

4

INSTALLING THE REMOTE UNIT

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4.1 REMOTE INSTALLATION OVERVIEW

Installation of the Remote consists of the following basic steps:



To insure that all connectors and ports remain dust-free during installation, leave all dust caps and dust protectors in place until directed to remove them.

- 1 Unpack and inspect your shipment.
- 2 Install the RF module(s).
- 3 Connect the ProAx Fiber Cables.
- 4 Connect external coaxial antenna cables must be routed from the antenna to the Remote TX0/RX0 and RX1 connectors.
- 5 Install the AC power cable and connect it the Remote's AC power port and to an external junction box .

4.1.1 Installation Hardware Provided with Remote

The installation hardware provided with the Remote is listed in [Table 4-1](#).

Table 4-1. Remote Unit Installation Hardware

| Item | Quantity |
|-------------------------------|----------|
| AC Power Cable (15 feet/4.6m) | 1 |
| Quad Fiber Cable Assembly | 1 (a) |
| 3/8-inch hex standoff | 3 |
| 3/8-inch 10-32 phillips screw | 3 |
| #10 split washer | 3 |

(a) If the Remote has more than 2 SFPs, two Quad Fiber Cable Assemblies are required.

4.1.2 Required Tools and Materials

The following tools are required in order to complete the procedures in this instruction:

- Socket Wrench and 3/8-inch Deep Socket
- Wire cutters
- Wire stripper
- Compression pliers for splicing grounding cable
- Tools for installing exterior AC circuit
- Tool kit for attaching N-Type connectors to coaxial cable
- Fiber cleaning kit

The following materials are required in order to complete the installation procedures:

- #6 AWG (4 mm) copper wire and splice
- #10 ring terminal for attaching #6 grounding wire to bottom of unit
- Connector for attaching #6 grounding wire to approved earth ground source
- Junction box, conduit, fasteners, connectors, and wire to install an exterior AC circuit.
- N-Type male connectors
- RJ-45 connector (if making a permanent external network cable connection)

4.2 REMOTE MOUNTING PLANS

The FlexWave Prism Remote Unit has a low profile design that requires minimal real estate for installation. The basic dimensions and weights of the Remote are listed in Table 4-2.

Table 4-2. Remote Dimensions

| Remote Configuration | Depth | Width | Height | Weight of Fully Populated Units |
|----------------------|------------|------------|--------|---------------------------------|
| Single- Band | 10.51 " | 12.15 " | 22.50" | ≤65 lbs |
| Double Band | 10.51 " | 12.15 " | 30.50" | ≤96 lbs |
| Triple Band | 10.51 " | 12.15 " | 38.46" | ≤127 lbs |
| Quad- Band | 10.51 " | 12.15 " | 49.60" | ≤165 lbs |

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

Detailed instructions for mounting the FlexWave Prism Remote are in the *Remote Unit Mounting Kit Installation Instructions* (ADCP-77-077).

4.3 INSTALL THE REMOTE

This chapter guides you through installing a Prism Remote, which requires 63 steps that are divided into 9 sections. Follow the steps in the order in which they are provided.



This is restricted access equipment and only service personnel should open and operate this equipment using appropriate tools



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.



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

4.3.1 Unpack and Inspect the Remote and Components

This section provides instructions for opening the shipping boxes, verifying that all parts have been received, and verifying that no shipping damage has occurred. Use the following procedure to unpack and inspect the Host and any accessories:

Unpack and inspect the various components as follows:

- 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 ADC Customer Service (see [“Contacting ADC”](#) on page 335). 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.

4.3.2 Install the Remote RF Module(s)

The RF Module cables that are pre installed in the Remote connect to the corresponding connectors on the RF Module. The RF Module cables correlate to the antenna connectors on the bottom of the Remote chassis. The cables and connectors have corresponding labels as shown in Table 4-3. The RF cable and connector labels also correspond to the RF Module slots in the Remote chassis, where MOD A is the bottom shelf and MOD D is the top shelf.

Table 4-3. RF Antenna Labels

| Remote RF Module Shelf | RF Module Cable, RF Module Connector, and Remote Antenna Connector Labels | Function |
|------------------------|---|---|
| MOD A | Mod A TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module A |
| | Mod A RX1 | Diversity receive for RF power from the antenna for RF Module A |
| MOD B | Mod B TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module B |
| | Mod B RX1 | Diversity receive for RF power from the antenna for RF Module B |
| MOD C | Mod C TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module C |
| | Mod C RX1 | Diversity receive for RF power from the antenna for RF Module C |
| MOD D | Mod D TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module D |
| | Mod D RX1 | Diversity receive for RF power from the antenna for RF Module D |

In the following steps, the RF cables and connectors are referred to as **MOD NTX0/RX0** and as **MOD NTRX1** where *N* equals **A, B, C, or D**.

- 5 Unpack and inspect the RF Module as described in “Unpack and Inspect the Remote and Components” on page 97.



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. 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 ADC for assistance (see “Contacting ADC” on page 335 for contact information).



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

- 6 Open the Remote enclosure.
- 7 Remove release liners, if present, from the thermal pads on the RF Module prior to installing the module into the Remote chassis.



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

Thermal pads are located as follows:

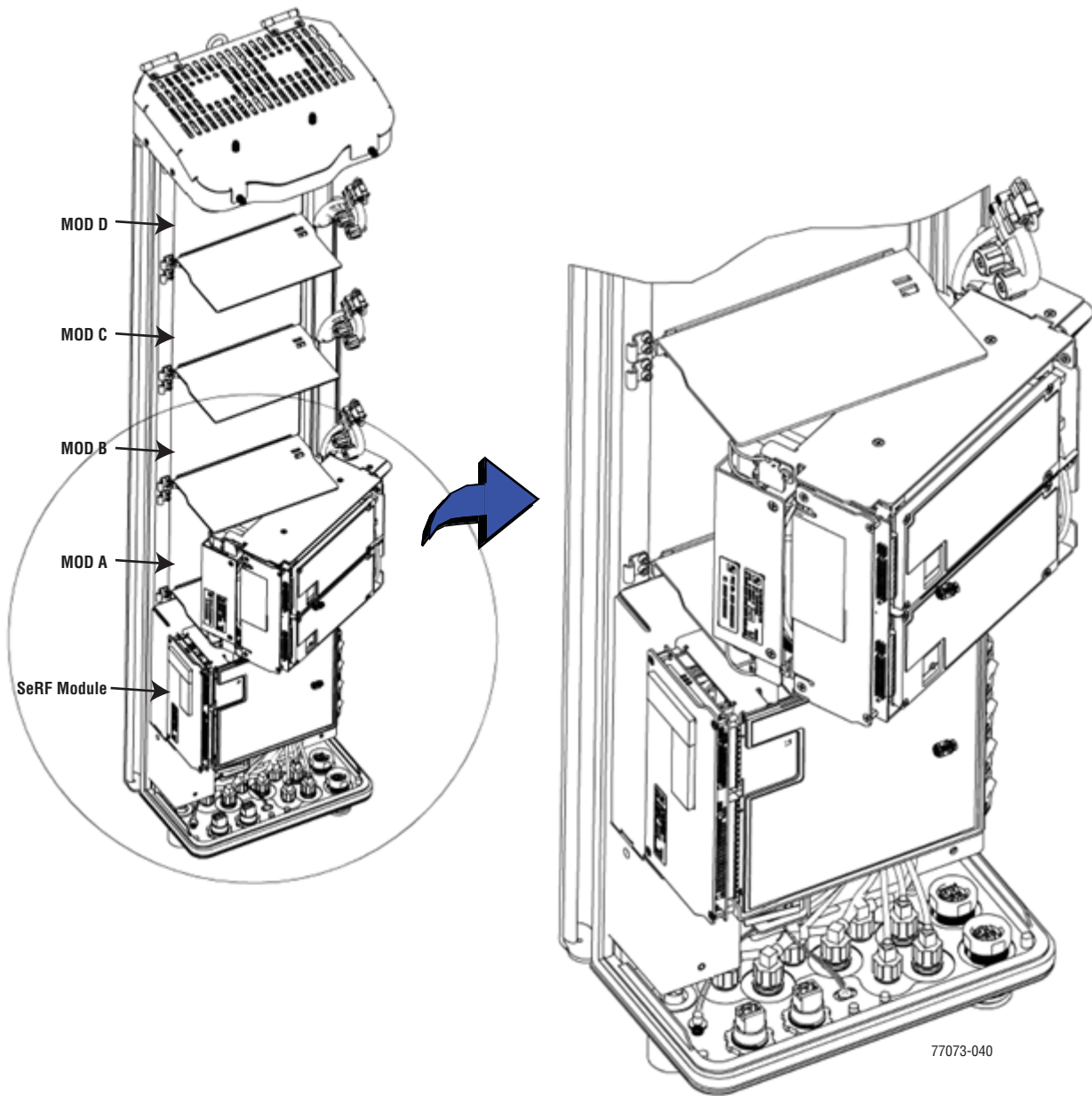
- one large pad on the back surface (LPA)
- up to two on the front surface (DARTs)
- two on the left side for the (RDI).

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



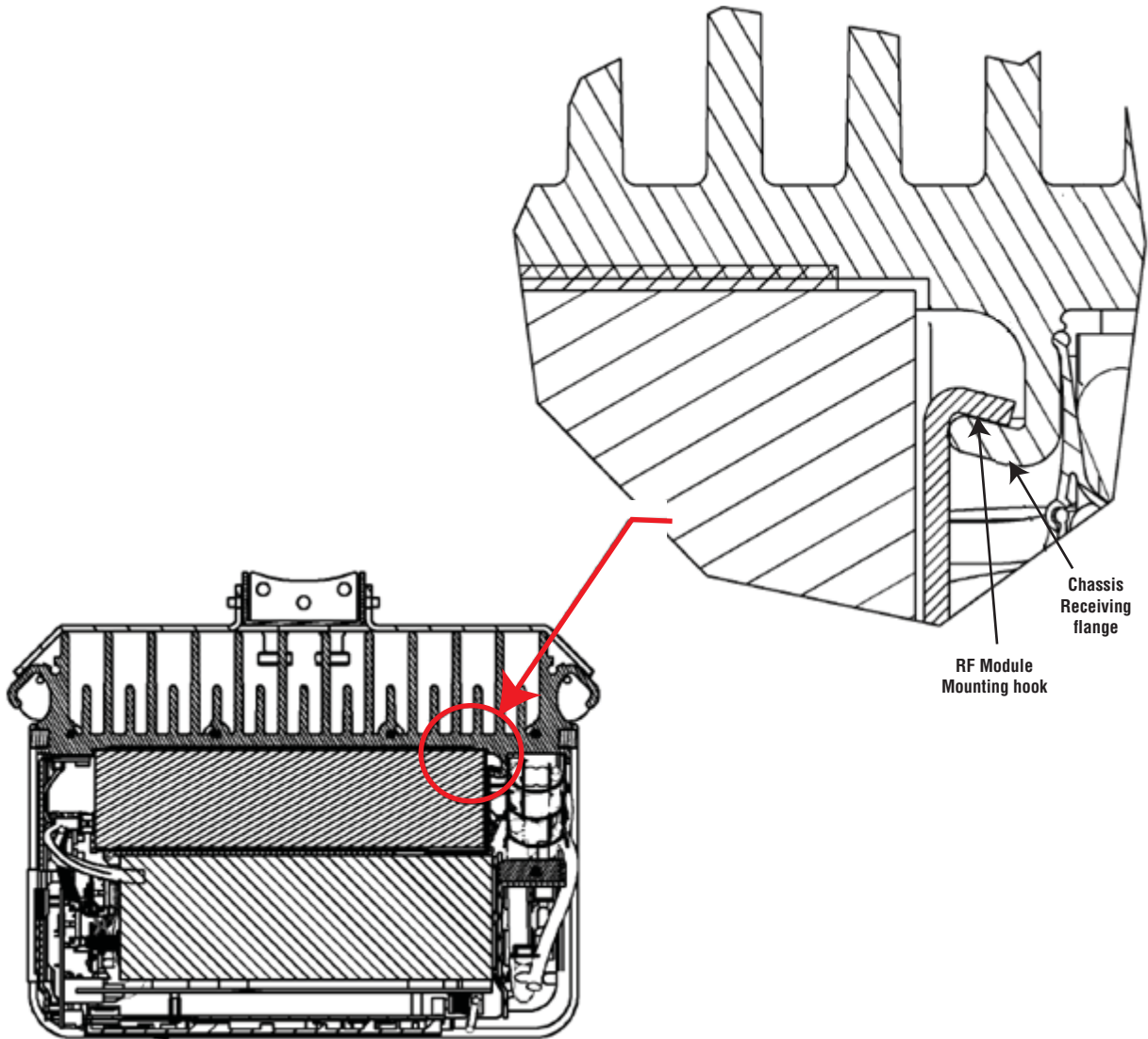
Always install RF Modules from the bottom up and do not skip a shelf.

- 9 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.



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- 10 Aligning the mounting hook on the module with the receiving flange on the Remote heat sink, and slide the RF Module in toward the flange until it can go no further.



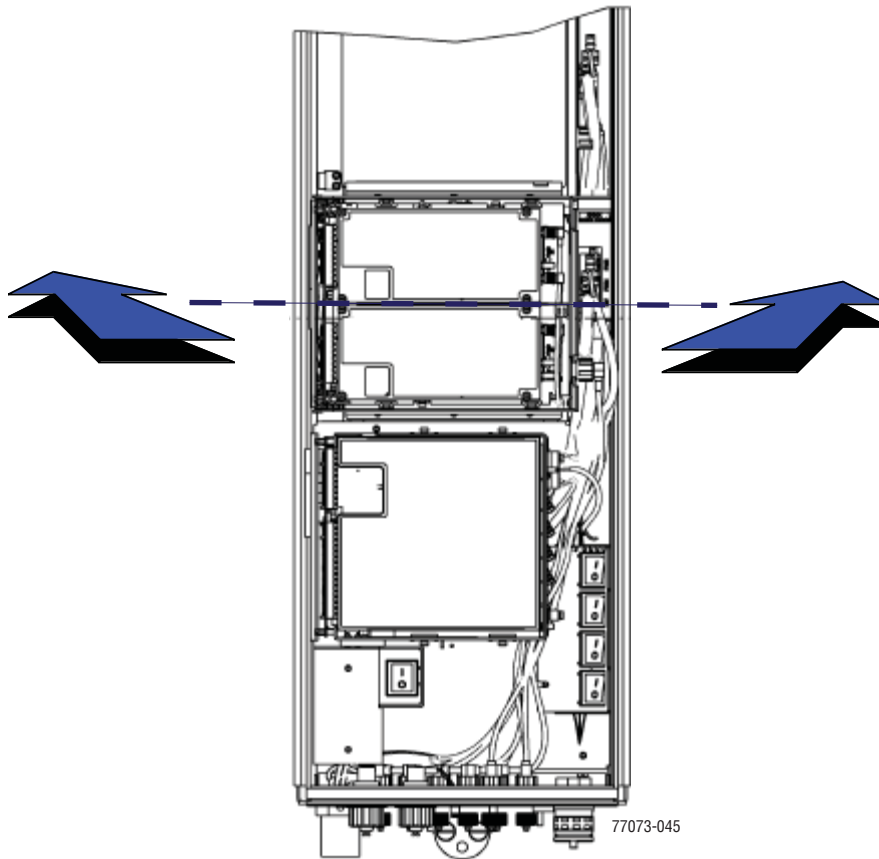
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- 11 Push the left edge of the RF Module back and into the Remote chassis until it can go no further.

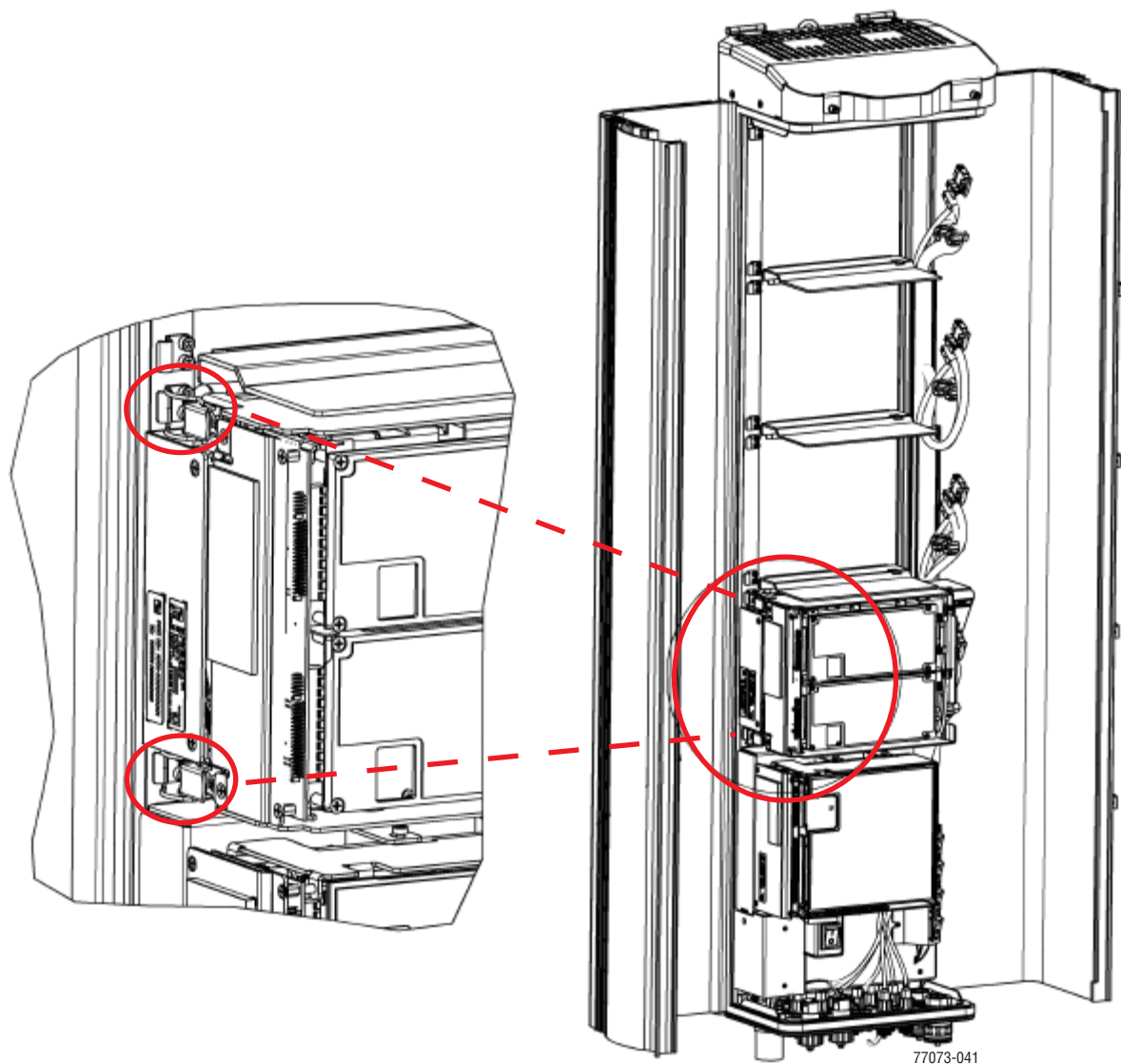


Make sure the RF Module is seated correctly in the Module shelf. Incorrect alignment of the RF Module can cause the RF Module to fail due to over heating.

- 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 chassis.
- If you later cannot shut the Remote door, verify that the RF Module is installed correctly.



- 12 Secure the two module latches on the left side of the RF Module.



- 13 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 [Step 9 on page 100](#) through [Step 12](#).
- 14 Position the cables so that are under the right edge of the RF Module, pointing up.

15 Follow these rules when connecting the RF Module cables:

- At each RF Module shelf, the Power (PWR) cable and two high-speed-data cables will always be provided.
- If you are installing a Non-Diversity Chassis, only one RF cable labeled **MOD N TX0/RX0** will be populated.
- Always connect the high-speed-data cable labeled **DIV**. This protects against the cable getting caught in the chassis door.
- If you are installing a Diversity Chassis, both RF cables labeled **MOD N TX0/RX0** and **MOD N RX1** will be populated.
- For Diversity modules, all cables are to be connected.
- If you order a Non-Diversity RF Module and are installing it in a Diversity chassis, connect it as if it was being installed into a Non-Diversity chassis.
- When you order a Dual SuperDART module, connect both high-speed data cables (**PRIM** and **DIV**) and the **RF TX0/RX0** cable.
- Adhere to a minimum bend radius of 1" for all RF cables from the integrated cable guide to the module.
- Maintain adequate strain relief distances from connection points to the module.

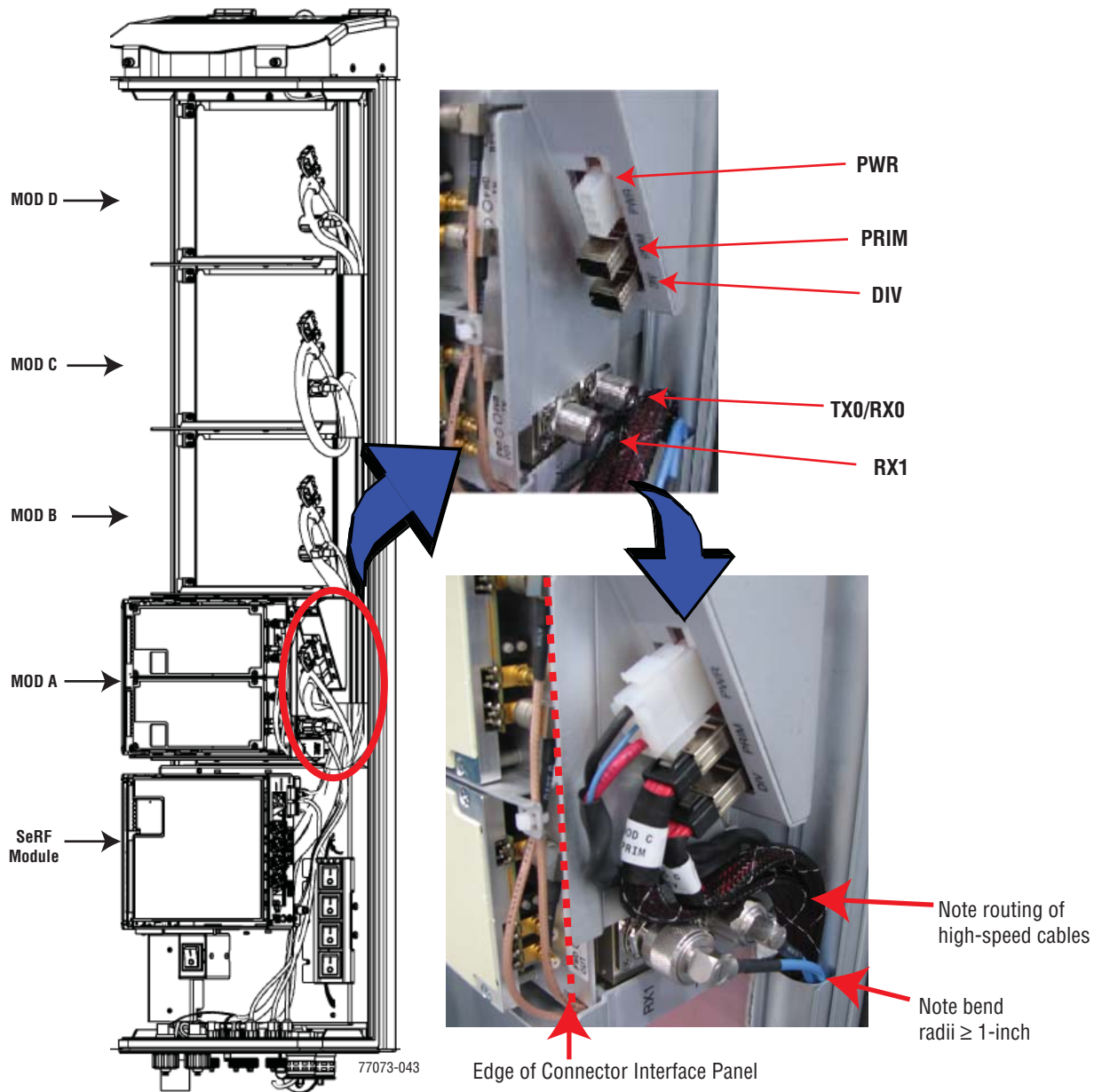
16 Working from the bottom connector up, connect the RF Module cables.

- a** If this is a Diversity chassis, connect the RF Diversity cable labeled **MOD N RX1** to the **RX1** connector and turn the thumbscrew to secure the cable to the chassis.
- b** Connect the RF cable labeled **MOD N TX0/RX0** to the **TX0/RX0** connector and turn the thumbscrew to secure the cable to the chassis.
- c** Connect the **MOD N DIV** high-speed-data cable to the **DIV** connector. This connects the Remote SeRF interface board (RSI) to the Diversity DART.



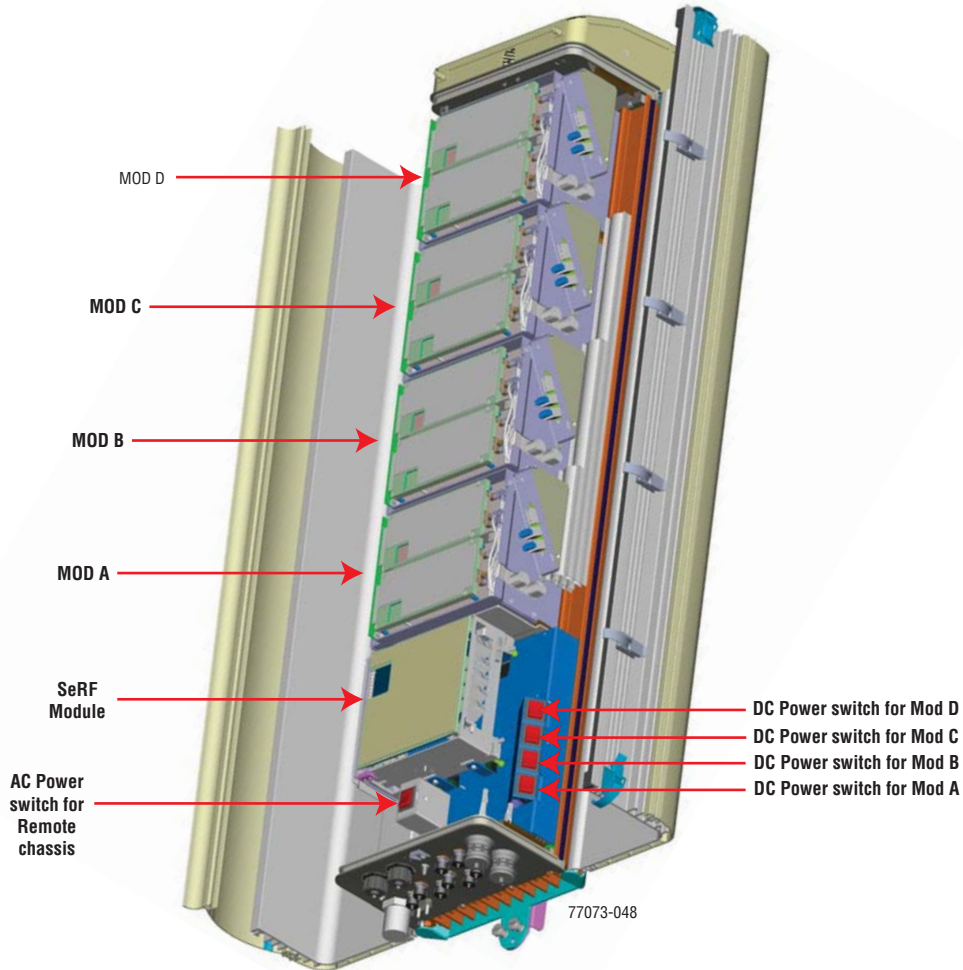
Always connect the Diversity high-speed-data cable, even for non-diversity modules. This prevents the cable from getting caught between the chassis door and the RF Module.

- d** Connect the **MOD N PRIM** high-speed cable to the **PRIM** connector. This connects the RSI to the Primary DART.
- e** Connect the Power cable to the **PWR** connector. This connects the RF Module to the DC power connection.



17 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 door, which can result in damage to the cables.

18 Toggle the Power switch that corresponds to the RF Module to its ON position.



19 Repeat [Step 5](#) through [Step 18](#) to install other RF Modules.

4.4 INSTALL ANY 40W RF MODULE(S)



The 40W RF Modules can only be installed in the top most slots of the Remote:

- Slots A and B for a Dual-Band chassis.
- Slots B and C for a Tri-Band chassis
- Slots C and D for a Quad-Band chassis

The RF Module cables that are preinstalled in the Remote connect to the corresponding connectors on the RF Module. The RF Module cables correlate to the antenna connectors on the bottom of the Remote chassis. The cables and connectors have corresponding labels as shown in Table 4-3. The RF cable and connector labels also correspond to the RF Module slots in the Remote chassis, where MOD A is the bottom shelf and MOD D is the top shelf.

Table 5. RF Antenna Labels for Dual-Slot Installations—From Top of Chassis Down

| RF Module Cable, RF Module Connector, and Remote Antenna Connector Labels ^(a) | Function | Single-Slot Remote RF Module Shelf Designations | Dual-Slot Remote RF Module Shelf Designations | | |
|--|---|---|---|----------|-----------|
| | | | Dual-Band | Tri-Band | Quad-Band |
| Mod D TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module D | MOD D | N/A | N/A | MOD C |
| Mod D RX1 | Diversity receive for RF power from the antenna for RF Module D | | | | |
| Mod C TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module C | MOD C | N/A | MOD B | |
| Mod C RX1 | Diversity receive for RF power from the antenna for RF Module C | | | | |
| Mod B TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module B | MOD B | MOD A | MOD B | |
| Mod B RX1 | Diversity receive for RF power from the antenna for RF Module B | | | | |
| Mod A TX0/RX0 | Transmit RF power and primary receive to/from the antenna for RF Module A | MOD A | MOD A | MOD A | |
| Mod A RX1 | Diversity receive for RF power from the antenna for RF Module A | | | | |

(a) For dual-slot installations, the RF cables and connectors are labeled as **MOD N TX0/RX0** and **MOD N TX1**, where **N** refers to the bottom slot of the double-slot installation. For example, for a dual-slot installation in a Quad-Band chassis, the RF cables and connectors are labeled as **MOD C TX0/RX0** and **MOD C TX1**.

NOTE: In the following steps, the RF cables and connectors are referred to as **MOD N TX0/RX0** and as **MOD N TRX1** where **N** equals A, B, C, or D.

4.4.1 Prepare the Remote and RF Module

- 1 Unpack and inspect the RF Module as described in “Unpack and Inspect the Remote and Components” on page 97.



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. 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 ADC for assistance (see “Contacting ADC” on page 335 for contact information).



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

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

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

Thermal pads are located as follows:

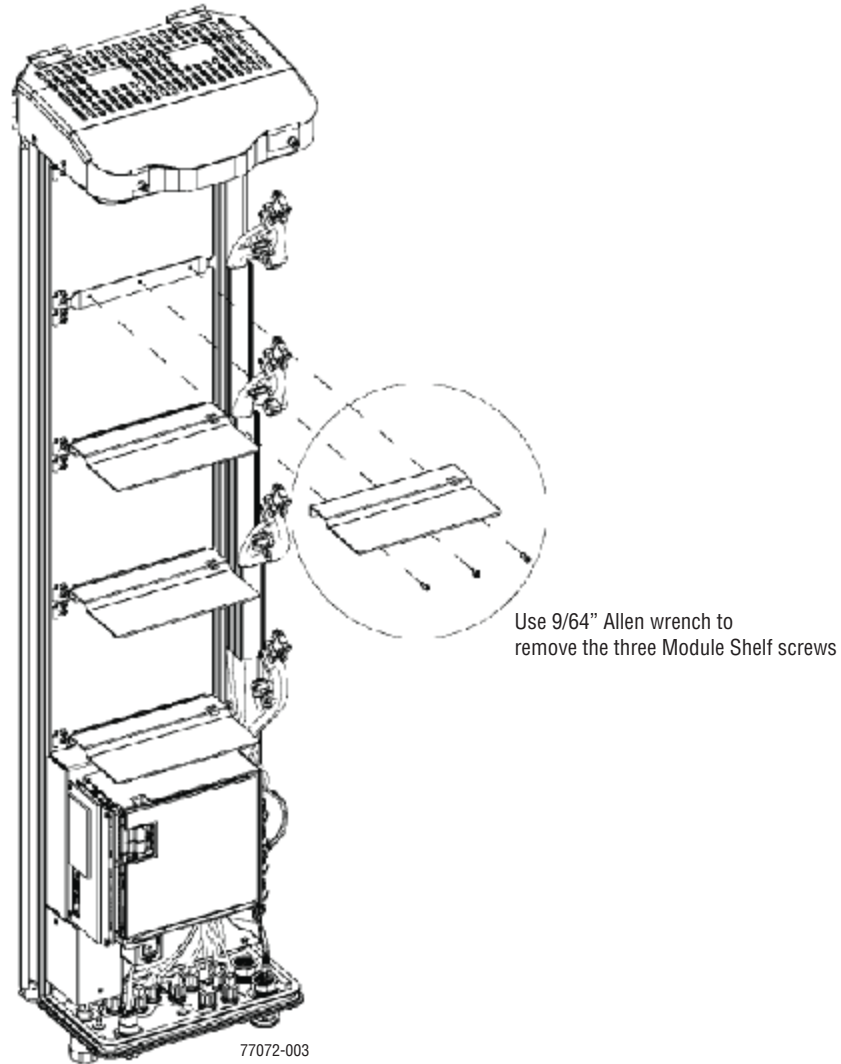
- one large pad on the back surface (LPA)
- up to two on the front surface (DARTs)
- one on the left side for the (RDI).

