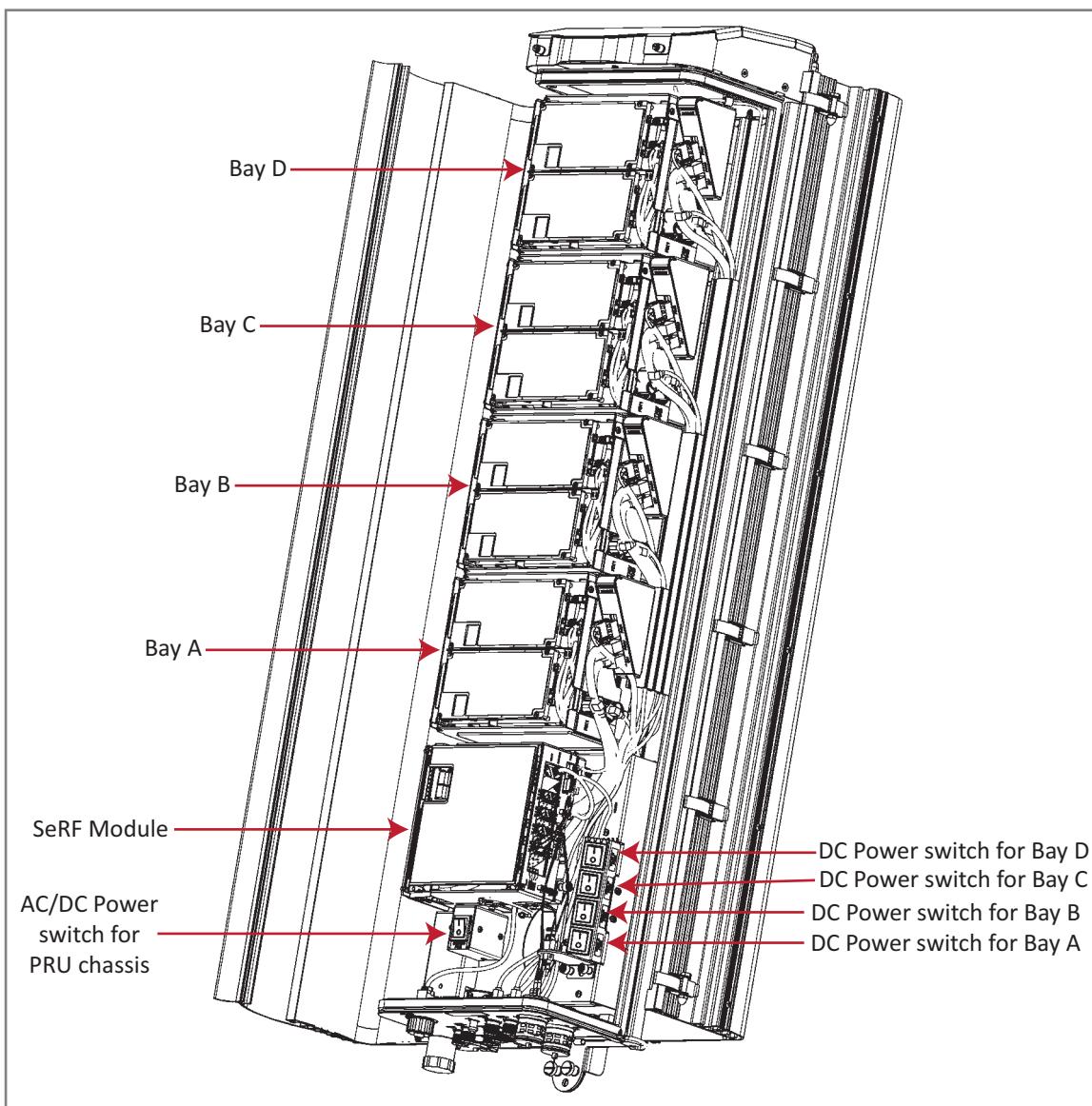
4 Verify that the LEDs for all installed RF Modules (located next to their respective connectors) are green. If any of the RF Module LEDs are not green, verify that each RF Module cable is seated fully in its respective connector. If after checking the cable connections and an LED is not green, contact CommScope for assistance (see "DCCS Global Technical Support" on page 119).

For further information on Status LEDs on HDM RF Modules, see "LEDS on Narrowband HDM RF Modules" on page 21 and "LEDS on Wideband and Fullband HDM RF Modules" on page 22.

CLOSE THE REMOTE UNIT DOOR AND SOLAR SHIELD

1 Do not slam the door to close it—gently swing the door shut and press it firmly closed.

2 Slowly close each door latch in a smooth fluid motion—do not allow the door latches to snap closed. For best results, starting with the top latch and working down to the bottom latch, use a flat-head screwdriver to close each latch as shown below.