4.4.2 Remove Module Shelf(s)

The module shelf for the upper module as defined in Table 4-3 on page 98 must be removed prior to installation of the dual-slot module:

- Module D Shelf for a Quad-Band chassis
- Module C Shelf for a Tri-Band chassis
- Module B Shelf for a Dual-Band chassis

- 4** Remove the module shelf:
 - a** Use a 9/64" Allen™ wrench to remove the three screws that attach the module shelf to the Remote chassis, as shown in the following graphic.
 - b** Discard or store the module shelf and fasteners.



4.4.3 Install the 40W RF Module

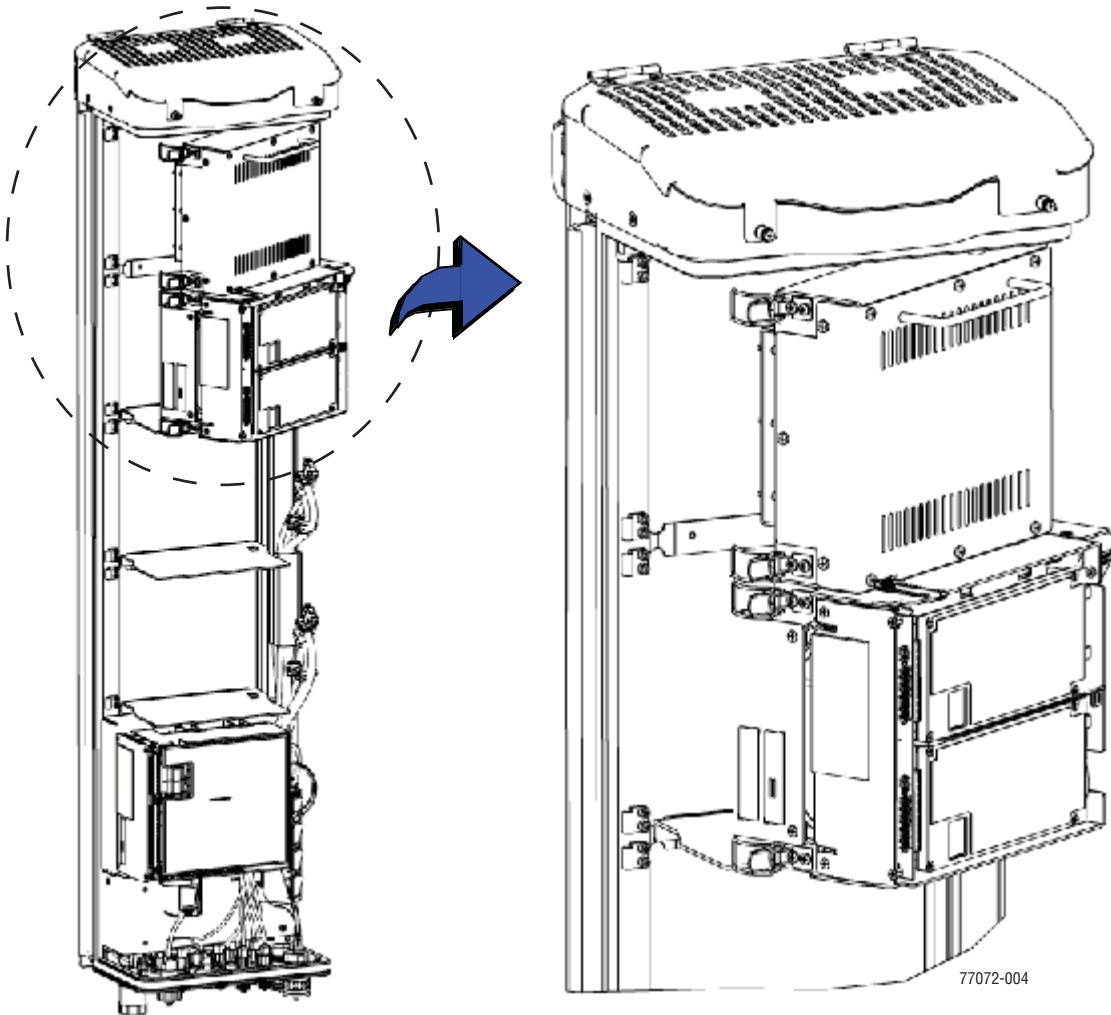
- 1 Hold the RF Module so that the DART card(s) face away from the Remote and the Mounting Hook is toward the Receiving flange on the Remote chassis.



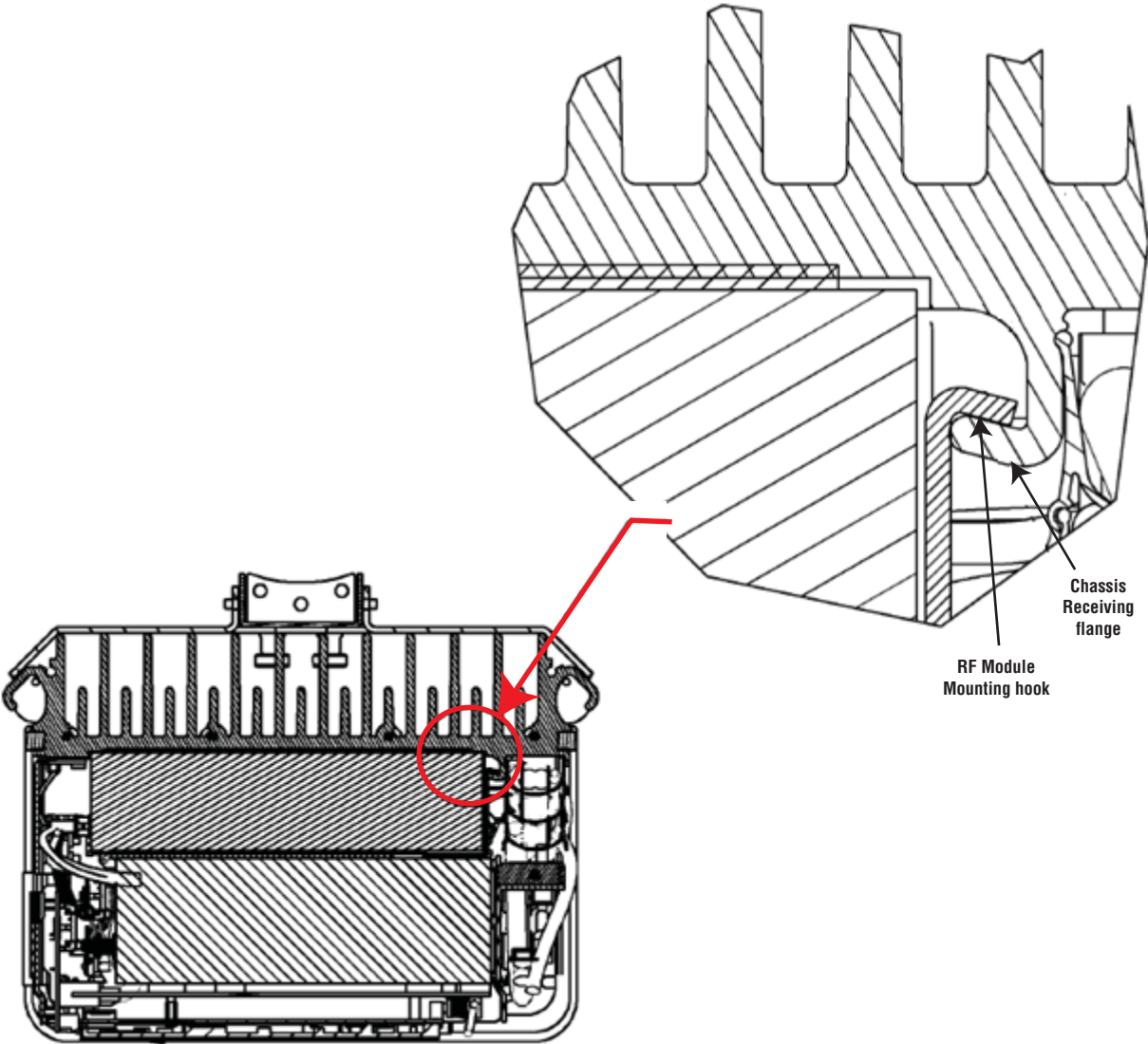
Always install RF Modules from the bottom up and do not skip a shelf.

- 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 below:

Installing a dual-slot RF Module



- 3 Aligning the mounting hook on the module with the receiving flange on the Remote heat sink, and slide the RF Module in toward the flange until it can go no further.



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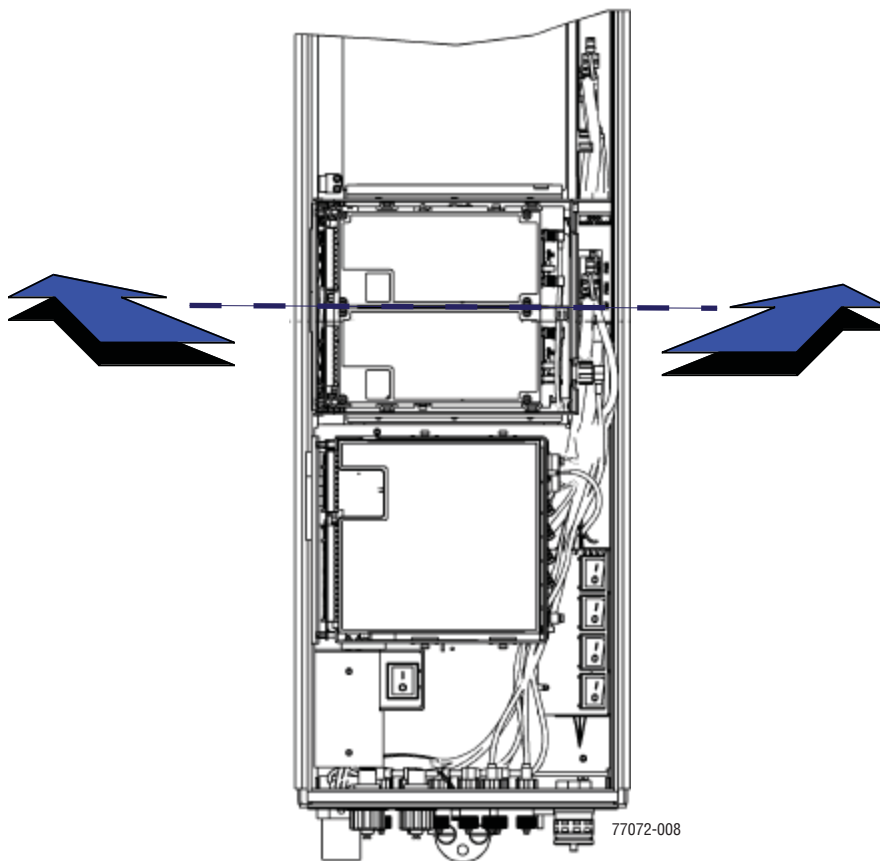
- 4 Push the left edge of the RF Module back and into the Remote chassis until it can go no further.



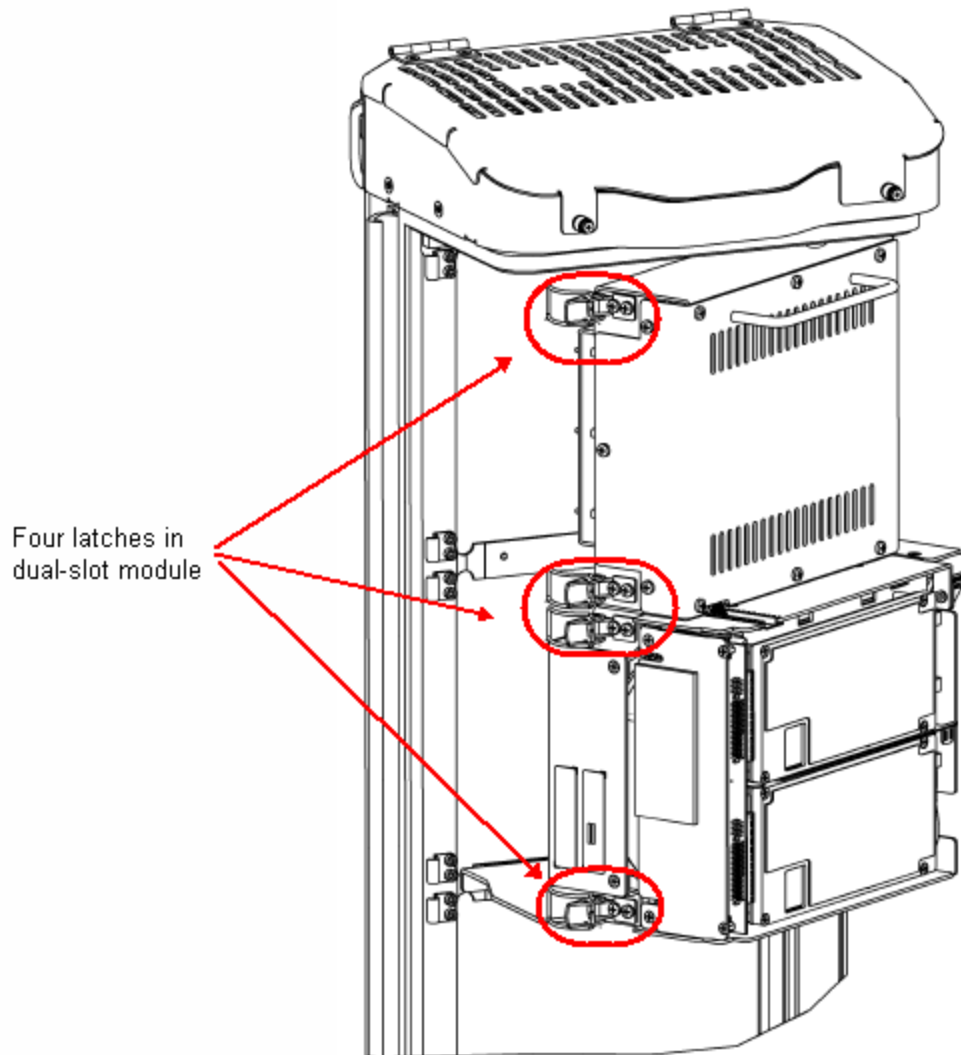
Make sure the RF Module is seated correctly in the Module shelf. Incorrect alignment of the RF Module can cause the RF Module to fail due to over heating.

- 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 chassis.
- If you later cannot shut the Remote door, verify that the RF Module is installed correctly.

In Steps 9 and 10, you engaged the right side of the RF Module with the Remote chassis.
In Step 11, you set the left edge of the RF Module into the Remote chassis.
By the end of Step 11, the front edge of the RF Module should be parallel with the shelf above it.
Now in Step 12, you are pushing the RF Module back into the chassis until it can go no further.



- 5 Secure the four module latches on the left side of the RF Module.



- 6 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 [Step 9 on page 100](#) through [Step 12](#).
- 7 Position the cables so that are under the right edge of the RF Module, pointing up.

- 8** Follow these rules when connecting the RF Module cables:
- At each RF Module shelf, the Power (PWR) cable and two high-speed-data cables will always be provided.
 - If you are installing a module into a Non-Diversity Chassis, only one RF cable labeled **MOD N TX0/RX0** will be populated.
 - High-speed data cables labeled **PRIM** and **DIV** should always either be connected or strain relieved to adjacent cables. This protects against the cable getting caught in the chassis door.
 - If you order a Non-Diversity RF Module and are installing it in a Diversity chassis, connect it as if it was being installed into a Non-Diversity chassis.
 - Connect both high-speed data cables (**PRIM** and **DIV**) and the **RF TX0/RX0** cable.
 - Adhere to a minimum bend radius of 1" for all RF cables from the integrated cable guide to the module.
 - Maintain adequate strain relief distances from connection points to the module.
 - When installing dual-slot RF modules:
 - The upper RF Module shelf will either not be present (factory installed module) or will be removed prior to installation (field installed module).
 - For dual-slot modules, only the RF cable labeled **MOD N TX0/RX0** on the lower module slot will be connected to the module connector **TX0/RX0**.
 - The **MOD N RX1** cable should be secured to the cable bundle using the provided cable tie.
 - Ensure that the **MOD N RX1** cable and connector are secured so that they will not be pinched or prevent the Remote door from closing.
 - The Power (PWR) cable and two high-speed-data cables of the upper RF Module slot will not be used. Connect the RF cable labeled **MOD N RX1** to the connector labeled **N/C** on the upper half of the double-slot module. Use one of the provided cable ties to secure the **MOD N TX0/RX0** RF cable, both high-speed data cables and the Power (PWR) cable to the RF cable labeled **MOD N RX1**, ensuring that the cable bundle will not be pinched or prevent the Remote door from closing.

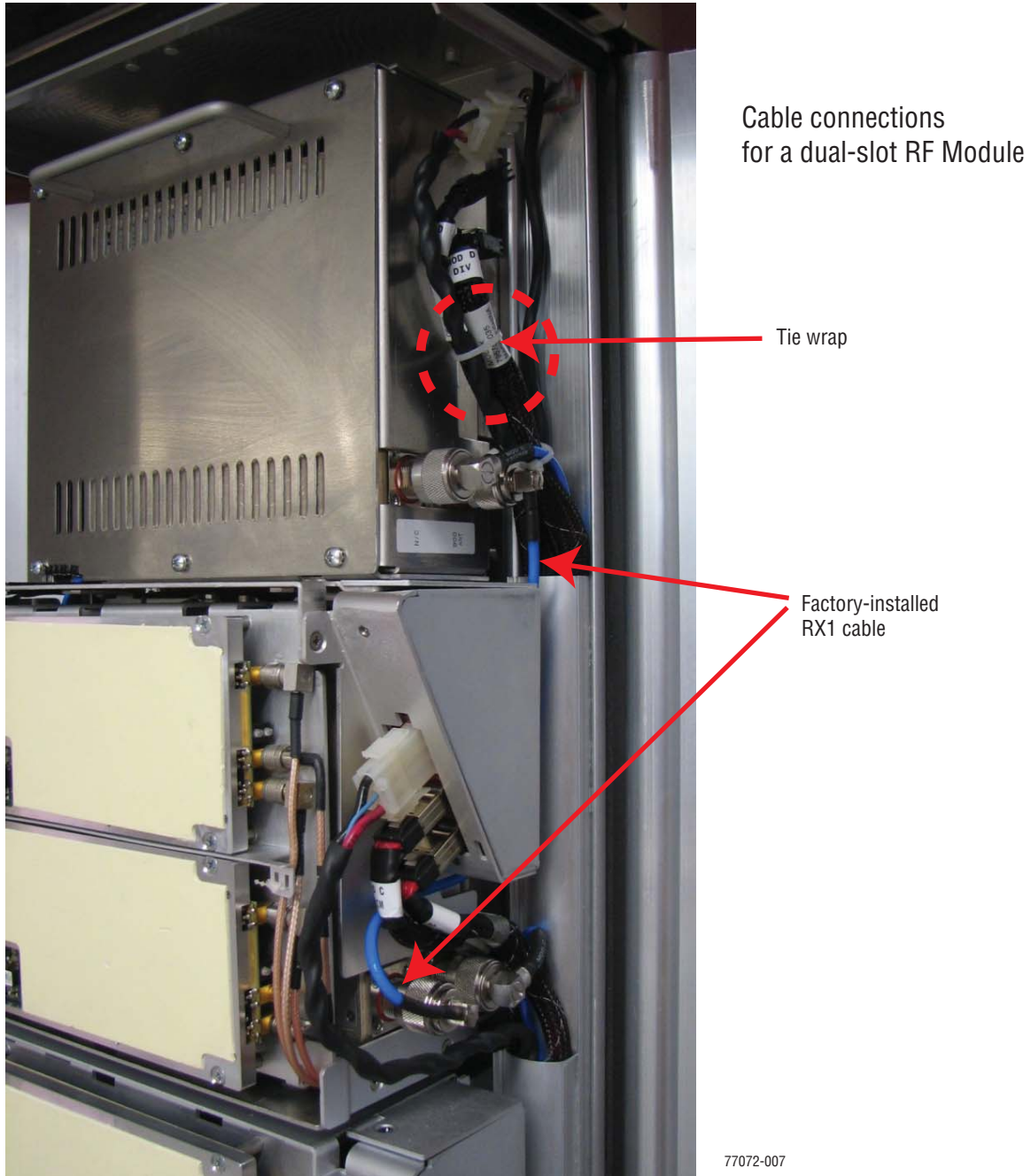
- 9 Working from the bottom connector up, connect the RF Module cables.
- a Connect the RF cable labeled **MOD N TX0/RX0** to the **TX0/RX0** connector and turn the thumbscrew to secure the cable to the chassis.



Always connect the Diversity high-speed-data cable, even for non-diversity modules. This prevents the cable from getting caught between the chassis door and the RF Module.

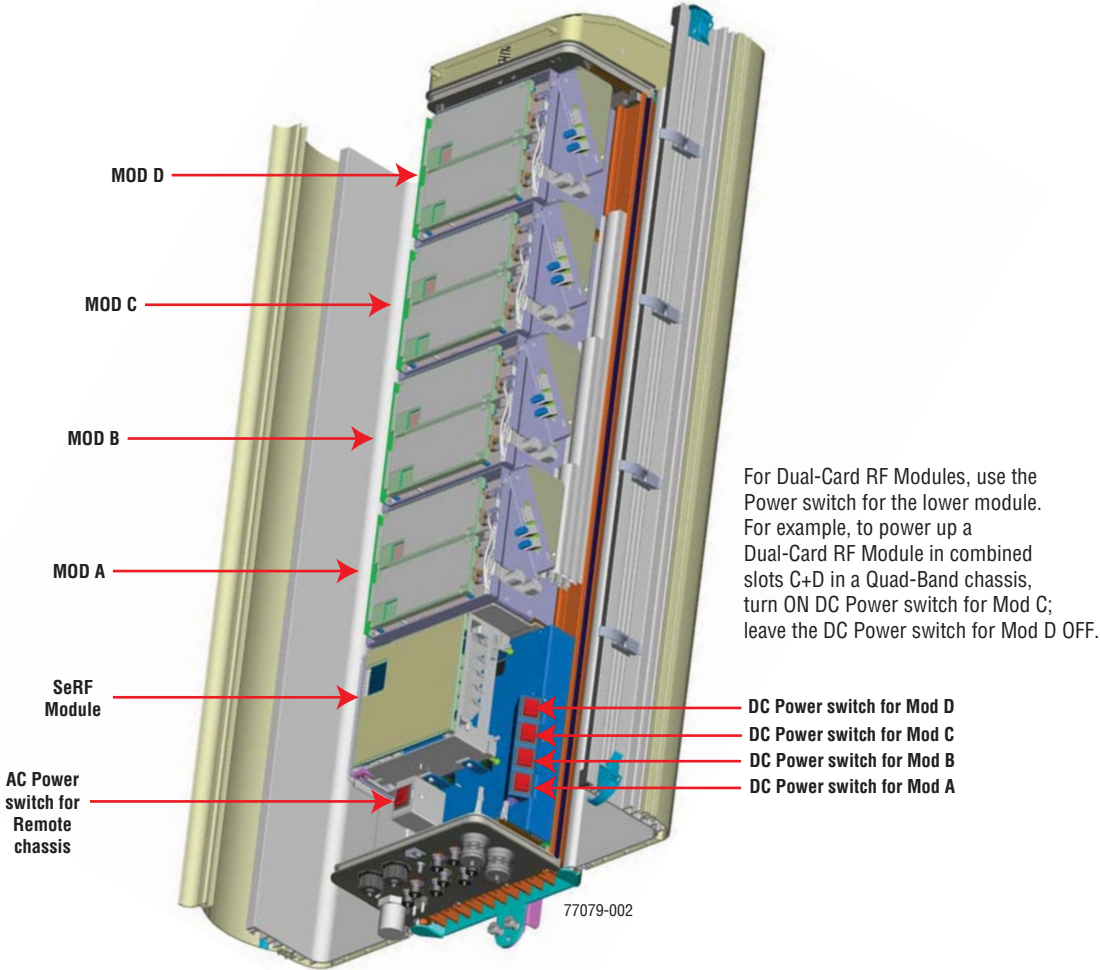
- b Connect the **MOD N PRIM** high-speed cable to the **PRIM** connector. This connects the RSI to the Primary DART.
- c Connect the Power cable to the **PWR** connector. This connects the RF Module to the DC power connection.
- d The Power (PWR) cable and two high-speed-data cables of the upper RF Module shelf are not be used in a dual-slot installation. Connect the RF cable labeled **MOD N RX1** of the upper RF Module shelf to the connector labeled **N/C** on the upper half of the dual-slot module. Use one of the provided cable ties to secure the **MOD N TX0/RX0** RF cable, both high-speed data cables and the Power (PWR) cable to the RF cable labeled **MOD N RX1**, ensuring that the cable bundle will not be pinched or prevent the Remote door from closing.

The following graphic shows cable connections for a dual-slot RF Module.



- 10** 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 door, which can result in damage to the cables.

11 Toggle the Power switch that corresponds to the RF Module to its ON position.



4.4.4 Ground Wire Installation

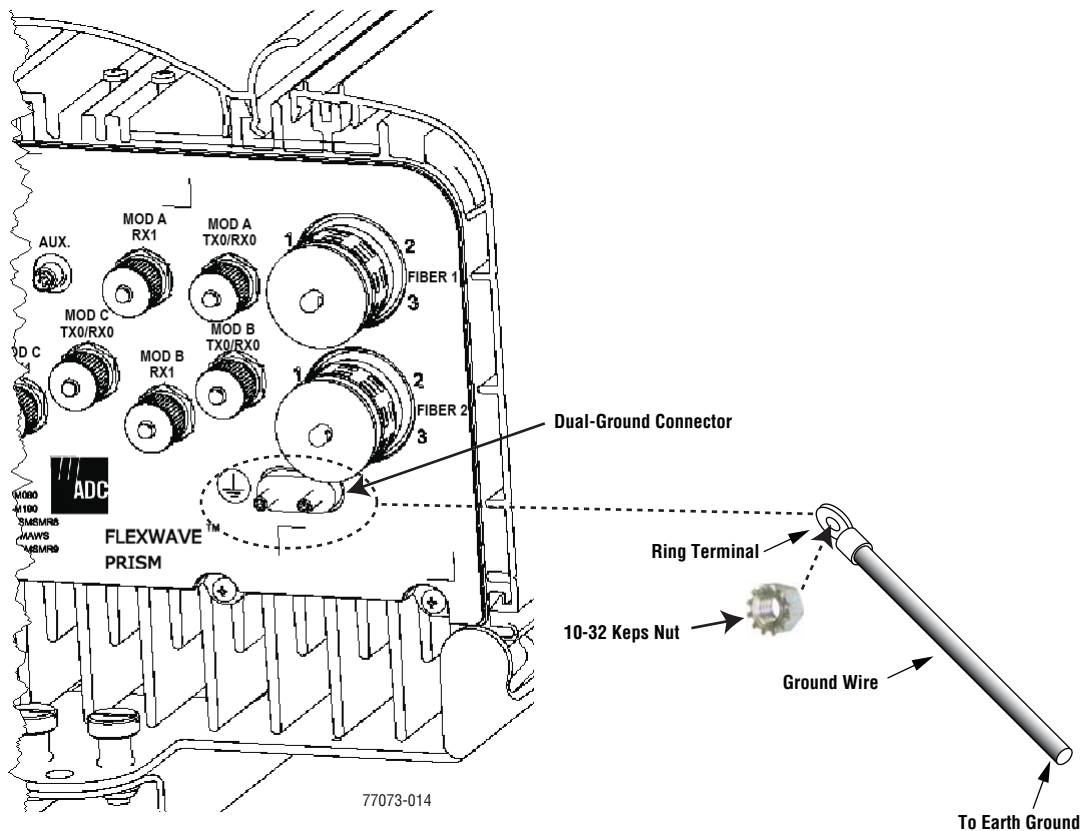


Avoid sharp bends in the ground wire.



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

- 12 Locate a #6 AWG (4 mm) copper grounding wire long enough to reach an approved earth ground.
- 13 Use a socket wrench with a 3/8-inch deep socket to remove the two 10-32 Keps Nuts from the Remote's Dual-Ground connector.
- 14 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 13](#), and then torque the nuts to 18 in-lbs \pm 1 in-lb.
- 15 Route the free end of the grounding wire to an approved earth ground source.
- 16 Cut the ground wire to length and connect it to the earth ground source as specified by local code or practice.



Partial Bottom View

4.4.5 Network Cable Installation

The Remote provides a Network port allowing communications with the internal processor and transfer of service data to the optical protocol allowing IP servicing between the Host and Remote(s). 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.

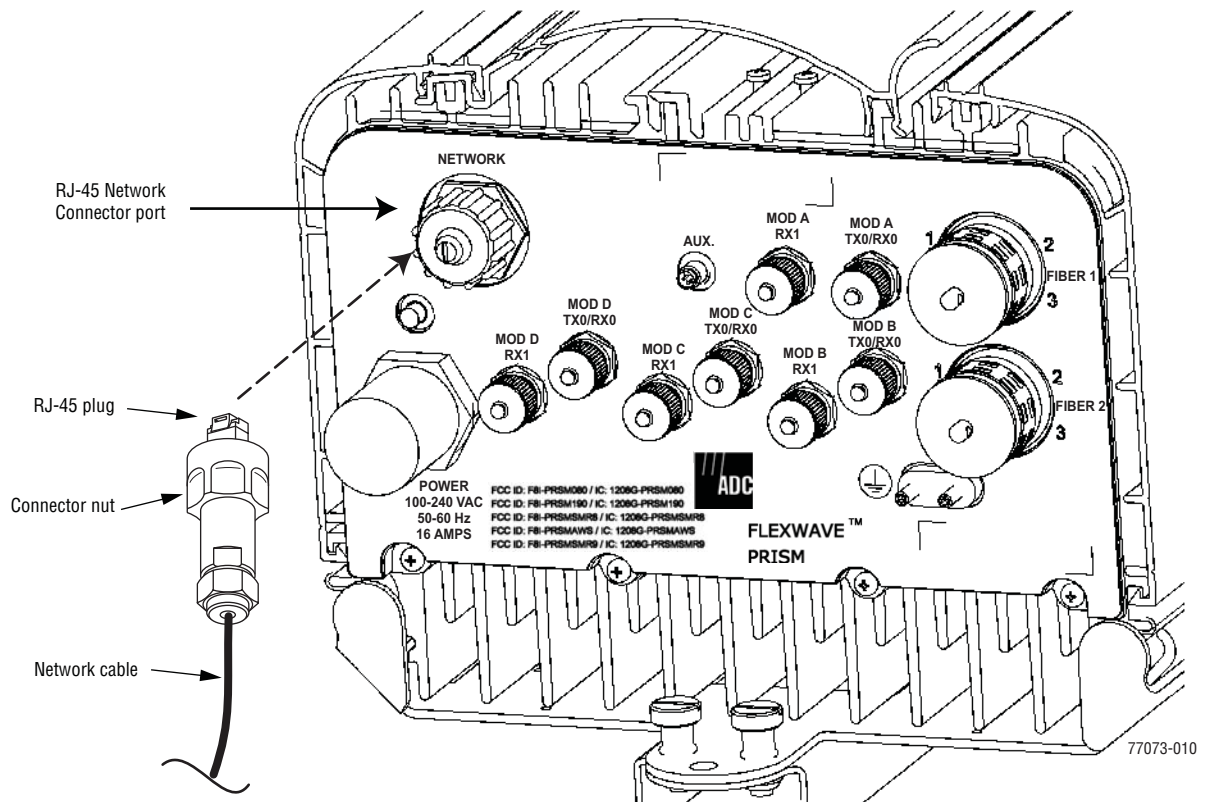


Although the interface might provide GigE, only 100 Mbps is provided for bandwidth between the Host and Remote.

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

Use the following procedure to install the Network cable:

- 17 Remove the dust cap from the RJ-45 connector located at the bottom of the Remote.



Bottom View

- 18 Route the network cable from the network connection to the underside of the Remote.
- 19 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.

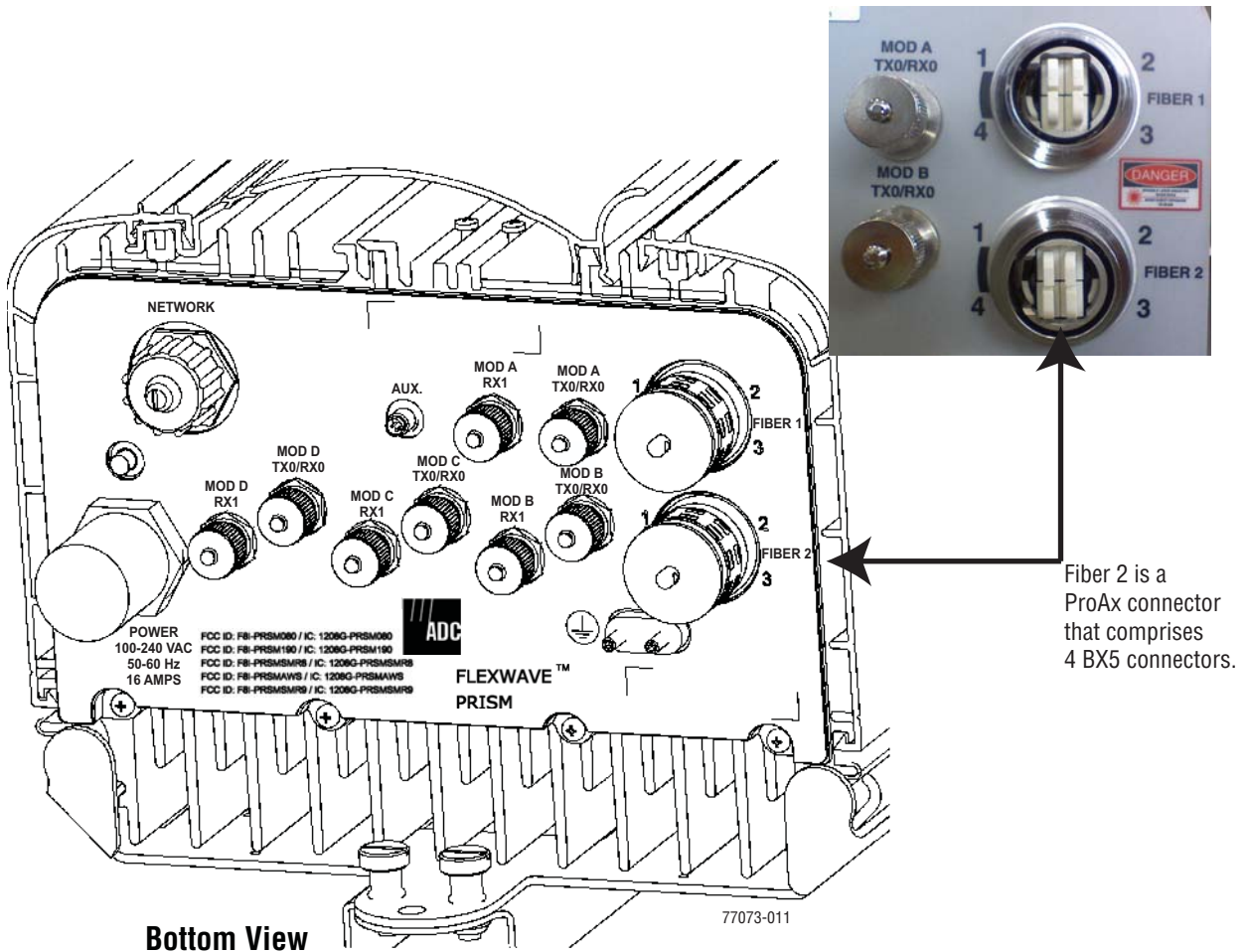
- 20 Slide the connector nut up to the port until it engages the connector locking mechanism.
- 21 Tighten the connector nut in a clockwise direction (if necessary, use a wrench or pliers to grip the connector nut) until it snaps past the indented position and locks into place. It may be necessary to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

4.4.6 Quad Fiber Cable Installation

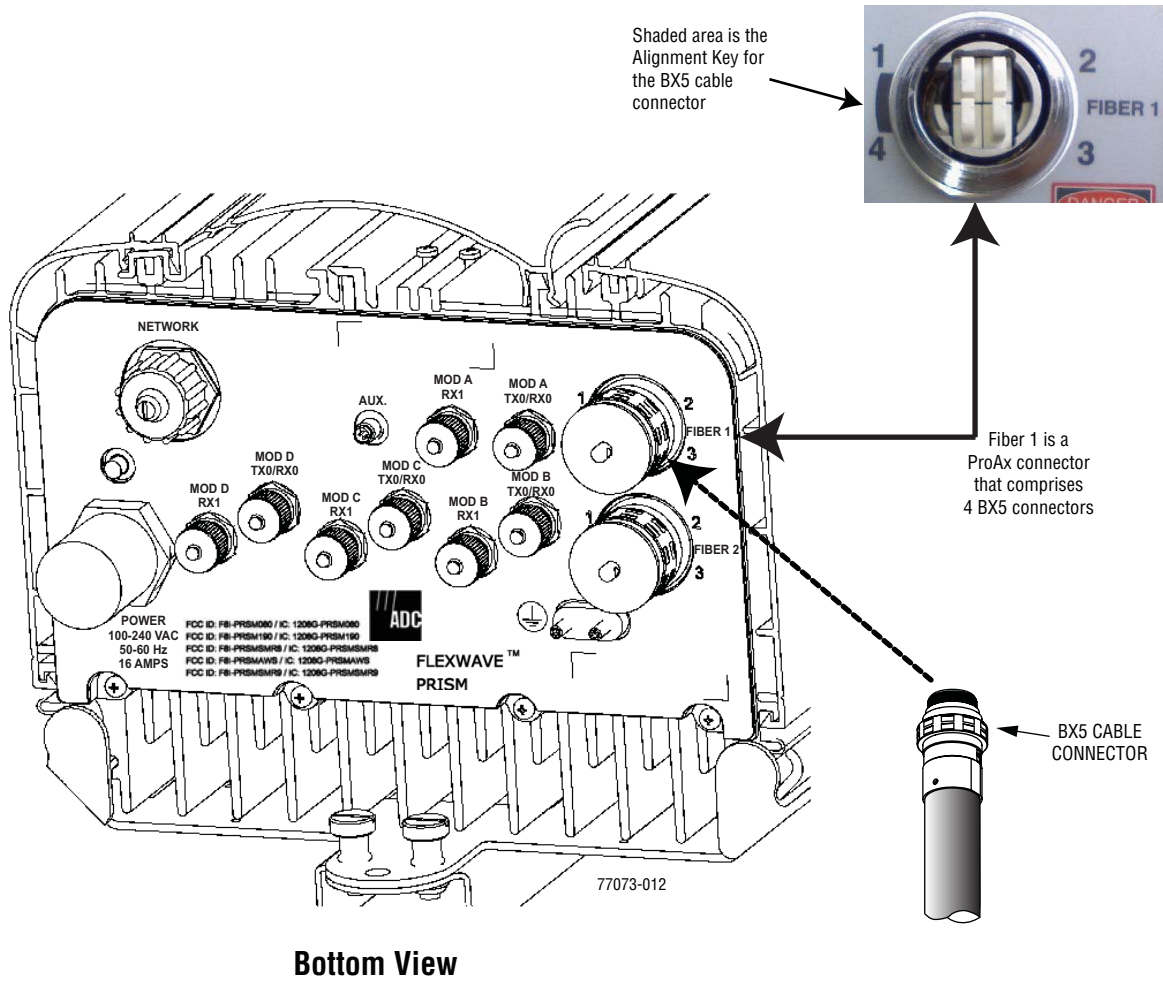
The Prism Remote ships with 10 meters of environmentally hardened cable with 1 meter of exposed, un-terminated single-mode 900µm optical fiber sufficient for splicing in an Outside Plant (OSP) splice tray. The fiber cable connector is a BX5 4-port fiber connector.

Use the following procedure to install the fiber cables:

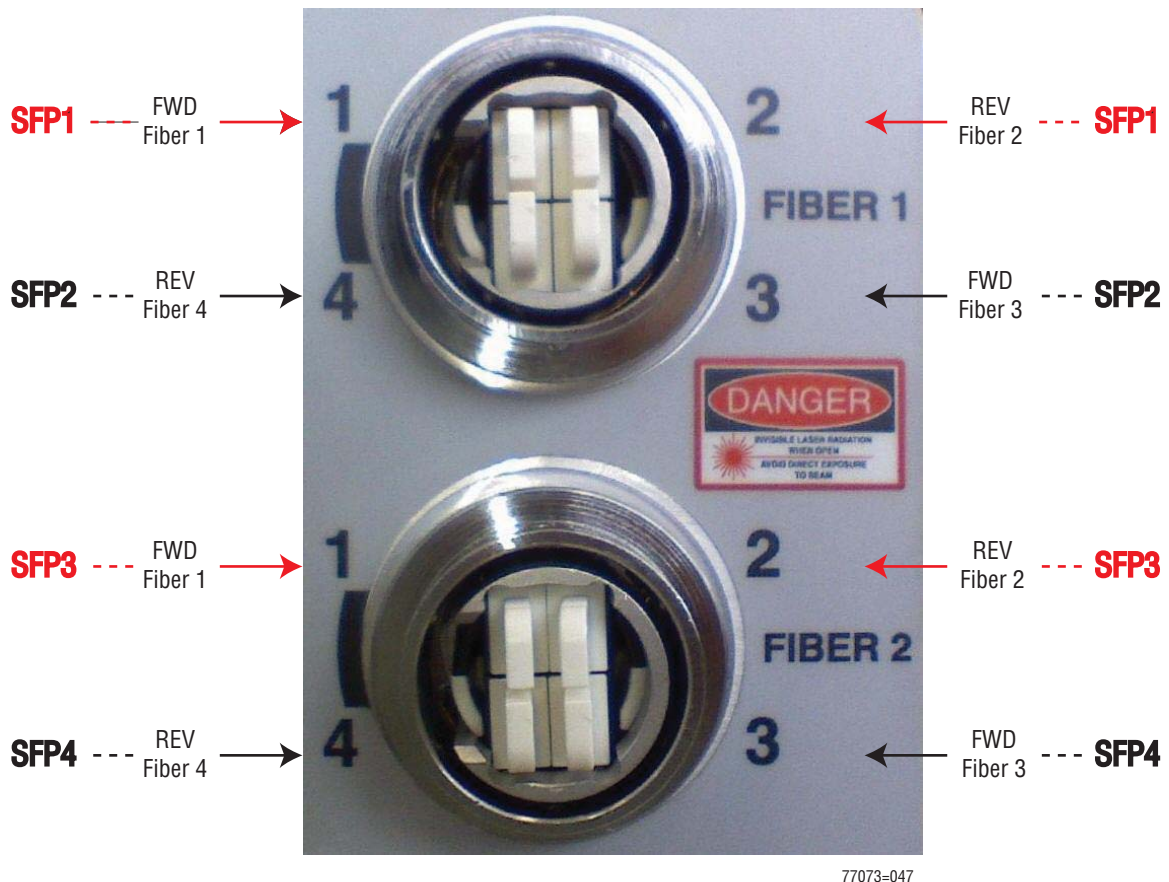
- 22 Remove ProAx connector dust cover located at the bottom of the Remote.



- 23 Remove the dust cap from the fiber cable BX5 connector (FIBER 1).
- 24 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.



- 25 Route the fiber cable from the underside of the Remote 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.



- 26 Secure fiber cable in place following local practices.
- 27 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 22](#) through [Step 26](#) to add the second fiber cable assembly, only this time, connect to the Fiber 2 ProAx connector located at the bottom of the Remote as shown in [Step 22](#).

4.4.7 Antenna Cable Installation

Coaxial antenna cables must be routed from the antenna to the Prism Remote. The cables must be terminated with an N-Type male connector for connection to the Remote antenna port or the lightning surge suppressor (accessory).



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

Refer to [Table 4-1](#) for the relationship between antenna numbers and Remote RF modules.

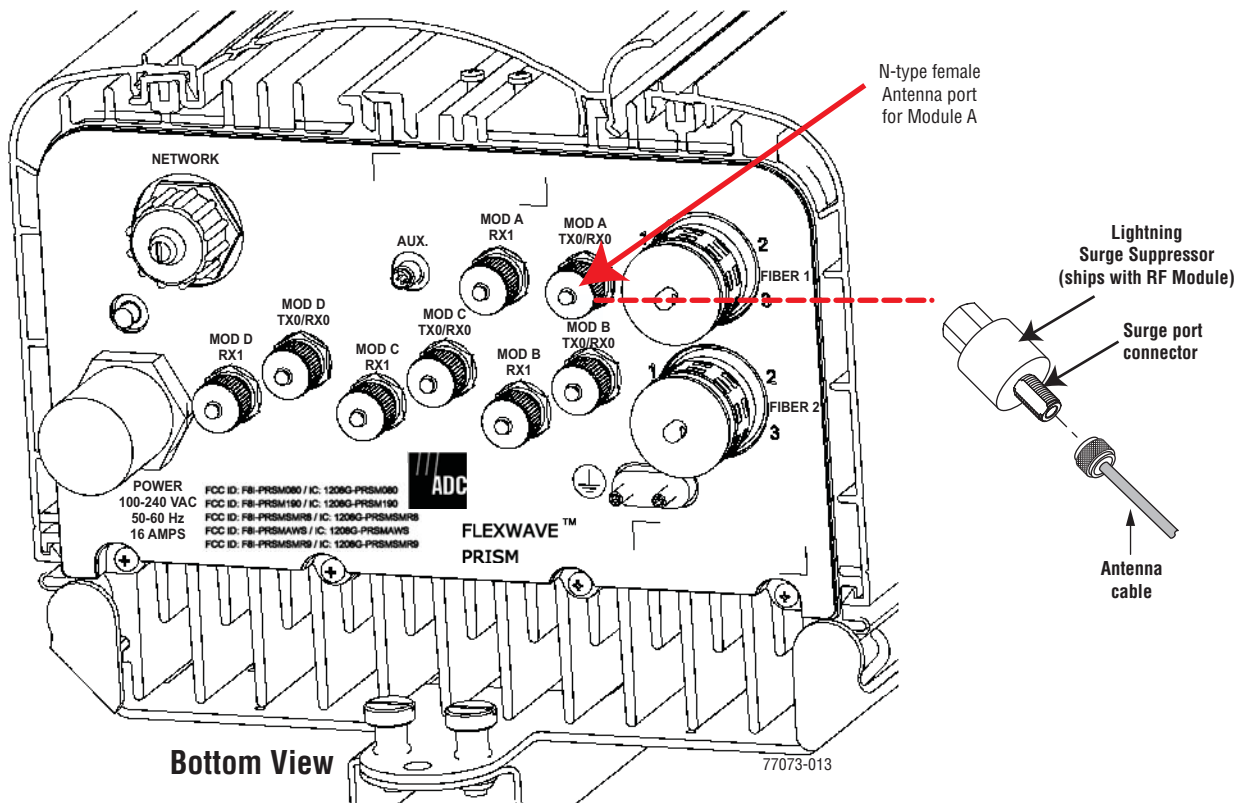
Table 4-1. Antenna Connectors

| Antenna Connector Label | RF Module | Function of Connection Point |
|----------------------------|-------------|---|
| Mod A TX0/RX0 ² | RF Module A | Transmit RF power and primary receive to/from the antenna |
| Mod A RX1 | RF Module A | Diversity receive for RF power from the antenna |
| Mod B TX0/RX0 | RF Module B | Transmit RF power and primary receive to/from the antenna |
| Mod B RX1 | RF Module B | Diversity receive for RF power from the antenna |
| Mod C TX0/RX0 | RF Module C | Transmit RF power and primary receive to/from the antenna |
| Mod C RX1 | RF Module C | Diversity receive for RF power from the antenna |
| Mod D TX0/RX0 | RF Module D | Transmit RF power and primary receive to/from the antenna |
| Mod D RX1 | RF Module D | Diversity receive for RF power from the antenna |

² Mod A/RF Module A is the bottommost Module in a Remote and Mod D/RF Module D is the topmost module in a Quad-Band Remote.

Use the following procedure to install the antenna cable(s):

- 28 Remove the dust cap from the N-type female connector located on the underside of the unit as shown below.



- 29 If specified, connect a lightning surge suppressor (accessory) to the antenna port.
- 30 Connect a ground wire to the lightning surge suppressor. Connect the ground wire to an approved earth ground.
- 31 Route the coaxial antenna cable from the antenna to the underside of the Remote.
- 32 Cut the antenna cable to the required length and terminate with an N-type male connector.
- 33 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.

- 34 Repeat the [Step 28](#) through [Step 33](#) for the remaining antenna cables.

4.4.8 AC Power Wiring Installation

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.

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.



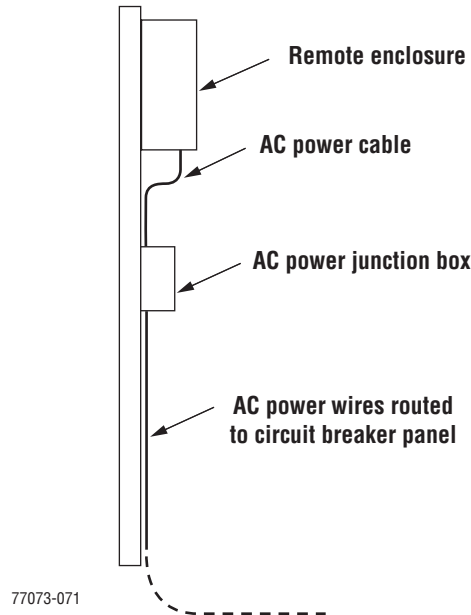
Use extreme caution when working with high voltage AC power. Ensure all power is disconnected before working on power circuits.



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 ADC Technical Assistance Center (see [“Contacting ADC” on page 335](#)).

Use the following procedure to install the AC power wiring:

- 35 Locate the AC power cable that is provided separately with the Remote.
- 36 Route the power cable between the AC power port, located on the underside of the Remote and the nearest AC power junction box as shown below. It may be necessary to install a new junction box if an existing junction box is not available.



- 37 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.

- 38 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 Remote 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.

- 39 Connect the AC power cable wires to the AC power supply wires. Refer to the following graphic to identify the color code and wire designations.

120 VAC CONNECTIONS

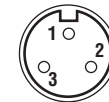


240 VAC CONNECTIONS



Connector Pin Designations

- Pin 1 - Green/Yellow
- Pin 2 - White
- Pin 3 - Black



End view of connector

- 40 At the AC box, connect the AC power supply load wires to a circuit breaker or fuse.



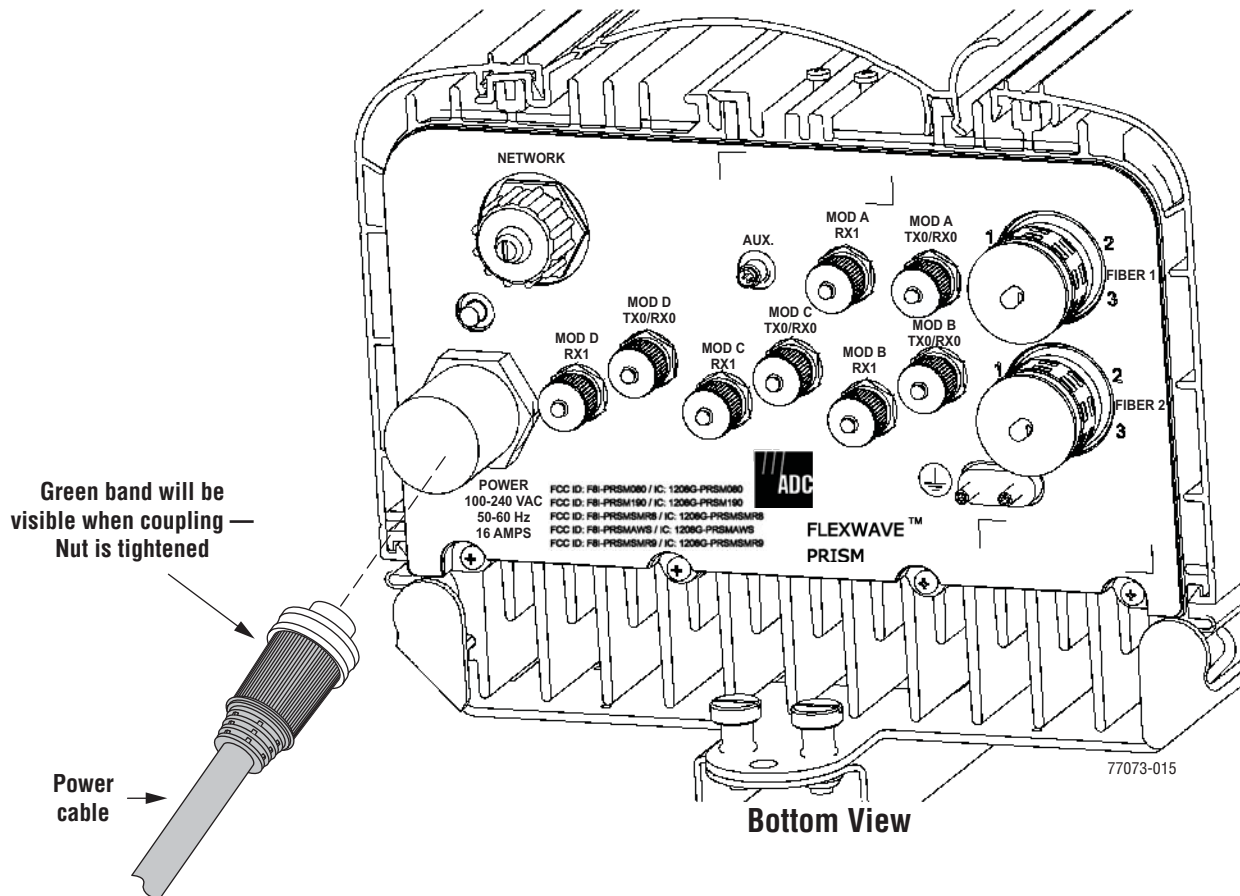
For proper and safe equipment operation, an approved earth ground connection must be provided and maintained.

- 41 Connect the ground wire to an approved earth ground.
- 42 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.
- 43 When testing is complete, place the circuit breaker in the OFF position.

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



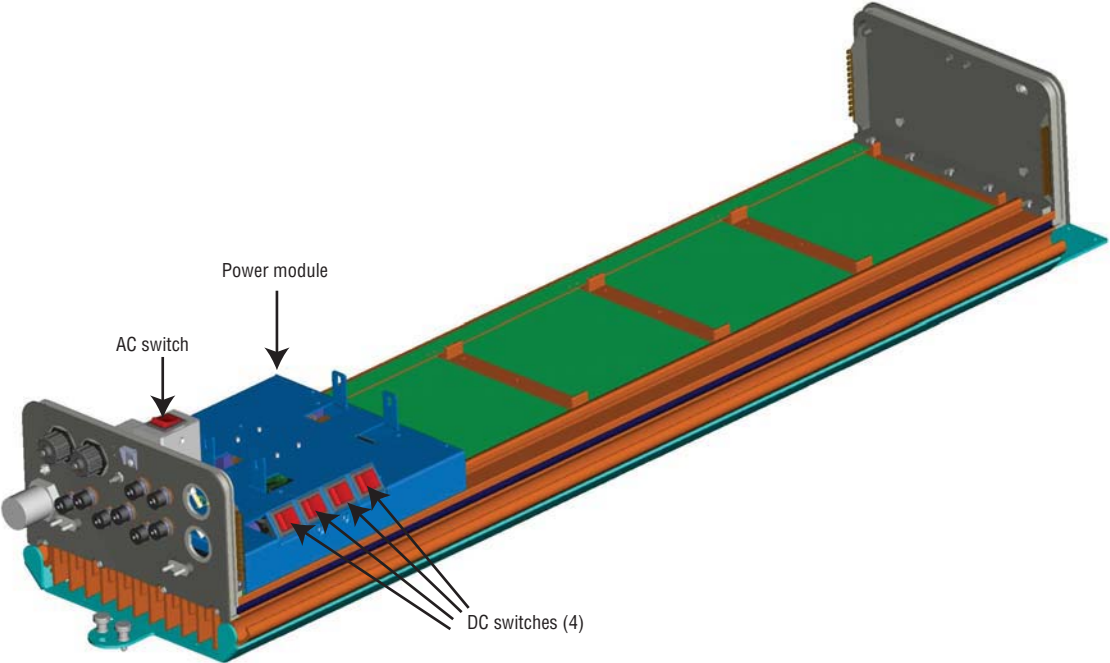
While trying to connect the AC power cable to the Remote AC power port, it is possible for the line terminal on the cable connector to contact the ground pin on the power port. If the AC cable is energized, this will result in a direct short to ground for the AC power. To avoid possible personal injury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



- 45 Connect the power cable connector to the AC power port.
- 46 Tighten coupling nut until the green band at the top of the connector body is visible.

4.4.9 Determine the Circuit Breaker or Fuse for Remote

The Prism Remote supports power input from a 90 to 240 VAC power supply as shown below.



4.4.9.1 Power Consumption

Do the following to determine the maximum power consumption, which determines the circuit breaker or fuse to use.

47 Review the Remote order to determine the information listed below and then use this information to find the power consumption from [Table 4-2](#) and [Table 4-3](#):

- RF bandwidth?
- DART type (Classic, Single SuperDART or Dual SuperDART)
- Diversity or Non-Diversity?

- 48 Enter the power consumption in the spaces provided below.
- 49 For the total RF Module power consumption, calculate the power consumption from [Table 4-3 on page 131](#) for each RF Module present in the Remote (RF Module A - D), add the Watts, and then enter the total in the Total Power Consumption field.

| | |
|--|------------------------|
| SeRF Module power consumption from Table 4-2 | _____Watts |
| Additional SFPs _____ x 1.25W | _____Watts |
| RF Module A power consumption from Table 4-3 | _____Watts |
| RF Module B power consumption from Table 4-3 | _____Watts |
| RF Module C power consumption from Table 4-3 | _____Watts |
| RF Module D power consumption from Table 4-3 | _____Watts |
| TOTAL POWER CONSUMPTION | <hr/> <hr/> _____Watts |

- 50 Divide the total Watts by the input Voltage to determine the current (Amperes) requirements.

$$\frac{\text{Watts}}{\text{Volts}} = \text{Amps}$$

- 51 Determine the circuit breaker or fuse size based on local codes and practices. Circuit breaker or fuse size must be 20 Amps or less.

4.4.9.2 Power Consumption Tables

Table 4-2. SeRF Module Power Consumption

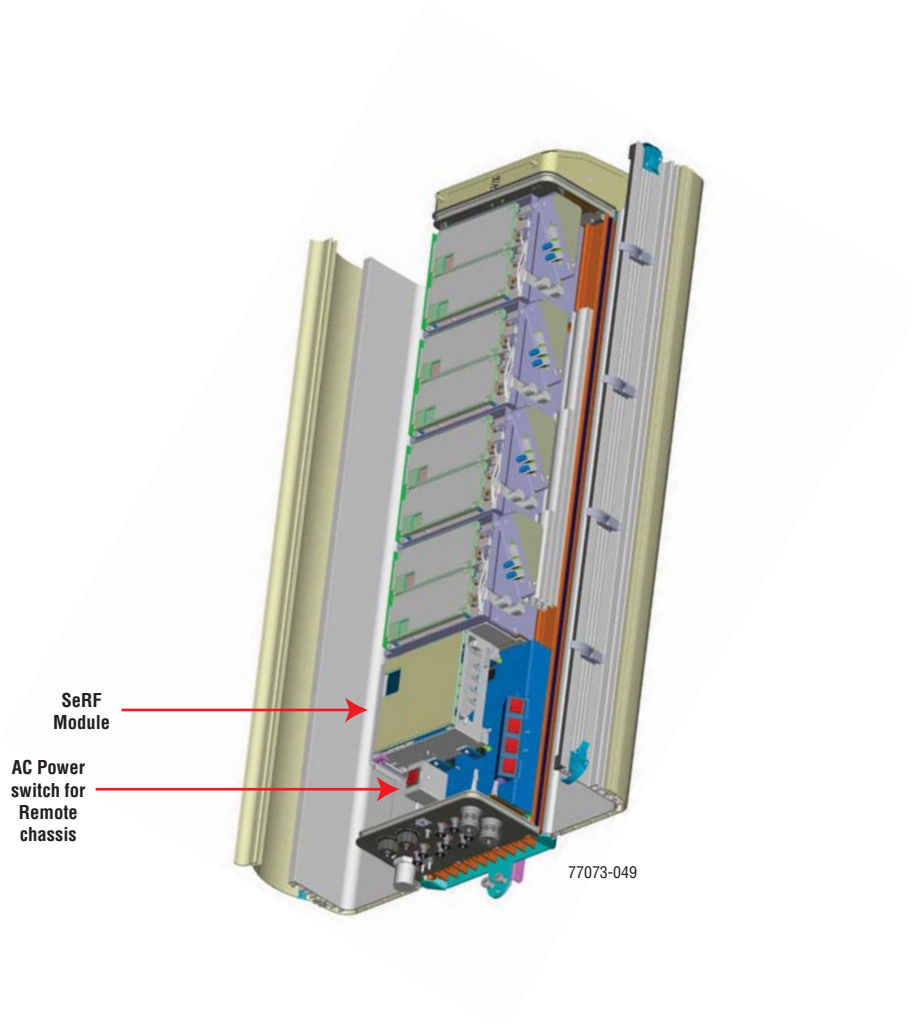
| SeRF Module | Power Consumption per Module | |
|---|------------------------------|-------------|
| | Nominal (W) @ 25C | Maximum (W) |
| SeRF Module (1 SFP) [add 1.25W for each SFP added] | 36 | 38 |

Table 4-3. RF Module Power Consumption

| Prism RF Module Description | | | Power Consumption per Module | |
|------------------------------------|------------------------|---------------|------------------------------|-------------|
| | | | Nominal (W)@ 25C | Maximum (W) |
| Single or Dual SuperDART RF Module | 10W GSM900 | Non-Diversity | 299 | 337 |
| | | Diversity | 321 | 359 |
| | 15.8W GSM1800 | Non-Diversity | 299 | 337 |
| | 15.8W UMTS | Non-Diversity | 285 | 350 |
| | 20W PCS or 20W AWS | Non-Diversity | 299 | 368 |
| Classic DART RF Module | 20W PCS or 20W AWS | Non-Diversity | 292 | 358 |
| | | Diversity | 314 | 381 |
| | 6.5W CELL or 6.5W ESMR | Non-Diversity | 195 | 196 |
| | | Diversity | 218 | 220 |
| | 20W CELL | Non-Diversity | 271 | 327 |
| | | Diversity | 293 | 350 |

4.4.10 Mount the Remote and Power Up

- 52 Refer to the detailed instructions for mounting the FlexWave Prism Remote in the *Remote Unit Mounting Kit Installation Instructions* (ADCP-77-077) to mount the Remote in the location selected in [Section 4.2, Remote Mounting Plans](#), on page 96.
- 53 Power up the Remote by turning its AC power switch to On.



- 54 Close and tightly secure the Remote door and Solar Shield.

PART III

SYSTEM SETUP AND MANAGEMENT

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5

FLEXWAVE ELEMENT MANAGEMENT SYSTEM

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|---------------------------------------|-------------|
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| 5.2 EMS Graphical User Interface..... | 138 |
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| 5.4 EMS Menu Bar | 140 |
| 5.5 EMS Alarm Indications | 141 |
| 5.6 EMS System Requirements | 142 |

This chapter introduces the ADC FlexWave Prism Element Management System (EMS).

5.1 FLEXWAVE EMS OVERVIEW

The ADC FlexWave EMS is an embedded software application that is accessed through an internet connection using a Web browser and provides a Graphical User Interface (GUI) for control and monitoring of a Prism system.