3 Do not slam the Solar Shield to close it—gently swing it shut and press it firmly closed.
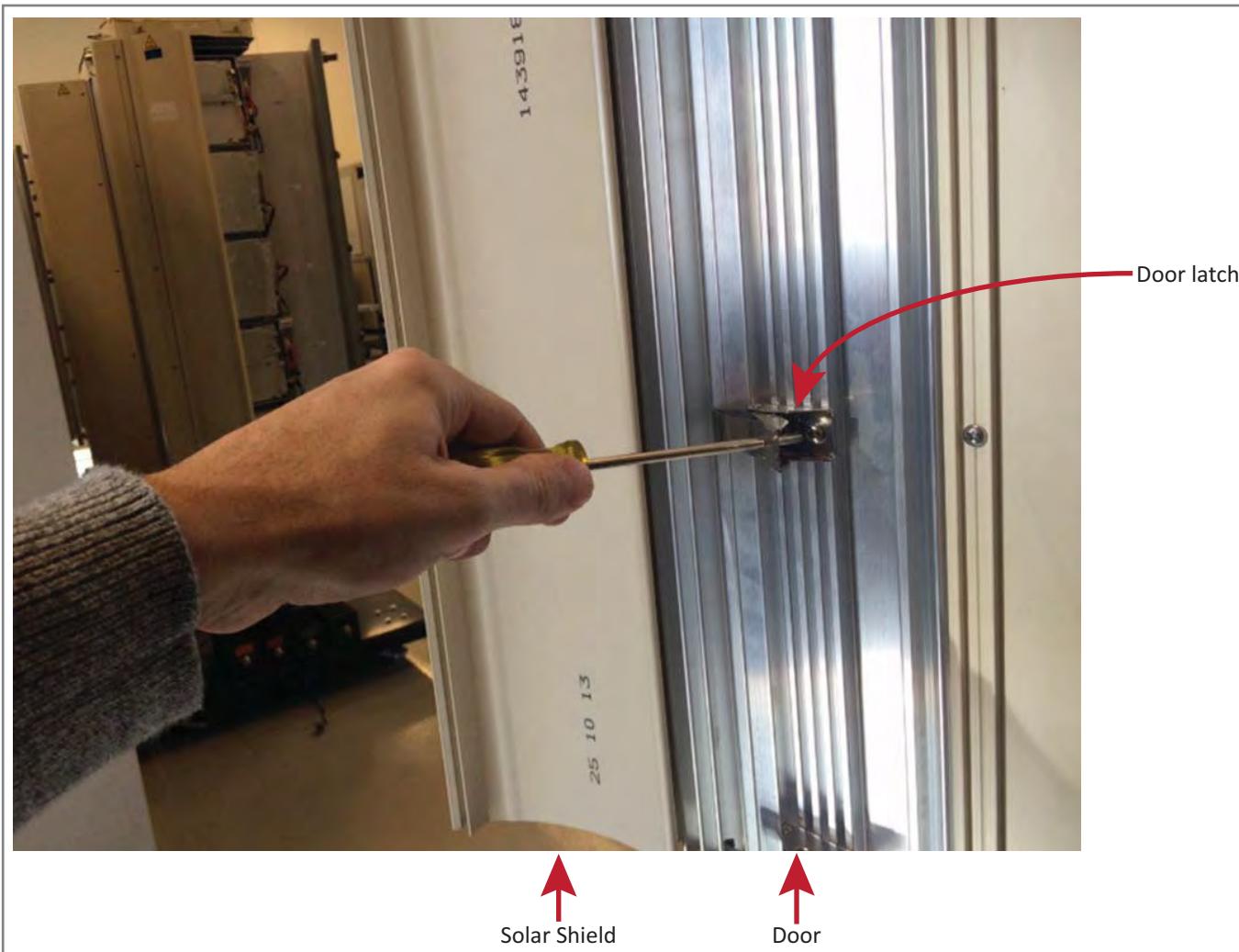
CAUTION! Service personnel must confirm that the perimeter gasket and door-to-door gaskets are in place when closing the Remote Unit doors after servicing.

CAUTION! If the PRU door was allowed to snap closed, RF output from an HDM RF Module may be disabled for up to three minutes. Any alarms generated immediately following the opening/closing of the PRU Doors, such as Door Open, RF Power Low, System VSWR Fault, and LPA VSWR Fault, automatically clear once the RF has recovered. If alarms do not clear after three minutes, please contact CommScope for technical support; see "DCCS Global Technical Support" on page 119.

PROVISION THE PRISM REMOTE UNIT

Refer to the current *EMS System Setup and Provisioning Guide* for information on configuring the PRU for a FlexWave Prism system.

FLEXWAVE NOTCH FILTER (FWP-SPRINTFILTER)

A FlexWave Notch Filter (FWP-SPRINTFILTER) ships with and is required in installations of the following RF Modules:

- Dual 20W SMR800 / PCS1900 RF Module (FWP-441T841MOD)

- Dual 20W 800 RF Module, MIMO, Single Bay, with two External Filters (FWP-44MT000MOD).

You install the Notch Filter between the Prism Remote Unit 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.

You use the same mounting methods to mount the Notch Filter as you used to mount the PRU. Take the following into consideration when planning the installation:

- The Notch Filter and its mounting brackets requires 19 inches of vertical space above the PRU (see Figure 35 and Figure 36 on page 110).

- The Notch Filter weighs 18 pounds; make sure the installation site can bear this additional weight.

- Mount the Notch Filter vertically with the N-type female connectors at the bottom.

- There are two Ground lugs on the Notch Filter, which are on the back of the two mounting brackets. Follow local practice to ground the Notch Filter.

- The notch filter must be connected to the 800 band module output before combining with other bands or connecting to an antenna.

Figure 35 provides the dimensions required to create a mounting template. (For full technical specifications, see Table 26 on page 116.)
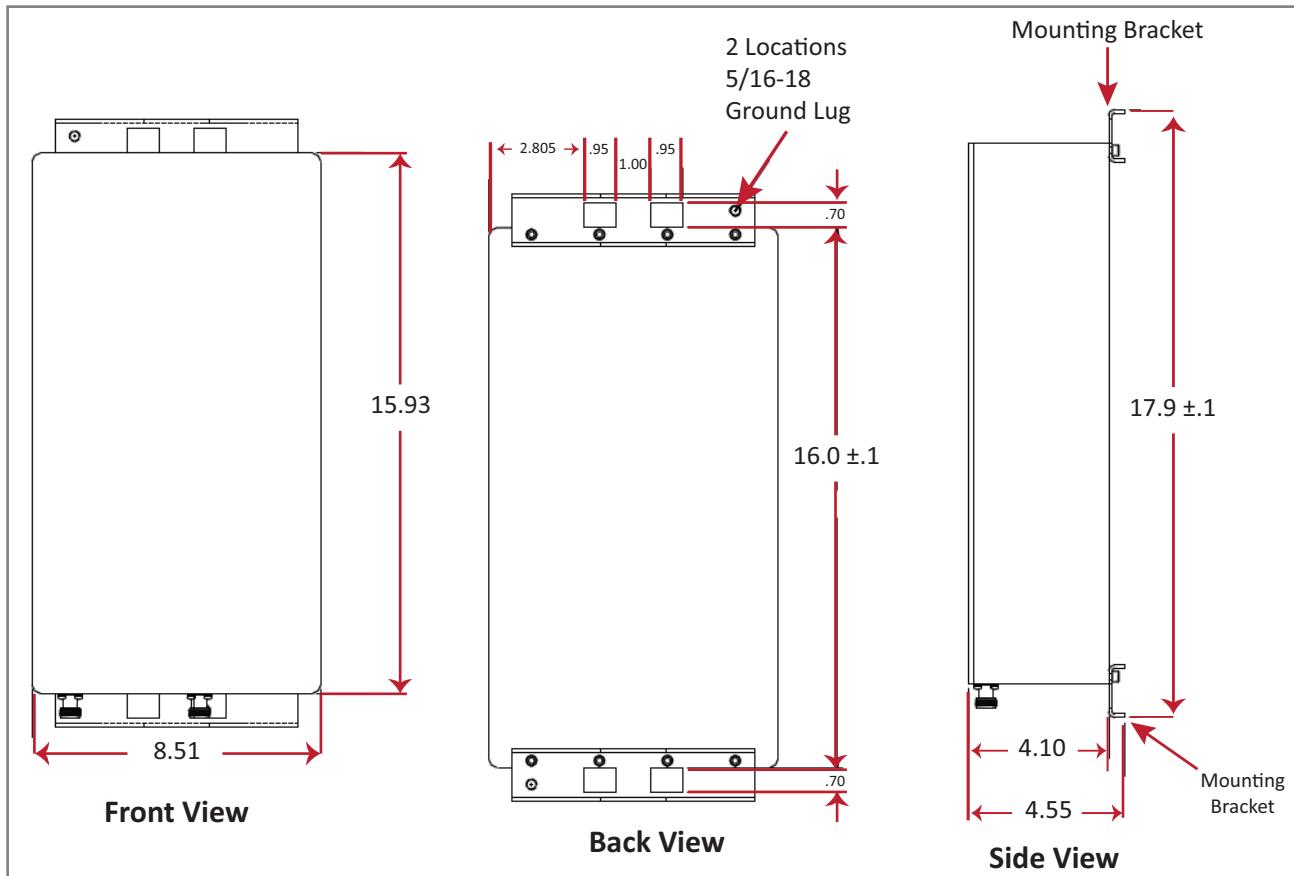
Figure 35. Notch Filter Mounting Dimensions

Figure 37 provides an example of how the dimensions required to mount the Notch Filter with a Quad-Bay PRU.