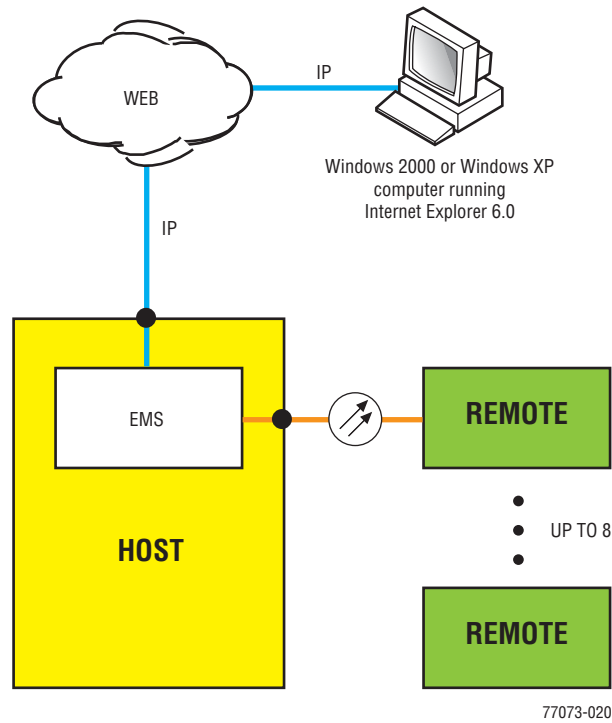
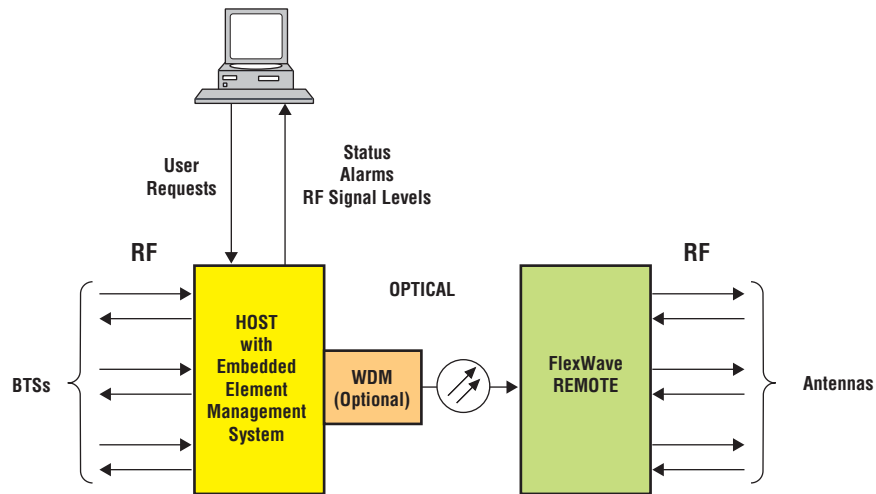


Figure 5-1. Typical FlexWave Prism System

As shown in [Figure 5-2](#), you access the embedded EMS through the Host, where RF signals are converted to optical signals for distribution to the local coverage area. The EMS is thus in a position to monitor both types of signals, and to report status, alarms, and RF signal levels through automatic, periodic updates and in response to user requests. User requests can include commands to set RF gain and propagation delay.



77073-021

Figure 5-2. The Function of the EMS

5.2 EMS GRAPHICAL USER INTERFACE

Before you start using the EMS, familiarize yourself with its components.

You use a Web browser to access the EMS Graphical User Interface (GUI). A typical display consists of the two frames shown in [Figure 5-3](#).

- Function Explorer Tree—appears in the left frame. Click on a node to open the corresponding screen.
- EMS View Frame—appears in the right frame. A typical page contains alarm indicators, lists of parameter values, and tools such as lists and text boxes that allow you to set parameter values.

The EMS View Frame includes the EMS Menu bar, which provides access to EMS configuration or summary windows. For further information on the EMS Menu bar, see “[EMS Menu Bar](#)” on page 140.

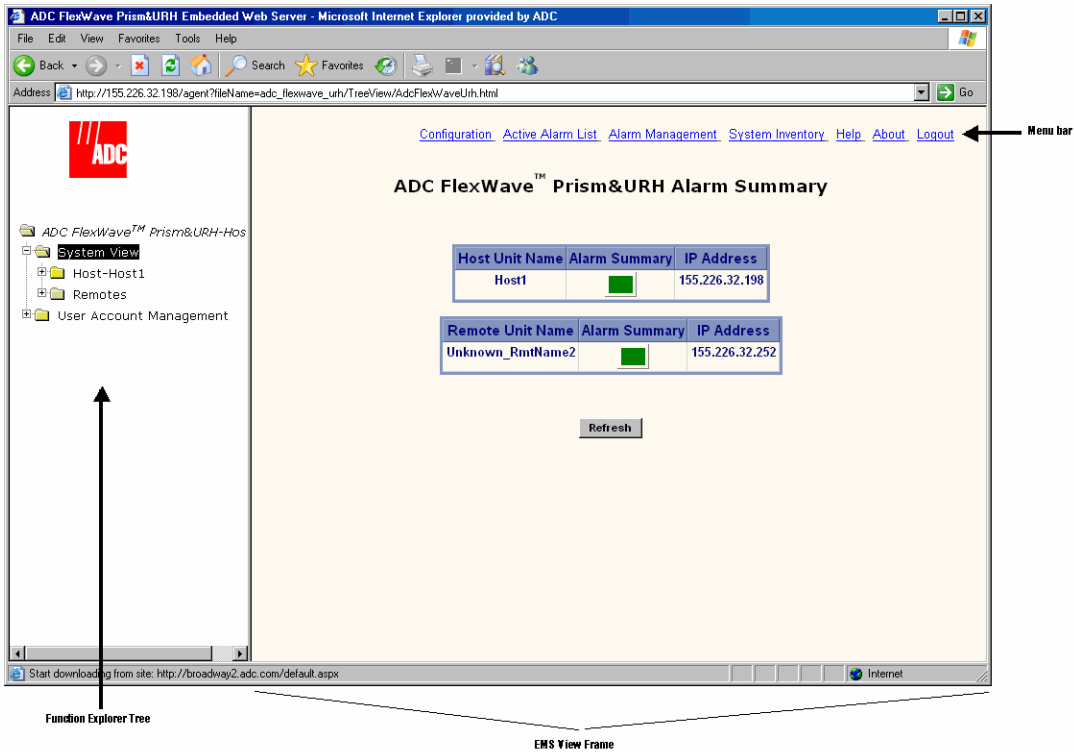


Figure 5-3. EMS Screen Example


5.3 PRODUCT IDENTITY

The FlexWave Prism system comprises a mix of URH Hosts and Prism Remotes. The system components are therefore identified as follows in the EMS:

- Login screens—**ADC FlexWave™ Prism&URH**
- Summary views—**ADC FlexWave™ Prism&URH**
- Host views—**ADC FlexWave™ Prism&URH on Host**
- Remote views refer to the Remote type:
 - **ADC FlexWave™ Prism Remote Unit**
 - **ADC FlexWave™ URH Remote Unit**

5.4 EMS MENU BAR

The EMS Menu bar links (Figure 5-4) perform as described in Table 5-1.



[Configuration](#) [Active Alarm List](#) [Alarm Management](#) [System Inventory](#) [Help](#) [About](#) [Logout](#)

Figure 5-4. EMS Menu Bar

Table 5-1. EMS Menu Bar Links

| Link | Function |
|-------------------|--|
| Configuration | Opens the General Configuration window from which you set system Auto refresh. See “ Setting Auto Refresh ” on page 179. |
| Active Alarm List | Opens the Active Alarm List window, which is a means to determine alarm type, Host unit name, Remote name, time stamp, and other information for active alarms. See “ Viewing Active Alarms ” on page 258. The Active Alarm List window provides a link to the History Log (see “ Viewing an Alarm History Log ” on page 259). |
| Alarm Management | Opens the Alarm Management Table, from which you can mask and unmask alarms. See “ Masking an Alarm Type ” on page 260 or “ Unmasking an Alarm Type ” on page 262. |
| System Inventory | Opens the System Inventory view, which identifies the main software and hardware components of the current, working system. See “ Working with the System Inventory ” on page 180. |
| Help | Opens the EMS online help system that provides a description for each node in the Function Explorer Tree. To access a specific help topic, click on the appropriate link. (The <i>Help: Overview</i> topic is the default topic.) |
| About | Opens a window that provides the software-release version of the EMS, and copyright and trademark information. |
| Logout | Logs you out of the EMS. |

5.5 EMS ALARM INDICATIONS

Some EMS parameter values are associated with alarms. When a parameter enters an alarm state, an alarm status indicator is activated where the color of the indicator indicates the alarm severity (Figure 5-5):

- Red status indicator—major alarm
- Yellow status indicator—minor alarm
- Green status indicator—normal (okay) state
- White status indicator—a device or component is not communicating, but is in the EMS database
- Grey status indicator—alarm is masked.

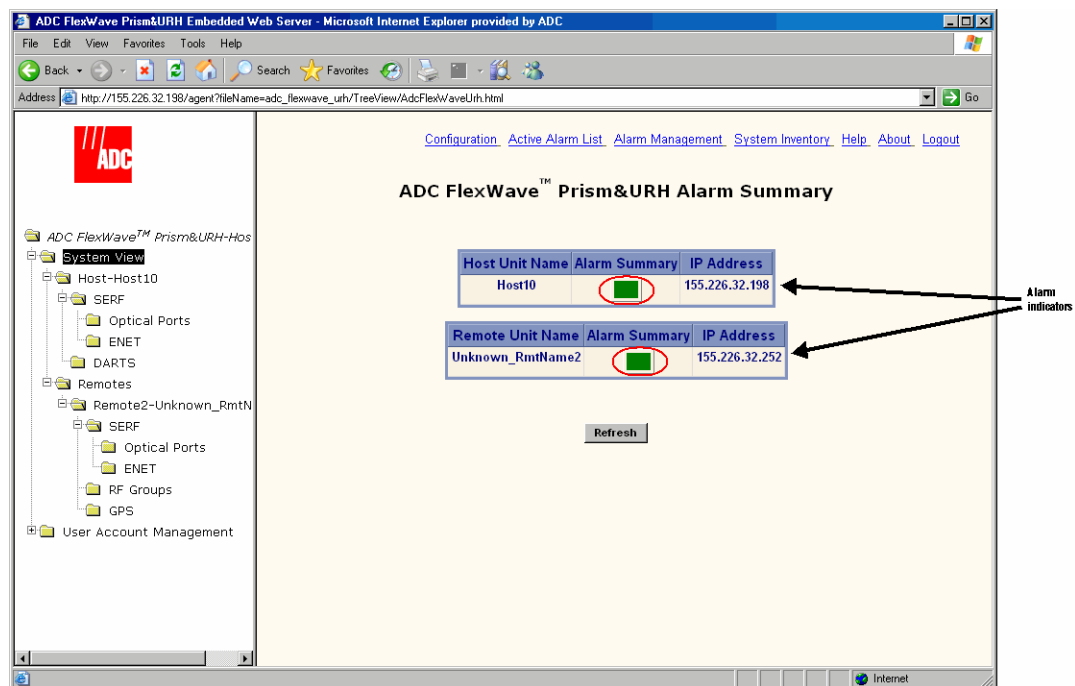


Figure 5-5. Example of Alarm Indicators

For further information on EMS alarms, see “Managing Alarms” on page 257.

5.6 EMS SYSTEM REQUIREMENTS

The computer that you use to remotely access the EMS must meet the following minimum requirements:

- Windows 2000 or Windows XP operating system
- Internet Explorer version 6.0. When a direct connection is made, an internet connection is not needed, but the user interface still displays in a Web browser.
- Network Interface Card (NIC)
- Ethernet cable with RJ-45 connectors.

The EMS database can also be accessed remotely using an SNMP manager. In this case, the user interface varies depending on the SNMP manager, but the underlying parameters, parameter values, and alarms are the same as in the standard EMS interface.

6

INITIAL PRISM SYSTEM SETUP

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| 6.4 Set the Clock Priority Level | 150 |
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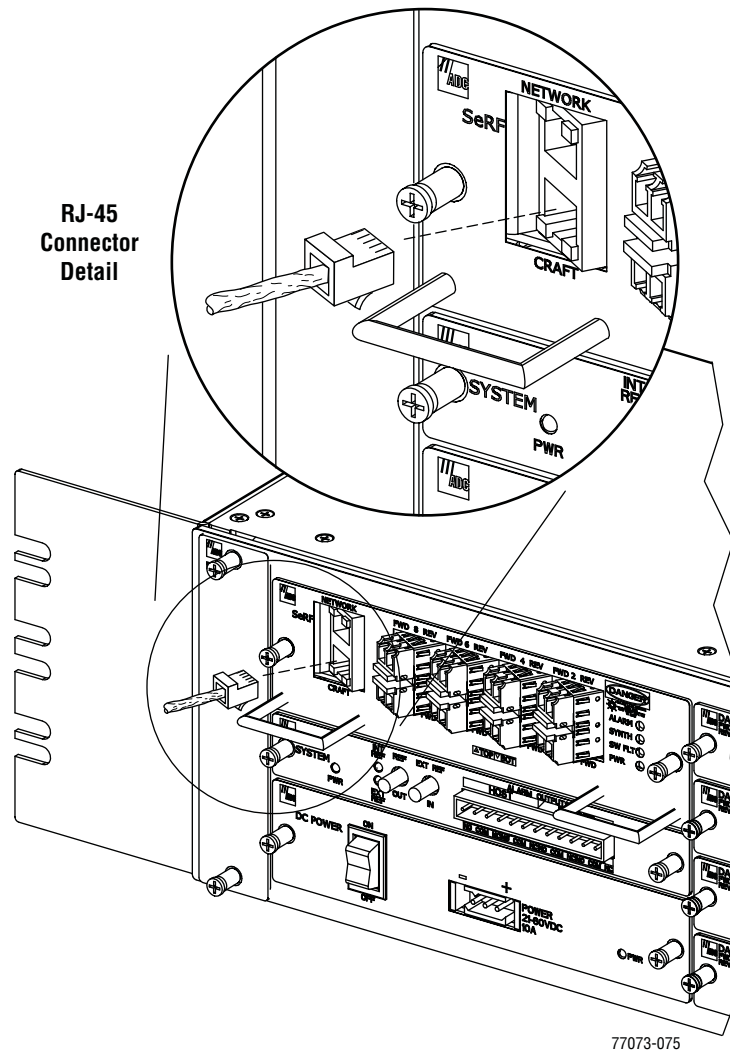
This chapter guides you through an initial Prism system setup, which requires that you follow the steps in the order given. There are 42 steps in this process that are divided into 10 sections.



Only a user logged in under the admin account can complete the initial Prism setup through the EMS.

6.1 ACCESS THE EMS

- 1 Use an Ethernet CAT 5 cable with RJ-45 connectors to connect a laptop to the Craft port of the Host, as shown in the following figure.

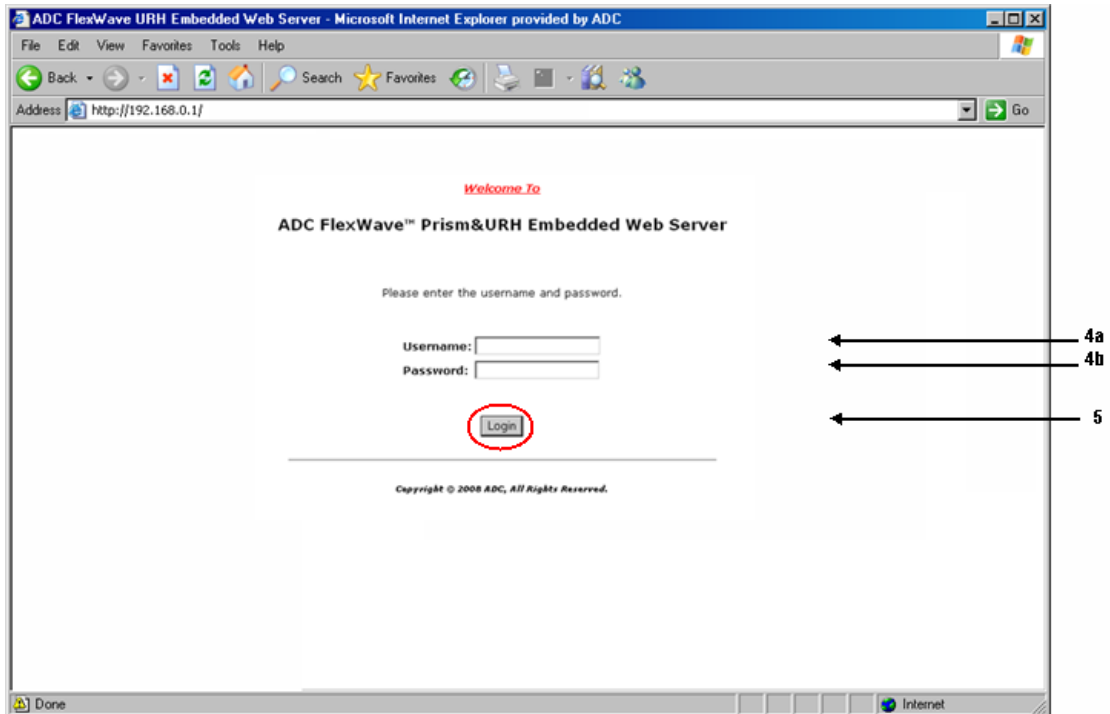


- 2 Connect your computer and start a Web browser.
- 3 In the Web browser URL field, enter the following IP address: **192.168.0.1**

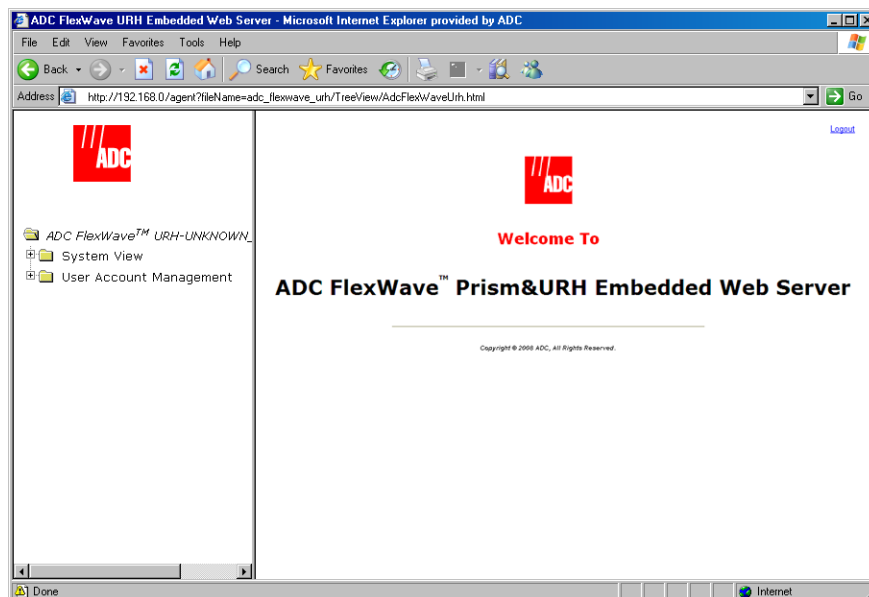


If you have configured your Prism system with static IP addresses, enter the assigned IP address instead of 192.168.0.1.

- 4 When the **ADC FlexWave Prism&URH Embedded Web Server Welcome** window opens:
 - a In the **Username** box, type the user name provided by ADC or by the Network Administrator. The default user name is **admin**.
 - b In the **Password** box, type the password provided by ADC or by the Network Administrator. The default password is **adc123**.



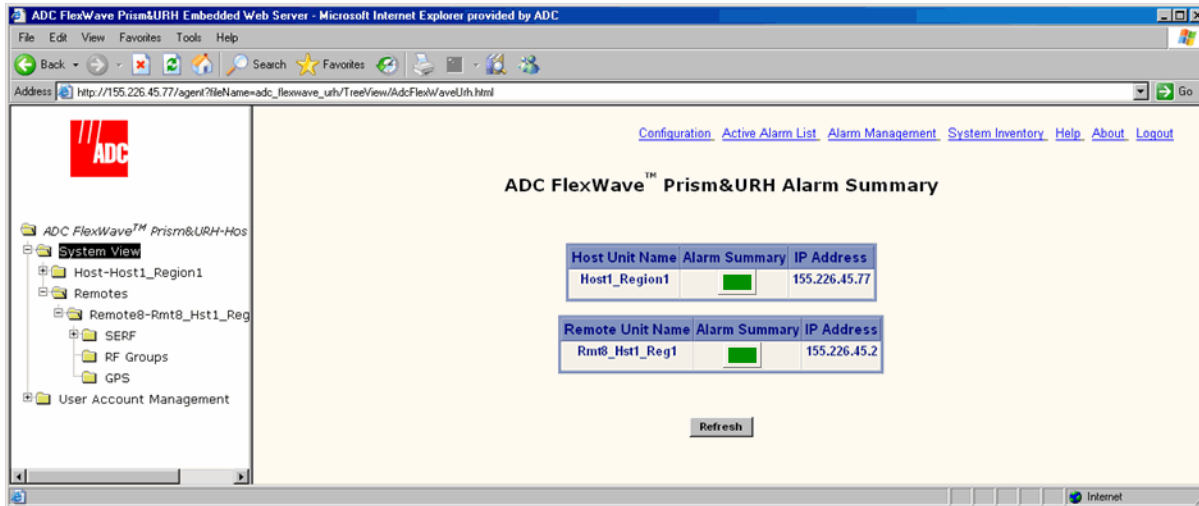
- 5 Click **Login**. to open the **Welcome to ADC FlexWave Prism Embedded Web Server** page.



6.2 DISCOVER IP ADDRESSES

6 In the Function Explorer Tree, click on **System View** to display a system view.

The **Alarm Summary** view opens in the EMS View Frame. The **Alarm Summary IP Address** columns provide the IP address for the Host and Remote. You can use this IP address to log into the Host and Remote unit through a LAN or WAN connection.



The **Alarm Summary** view will display all Remotes connected to the Host, so up to eight Remotes can be listed. (The number of Remotes listed changes as Remotes are added or removed from the FlexWave system.)

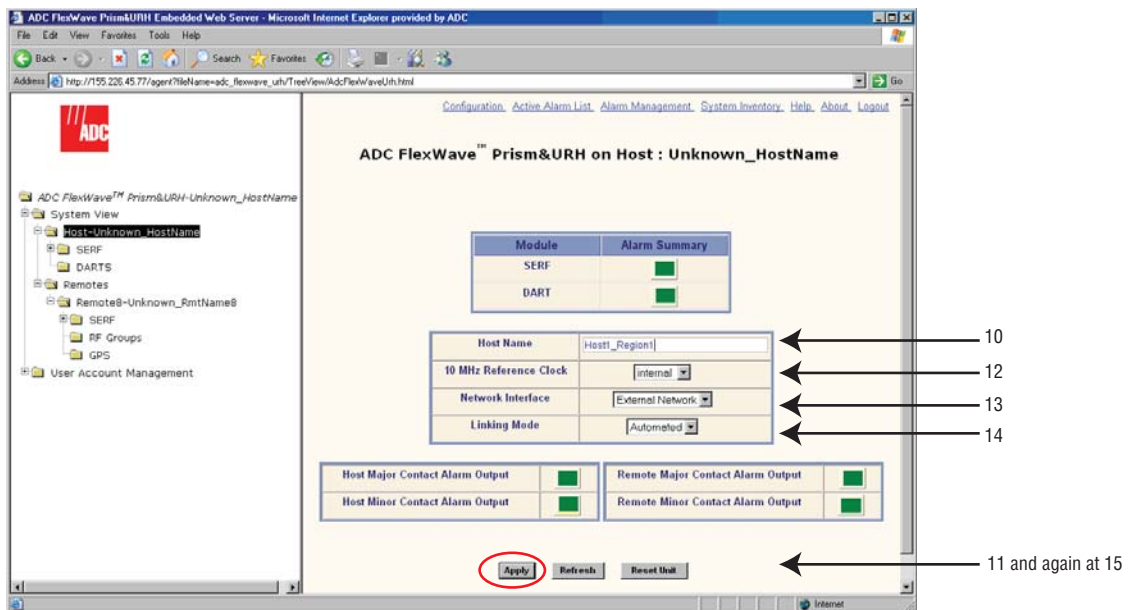
7 Note the Host IP address for future use: _____

8 Note the Remote IP address(es) for future use:

- Remote1 _____
- Remote2 _____
- Remote3 _____
- Remote4 _____
- Remote5 _____
- Remote6 _____
- Remote7 _____
- Remote8 _____

6.3 ENTER A HOST NAME, CLOCK SOURCE, AND LINKING MODE

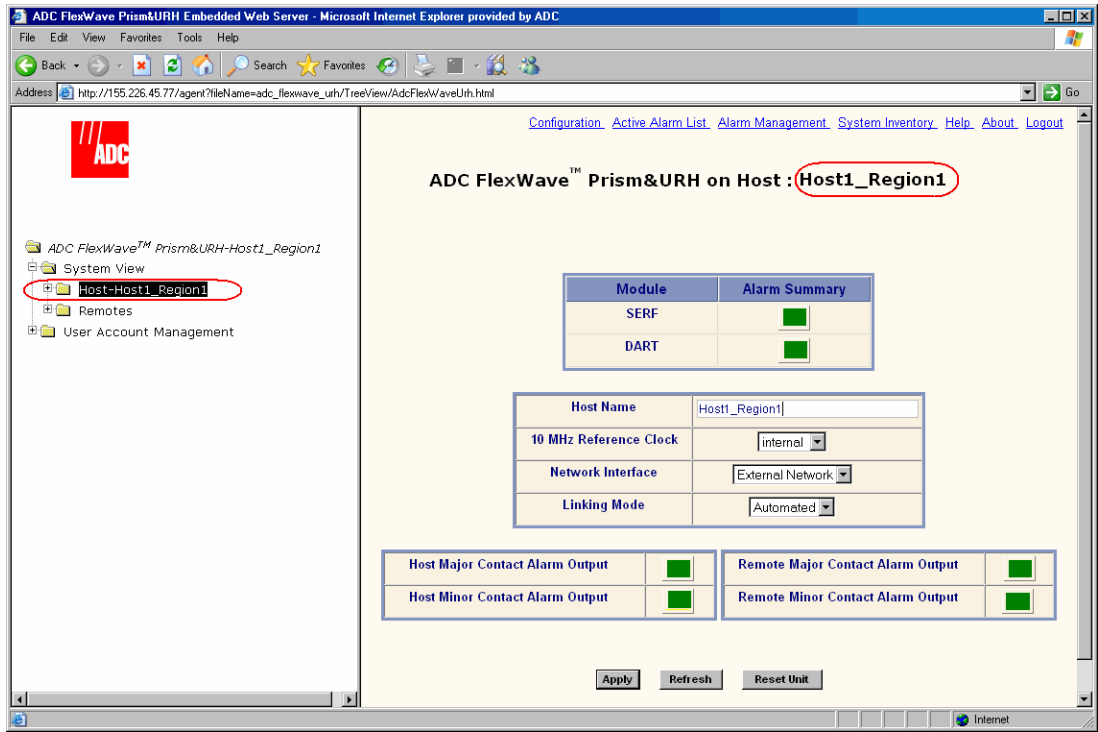
- 9 In the Function Explorer Tree, select **System View, Host-Unknown_HostName** to open the **Host Summary** view in the EMS View Frame. (For information on the read-only status indicators in the **Host Summary** view, see “[Viewing the Host Summary](#)” on page 214.)
- 10 In the **Host Name** box, enter an identifying name for the Host. The **Host Name** must be between 5 and 40 characters, with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.



- Click **Apply**. The new **Host Name** displays in the Function Explorer Tree and the **Host Summary** view as part of the view title and in the **Host Name** box.



You may need to click in the Function Explorer Tree frame and then click Refresh before the new name appears.



- In the **10 MHz Reference Clock** list, select **internal** (default) or **external**. The SeRF board on each Host and Remote contains the master clock for that unit. At the Remote, the reference is a clock derived from the Host clock. The **10 MHz Reference Clock external** setting allows you to frequency lock the master clock to an external 10 MHz reference.



When using the 10 MHz external reference clock, the signal must be connected to the Host before enabling the clock in the software. If an external 10MHz reference clock is selected for operation, but is not present or outside of the frequency range of 10MHz +/- 5ppm, communication between the Host and Remote over the optical fiber will fail.

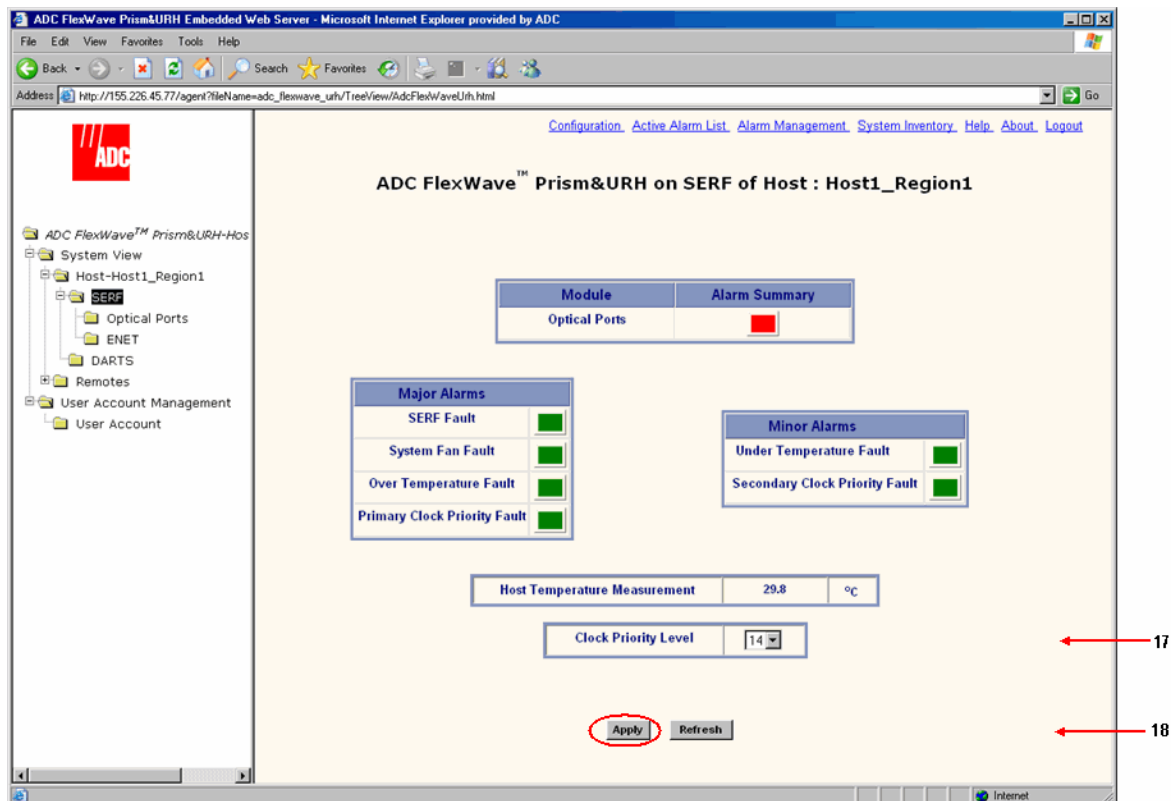
- 13 Skip setting the **Network Interface** parameter—do not change this setting during this procedure. Refer to [“Changing to Built-In Network Mode”](#) on page 186 for information on setting the **Network Interface**.
- 14 In the **Linking Mode** list, keep the default setting of **Automated**. In Automated Linking mode, the Host passes its **DART Pass Band** and **DART Diversity Status** to connected Remotes. For a Multi-Host system, you must select **Manual** as this allows you to manually set **DART Pass Band** and **DART Diversity Status**. If you are setting up a Multi-Host system, leave the **Linking Mode** set to **Automated**, complete the initial setup, and then complete [“\(Optional\) Configuring Multi-Host Systems for Manual Mode”](#) on page 168.
- 15 Click **Apply** to save the **10 MHz Reference Clock** and **Linking Mode** changes.

6.4 SET THE CLOCK PRIORITY LEVEL

- 16 In the Function Explorer Tree, select **System View, Host-x, SERF** (where -x is the Host name) to open the **Prism on SERF of Host-n** view in the EMS View Frame.
- 17 In the **Clock Priority Level** list, set the Clock Priority Level for the Host. This is in effect a Master/Slave setting in that the Host in a multi-Host system with the highest **Clock Priority Level** (CPL) will provide the Master Clock on the fibers. All other Hosts and Remotes will recover clocks from higher levels. The highest level is **1**, the lowest level is **14**. **0** and **15** are “no level” settings that results in a zero pattern being played on the fiber, which effectively shuts it down. The default is **14**.

In a Multi-Host system, each Host must have a unique CPL. If one or more Host is set to the same CPL, an alarm will be generated.

- 18 Click **Apply**.