External Notch Filter

19 inches of vertical space to mount the Notch Filter

To the PRU Input or Output port

From the Antenna

41.7" (105.918 cm) Band 1 to Bottom Band

Bands for a Quad-Bay PRU
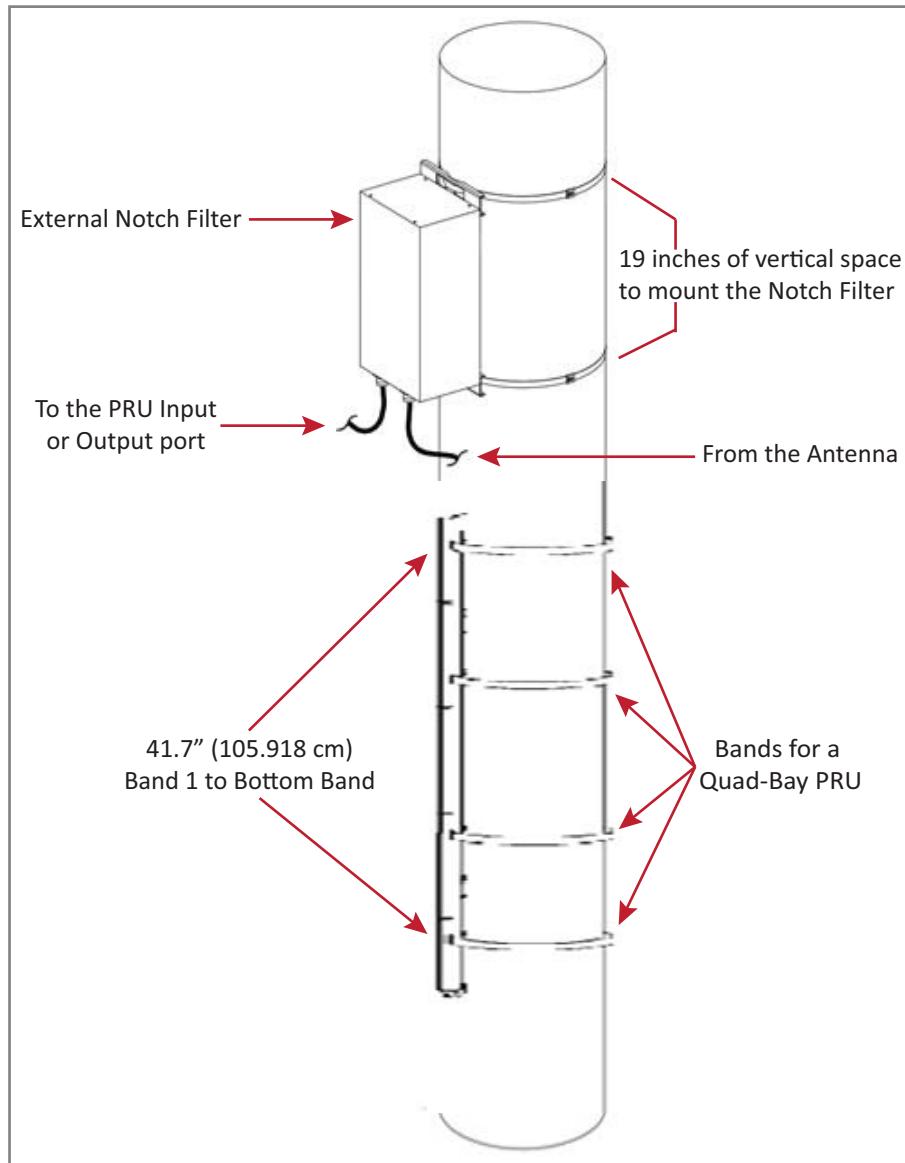
Figure 36. Pole Mounting a Quad-Bay PRU with a Notch Filter

Figure 37 illustrates how to pole mount the Notch Filter.
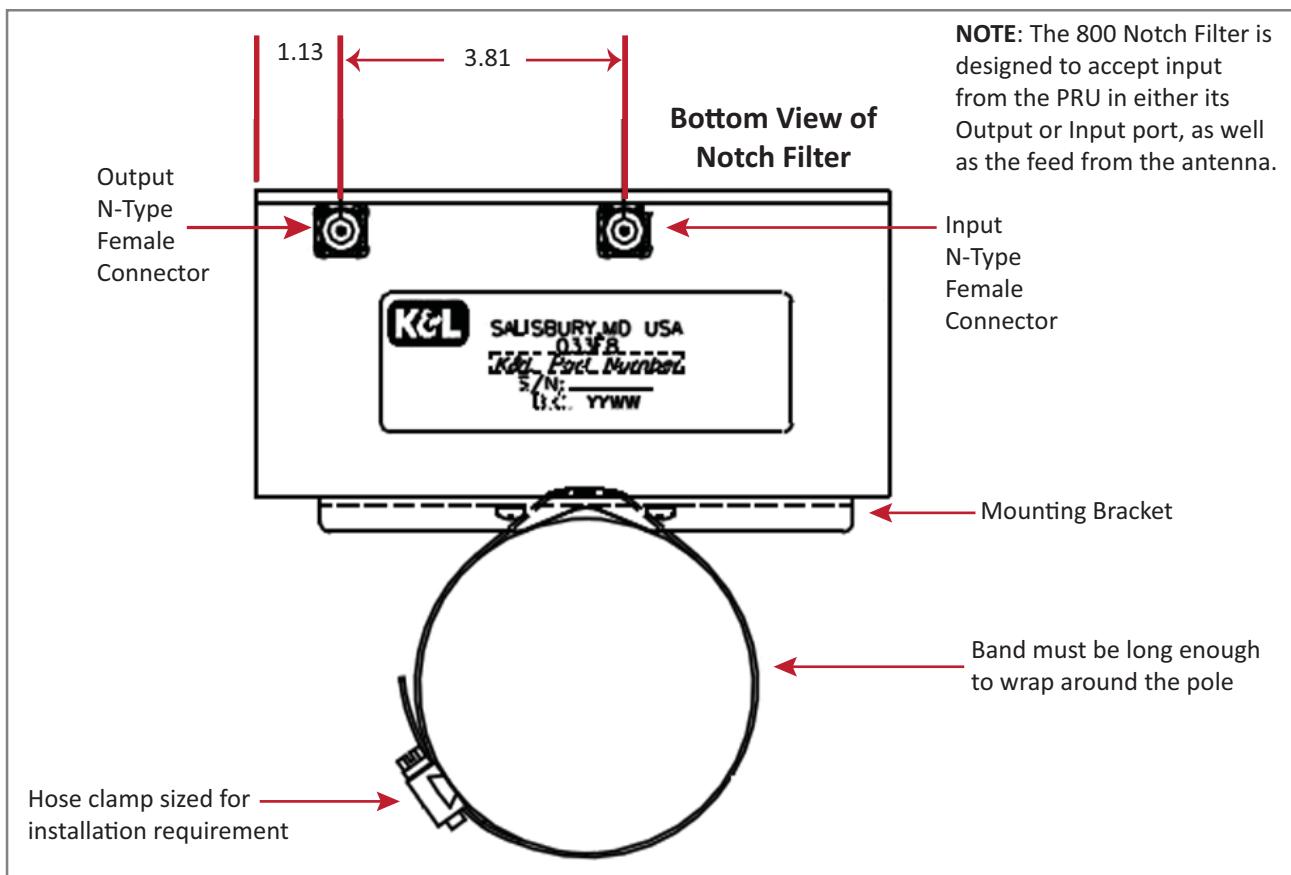
Figure 37. Pole Mounting a Notch Filter

FAN MODULE MAINTENANCE

Continuous airflow to cool the PRU is provided by the Fan Module that is mounted on the top of the PRU chassis. The cooling fans pull the heated air up from the chassis. The heated air is then exhausted through the vent openings at the top of the chassis. This constant movement of air requires that the Fan Module be placed on a maintenance schedule.

ANNUAL FAN CHECKUP

CAUTION! **A mechanical hazard exists due to rotating fan blades. Keep hands and fingers away from fan blades during removal of Fan Module. Use only the designated pull areas to disengage the fan tray. Allow adequate time for fans to spin down prior to removal.**

Check the Fan Module on an annual basis. Inspect the intake and exhaust vents for obstructions and/or debris. If obstructions and/or debris is observed, remove from exterior of system as necessary.

POTENTIAL FAN ALARMS

Check the Fan Module should any one of the following alarms occur:

- Fan Under Speed (`fwuRmtFanUnderSpeedFault`)

- Temperature High (`fwuRmtOverTempFault`)

- DART Temperature High (`fwuRmtDARTOverTempFault`)

- LPA Over Temperature (`fwuRmtLPAHighTempFault`)

REPLACING THE FAN MODULE

CAUTION! **The rotating fan blades create a hazardous environment. Keep hands and fingers away from the fan blades. Use only the designated pull areas to disengage the Fan Tray. Allow adequate time for fans to spin down prior to removal.**

CAUTION! **Low voltage electrical shock hazard!**

  - **Do not touch bare conductors or other potentially energized parts.**

  - **Use appropriate safety equipment approved for use on electrical installations.**

  - **Ensure fan module exterior of electrical connector and immediate area are clean and dry prior to disconnection.**

  - **Do not perform service during or while conditions of impending rain or snow are observed.**

NOTE: **You do not need to disconnect the power cabling from the Prism Remote Unit to replace the Fan Module.**

NOTE: **If the PRU has an Enhanced Fan Shroud, refer to the *FlexWave Prism Remote Unit Enhanced Fan Shroud Installation Guide* (TECP-77-235) for information on how to replace the Fan Module.**

Use the following procedure to remove and replace the PRU Fan Module:

1 Read all instructions and procedures of this section prior to beginning work to replace Fan Module.

2 Order a Prism Remote Unit Fan Replacement Kit, catalog number FWP-RUFAN001.

3 Notify the NOC or alarm monitoring system operator that the Fan Module is being replaced, which will generate fan and power alarms for the affected PRU.