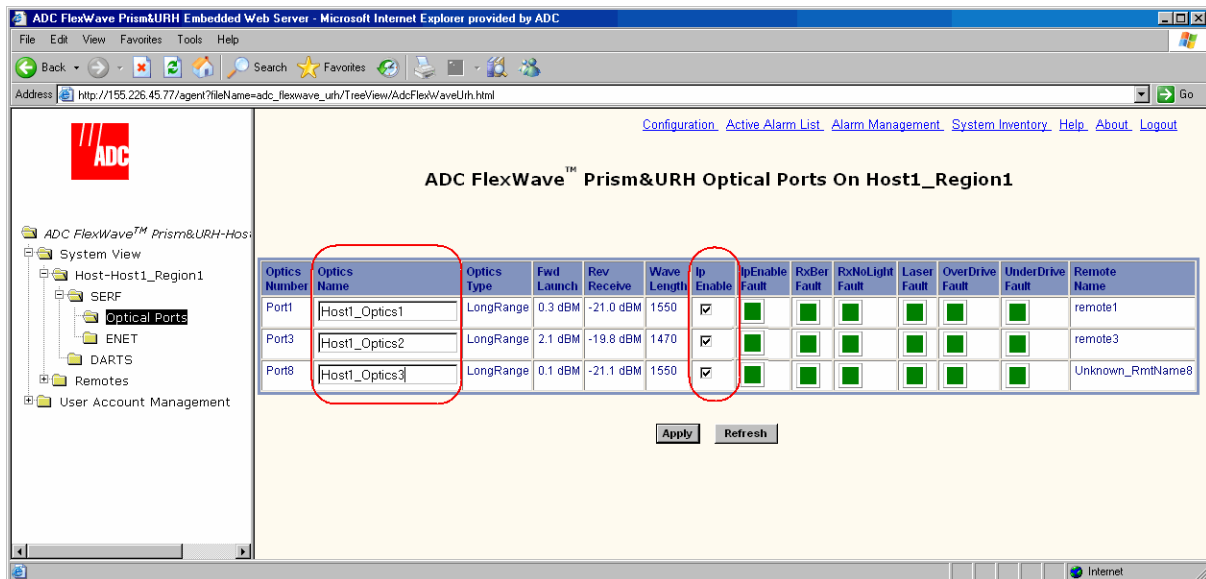


For information on the SeRF alarm indicators, see “Viewing the Host SeRF Summary” on page 222.

6.5 PROVISION THE HOST SERF OPTICAL PORTS

There can be up to eight Host SeRF optical ports that correspond to the eight physical ports on the Host. Labeling the Host SeRF Optical Ports provides for easier off-site management.

- 19 In the Function Explorer Tree, select **System View, Host-x, SERF, Optical Ports** (where -x is the Host name) to open the **Optical Ports** view for the Host in the EMS View Frame. The default **Optics Name** for the Optical ports is **UNKNOWN_SFPNAME**. (For information on the status indicators in the **Optical Ports** view, see “Viewing Host SeRF Optical Ports” on page 224.)



- 20 In the **Optics Name** box, enter a label for the selected Optics port. The **Optics Name** must be between 5 and 32 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.
- 21 Select **Ip Enable** to configure the Small Form-Factor Pluggable (SFP) for exchange of management traffic. By default **Ip Enable** is not selected. If **Ip Enable** is left unselected, the SFP cannot exchange management traffic. How you set **Ip Enable** is dependent on the system configuration:
 - In a multifiber scenario, do not enable IP on both SFPs from the same Host to the same Remote. Typically, the first SFP on the Host that goes to that Remote is used as the IP enabled port for management communications.
 - In a Multi-Host system, multiple fibers connected to a Remote come from different Hosts. However, a Remote can accept an IP connection from only one Host and only one Host can “own” the Remote for the purposes of provisioning and monitoring. When a second Host attempts to establish an IP connection, this second connection fails and an IP Conflict alarm is triggered. You therefore select **Ip Enable** only for the Host that manages the Remote so that only one of the fibers connected to the Remote will have IP.
- 22 Click **Apply**.

6.6 CONFIGURE THE HOST DARTS

Configuring a Host DART provides information required for the DART to operate in RF transmission. Each DART is configured in hardware to operate within a specific RF band such as PCS or Cellular; the passband is a software-defined sub-band of the hardware-defined band. Forward and reverse path gain, diversity status, and operating mode may also be set when a Host DART is configured. The same settings are applied to the Remote DART when linked to the Host DART. The Host has eight slots for DART cards.



If you are setting up a multi- host system, go to “(Optional) Configuring Multi-Host Systems for Manual Mode” on page 168.

- 23 In the Function Explorer Tree, select **System View, Host-x, SERF, DARTS** (where -x is the Host name) to open the **DART's Alarm Summary** view in the EMS View Frame.

The **DART's Alarm Summary** view displays all the Host DARTS that are present, starting from slot 1 at the top of the list and working sequentially down to last DART, which can be slots 1-8.

- 24 In the **Information** column, click on the **Band-Config** link for the DART to be configured.

The screenshot shows a web browser window displaying the ADC FlexWave Prism&URH Host DART's Alarm Summary page. The page title is "ADC FlexWave™ Prism&URH Host DART's Alarm Summary". The interface includes a navigation menu on the left with "System View", "Host-Host_3", "SERF", "DARTS", "Remotes", and "User Account Management". The main content area features a table with the following structure:

| Module | Information | Alarm Summary |
|------------------|-----------------------------|--------------------------------------|
| UNKNOWN_DARTNAME | Band-Config | ■ |
| UNKNOWN_DARTNAME | Band-Config | ■ |
| UNKNOWN_DARTNAME | Band-Config | ■ |
| UNKNOWN_DARTNAME | Band-Config | ■ |

A red circle highlights the "Band-Config" link in the Information column of the first row, and a red line extends from the number "24" to this link. Below the table is a "Refresh" button.

- 25 In the **Configuration and Alarm Details of DART n** window that opens, set the **DART Attributes**:

ADC FlexWave™ Prism&URH Configuration and Alarm Details of DART 1 on Host1_Region1

| DART Attributes | | Values | | DART Major Alarms | | DART Attributes | | Values | |
|----------------------------|--------------------|------------------------------|-------------------------------------|---------------------|--------|-----------------------|-------------------------------------|-----------------------|--------------|
| DART Name | DCSHost1 | DART Fault | <input checked="" type="checkbox"/> | DART Operating Mode | normal | DART Over Drive Fault | <input checked="" type="checkbox"/> | DART Diversity Status | nonDiversity |
| DART Number | 1 | DART Hardware Mismatch Fault | <input checked="" type="checkbox"/> | DART Forward Gain | 31 | | | | |
| DART Type | DCS FULLBAND12 | | | | | | | | |
| DART Pass Band (Timeslots) | DCS Full Band (12) | | | | | | | | |

DART Minor Alarms

| | |
|-----------------------|-------------------------------------|
| DART UnderDrive Fault | <input checked="" type="checkbox"/> |
|-----------------------|-------------------------------------|

Decommission Apply Refresh Close

- a In the **DART Name** box, enter a name for the DART between 5 and 32 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.
- b In the **DART Pass Band (Timeslots)** list, select the DART Pass Band to be supported by this DART. The list will include only those pass bands that are valid selections for the DART band. For example, if the DART band is “cellular,” only cell pass bands are listed.
- c In the **DART Operating Mode** list, select one of the following:
- **Standby**—forces the RF function to be muted in the Host and its linked Remote.
 - **Normal**—allows the system to operate normally (RF function not forced to be muted), assuming all other system components are in proper working order. (Default setting.)

The mode **Undefined** is not user selectable, and indicates that the EMS is unaware of the current mode.

- d In the **DART Diversity Status** list, select **nonDiversity** or **diversity**. For a diversity application, one DART will be configured **nonDiversity** for the primary FWD/REV path signal and the other DART will be configured **Diversity**. This selection therefore determines whether the DART card being configured will carry the primary or secondary RF path.

For dual DART configurations, such as dual-pcs, smr800/smr900 and dual-aws, both DARTs must have **DART Diversity Status** set to **nonDiversity**.



The diversity status of the Host DART will extend to the Remote DART connected to it. For further information, see **“Link the Host and Remote DARTs.” on page 159**.

- e In the **DART Forward Gain** list, set this value (0 to 31 dB) based upon the fully loaded forward path signal level from the Base Station. The Host DART expects signal levels from **-25 to +5 dBm**. If the fully loaded signal is +5 dBm, then the DART forward gain should be set to 0 dB, if the fully loaded signal is -25 dBm, then the DART Forward Gain should be set to 30 dB. The equation is:

$$\text{DART Forward Gain} = 5 - \text{fullyLoadedBasestationSignal.}$$



If you are setting up the system when no calls are going through, you must allow headroom for a fully loaded forward path. For CDMA protocols, the difference from unloaded to fully loaded is typically 8dB, so if the unloaded signal is -15dBm, then the fully loaded input would be -7 dBm and the Host Forward Gain should be set to 5- (-7) = 12 dB.

The same rules applies for GSM carriers, except that the unloaded to loaded is determined by the equation $10 \cdot \log_{10}(\# \text{ RF Channels})$. So if there are 4 GSM RF Channels, then the loaded forward path is 6 dB above unloaded.

If sufficient headroom is not present, then the LPA can be over- powered causing a Loss Of Service.



When configured correctly, the Host DART Forward input can handle peaks of 14dB above the BTS signal level. For example, if the fully loaded CDMA carrier is -25dBm, then peaks up to -11 dBm can be handled (CDMA peak to average is typically 10-12 dB). If the peaks exceed the 14 dB of headroom, then Automatic Level Control (ALC) will occur to prevent over- driving the A/D Converter.

- f Set the **DART Reverse Gain** value to achieve the required gain from the input to the Remote to the output of the Host DART. The range is:
 - **5 to 36 dB** for Cellular, SMR800, SMR900, Narrowband PCS & Narrowband AWS DARTs
 - **0 to 31 dB** for Fullband GSM1800, UMTS, Fullband AWS, and EGSM900

When setting the **DART Reverse Gain** value, the following rules must be observed:

- n The **DART Reverse Gain** setting can be used to overcome losses from the Host DART to the BTS. If you want unity reverse path gain and the losses to the BTS are 20 dB, then the Reverse Gain should be set to 20 dB.
- n If you want to match the URH noise floor to the BTS noise floor, then the noise floors for both the URH and the BTS must be known. Use the **DART Reverse Gain** to match these to optimize the reverse path. For example, if the BTS has a noise floor of -114 dBm/30 kHz and the URH has a single Remote noise floor of -124 dBm/30kHz, and there is 2 dB of loss from the Host DART to the BTS, then the Reverse path gain should be set to 12 dB.
- n Simulcast changes the actual REV gain level by $20\log(n)$ where n = the number of simulcast links. For example, if REV gain is set to 10dB in a 2:1 simulcast configuration, the actual REV gain is only 4dB (10dB - 6dB). If REV gain is set to 20dB in a 4:1 simulcast, the actual gain is 8dB (20dB - 12dB).
The Noise Floor of the URH goes up of $10*\log_{10}(n)$, where n = simulcast #. For example, the single node Remote noise floor is -124 dBm/30kHz (Before any Reverse path gain), then the noise floor for two remotes is -121 dBm, for 4 remotes it is -118 dBm/30kHz and for 8 remotes it is -115 dBm.
- n Dual PCS uplink splitting causes a 3 dB degradation in the noise figure.

26 Click **Apply** and then **Close**.

6.7 ENTER A REMOTE NAME

A Remote becomes known to the EMS when an optical fiber is connected from the Host to the Remote and IP has been enabled as described in “[Provision the Host SeRF Optical Ports](#)” on page 151. The Remote appears as **Remote_Unknown_RmtName** in the the EMS Function Explorer Tree of functions and can be renamed using the following procedure.

Remotes are assigned a number from 1 through 8 that correspond to the physical SFP port assignment on the Host. For example, SFP port 3 is **Remote3**.

- 27 In the Function Explorer Tree, select **System View, Remotes, Remote#-x** (where **Remote#** indicates the Remote number that corresponds to a Host SFP port number and *n* is the Remote name). **Remote-Unknown_RmtName** is the default Remote name until it is user-defined.

The **Remote Unit** view opens in the EMS View Frame. (For information on the alarms shown in the **Remote Unit** view, see “[Monitoring a Remote Unit](#)” on page 240.)

28 In the **Remote Name** box, enter a name for the Remote. The Remote Name must be between 5 and 40 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.

29 Click **Apply**.

The new **Remote Name** is shown in the in the Function Explorer Tree and the **Remote Unit** view.

ADC FlexWave™ Prism Remote Unit : **Rmt8_Hst1_Reg1**

| Module | Alarm Summary |
|-----------|-------------------------------------|
| SERF | <input checked="" type="checkbox"/> |
| RF Groups | <input checked="" type="checkbox"/> |
| GPS | <input type="checkbox"/> |

| | |
|--------------------|----------------|
| Remote Name | Rmt8_Hst1_Reg1 |
| Remote Capacity | 3 |
| Remote Temperature | 80.5 °C |

| Major Alarms | |
|-----------------------------|-------------------------------------|
| Host Lost Fault | <input checked="" type="checkbox"/> |
| Remote Lost Fault | <input checked="" type="checkbox"/> |
| AC Power Supply Fault | <input checked="" type="checkbox"/> |
| Over Temperature Fault | <input checked="" type="checkbox"/> |
| Major Ext Alarm Input Fault | <input checked="" type="checkbox"/> |
| Fan Under Speed Fault | <input checked="" type="checkbox"/> |


| Minor Alarms | |
|-----------------------------|-------------------------------------|
| Minor Ext Alarm Input Fault | <input checked="" type="checkbox"/> |
| Under Temperature Fault | <input checked="" type="checkbox"/> |
| Fan Over Speed Fault | <input checked="" type="checkbox"/> |
| Open Door Fault | <input checked="" type="checkbox"/> |

Apply Refresh Reset Unit Decommission Unit


6.8 CONFIGURE THE REMOTE SERF OPTICAL PORTS

- 30 In the Function Explorer Tree, select **System View, Remotes, Remote#-x, SERF, Optical Ports** (where **Remote#** indicates the Remote number that corresponds to a Host SFP port number and *n* is the Remote name).

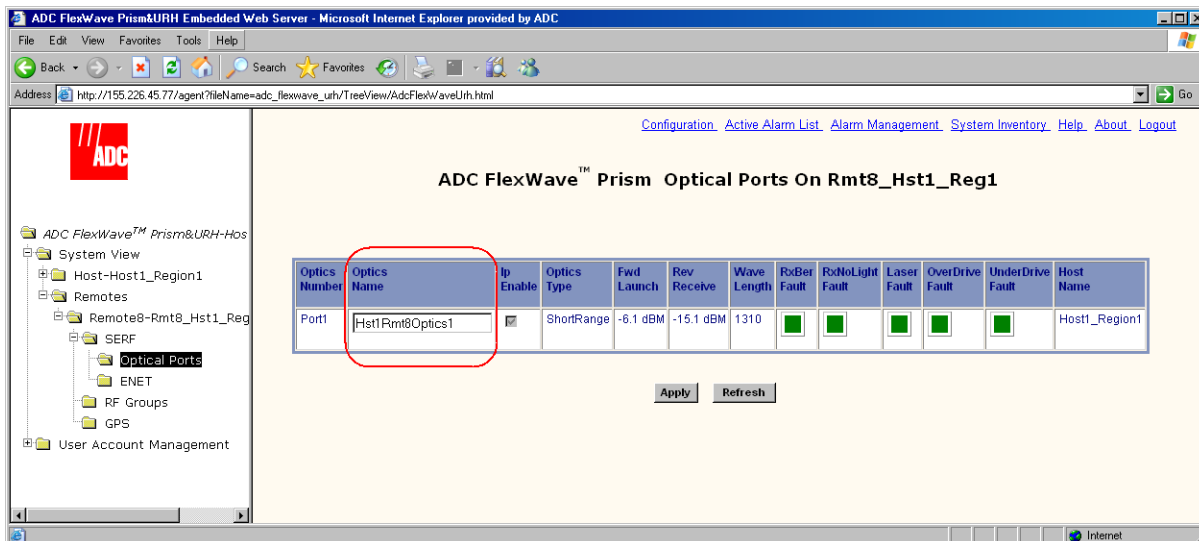
The Optical Ports view for the selected Remote opens in the EMS View Frame.

 For information on the optical port indicators, see **“Viewing Remote SerF Optical Ports” on page 248.**

- 31 In the **Optics Name** box, enter a label for the port that is between 5 and 32 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.

 The **Ip Enable** field is not selectable for Remotes as it is configured at the Host SerF SFPs. Its inclusion in this view is to indicate which Remote SFP has IP on it. For information on Ip Enable alarms, see **“Viewing Host SerF Optical Ports” on page 224.**

- 32 Click **Apply**.



| Optics Number | Optics Name | Ip Enable | Optics Type | Fwd Launch | Rev Receive | Wave Length | RxBer Fault | RxDtoLight Fault | Laser Fault | OverDrive Fault | UnderDrive Fault | Host Name |
|---------------|-----------------|--------------------------|-------------|------------|-------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|
| Port1 | Hst1Rmt8Optics1 | <input type="checkbox"/> | ShortRange | -6.1 dBm | -15.1 dBm | 1310 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Host1_Region1 |

6.9 LINK THE HOST AND REMOTE DARTS.



If you are setting up a multi- host system, go to “(Optional) Configuring Multi-Host Systems for Manual Mode” on page 168.

“Linking” establishes an association in software between a particular Host DART and a particular Remote DART, enabling the two DARTs to act as an operational unit in providing one RF band. There are four pre-requisites to this procedure:

- The Host DART and Remote DART must be connected through the optical fiber and be communicating with each other.
- The Host DART card must be configured as described in “Configure the Host DARTs” on page 152.
- The Host and Remote DARTs must be of the same type (such as, Cellular or PCS).
- There must be a sufficient number of fiber timeslots available in order to accommodate the requested passband (for example, PCS A band requires 3 timeslots).

In the Remote DART configuration page, all Host DARTs are listed that have the same band as the Remote DART. A link is established by selecting a Host DART to be paired with the Remote DART.

6.9.1 Use of Multi Fibers

The EMS provides the ability to install “multi fibers” between a Host and Remote. This means that, in addition to the minimum two fibers (RX and TX) in the Host to Remote connection, one or more additional fiber pairs are installed. This is done to increase the bandwidth between the Host and Remote. Each fiber pair can handle approximately 75 Mbps of RF bandwidth.

Each fiber is capable of supporting 12 TDM timeslots:

- Classic DARTs or Single SuperDARTs support up to 35 MHz of RF
 - Cellular
 - SMR800
 - SMR900
 - PCS Narrowband
 - AWS Narrowband
 - EGSM900
- Dual SuperDARTs support up to 75 MHz of RF
 - GSM1800
 - UMTS
 - AWS Fullband

When a Host DART is linked to a Remote DART in a multi-fibers configuration, the EMS uses the first fiber (in numerical order) on which the required number of timeslots is available for the passband being linked. The EMS will not divide up the timeslots between two fibers. So, for example, if the passband requires eight timeslots, and only six timeslots are available on the first fiber, the EMS will bypass the first fiber and assign all eight timeslots to the second fiber, leaving four timeslots unused on the second fiber.

6.9.2 RF Groups in the Remote and the EMS GUI

The EMS **Alarm Summary of RF Groups** view displays up to four rectangles labeled **RF Module / Band N** (where N equals A, B, C, or D). Each rectangle represents one RF Module in the Remote. **Figure 6-1** shows how the FlexWave EMS maps the RF Modules in the GUI to the physical modules and antennas.

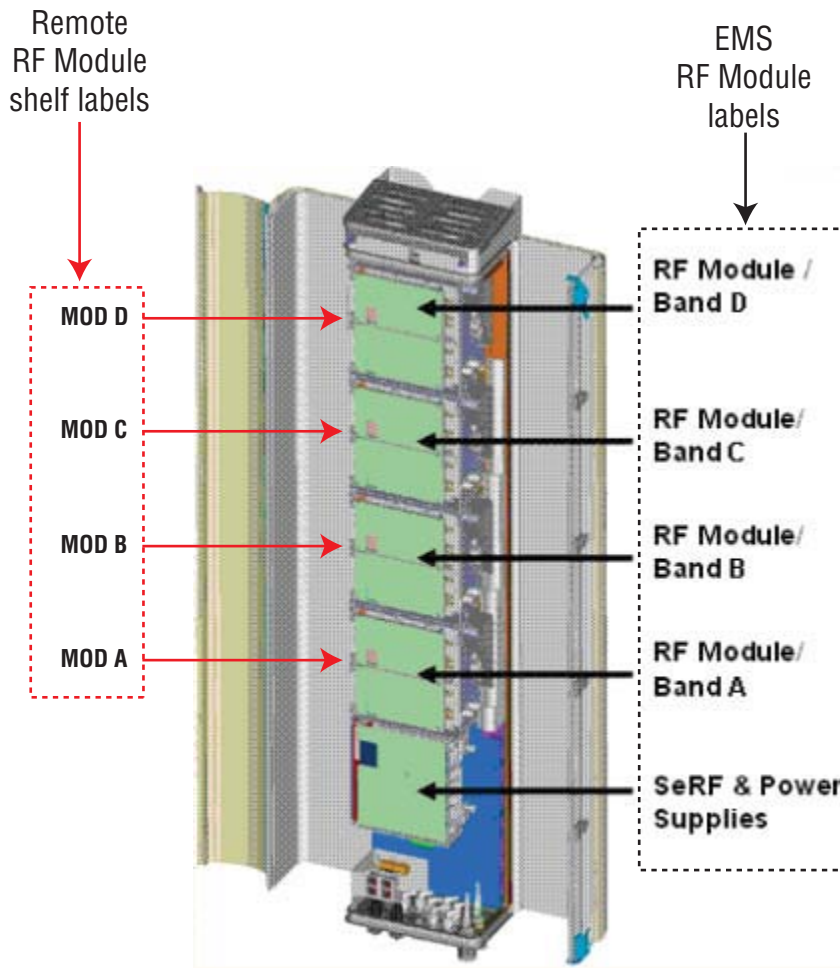


Figure 6-1. Matching Remote RF Modules to EMS Group Labels

Figure 6-2 shows the **Alarm Summary of RF Groups** view. If a slot is not occupied by an RF Module, the slot is shown with a white indicator.

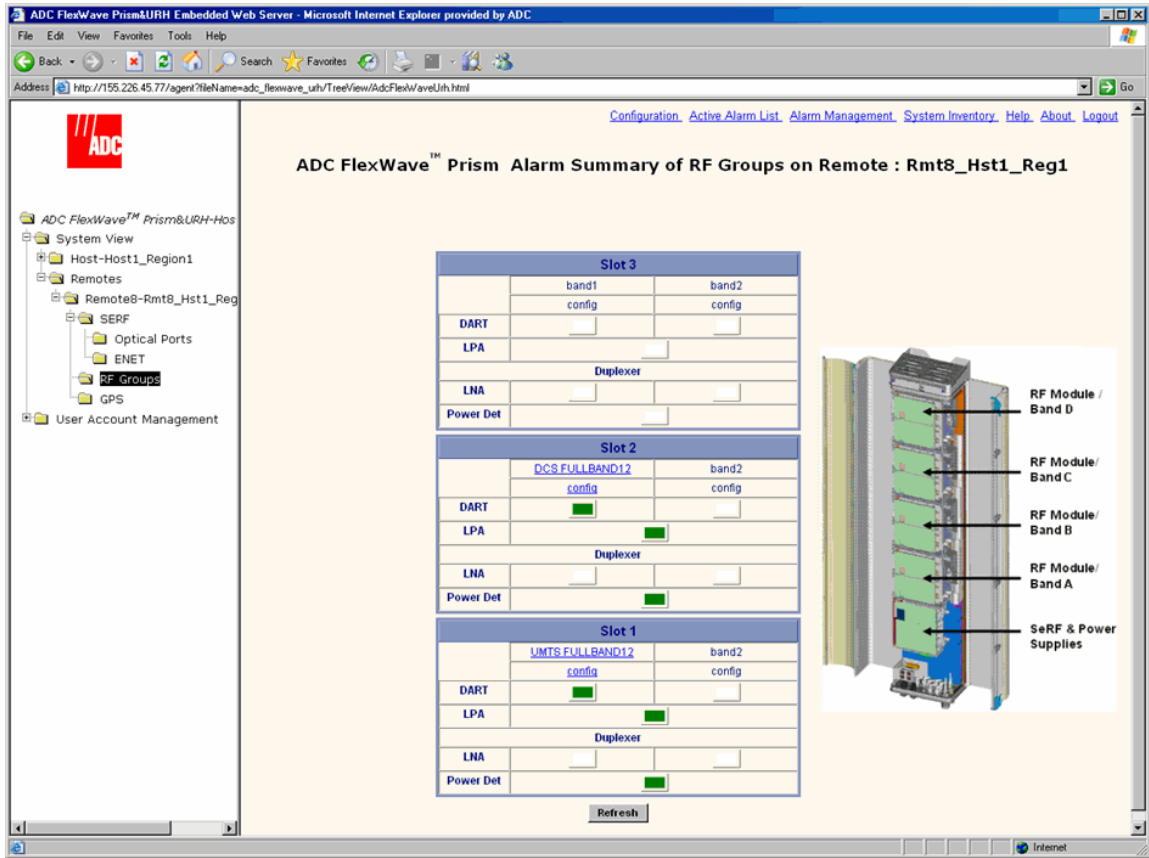


Figure 6-2. Alarm Summary of RF Groups View

Figure 6-3 provides a close up view of the Slot 2 panel in the Alarm Summary of RF Groups view where:

- **a:** DCS FULLBAND12 indicates that a 12-slot DCS FullBand DART is plugged into band1.
- **b:** An expander for the DCS FullBand DART is plugged into band2 and therefore is represented with a White indicator to indicate that a configurable DART is not present.

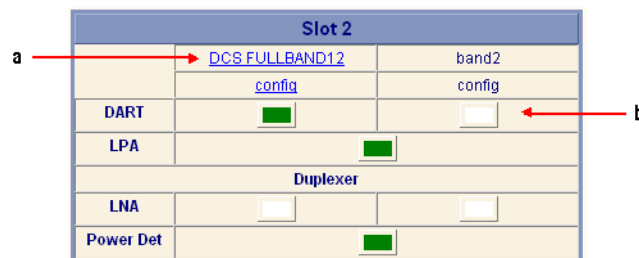


Figure 6-3. RF Groups in the FlexWave EMS

6.9.3 Link a Remote DART to a Host DART



This procedure requires that the antenna has been connected and the system is ready to transmit RF. For information on connecting the antenna, see “[Antenna Cable Installation](#)” on page 123.

- 33 Verify that the Host DART is configured as described in “[Configure the Host DARTs](#)” on page 152.
- 34 In the Function Explorer Tree, select **System View, Remotes, Remote#-x, SERF, RF Groups** (where **Remote#** indicates the Remote number that corresponds to a Host SFP port number and *n* is the Remote name) to open the **Alarm Summary of RF Groups** view (see [Figure 6-2](#) on page 161).
- 35 In the rectangle for the RF group selected, click on the **config** link for the band being linked to open a **Configuration Details** window that corresponds to the selected link.

ADC FlexWave™ Prism Configuration Details of DCS FULLBAND12 on Rmt8_Hst1_Reg1

| DART Attributes | Values |
|----------------------------|---------------------|
| DART Name | unknown_RmtDARTName |
| DART Number | 3 |
| DART Band | DCS FULLBAND12 |
| DART Pass Band (Timeslots) | Undefined |
| DART Operating Mode | normal |

| LPA Attributes | Values |
|--------------------|---------|
| LPA Number | 2 |
| LPA Operating Mode | standby |

| LNA Attribute | Values |
|---------------|--------|
| LNA Number | 3 |

| DART Attributes | Values |
|--------------------------|--------------|
| DART Diversity Status | nonDiversity |
| DART Forward Gain | 0 dB |
| DART Forward Delay | μs |
| DART Forward Delay Range | 9 - 244 μs |
| DART Reverse Delay | 10 μs |
| DART Reverse Delay Range | 10 - 245 μs |

| Power Det Attributes | Values |
|----------------------|-----------|
| Vswr Measurement | 2.7:1 |
| RF Power Measurement | -10.7 dBm |

| Host Dart Id | Host Dart SFP Id | Host Dart Band | Host Dart Pass Band | Host Dart Status | Remote Dart Id | Remote Dart SFP Id | Remote Dart Status |
|--------------|------------------|----------------|---------------------|------------------|----------------|--------------------|--------------------|
| 1 | 8 | DCS FULLBAND12 | DCS Full Band | active | 3 | 1 | active |
| unlink | unlink | unlink | unlink | unlink | unlink | unlink | unlink |

Buttons: Decommission, LPA Reset, Apply, Refresh, Close

The table at the bottom of the **Configuration Details** window indicates which Host Unit DART is available for use in linking. In this example, the display indicates that **Host DART ID 1** (top row, circled in red) is assigned to **DCS Full Band**.

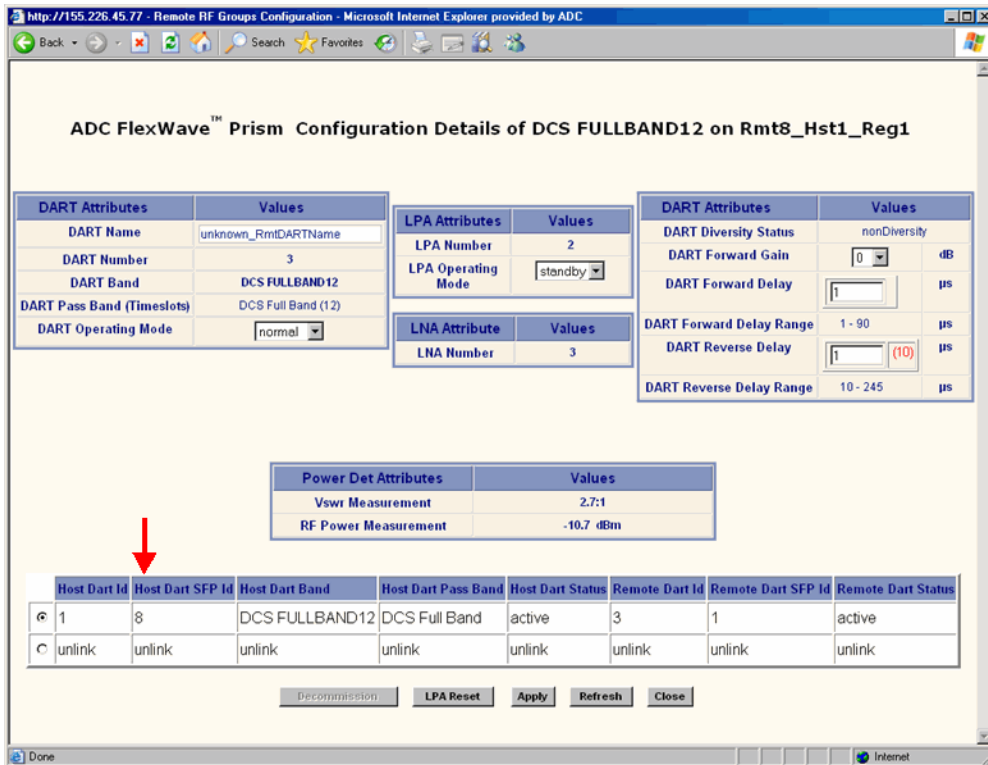
The **Configuration Details** table has the following columns:

- **Host DART Id**—Slot number of slot occupied by the Host DART card. The Host has eight slots numbered from 1 to 8, read from top to bottom. If the Host DART is a 12-Timeslot DART, then only the first of the two slots it occupies will be shown (for example, if the Host 12-Timeslot DART occupies slots 1 and 3, only slot 1 will be shown).
- **Host DART SFP Id**—Port number of physical optical port where Host-Remote optical fiber is connected on the Host.
- **Host DART Band**—Frequency band of the Host DART. This field is not configurable and reports the DART type (such as, cellular, pcs, and so forth).
- **Host DART Pass Band**—Passband assigned to the specified Host DART.
- **Host DART Status**—System entered status of Host DART card. This will be active, standby, or not in service
- **Remote DART Id**—Number (1-8) indicating the physical location where this DART card is mounted in the Remote; see “[RF Groups in the Remote and the EMS GUI](#)” on page 160) for an explanation of how the Remote DARTs are numbered.
- **Remote DART SFP Id**—Shows the available Remote SFPs that can be used to link the DARTs. 1 is shown in this example, so the Remote has fibers connected to this Host using Remote SFP 1. If there are two or more sets of SFPs connected between the same Host DART and Remote DART, this field will contain a value such as 2/3 or 2/3/4 where each one-digit number represents one Remote optical port where an SFP is connected for this Host/Remote pair. Each set of one Host SFP and one Remote SFP supports two optical fibers (RX and TX), each with a capacity of 12 TDM timeslots
- **Remote DART Status**—System entered status of Remote DART card, which can be active or unlink
- **Decommission** button—used to clean out settings and information for hardware that has been removed.
- **LPA Reset** button—When clicked, causes the LPA to reset as described in “[Restarting an LPA](#)” on page 236.