4 Power down the PRU and wait until the fans spin down to a stop.

5 Put on an ESD wrist strap and ensure that it makes maximum contact with bare skin throughout this procedure. ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. To ensure adequate grounding, the ESD wrist strap should be connected to any bare metal surface of the PRU chassis, or to the Dual-Ground Connector at the bottom of the unit. For further information on the Dual-Ground Connector, see "Ports and Connectors" on page 7.

NOTE: **It may be necessary to scrape a small section of the coating off the Prism Remote Unit chassis to ensure connection to a bare metal surface.**

6 Loosen the two screws that secure the Fan Module Cover at the top of the PRU chassis to the front of the enclosure as shown in the graphic to the right.

7 Open the fan cover by rotating it up and back on its hinges.

8 Do the following before you lift the Fan Module out of the PRU chassis:

  a Inspect, clean and dry the top surface surrounding the fan connector.

  b Loosen the two captive screws that secure the Fan Module to the PRU chassis.

  c Disconnect the Fan Module power cable by rotating its coupling nut counter-clockwise until the receptacle can be lifted off its bulkhead plug.

Top of Prism Remote Unit

Two captive screws
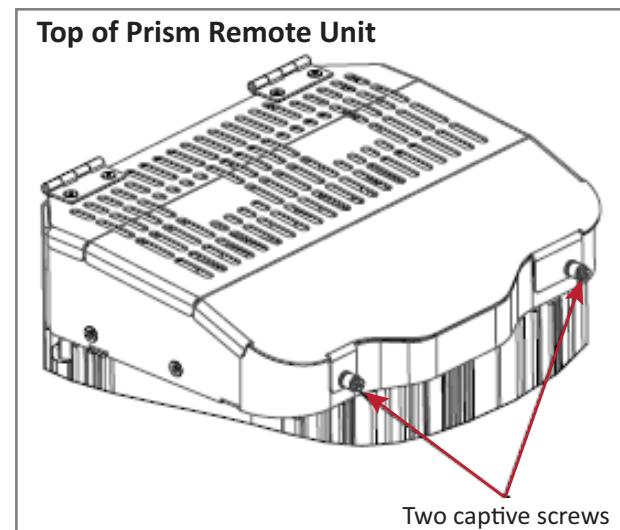
9 Remove the old Fan Module from the PRU:

   a The Fan Module has two keyhole rivets that extend through their designated slots into the sheet metal frame. To disengage the Fan Module keyhole rivets, slide the Fan Module forward approximately 1/4-inch.

   b Lift the Fan Module straight up to remove it from the PRU chassis.
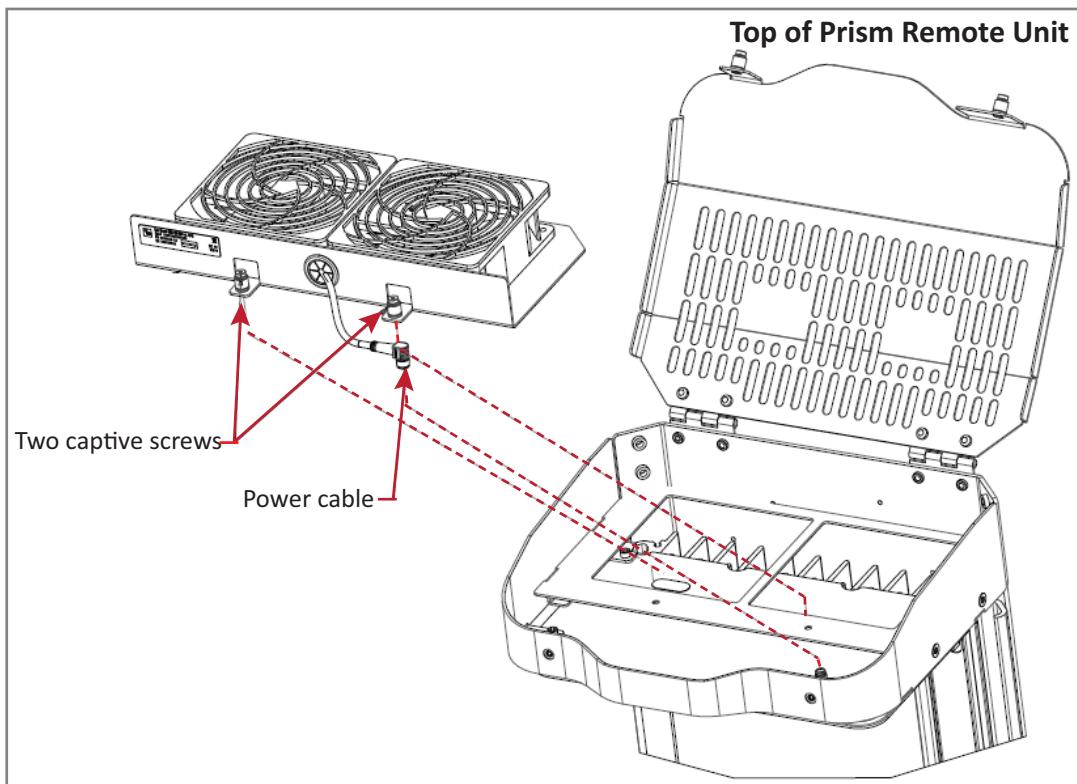
10 Lower the Fan Module into the PRU from the top. Ensure that the two keyhole rivets on the new Fan Module extend through their designated slots in the sheet metal frame, and then slide Fan Module back approximately 1/4-inch to engage its keyhole rivets.

11 Align and then insert the Fan Module's two captive screws with nuts on the PRU; ensure correct thread engagement, and then tighten the Fan Module's captive screws.

12 Insert the Fan Module power cable so that the cable is directed to the left of the connector. Use the key to align the cable correctly. Do not use excessive force to mate the receptacle to the plug.

CAUTION! **Failure to align the Fan Module power cable correctly may cause damage to the PRU power connectors, which could result in needing to replace the PRU chassis.**

13 Use your fingers to turn the coupling nut on the power cable approximately 2-1/2 revolutions, and then tighten the coupling nut another 1/4 revolution.

14 Tighten the two captive screws that secure the Fan Module to the chassis; torque the screws to 10 IN-LBS ±1 IN-LB.

15 Close the Fan Module cover and tighten its two captive screws; torque the screws to 10 IN-LBS ±1 IN-LB.

SPECIFICATIONS

The following specifications pertain to the PRU hardware components; for information on RF and optical specifications and the frequency and composite output power at the Antenna port, see the *FlexWave Prism Performance Specifications* that correspond to the FlexWave software release managing this PRU.

Table 25.   *Prism Remote Unit Technical Specifications*

Parameter	Specification	Remarks
Enclosure dimensions	See Table 19 on page 31	
Weight	See Table 18 on page 31	
Mounting	Wall, Pole, Inside Pole, and Vault	
Outside Ambient		
Temperature Rating	-40° C to +50° C (-40º F to +122º F)	
Storage Temperature	-40° C to +70° C (-40º F to +158º F)	
Humidity	10% to 90% non-condensing	
Weather Resistance	IP-65	Indoor or outdoor installation
Lightning Protection	20kA IEC 1000-45 8/30 ìs Waveform	Provided by external lightning protector, which is an accessory.
Cooling Fan	Fan, IP-55	
Operating Voltage Range	10 - 28 Vdc	
Connectors		
Network port	RJ-45 female connector	
AC power connector	Sealed 3-pin	Connection point for the AC power cable
Antenna cable connector	50 ohm N-Type (female)	50 ohms input/output impedance
Voltage input		
AC-Powered PRUs	100 to 240 Vac, 50 to 60 Hz	Operating range 90 to 265 Vac
DC-Powered PRUs	-40 to -60 Vdc	
Current rating		
AC-Powered PRUs	15 AMPS	
DC-Powered PRUs	45 AMPS	

Table 26. *Notch Filter Specifications*

Frequency Range (MHz)	Maximum Emissions (Sprint requirement) per 30 kHz
817-824	—
< 854	< -76 dBm
854-859	< -76 dBm
859-861.35	< -76 dBm
861.35-861.5	< -56 dBm
861.5-861.6	< -42 dBm
862-869	—
Enclosure Rating	IP67
RF Connectors	N-Type Connector, Female (2)
Ground Studs (w/star washer)	All ground Studs must accept AWG 6 wire
Mounting	Strap mount (Vertical and Horizontal) on up to 12" pole, or Wall mount
Size	15.93" x 8.51" x 4.10"
Weight	18 LBS
Operational Temperature	-25°C to +65°C
Humidity	ETSI 300-019-1-3 10%-100% Condensing
Vibration-operation	ETSI 300-019-1-4
Vibration-transportation	ETSI 300-019-1-2

Standards Certification

FCC

This equipment complies with the applicable sections of Title 47 CFR Part 15 (Host Unit), Part 22 (800 MHz Cellular), Part 24 (1900 MHz - PCS), Part 90 (800/900 - SMR), and Part 27 (2100 MHz - AWS) & (700 MHz -LTE).

WARNING. This is NOT a CONSUMER device. It is designated for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express Consent of an FCC Licensee to operate this device. Unauthorized use may result in Significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

IC

This equipment complies with the applicable sections of RSS-131. The term "IC:" before the radio certification number only signifies that Industry Canada Technical Specifications were met.