36 To link the Host DART to the Remote DART for this pass band, click in the radio button next to Host DART Id (ID 1 in this example).

| | Host Dart Id | Host Dart SFP Id | Host Dart Band | Host Dart Pass Band | Host Dart Status | Remote Dart Id | Remote Dart SFP Id | Remote Dart Status |
|----------------------------------|--------------|------------------|----------------|---------------------|------------------|----------------|--------------------|--------------------|
| <input checked="" type="radio"/> | 1 | 8 | DCS FULLBAND12 | DCS Full Band | active | 3 | 1 | active |
| <input type="radio"/> | unlink | unlink | unlink | unlink | unlink | unlink | unlink | unlink |

37 Click **Apply**. The following example shows the completed link (in this case, **Host DART SFP Id 8** has been selected).



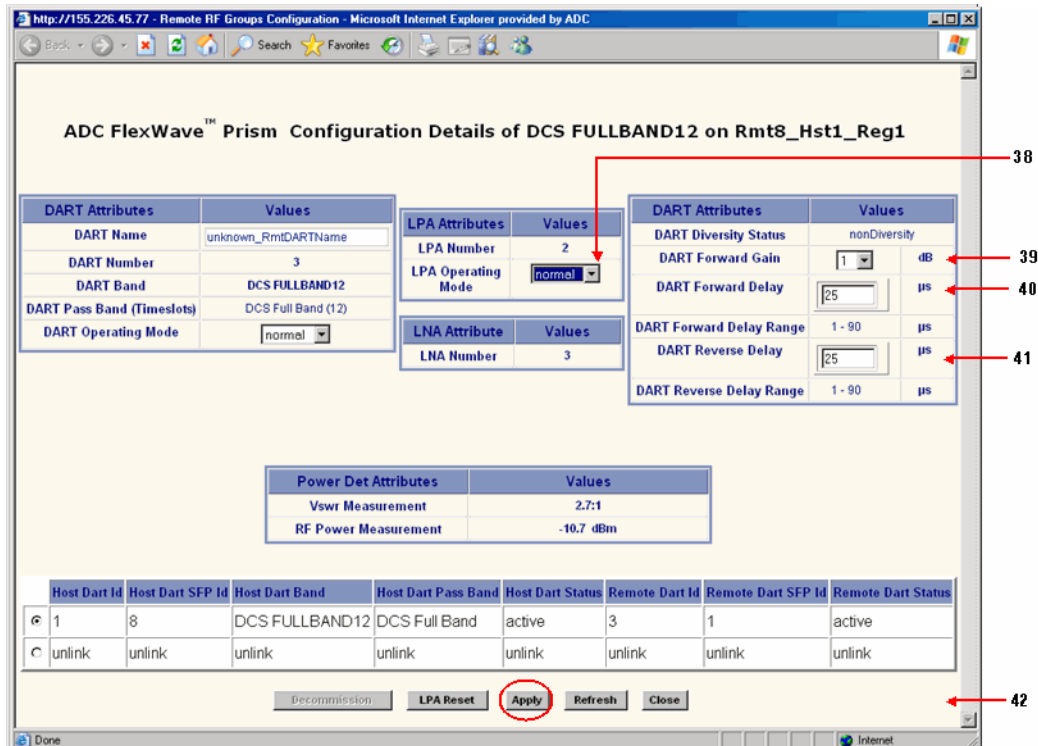
If multi fibers are connected between the Host and Remote, the system will try the fibers in numerical sequence until a link can be established for the identified passband. If no fiber is available providing the number of TDM timeslots required for the passband, an error message is returned indicating that “DART linking failed due to a problem on the host.”

If adding a link to an existing simulcast connection, the system requires the use of the same timeslots. If the timeslots aren't available, the system returns the following error message: “DART linking failed due to a problem on the host.”

38 Set the LPA Operating Mode to normal.



As soon as you set the LPA Operating Mode to normal, RF transmission will start. Before you set the LPA Operating Mode to normal, make sure that the antenna has been connected and the system is ready to transmit RF. For information on connecting the antenna, see “[Antenna Cable Installation](#)” on page 123.



- 39 In the **DART Forward Gain** list, select the dB (0 to 31), which is the actual gain, *not* attenuation, that will be applied to the RF forward path signal (where 0 = 0 dB gain, 1 = 1 dB gain, and so forth) The DART Forward Gain is based on the EIRP desired at the antenna. You therefore need to know how much cable, insertion, and any other loss (such as splitters) exist between the Remote and the antenna. Set the **DART Forward Gain** to achieve the required output power level to meet the EIRP of your RF link budget.

The following table provides calculations you need to set the gains to achieve the desired Output power for a single-DART configuration.

| DART Input Level | Host DART Fwd Gain | Remote DART Fwd Gain | Expected Output (in dBm) | |
|------------------|--------------------|----------------------|--------------------------|-----------|
| | | | 20W DART | 6.5W DART |
| -25 | 31 | 31 | 43 | 38 |
| -25 | 31 | 0 | 12 | 7 |
| +6 | 0 | 31 | 43 | 38 |
| +6 | 0 | 0 | 12 | 7 |

For dual-DART configurations, you need to reduce each path by 3dB at the Remote **DART Forward Gain**. For example, for a DART Input Level of -25dBm, the Host FWD Gain setting would be 31dB and the Remote FWD Gain setting would be 28dB.

- 40 In the **DART Forward Delay** box, set in microseconds the actual delay that will be applied to the RF forward path signal. The minimum delay required is calculated. The acceptable range of delays is 88us. If you attempt to set the delay to a value outside the allowed range, the DART uses either the minimum or maximum, dependant on whether the DART is exceeding the set delay (too high or low).

Be aware of simulcast links. Observe the minimum delay required for the longest link, and set the delay to the same value for all simulcast nodes in the same connection based on this value.

Here is an example:

- Fiber has 8 usec per mile of fiber.
- Remote 1 has 5 miles of fiber (40 usec of fiber delay).
- Remote 2 has 10 miles of fiber (80 usec of fiber delay).
- Remotes are set to Cellular A"/A Band which has 8 usec of system delay. The delay ranges will therefore be:
 - Remote 1 delay (48-136)
 - Remote 2 delay (88-176)

The system calculates these delay values—this is a typical example based on the fiber lengths provided. You select a delay value that's within the range calculated by the system.

Set the delays to the same values for all nodes in the network in order to:

- Optimize simulcast
- Make BTS datafill changes simple (same delay offsets for all nodes)
- Simplify E-911 integration (same delay offsets for all nodes)

Delays cannot be shortened; they can only be lengthened. The recommended approach is to normalize all Remotes to the longer minimum delay. In this example the delay would therefore have to be 88 usec.

- 41 In the **DART Reverse Delay** box, set in microseconds the actual delay that will be applied to the RF reverse path signal. The actual delay of the RF path will be within 1 usec. For E-911 TDOA applications, the reverse path delay must be measured to achieve the +/- 50 nsec delay accuracy specified for DAS networks. The FWD and REV delay values are usually the same because the fiber path between the two is typically the same.

- 42 Click **Apply**.

6.10 CONCLUDE INITIAL SYSTEM SETUP

The FlexWave system is now ready for use and further configuration as described in this document.



The default admin user account has unrestricted access to all EMS user accounts and management capabilities. To protect against unauthorized access to the Prism network, as soon as possible, the user assigned the admin role should follow the process described [“Changing Your Own Password” on page 208](#) to change the password for the default admin user.

6.11 (OPTIONAL) CONFIGURING MULTI-HOST SYSTEMS FOR MANUAL MODE



You can only switch between the Automated and Manual modes when there are no active links in the system. Once a link is established the mode is locked and selections in the Linking Mode list are disabled. All active links must be unlinked to enable the selections in the Linking Mode list.

When the Prism system is set to Automated linking mode, you establish a link in the **Configuration Details** window by selecting the Host DART to link to and then clicking **Apply** (see [“Link a Remote DART to a Host DART” on page 162](#)). The link is then established on both the Host and Remote ends, using the fiber and the timeslots that are automatically selected by the FlexWave EMS. The Remote DART also automatically adopts the Host DART's pass band and diversity setting.

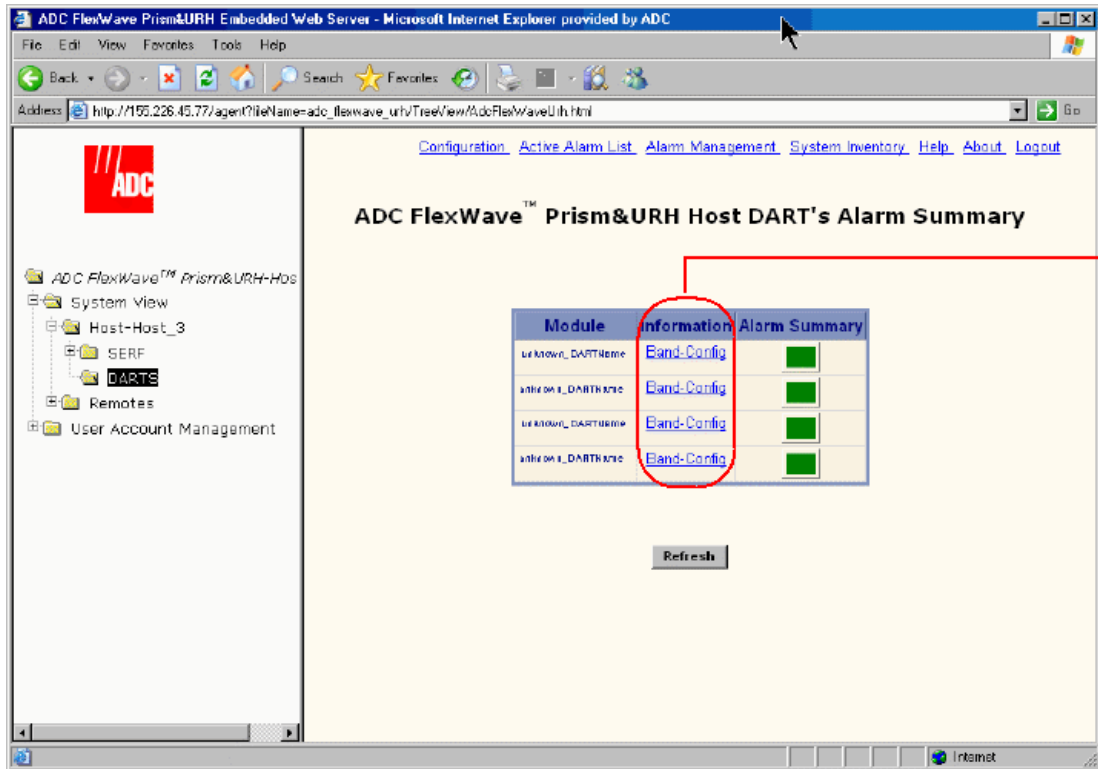
Multi-Host systems must be set to Manual linking mode so each side of the link (Host and Remote) can be established independently. The Network Administrator must also manually specify the fiber, timeslots, pass band, and diversity status for each end. There is no system crosscheck to validate the selections—so the setup described in this section should be performed only by an administrator who is very familiar with the concepts involved.

6.11.1 Set the Multi-Host System to Manual Mode

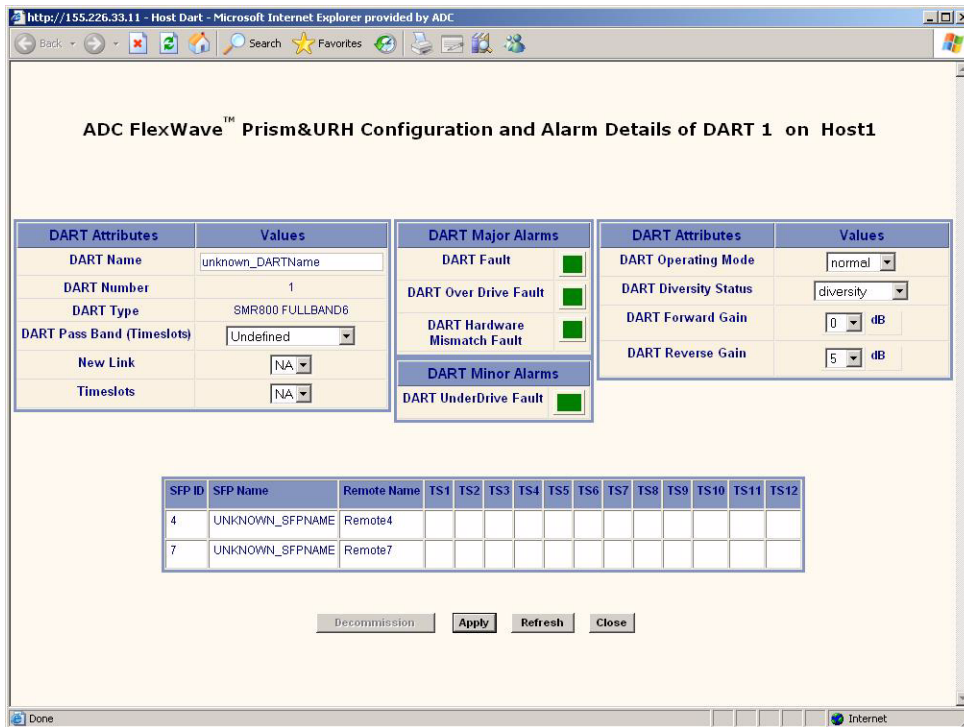
- 1 In the Function Explorer Tree, select **System View, Host-Unknown_HostName** to open the **Host Summary** view in the EMS View Frame. (For information on the read-only status indicators in the **Host Summary** view, see [“Viewing the Host Summary” on page 214](#).)
- 2 In the **Linking Mode** list, select **Manual**.
- 3 Click **Apply**.

6.11.2 Configure the Host DARTs

- 4 In the Function Explorer Tree, select **System View, Host-x, SERF, DARTS** (where *-x* is the Host name) to open the **DART's Alarm Summary** view in the EMS View Frame.
The **DART's Alarm Summary** view displays all the Host DARTS that are present, starting from slot 1 at the top of the list and working sequentially down to last DART, which can be slots 1-8.
- 5 In the **Information** column, click on the **Band-Config** link for the DART to be configured.



- 6 In the **Configuration and Alarm Details of DART n** window that opens, set the **DART Attributes**. The table at the bottom of the **Configuration and Alarm Details of DART n** window shows how many SFPs have been discovered that are available for linking—their corresponding timeslots are blank.



- a In the **DART Name** box, enter a name for the DART between 5 and 32 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.
- b In the **DART Pass Band (Timeslots)** list, select the DART Pass Band to be supported by this DART. The list will include only those pass bands that are valid selections for the DART band. For example, if the DART band is “cellular,” only cell pass bands are listed.
- c In the **New Link** list, select the SFP ID for the fiber to be used to communicate with the Remote for the DART's RF. Only the IDs of fiber with enough available contiguous timeslots for the selected passband will be available in the **New Link** list. The table in the lower part of the screen shows which fibers are available and which timeslots on the fibers are in use. Be careful to select a fiber to the Remote to which you want to link.
- d In the **Timeslots** list, select the timeslots on the fiber that will carry the RF. The **Timeslots** list displays the range of timeslots that can be used—only unused timeslots will be available for selection. If the DART is already linked to a Remote, the **Timeslots** list comprises the timeslots being used for that previous link. If you are linking to more than one Remote, the same timeslots must be used on all fibers for this DART.

- e In the **DART Operating Mode** list, select one of the following:
- **Standby**—forces the RF function to be muted in the Host and its linked Remote.
 - **Normal**—allows the system to operate normally (RF function not forced to be muted), assuming all other system components are in proper working order. (Default setting.)

The mode **Undefined** is not user selectable, and indicates that the EMS is unaware of the current mode.

- f In the **DART Diversity Status** list, select **nonDiversity** or **diversity**. For a diversity application, one DART will be configured **nonDiversity** for the primary FWD/REV path signal and the other DART will be configured **Diversity**. This selection therefore determines whether the DART card being configured will carry the primary or secondary RF path.

For dual DART configurations, such as dual-pcs, smr800/smr900 and dual-aws, both DARTs must have **DART Diversity Status** set to **nonDiversity**.



The diversity status of the Host DART will not extend to the Remote DART connected to it. You must explicitly configure the Remote DART to have the same diversity status as the Host DART.

- g In the **DART Forward Gain** list, set this value (0 to 31 dB) based upon the fully loaded forward path signal level from the Base Station. The Host DART expects signal levels from **-25 to +5 dBm**. If the fully loaded signal is +5 dBm, then the DART forward gain should be set to 0 dB, if the fully loaded signal is -25 dBm, then the DART Forward Gain should be set to 30 dB. The equation is:

$$\text{DART Forward Gain} = 5 - \text{fullyLoadedBasestationSignal}$$



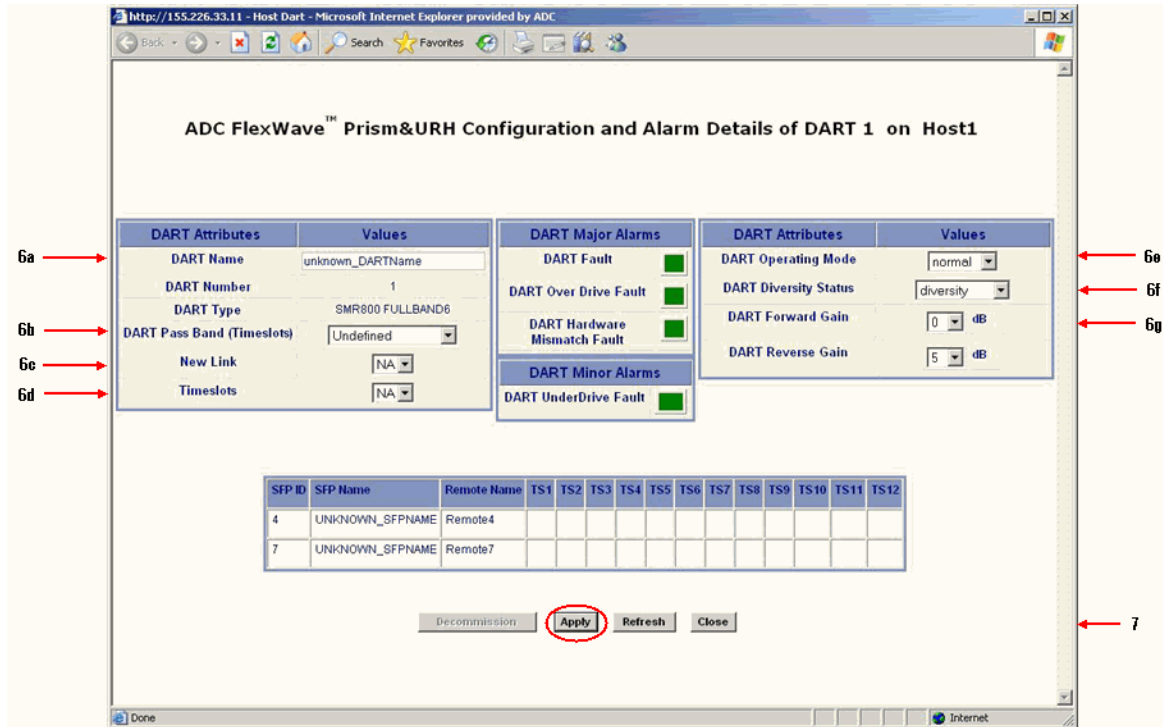
If you are setting up the system when no calls are going through, you must allow headroom for a fully loaded forward path. For CDMA protocols, the difference from unloaded to fully loaded is typically 8dB, so if the unloaded signal is - 15dBm, then the fully loaded input would be - 7 dBm and the Host Forward Gain should be set to 5- (- 7) = 12 dB.

The same rules applies for GSM carriers, except that the unloaded to loaded is determined by the equation $10 \cdot \log_{10}(\# \text{ RF Channels})$. So if there are 4 GSM RF Channels, then the loaded forward path is 6 dB above unloaded.

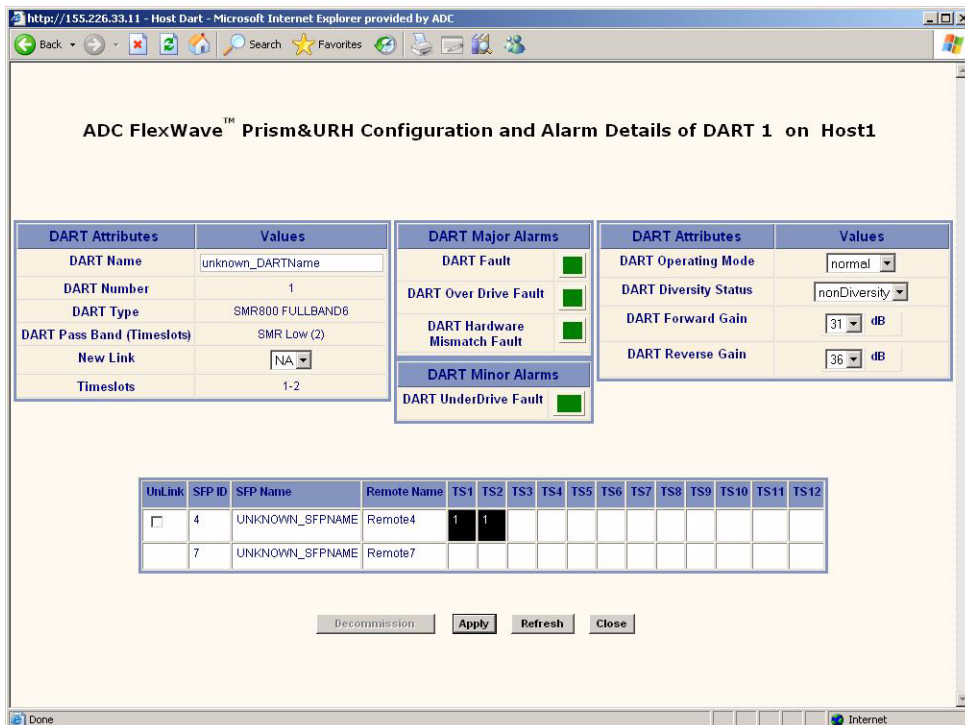
If sufficient headroom is not present, then the LPA can be over- powered causing a Loss Of Service.



When configured correctly, the Host DART Forward input can handle peaks of 14dB above the BTS signal level. For example, if the fully loaded CDMA carrier is - 25dBm, then peaks up to - 11 dBm can be handled (CDMA peak to average is typically 10- 12 dB). If the peaks exceed the 14 dB of headroom, then Automatic Level Control (ALC) will occur to prevent over- driving the A/D Converter.



7 Click **Apply**.



8 Click Close.



To unlink a Host DART from a Remote, click on the checkbox in the fiber timeslot table for the Remote being unlinked, and then click Apply.

6.11.3 Configure the Remote DARTs

- 9 Login to the web server on the Host that is managing the Remote (that is, the Host has IP enabled to the remote). This may be the Host you are currently logged into or could be a different Host in the Multi-Host group.
- 10 In the Function Explorer Tree, select **System View, Remotes, Remote#-x, SERF, RF Groups** (where **Remote#** indicates the Remote number that corresponds to a Host SFP port number and *n* is the Remote name) to open the **Alarm Summary of RF Groups** view (see [Figure 6-2 on page 161](#)).
- 11 In the rectangle for the RF group selected, click on the **config** link for the band being linked to open a **Configuration Details** window that corresponds to the selected link.
- 12 In the **Configuration Details of DART n on Remote//** window that opens, set the **DART Attributes**. The table at the bottom of the **Configuration and Alarm Details of DART n** window shows how many SFPs have been discovered that are available for linking—their corresponding timeslots are blank.
 - a In the **DART Name** box, enter a name for the DART between 5 and 32 characters with no spaces. The only special character allowed is an underscore, but it cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.
 - b In the **DART Pass Band (Timeslots)** list, select the DART Pass Band to be supported by this DART. The list will include only those pass bands that are valid selections for the DART band. For example, if the DART band is “cellular,” only cell pass bands are listed.
 - c In the **New Link** list, select the SFP that you want to link.
 - d In the **Timeslots** list, select the timeslot for the SFP. If the DART is already linked, the **Timeslots** list is read-only and displays the range of timeslots occupied by the DART.
 - e In the **DART Operating Mode** list, select one of the following:
 - **Standby**—forces the RF function to be muted in the Host and its linked Remote.
 - **Normal**—allows the system to operate normally (RF function not forced to be muted), assuming all other system components are in proper working order. (Default setting.)

The mode **Undefined** is not user selectable, and indicates that the EMS is unaware of the current mode.
 - f In the **DART Diversity Status** list, select **nonDiversity** or **diversity**. For a diversity application, one DART will be configured **nonDiversity** for the primary

FWD/REV path signal and the other DART will be configured **Diversity**. This selection therefore determines whether the DART card being configured will carry the primary or secondary RF path.

For dual DART configurations, such as dual-pcs, smr800/smr900 and dual-aws, both DARTs must have **DART Diversity Status** set to **nonDiversity**.



The diversity status, fiber, and timeslots of the Host DART must match the Remote DART linked to it.

- g** In the **DART Forward Gain** list, set this value (0 to 31 dB) based upon the fully loaded forward path signal level from the Base Station. The Host DART expects signal levels from **-25 to +5 dBm**. If the fully loaded signal is +5 dBm, then the DART forward gain should be set to 0 dB, if the fully loaded signal is -25 dBm, then the DART Forward Gain should be set to 30 dB. The equation is:

$$\text{DART Forward Gain} = 5 - \text{fullyLoadedBasestationSignal.}$$



If you are setting up the system when no calls are going through, you must allow headroom for a fully loaded forward path. For CDMA protocols, the difference from unloaded to fully loaded is typically 8dB, so if the unloaded signal is - 15dBm, then the fully loaded input would be - 7 dBm and the Host Forward Gain should be set to 5- (- 7) = 12 dB.

The same rules applies for GSM carriers, except that the unloaded to loaded is determined by the equation $10 \cdot \log_{10}(\# \text{ RF Channels})$. So if there are 4 GSM RF Channels, then the loaded forward path is 6 dB above unloaded.

If sufficient headroom is not present, then the LPA can be over- powered causing a Loss Of Service.



When configured correctly, the Host DART Forward input can handle peaks of 14dB above the BTS signal level. For example, if the fully loaded CDMA carrier is - 25dBm, then peaks up to - 11 dBm can be handled (CDMA peak to average is typically 10- 12 dB). If the peaks exceed the 14 dB of headroom, then Automatic Level Control (ALC) will occur to prevent over- driving the A/D Converter.

- h** In the **DART Forward Delay** box, set in microseconds the actual delay that will be applied to the RF forward path signal. The minimum delay required is calculated. The acceptable range of delays is 88us. If you attempt to set the delay to a value outside the allowed range, the DART uses either the minimum or maximum, dependant on whether the DART is exceeding the set delay (too high or low).

Be aware of simulcast links. Observe the minimum delay required for the longest link, and set the delay to the same value for all simulcast nodes in the same connection based on this value.

Here is an example:

- Fiber has 8 usec per mile of fiber.
- Remote 1 has 5 miles of fiber (40 usec of fiber delay).
- Remote 2 has 10 miles of fiber (80 usec of fiber delay).

- Remotes are set to Cellular A"/A Band which has 8 usec of system delay. The delay ranges will therefore be:
 - Remote 1 delay (48-136)
 - Remote 2 delay (88-176)

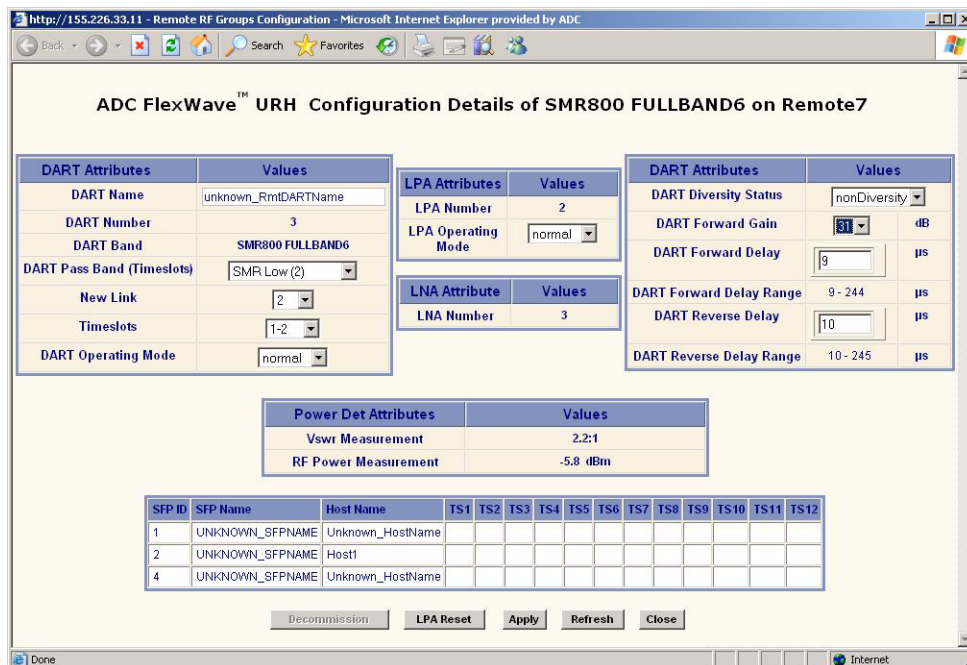
The system calculates these delay values—this is a typical example based on the fiber lengths provided. You select a delay value that's within the range calculated by the system.

Set the delays to the same values for all nodes in the network in order to:

- Optimize simulcast
- Make BTS datafill changes simple (same delay offsets for all nodes)
- Simplify E-911 integration (same delay offsets for all nodes)

Delays cannot be shortened; they can only be lengthened. The recommended approach is to normalize all Remotes to the longer minimum delay. In this example the delay would therefore have to be 88 usec.

- i In the **DART Reverse Delay** box, set in microseconds the actual delay that will be applied to the RF reverse path signal. The actual delay of the RF path will be within 1 usec. For E-911 TDOA applications, the reverse path delay must be measured to achieve the +/- 50 nsec delay accuracy specified for DAS networks. The FWD and REV delay values are usually the same because the fiber path between the two is typically the same.



13 Click **Apply**.

ADC FlexWave™ URH Configuration Details of SMR800 FULLBAND6 on Remote7

| DART Attributes | | Values |
|----------------------------|--|---------------------|
| DART Name | | unknown_RmtDARTName |
| DART Number | | 3 |
| DART Band | | SMR800 FULLBAND6 |
| DART Pass Band (Timeslots) | | SMR Low (2) |
| New Link | | 2 |
| Timeslots | | 1-2 |
| DART Operating Mode | | normal |

| LPA Attributes | | Values |
|--------------------|--|--------|
| LPA Number | | 2 |
| LPA Operating Mode | | normal |

| LNA Attribute | | Values |
|---------------|--|--------|
| LNA Number | | 3 |

| DART Attributes | | Values |
|--------------------------|--|--------------|
| DART Diversity Status | | nonDiversity |
| DART Forward Gain | | 31 dB |
| DART Forward Delay | | 9 μs |
| DART Forward Delay Range | | 9 - 244 μs |
| DART Reverse Delay | | 10 μs |
| DART Reverse Delay Range | | 10 - 245 μs |

| Power Det Attributes | | Values |
|----------------------|--|----------|
| Vswr Measurement | | 2.2:1 |
| RF Power Measurement | | -5.8 dBm |

| UnLink | SFP ID | SFP Name | Host Name | TS1 | TS2 | TS3 | TS4 | TS5 | TS6 | TS7 | TS8 | TS9 | TS10 | TS11 | TS12 |
|--------------------------|--------|-----------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| | 1 | UNKNOWN_SFPNAME | Unknown_HostName | | | | | | | | | | | | |
| <input type="checkbox"/> | 2 | UNKNOWN_SFPNAME | Host1 | 3 | 3 | | | | | | | | | | |
| | 4 | UNKNOWN_SFPNAME | Unknown_HostName | | | | | | | | | | | | |

Buttons: Decommission, LPA Reset, Apply, Refresh, Close

14 Click Close.



To unlink the Remote DART, click on the checkbox in the fiber timeslot table (at the bottom of the window) in the Unlink column and then click Apply.

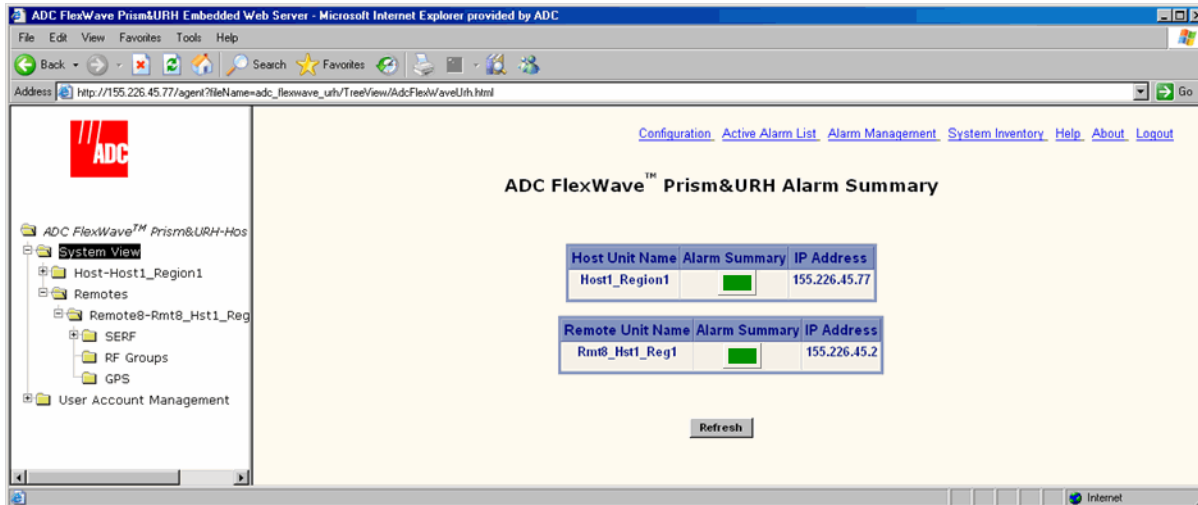
7

USING THE EMS TO MANAGE A PRISM SYSTEM

| Content | Page |
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7.1 DISPLAYING THE SYSTEM VIEW

In the Function Explorer Tree, click on **System View** to open the system view, which is labeled as the **Alarm Summary**, in the EMS View Frame.



The **Alarm Summary** provides a top-level view of the Prism system, which identifies the Host and all Remotes known to the EMS by their IP addresses and provides a summary alarm status indicator for each unit.

- **Host Unit Name**—name entered by user or **Unknown_HostName** if no name has been entered. Current summary alarm state of Host is indicated by status indicator in same row.
- **Alarm Summary** indicator—indicates if the state of the unit:
 - Green indicates a Normal state
 - Yellow indicates that a Minor alarm is active, and is the highest-level active alarm
 - Red indicates that a Major alarm is active.
- **Remote Unit Name**—name entered by user or **Unknown_RmtName** if no name has been entered. Summary alarm state is indicated by status indicator in same row.
- **IP Address (Host/Remote)**—IP Address of the Host/Remote. If logged into a Remote that is not connected to a Host, the Host IP Address will appear as **NOT_CONNECTED**, and the Remote IP Address will appear as **0.0.0.0** if the remote is setup for DHCP. If a static IP address has been assigned to the Remote, the actual IP address for the Remote will display when the Host is not connected.

7.2 SETTING AUTO REFRESH



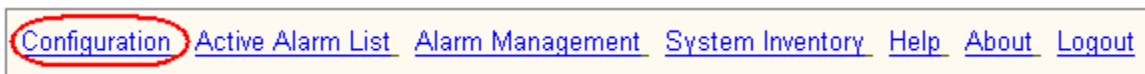
Only a user logged in under the admin or a Network Manager account can change Prism settings through the EMS.

Auto Refresh is intended for use after the Prism system has been configured during initial setup and you want to monitor system performance without having to trigger manual page refreshes.

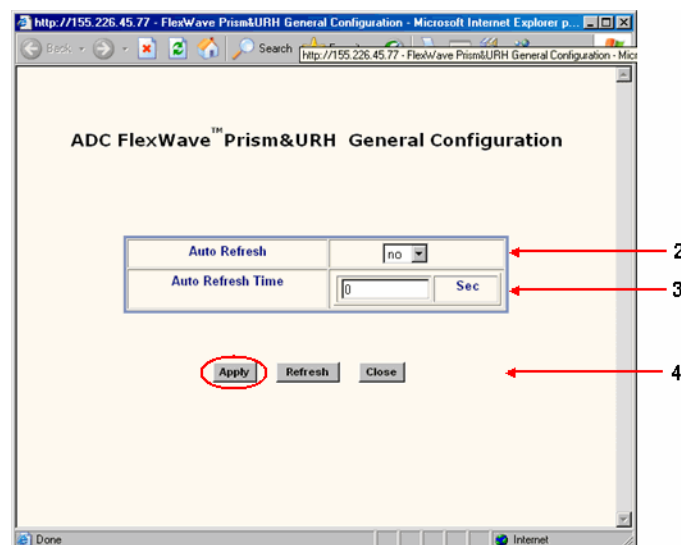


Do not set Auto Refresh until after the initial Prism system setup described in “[Initial Prism System Setup](#)” on page 143. If you apply Auto Refresh before initial system setup, entered configurations can be lost.

- 1 In the EMS Menu bar, click **Configuration**.



The **General Configuration** window opens.

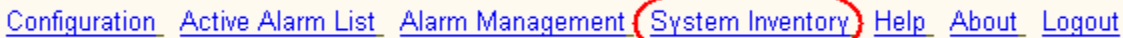


- 2 In the **Auto Refresh** list, select **yes** to set the EMS pages to auto refresh.
- 3 In the **Auto Refresh Time** box, enter the number of seconds (1 - 1800) between EMS auto refreshes.
- 4 Click **Apply**.

7.3 WORKING WITH THE SYSTEM INVENTORY

The **System Inventory** view identifies the main software and hardware components of the current, working system.

- 1 To open the **System Inventory** view, in the EMS Menu bar, click **System Inventory**.



[Configuration](#) [Active Alarm List](#) [Alarm Management](#) [System Inventory](#) [Help](#) [About](#) [Logout](#)

- 2 Confirm that the Host and its Remotes are operating at the same software revision by looking at the values displayed in the **Compact Flash SwVer** column.
- 3 Confirm that all installed devices are displayed in the **Hardware Inventory** table:
 - Host
 - SeRFs
 - DART
 - System card
 - Remotes
 - One RSI per connected Remote
 - One SeRF per connected Remote
 - Remote RF Modules
 - One RDI
 - Power Detector
 - One or two DARTs, depending on configuration.
 - One or two LNAs, depending on configuration.

7.3.1 System Inventory View Components

The **System Inventory** view is a too long to present in one graphic. This document therefore presents the **System Inventory** view in two sections:

- “**System Inventory and Host Inventory Tables**” on page 181 describes the two tables at the top of the view.
- “**Remote Inventory Tables**” on page 182 describes the tables at the bottom of the view.

7.3.1.1 System Inventory and Host Inventory Tables

ADC FlexWave™ Prism&URH System Inventory

| Software Inventory | | | | | | | | | | | |
|-----------------------|-------------|------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|---------------|---------------|---------------|
| Unit | Module Type | Linux Kernel Ver | Boot Loader Ver | Compact Flash SwVer | FPGA Ver | Agent SwVer | HWMon SwVer | APPMon SwVer | MATEMon SwVer | ENETMon SwVer | FPGAMon SWVer |
| Host-Host1_Region1 | Serf | 1.0.0.4 | 01.00.00.07 | 5.1.0.9 | 00.00.31.60 | 05.01.00.07 | 02.03.00.01 | 01.00.00.08 | 05.00.00.04 | 02.00.00.02 | 05.01.00.05 |
| Remote-Rmt8_Hst1_Reg1 | Serf | 1.0.0.4 | 01.00.00.07 | 5.1.0.9 | 00.00.31.60 | 05.01.00.07 | 02.03.00.01 | 01.00.00.08 | 05.00.00.04 | 02.00.00.02 | 05.01.00.05 |

| Host: Host1_Region1 (155.226.45.77) | | | | |
|-------------------------------------|-----------|--------|---------------|-------------|
| Module Type | Date Code | Hw Ver | Serial Number | Part Number |
| Serf | 18/2008 | 11 | 224735816 | 1433780 |
| Dart-DCSHost1 | 35/2008 | 0 | 1001297 | 1445537 |
| Dart-UMTSHost | 32/2008 | 0 | 1001025 | 1445539 |
| Dart-PCSHost_Slot5 | 20/2008 | 14 | 224746492 | 1425437 |
| Dart-PCSHost_Slot6 | 07/2008 | 11 | 224457798 | 1425437 |
| System Card | 13/2008 | 21 | 224593236 | 1397156 |

Remote: Rmt8_Hst1_Reg1 on SFP8 (155.226.45.2)

Figure 7-1. System Inventory and Host Inventory Tables

The **System Inventory** table provides the following information:

- **Unit**—Host or Remote name
- **Module Type**—Host or Remote as listed in the row labeled as **Host** or **Remote**
- **Linux Kernel Ver**—Version of the Linux Kernel on the Host or Remote
- **Boot Loader Ver**—Version of the Boot Loader on the Host or Remote
- **Compact Flash SwVer**—Version of the Compact Flash (Host or Remote, refer to the row labeled for the Host or Remote). The version of the Compact Flash drives all other software versions.
- **FPGA Ver**—Version of the FPGA on the Host or Remote Serf (refer to the row labeled for the Host or Remote)
- **Agent SwVer**—Version of the Agent on the Host or Remote (refer to the row labeled for the Host or Remote)
- **HWMon SwVer**—Software Version of the Hardware Monitor process running on the Host or Remote
- **APPMon SwVer**—Software Version of the Application Monitor process running on the Host or Remote
- **MATEMon SwVer**—Software Version of the Mate Monitor process running on the Host or Remote
- **ENETMon SwVer**—Software Version of the Ethernet Monitor process running on the Host or Remote

- **FPGAMon SWVer**—Software Version of the FPGA Monitor process running on the Host or Remote

The **Host** table provides the following information:

- **Title**—Name of the Host in the format of **Host: HostName (xxx.xxx.xxx.xxx)** where:
 - **HostName** is the default or user-assigned name for the Host
 - **xxx.xxx.xxx.xxx** is the Host IP address
- **Module Type**—Type of module (such as SeRF, DART).
- **Date Code**—Date code for the module
- **Hw Ver**—Version of the module hardware
- **Serial Number**—Unique serial number for the module
- **Part Number**—ADC part number for the module

7.3.1.2 Remote Inventory Tables

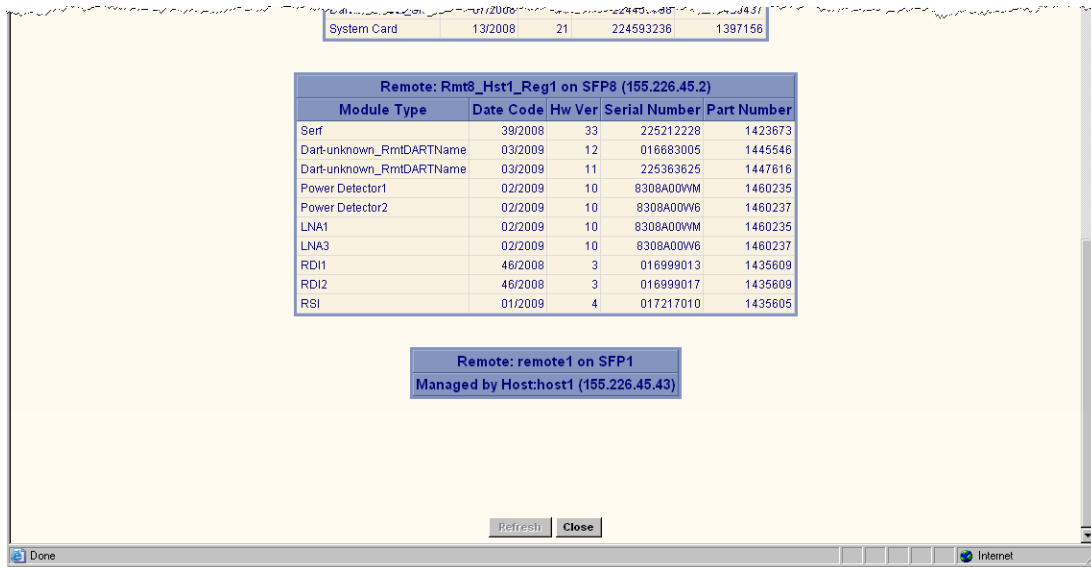


Figure 7-2. Remote Inventories

The **Remote Inventory** tables, of which there can be up to eight, comprise the following information:

- **Title**—Name of the Remote in the format of **Remote: RemoteName (xxx.xxx.xxx.xxx)**, where
 - **RemoteName** is the default or user-assigned name for the Remote
 - **xxx.xxx.xxx.xxx** is the Remote IP address
- **Module Type**—Type of module (such as LNA, SeRF, DART).
- **Date Code**—Date code for the module
- **Hw Ver**—Version of the module hardware
- **Serial Number**—Unique serial number for the module
- **Part Number**—ADC part number for the module

7.4 WORKING WITH PRISM SYSTEM NETWORK INTERFACES

You use the EMS to configure the Prism system for one of the two different modes listed below, which affects how you configure the network interface of the Network and Craft ports and how you access the system through the EMS. In each mode, the Host and its subtended Remotes require the same configuration. Both modes require a DHCP server, which assigns an IP address to the Host and its subtended Remotes.

- **External Network** mode—is the default mode. The Host and subtended Remotes are DHCP clients and expect IP addresses to be assigned by an external DHCP server through a network Ethernet connector. If there is no external DHCP server, the Host will not be able to communicate with any connected Remotes.

The Host Craft port has a DHCP server that you can use to communicate with the Host directly. The IP address for the Host Craft port is 192.168.0.1. You can access the EMS via the Craft port, but if the Network port is not connected to an external DHCP server, the Remotes will not be visible to you.

- **Built-in Network** mode—**Built-In Network** mode is best suited for when there is no network to connect to or if the Prism network does not have a DHCP server. In Built-In Network mode, the functionality of the Network port and the Craft port are swapped. You connect a laptop to the Host Network port, which is assigned a default fixed IP address of 10.0.0.1 and all subtended network interfaces obtain a DHCP address in this same subnet. Alternatively, in Built-In Network mode you can connect the Craft port to an external DHCP server from which the Craft port obtains its IP address.



Static Mode—You also have the option of giving the devices on your Prism system static IP addresses. Contact ADC for further information (see [“Contacting ADC” on page 335](#)).



There are potential problems in switching between the External Network and Built-In Network modes. If cabled incorrectly your DHCP server could provide private IP addresses on a public network. Set the Prism system mode once and then do not change it.

[Table 7-1](#) describes how the system mode affects the IP address for the Host and subtended Remotes.

Table 7-1. Prism System Modes and IP Addresses

| Mode | Host IP Addresses | | Remote IP Addresses | |
|-------------------------|--|---|--|---|
| | Craft Port | Network Port | Craft Port | Network Port |
| External Network | <p>DHCP server assigns IP addresses in the 192.168.0.x range.</p> <p>For direct access to the Host through the EMS, in a Web browser enter the IP address 192.168.0.1 (http://192.168.0.1)</p> | <p>The Host Network port is a DHCP client and must be connected to a network with a DHCP server to obtain an IP address.</p> <p>For direct access to the Host through the EMS, in a Web browser enter the IP address assigned by the DHCP server. For information on discovering the IP address, see the DHCP server or connect to the EMS using the craft port and bring up the System View.</p> | <p>Remote Craft port IP address is 192.168.0.1. However, you cannot get direct access to the Host or the network from the Remote Craft port. You get read-only view to Remote configuration.</p> | <p>The Remote network port obtains its IP address from the external DHCP server.</p> <p>You can reach the Remote via telnet or ssh from the Host.</p> |
| Built-In Network | <p>DHCP client must be connected to a network with a DHCP server to obtain an IP address. The IP address can then be used by HTTP and SNMP to connect to the Host.</p> | <p>The Network port is a DHCP server with a fixed IP address of 10.0.0.1 and assigns IP addresses in the 10.0.0.x range to subtended Remotes.</p> <p>For direct access to the Host through the EMS, in a Web browser enter the IP address 10.0.0.1 (http://10.0.0.1)</p> | <p>Remote Craft port IP address is 192.168.0.1. However, you cannot get direct access to the Host or the network from the Remote Craft port. You get read-only view to Remote configuration.</p> | <p>The Remote Network port is a LAN/WAN connection to the network to which the Host Network port is connected. The Remote Network port therefore obtains an IP address in the 10.0.0.x range from the DHCP server in the Host.</p> <p>You can reach the Remote via telnet or ssh from the Host.</p> |

7.4.1 Changing to Built-In Network Mode



Only a user logged in under the admin or a Network Manager account can change Prism settings through the EMS.

Built-In Network mode allows all Remotes to be assigned an IP address to allow communication without the need for an external DHCP router. You therefore set the Prism system to **Built-In Network** mode if there is no network to connect to or if the network does not have a DHCP server. You would also change the Prism system to **Built-In Network** mode if you intend to transition to static IP addresses.



When changing from External Network mode to Built-In Network mode, if the Prism system is cabled incorrectly, the Prism DHCP server could broadcast private IP addresses on a public network. You should therefore only change the mode once, preferably during setup.

- 1 To open the **Host Summary** view in the EMS View Frame, in the Function Explorer Tree select **System View**, and then click on the Host name node.

ADC FlexWave™ Prism&URH on Host : Host1_Region1

| Module | Alarm Summary |
|--------|-------------------------------------|
| SERF | <input checked="" type="checkbox"/> |
| DART | <input checked="" type="checkbox"/> |

| | |
|------------------------|------------------|
| Host Name | Host1_Region1 |
| 10 MHz Reference Clock | internal |
| Network Interface | Built-In Network |
| Linking Mode | Automated |

| | | | |
|---------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| Host Major Contact Alarm Output | <input checked="" type="checkbox"/> | Remote Major Contact Alarm Output | <input checked="" type="checkbox"/> |
| Host Minor Contact Alarm Output | <input checked="" type="checkbox"/> | Remote Minor Contact Alarm Output | <input checked="" type="checkbox"/> |

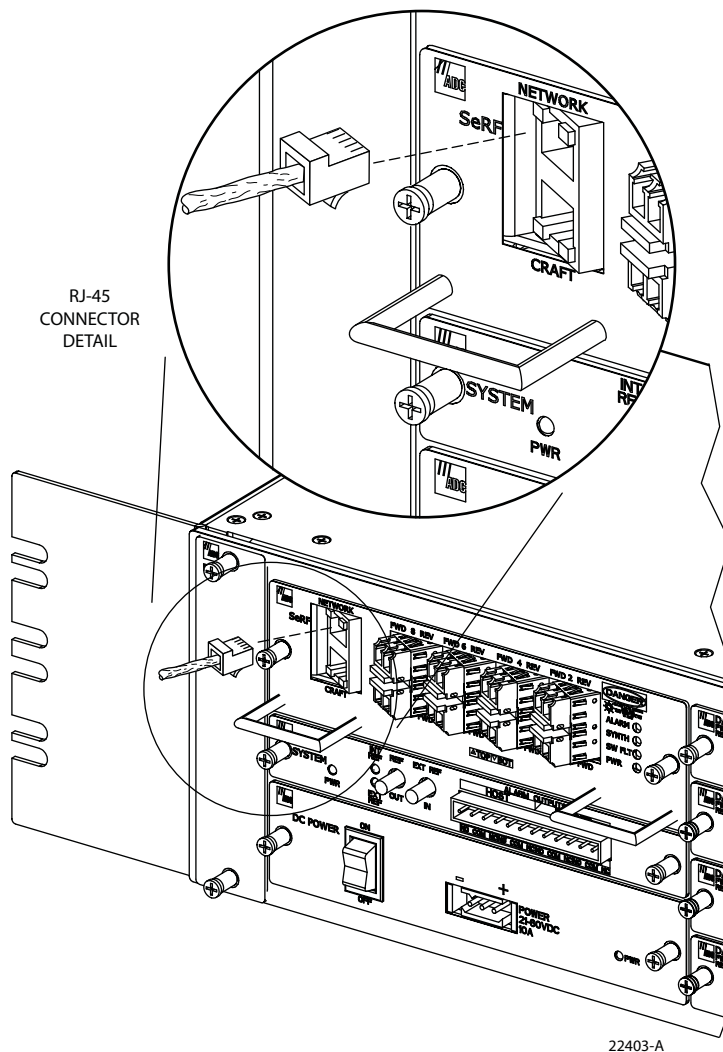
Apply Refresh Reset Unit

- 2 Set **Network Interface** to **Built-In Network**. This sets the Network port on the Host to the IP address 10.0.0.1 and starts a DHCP server on the Host that will provide IP addresses to connected Remotes. Built-In Network mode also causes the Host Craft port to run a DHCP client instead of using the IP address 192.168.0.1.
- 3 Click **Apply**.

- 4 In the confirmation dialog, click **OK**. Your current EMS session will close down as the IP addressing and configuration will have been modified.



- 5 Disconnect the Ethernet cable from the Host Craft port and connect it to the Host Network port.



- 6 Connect the free end of the Ethernet cable to the computer's port. Leave your computer in DHCP mode. It will automatically receive an IP address in the 10.0.0.0/24 subnet from the Host Network port.



It can take a while for the system to update the interfaces (can be up to 30 minutes, but typically is no more than 10 minutes). If the Remotes already have a DHCP IP address from an external network and you change it to built- in (in a different subnet), it can take 30 minutes for the Remote to request an update from an external IP address to the 10.0.0.x IP address. During this transient period, there will not be communication with the Remotes.

The Host will also take awhile to change from an external IP address to the 10.0.0.1 Ip address, so a period of no communication with the Host can be expected as well.

- 7 Open a Web browser and in its URL field, enter the Host IP address: 10 . 0 . 0 . 1
- 8 When the **Connect to** dialog opens:
 - a Enter the **User name** provided by ADC or by the Network Administrator. The default is **admin**.
 - b Enter the **Password** provided by ADC or by the Network Administrator. The default is **adc123**.
- 9 Click **OK**. The **Welcome to ADC FlexWave Prism Embedded Web Server** page opens.

7.4.2 EMS Access Methods

The FlexWave EMS has four access methods that are listed below and as shown and numbered in [Figure 7-3](#).

- 1 A laptop subtended to the Craft port on the Host provides direct access to the EMS. In this scenario the Host and the Remote can be configured and monitored through the EMS. This is the default access scenario during initial configuration and commissioning as described in [“Access the EMS” on page 144](#).
- 2 A personal computer with a Web browser connected through the internet or intranet to the Network port on the Host. This method provides a remote user access to the EMS through a Local Area Network (LAN) or Wide Area Network (WAN). In this scenario the Host and subtended Remotes can be configured and monitored through the EMS. After initial system setup, this is the default access method.



EMS Access Methods 1 and 2 are true for the default External Network mode described in this chapter. If your Prism system is set to Built- in Network mode, then the definitions for EMS Access Methods 1 and 2 for the Host Network and Craft ports are switched.

- 3 A personal computer with a Web browser connected to the Network port on the Remote provides a remote user a LAN connection to the Host network interface, which provides access to the EMS. See [“Accessing the EMS Through the Remote Network Port” on page 189](#).

- 4 A laptop subtended to the Remote Craft port provides access to the EMS. In this scenario, Remote configuration interfaces can be viewed in Read-Only format. The Host configuration interfaces are disabled and cannot be viewed. See “[Accessing the EMS Through the Remote Craft Port](#)” on page 192.

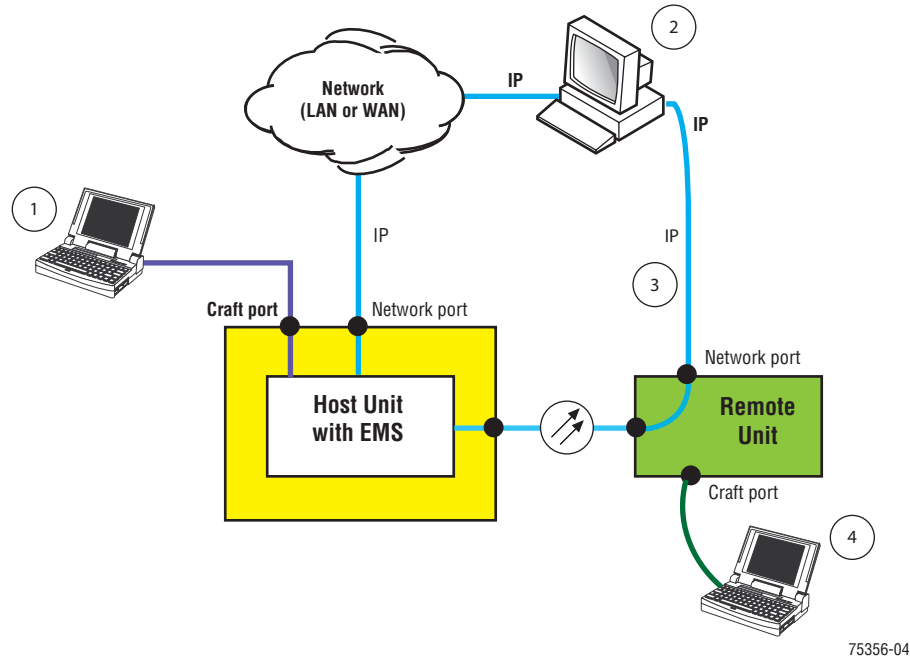


Figure 7-3. Four Points of EMS Access

7.4.2.1 Accessing the EMS Through the Remote Network Port

The Remote provides a Network port allowing communications with the internal processor and transfer of service data to the optical protocol allowing IP servicing between the Host and Remote(s). This port is customer accessible for monitoring the interface with the subtended Host and ENET subtended devices at the Remote. The Network port is 10/100/1000 BASE-T MDI and requires a minimum of CAT 5 cable.



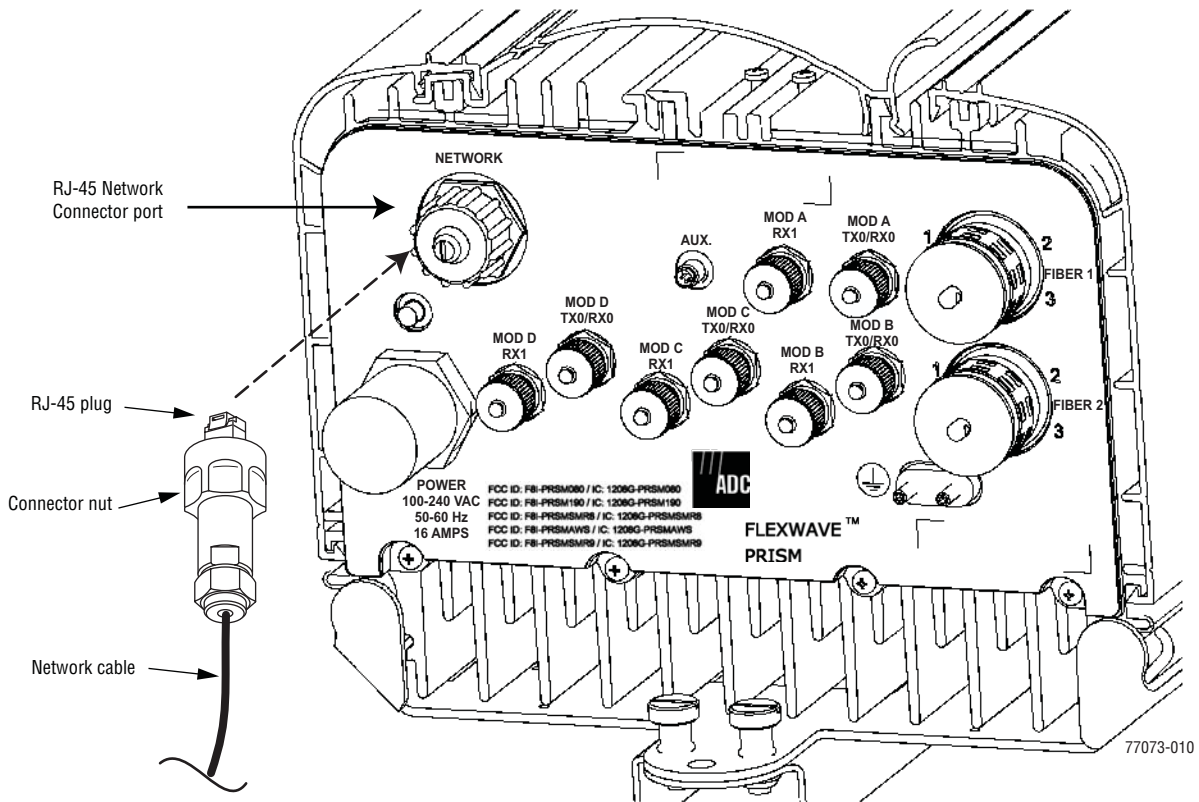
Although the Network port on the Remote is a GigE port, the available bandwidth is only 100Mbps (part of this bandwidth is used for system management services).

You cannot dedicate a full 100Mbps of bandwidth for external ethernet services off the Remote’s Network port. For example, if connecting a WiFi access point to the Remote’s Network port, you need to reduce the available bandwidth to less than 100Mbps (such as, 50Mbps).

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

Use the following procedure to install the Network cable and then log in to the EMS.

- 1 Remove the dust cap from the RJ-45 connector located at the bottom of the Remote as shown below.



Bottom View

- 2 Route the network cable from the network connection to the underside of the Remote.
- 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 or pliers 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 in order to turn it past the indented position.



It may be necessary to apply 30 to 50 lbs/force-inches (3.4 to 5.6 Nm) of torque to the connector nut in order to turn it past the indented position.

- 6 Connect your computer and start a Web browser.
- 7 In the URL field for the Web browser, enter the IP address of the EMS Host:
 - If the Prism system is set to **External Network** mode, enter IP Address obtained from the DHCP server. (Your computer also receives an IP address from the external DHCP server connected to the Host.
 - If the Prism system is set to **Built-In Network** mode, enter **10.0.0.1** . (The Remote Network port is a LAN extension from the Host Network port. Your computer receives an IP address in the 10.0.0.0/24 subnet from the Host.)
- 8 When the **Connect to** dialog opens:
 - a Enter the **User name** provided by ADC or by the Network Administrator. The default is **admin**.
 - b Enter the **Password** provided by ADC or by the Network Administrator. The default is **adc123**.
- 9 Click **OK**. The **Welcome to ADC FlexWave Prism Embedded Web Server** page opens.

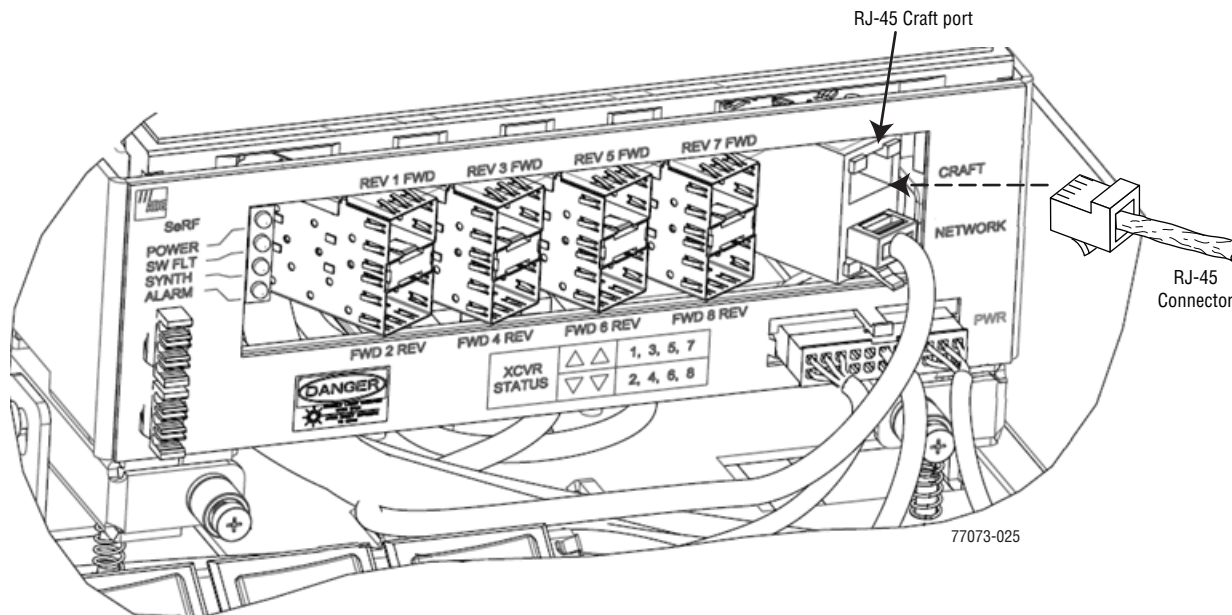
7.4.2.2 Accessing the EMS Through the Remote Craft Port

You can use the Craft port on the SeRF Module to access the FlexWave EMS to view system configuration and alarms. For example, if there is a problem communicating with the Remote and you have determined that fiber is not the issue, connecting to the Craft port helps you obtain beneficial troubleshooting information.



When you access the EMS through the Remote Craft port, the EMS GUI shows only the Remote in its Function Explorer Tree. You cannot configure any system components or clear alarms.

- 1 Verify that your PC network interface is configured for DHCP.
- 2 If you have a wireless network interface, disable it. Otherwise an IP conflict may result if the wireless network resides in the same IP subnet as the Craft port.
- 3 Open the Prism door.
- 4 Remove the dust cap from the Craft port located on the SeRF Module.