The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

NOTE: To comply with Maximum Permissible Exposure (MPE) requirements, the maximum composite output from the antenna cannot exceed 1000 Watts ERP (LTE, Cellular, and PCS), the antenna cannot exceed 1640 Watts EIRP (PCS and AWS), and the antenna must be permanently installed in a fixed location that provides at least 6 meters (20 feet) of separation from all persons.

UL/CUL

This will be installed in a restricted access location. This equipment complies with Type 4, per UL and CUL 50, Standard for Enclosures for Electrical Equipment. This equipment provides the degree of protection specified by IPX6 as defined in IEC Publication 529.

FDA/CDRH

This equipment uses a Class 1 LASER according to FDA/CDRH Rules. This product conforms to all applicable standards of 21 CFR Part 1040.

CAUTION: Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

EU Harmonized Standards

Meets essential requirements of R&TTE 1999/5/EC.

- Article 3.1a—The protection of the health and the safety of the user and any other person, including the objectives with respect to safety requirements contained in Directive 2006/95/EC, but with no voltage limit applying.
- Article 3.1b—The protection requirements with respect to electromagnetic compatibility contained in Directive 2004/108/EC.
- Article 3.2—In addition, radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communication and orbital resources so as to avoid harmful interference.

EMC Standards

EN 55022 and EN55024 (CE marked)

Safety Standards

This equipment complies with IEC 60950-1, 2ND Edition + Amendment 1 (CE marked) and with UL 60950-1, 2ND Edition + Amendment 1 (File number E174166) (USA and Canada)

Burn-In Testing

CommScope is committed to delivering the highest quality products. Ongoing reliability testing of products prior to sale is one element of our quality management system. This includes random sample system burn-in on Prism HDM RF Modules and Remote Unit enclosures, to ensure we deliver the most reliable solution possible.

DCCS GLOBAL TECHNICAL SUPPORT

The following sections tell you how to contact the CommScope Distributed Coverage and Capacity Solutions (DCCS) Technical Support team. Support is available 7 days a week, 24 hours a day.

Helpline Support

Use the following Helpline telephone numbers to get live support, 24 hours a day.

24x7	+1 888-297-6433 (Toll free for U.S. and Canada)
EMEA 8:00-17:00 (UTC +1)	+ 800 73732837 (Toll free for parts of EMEA, Australia)
	+ 49 909969333
	If you call the EMEA Helpline outside of the 8:00 to 17:00 time frame, your call will be forwarded to the 24x7 Helpline.

Online Access

Click on the following URL link to access an online DCCS Technical Support Form:

http://www.commscope.com/wisupport

Alternatively, you can enter the preceding URL into your web browser, and then press **ENTER** on your keyboard.

Email

Use the following email address to email the DCCS Global Technical Support team:

wisupport@commscope.com

RETURN MATERIAL AUTHORIZATIONS

Prior to removing any equipment from the field, please contact DCCS Technical Support to assist in troubleshooting and fault isolation. If the issue cannot be resolved, Technical Support will facilitate your RMA request.

TECHNICAL TRAINING

You can access training on the online CommScope DAS and Small Cell Institute, as described below.

1 Click on the following URL link to the Infrastructure Academy:

http://www.commscopetraining.com/courses/dassc/

(Alternatively, enter the preceding URL into your web browser, and then press ENTER on your keyboard.)

2 Review the courses listed in separate course panels; for further information on a course, click its **Full details** button. Instructor-led courses are conducted in North America and Europe. Before choosing a course, please verify the region.

3 To view the course schedule and register, click **Course Registration** at the top of the course page; this opens the **Partner Learning Center Login** page.

- If you have an account, enter your **Username** and **Password**, and then click **Login**. (Click on the **Reset Password** link if you do not have your login information.)

- If you don't have an account, click on the **Create New User Account** link under the **Login** button, and follow the prompts.

Once you have logged in, you will see a list of available class dates.

4 Click the date you prefer and select the **Enroll** or **Register Now** button to enroll. Follow the prompts through the payment process.

5 Click either the **Available Training** or **Calendar** tab to view other training courses.

ACCESSING FLEXWAVE PRISM USER DOCUMENTATION

You can access the FlexWave Prism user documentation on the CommScope DCCS Customer Portal, as described below.

1 Click on the following URL link:

https://www.mycommscope.com

(Alternatively, enter the preceding URL into your web browser, and then press **ENTER** on your keyboard.)

2 Access to the Customer Portal requires a user account and password. On the **Sign In** page, do one of the following:

- If you have an account, enter your **Email** address and **Password**, and then click **Sign In**.

- If you don't have an account, click **New user registration**, and follow the prompts.

3 Click **DCCS**.

4 Select your site, and then click **FlexWave Prism**.

5 Click on the title of any document to open it.

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