- 5 Use an Ethernet CAT 5 cable with RJ-45 connectors to connect a laptop to the Craft port.
- 6 Connect your computer and start a Web browser.
- 7 Verify that the laptop is receiving an IP address in the 192.168.0.0/24 subnet (that is, 192.168.0.100 or 192.168.0.99 and so forth).
- 8 In the URL field for the Web browser, enter the IP address of the Craft port (defaults to 192.168.0.1).
- 9 When the **Connect to** dialog opens enter **viewer** in the **User name** box and in the **Password** box.



The user name (**viewer**) and password (**viewer**) used to access the EMS through the Remote Craft port cannot be changed.

- 10 Click **OK**. The **Welcome to ADC FlexWave Prism Embedded Web Server** page opens.

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8

MANAGING USER ACCOUNTS

| Content | Page |
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| 8.1 FlexWave EMS User Accounts..... | 196 |
| 8.2 Viewing User Accounts | 197 |
| 8.3 Adding a User Account | 198 |
| 8.4 Changing a User Access Level | 202 |
| 8.5 Changing the Password of Another User | 206 |
| 8.6 Changing Your Own Password | 208 |
| 8.7 Deleting a User Account | 210 |

8.1 FLEXWAVE EMS USER ACCOUNTS

The EMS provides security, which can be broadly classified as:

- **User Authentication**, which defines the way a user is identified prior to being allowed to log on to the EMS. User Authentication ensures that only known users have access by providing a method of identifying each user through a user ID and password.
- **User Authorization**, which involves managing the user's privileges in the Prism network management infrastructure. Authorization is based on the concept of user access system configuration restrictions.

There are three user-access levels that can be assigned by the admin:

- **admin**—the default user account that has unrestricted access to all EMS user accounts and management capabilities. To protect against unauthorized access to the Prism network, the user assigned the admin role should follow the process described in [“Changing Your Own Password” on page 208](#) to change the password for the admin user account.
- **Network Manager**—has read and write access to all system functions except user account management.
- **Network User**—has read only permissions into the system.

There are also two default user-access levels for the Remote that cannot be deleted or changed:

- **Operator**—has Read and Write access to only the Prism Remote functions, all other operations are Read Only. (This user is not available on URH Remotes.)
- **Viewer**—has Read Only rights for Prism and URH Remotes.

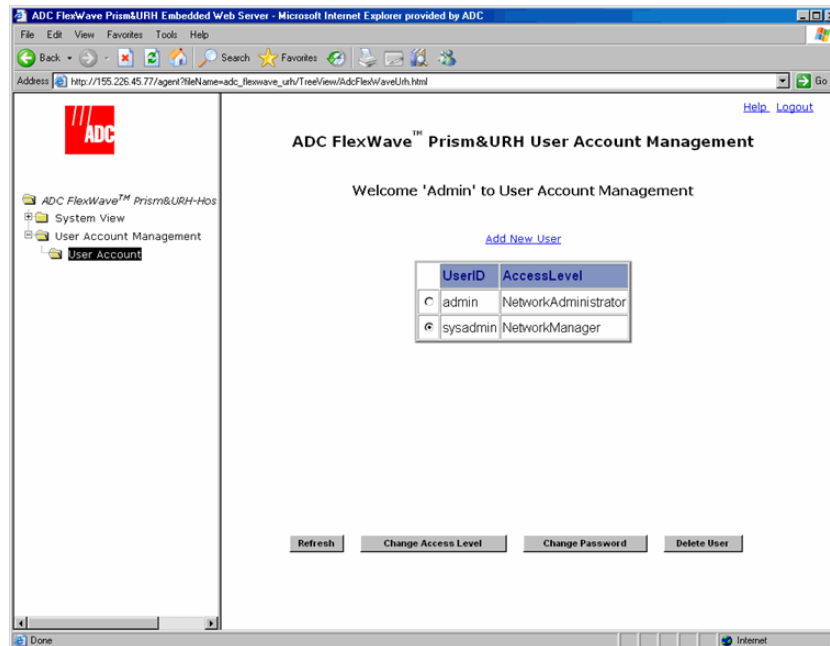
FlexWave EMS prevents a login in which the user enters an invalid User ID or password.

8.2 VIEWING USER ACCOUNTS



Only a user logged in under the admin account can view all existing user accounts.

In the Function Explorer Tree, click on **User Account Management**, **User Account** to open the **User Account Management** view in the EMS View Frame with a table that lists all current user accounts.



The **User Account Management** view has the following elements:

- **Add New User** link—Opens the **Add New User** dialog (see “[Adding a User Account](#)” on page 198).
- Select radio button—Selects the user whose account the admin wants to manage.
- **UserID** column—Lists users by the User ID entered into the EMS by the admin.
- **AccessLevel** column—identifies the user’s access level.
- **Refresh** button—updates the **User Account Management** view
- **Change Access Level** button—opens the **Change Access Level** window (see “[Changing a User Access Level](#)” on page 202).
- **Change Password** button—opens the **Change Password Settings** view (“[Changing the Password of Another User](#)” on page 206)
- **Delete User** button—allows the admin to delete a user account (see “[Deleting a User Account](#)” on page 210).

8.3 ADDING A USER ACCOUNT



Only a user logged in under the admin account can add user accounts.

The FlexWave EMS limits the number of users to 50.

- 1 In the Function Explorer Tree, click on **User Account Management, User Account** to open the **User Account Management** view in the EMS View Frame with a table that lists all current user accounts.

ADC FlexWave™ Prism&URH User Account Management

Welcome 'Admin' to User Account Management

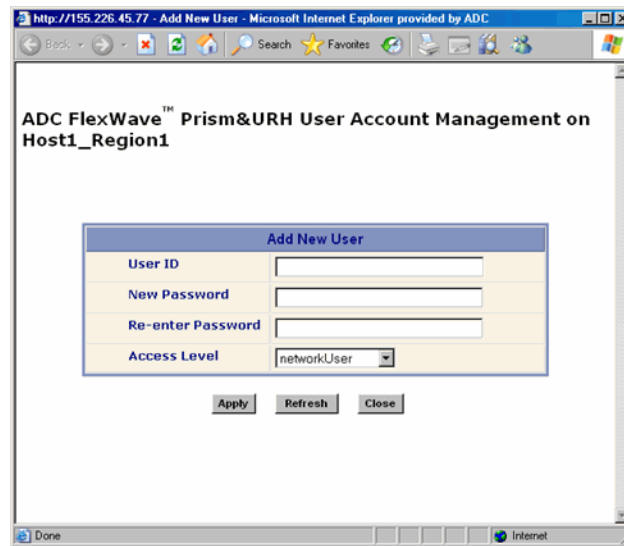
[Add New User](#) ← Step 3

| UserID | AccessLevel |
|--------|----------------------|
| admin | NetworkAdministrator |

← User Account table

Refresh Change Access Level Change Password Delete User

- 2 Click on **Add New User** to open the **Add New User** dialog.



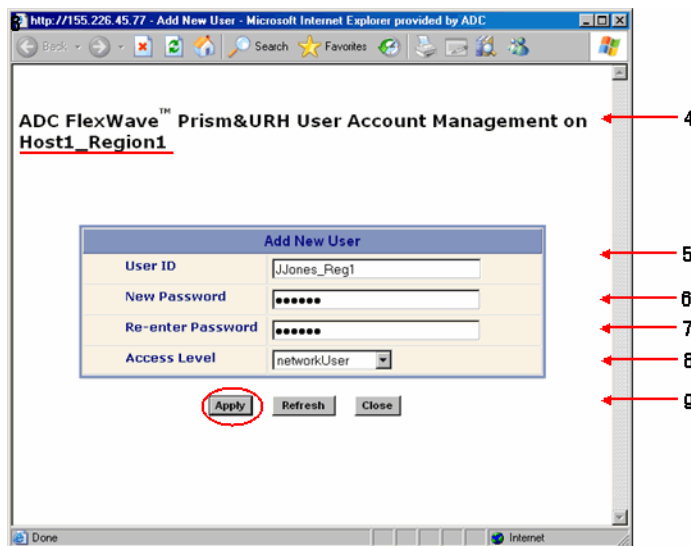
The screenshot shows a web browser window titled "http://155.226.45.77 - Add New User - Microsoft Internet Explorer provided by ADC". The main heading of the page is "ADC FlexWave™ Prism&URH User Account Management on Host1_Region1". In the center, there is a dialog box titled "Add New User" with the following fields and controls:

| Add New User | |
|-------------------|----------------------|
| User ID | <input type="text"/> |
| New Password | <input type="text"/> |
| Re-enter Password | <input type="text"/> |
| Access Level | networkUser |

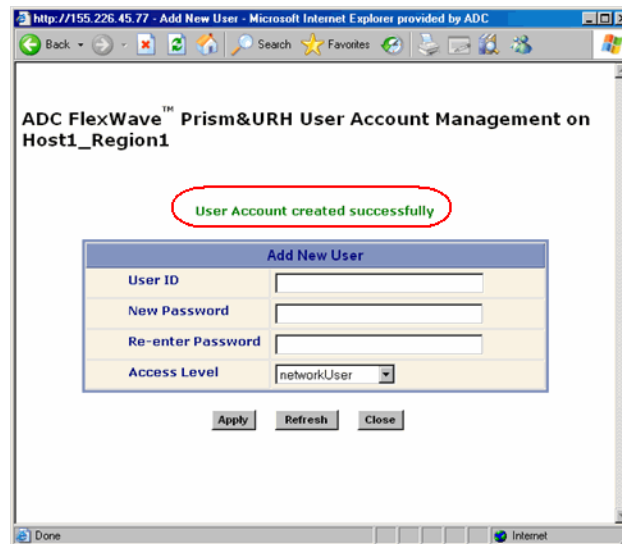
Below the dialog box are three buttons: "Apply", "Refresh", and "Close".

- 3 Verify that the Host name in the **User Account Management** view heading is correct. In the graphic above, a user account will be added to **Host1_Region1**.

- 4 In the **User ID** box, type a name by which the user can be identified. No less than 5 or more than 32 characters may be entered. No spaces are allowed. The only special character allowed is an underscore, which cannot be the first character of the name. Numerals are allowed, but cannot be the first character of the name.
- 5 In the **New Password** box, create a password for the new user. A password must be between 6 and 12 alphanumeric characters and cannot contain spaces.
- 6 In the **Re-enter Password** box, retype the new user's password.
- 7 In the **Access Level** list, select the security level for the user. The system supports only one Network Administrator (admin) account, so the new user **Access Level** can therefore only be one of the following:
 - **networkManager**—assigns the role of Network Manager, which provides read and write access to all system functions except user account management.
 - **networkUser**—assigns the role of Network User, which provides read only permission.



- 8 Click **Apply**. The **User Account created successfully** message displays and the **Add New User** panel is cleared so you can add another user.



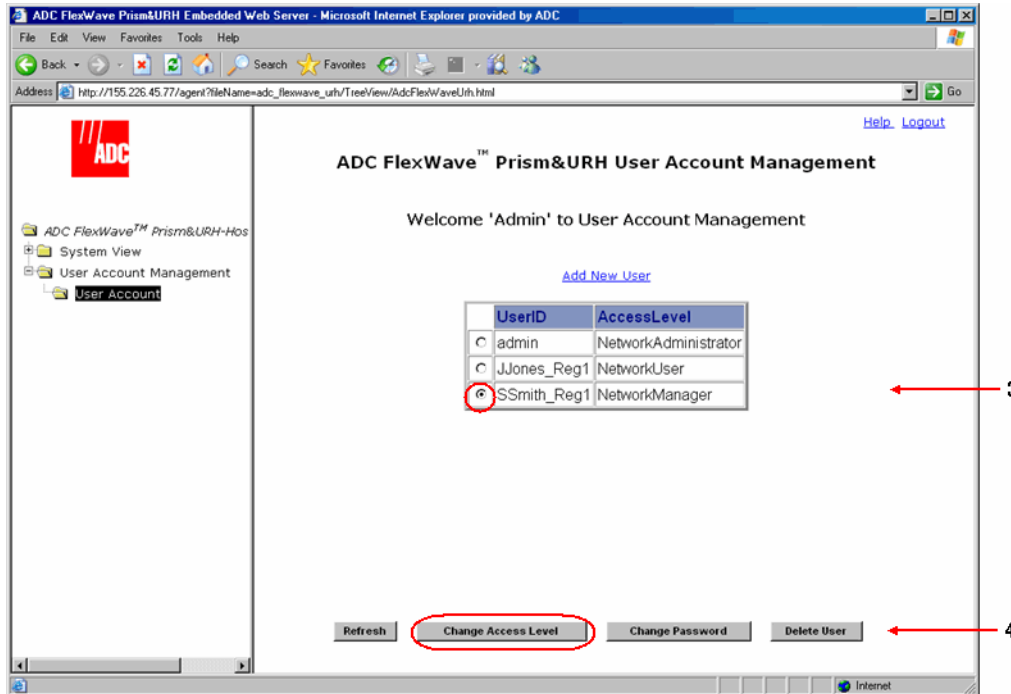
- 9 Do one of the following:
 - Follow Steps 5 - 9 to create another user account.
 - Click **Close** to close the **Add New User** dialog.
- 10 In the **User Account Management** view, click **Refresh** to display the newly added user(s).

8.4 CHANGING A USER ACCESS LEVEL



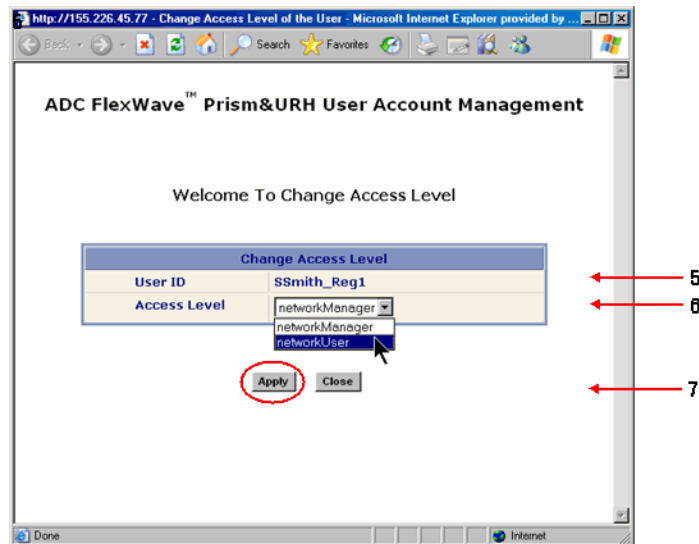
Only a user logged in under the admin account can change a user Access Level.

- 1 In the Function Explorer Tree, click on **User Account Management, User Account** to open the **User Account Management** view in the EMS View Frame with a table that lists all current user accounts.



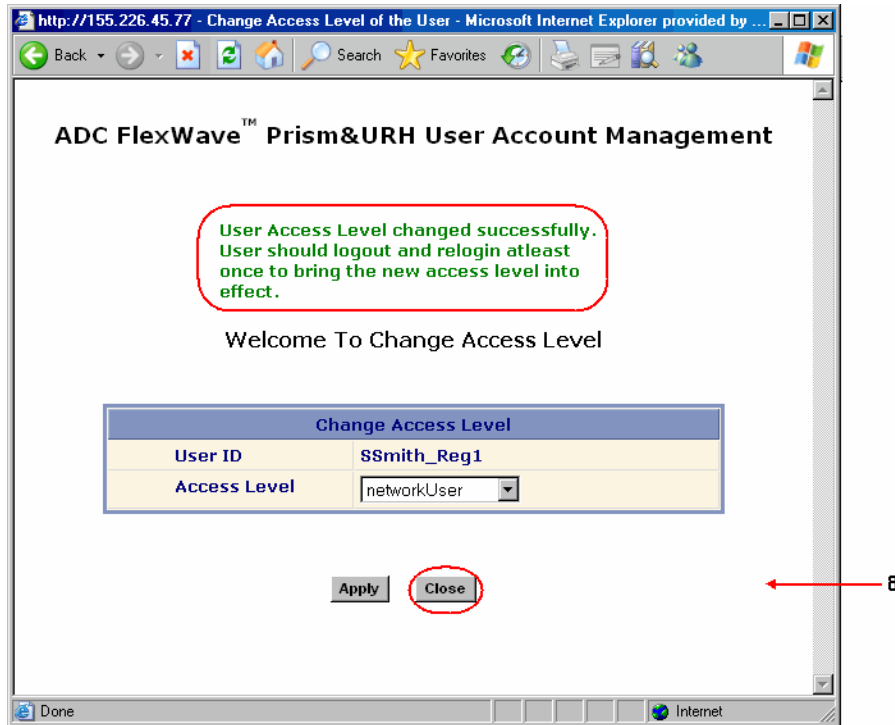
- 2 Click the radio button that corresponds to the user whose account is to be edited.

- 3 Click **Change Access Level** to open the **Change Access Level** window.



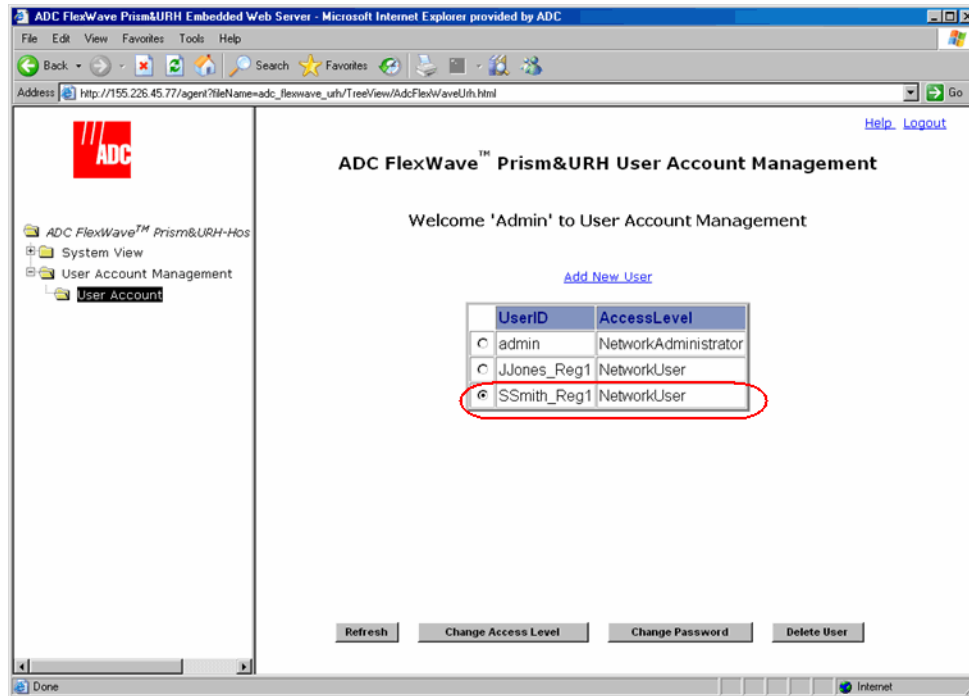
- 4 Verify that the correct user is listed in the **User ID** field.
- 5 Select a new access level. The system has three access levels, but supports only one admin (Network Administrator) account. The revised user **Access Level** can therefore only be one of the following:
 - **networkManager**—has read and write access to all system functions except user account management.
 - **networkUser**—has read only permissions into the system.
- 6 Click **Apply**.

The **User Account Management** window opens showing the new Access Level and stating that the Access Level has been changed.



- 7 In the **Change Access Level** window, click **Close**.
- 8 In the **User Account Management** view, click **Refresh**.

The new access level assigned to the user is listed in the **AccessLevel** column that corresponds to the **UserID**.



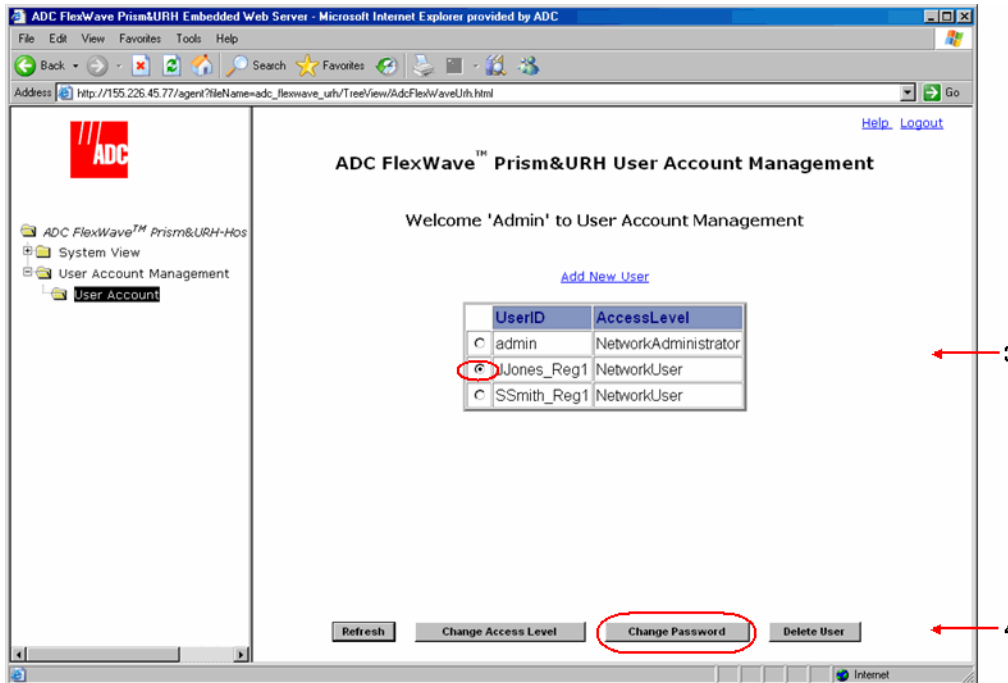
- 9 If the user was logged on to the system during this procedure, the user needs to log off and then log back on again to put the new access level into effect.

8.5 CHANGING THE PASSWORD OF ANOTHER USER

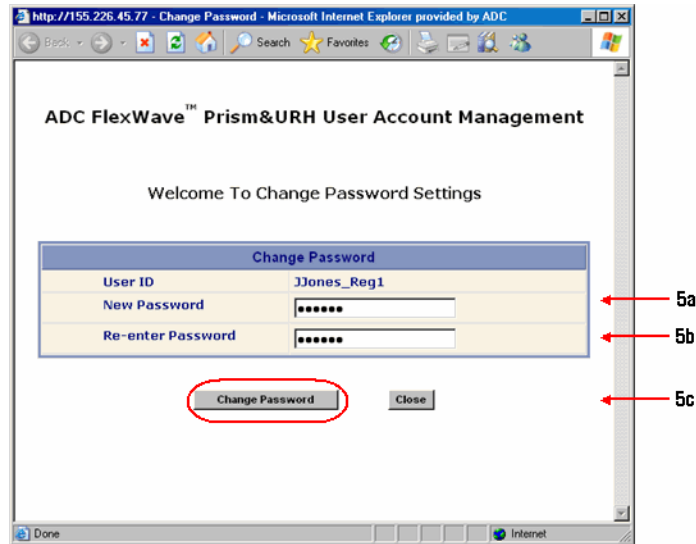


Only a user logged in under the admin account can change the password for another user. All users can change their own password (see “Changing Your Own Password” on page 208).

- 1 In the Function Explorer Tree, click on **User Account Management**, **User Account** to open the **User Account Management** view in the EMS View Frame with a table that lists all current user accounts.

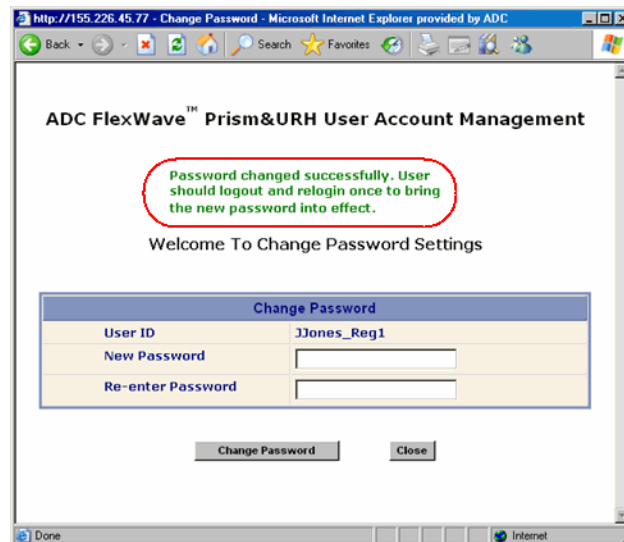


- 2 Click the radio button that corresponds to the user account for which you want to change the password.
- 3 Click **Change Password** to open the **Change Password Settings** window.



- 4 In the **Change Password Settings** window, do the following:
 - a In the **New Password** box, type a new password. A password must be between 6 and 12 alphanumeric or special characters, but cannot contain spaces.
 - b In the **Re-enter Password** box, retype the new password.
 - c Click **Change Password**.

The password changed successfully message displays:



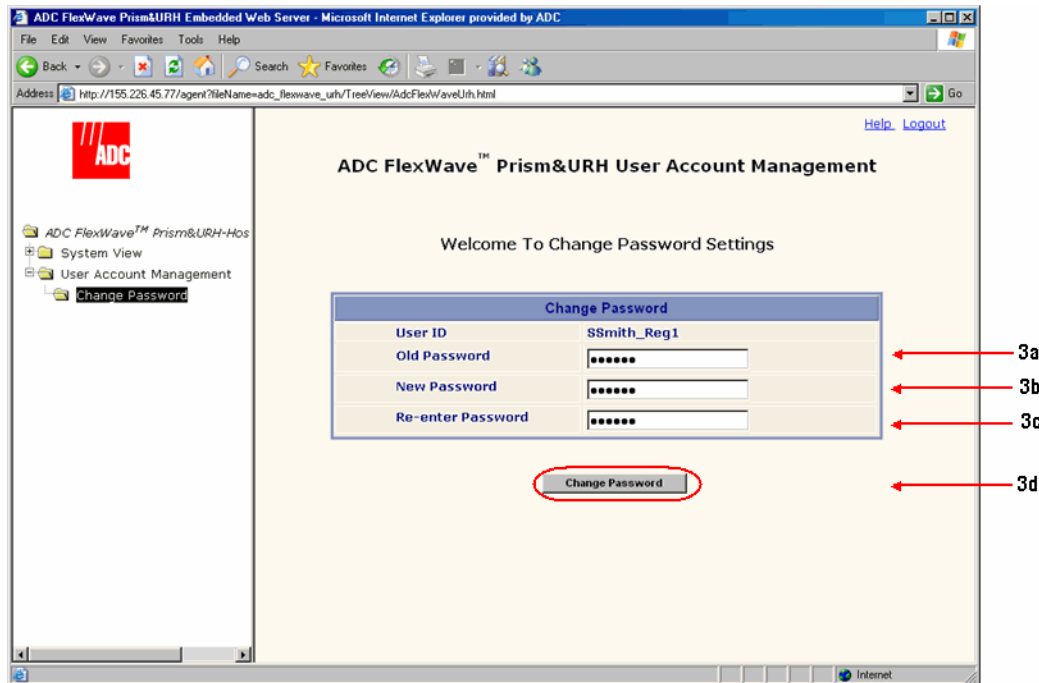
- 5 Click **Close** to close the **Change Password Settings** window.

8.6 CHANGING YOUR OWN PASSWORD



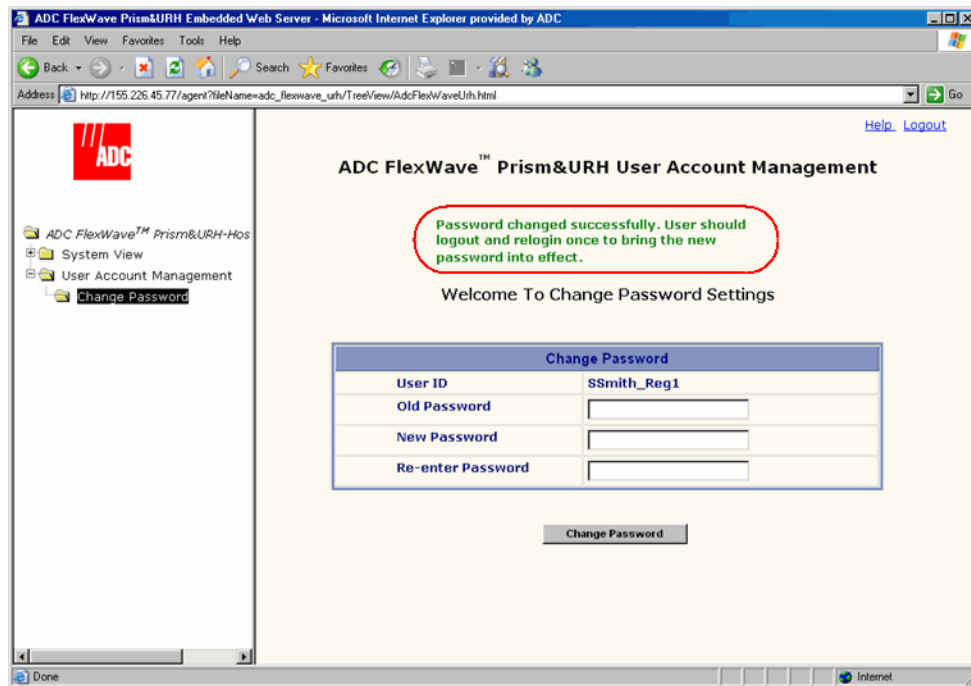
All users can change their own password. Only a user logged in under the admin account can change the password for another user (see “[Changing the Password of Another User](#)” on page 206).

- 1 In the Function Explorer Tree, select **User Account Management, Change Password** to open the **Change Password Settings** view in the EMS View Frame.



- 2 Do the following in the **Change Password Settings** view:
 - a In the **Old Password** box, type your current password.
 - b In the **New Password** box, type the new password. A password must be between 6 and 12 alphanumeric or special characters, but cannot contain spaces.
 - c In the **Re-enter Password** box, retype the new password.
 - d Click **Change Password**.

The password changed successfully message displays:



- 3 Log out of the EMS and then log back in to set your new password.

8.7 DELETING A USER ACCOUNT

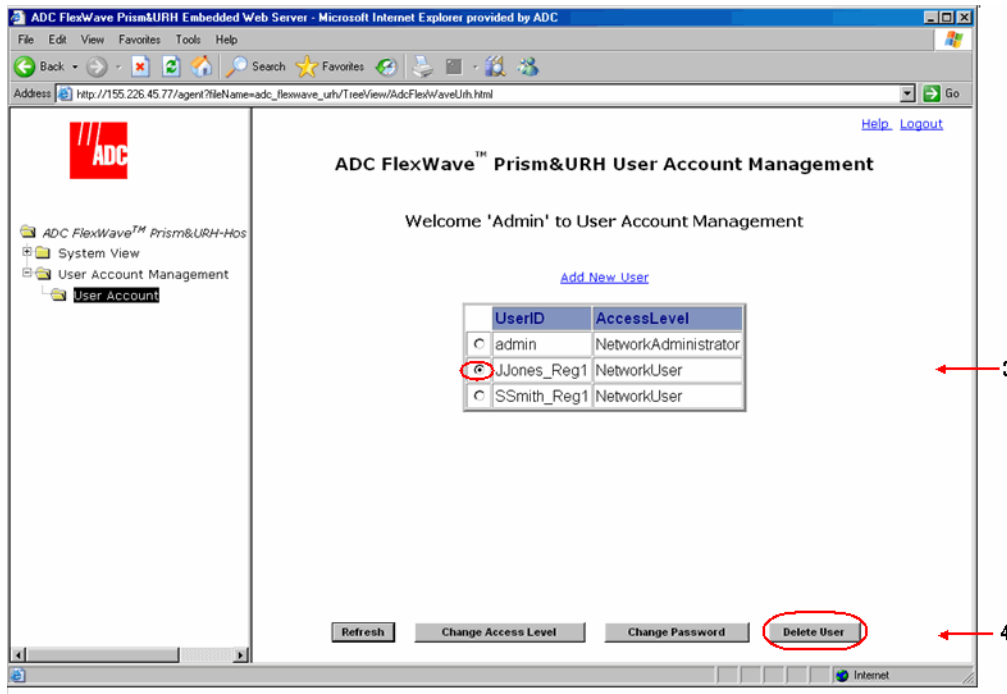


Only a Network Administrator can delete a user account.

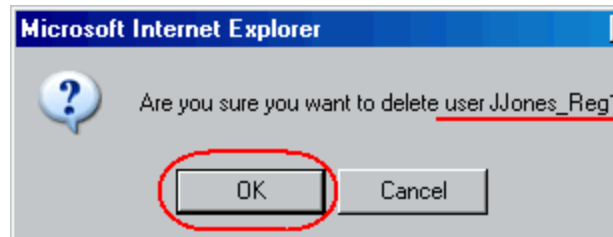


The default Network Administrator account with the User ID of admin cannot be deleted.

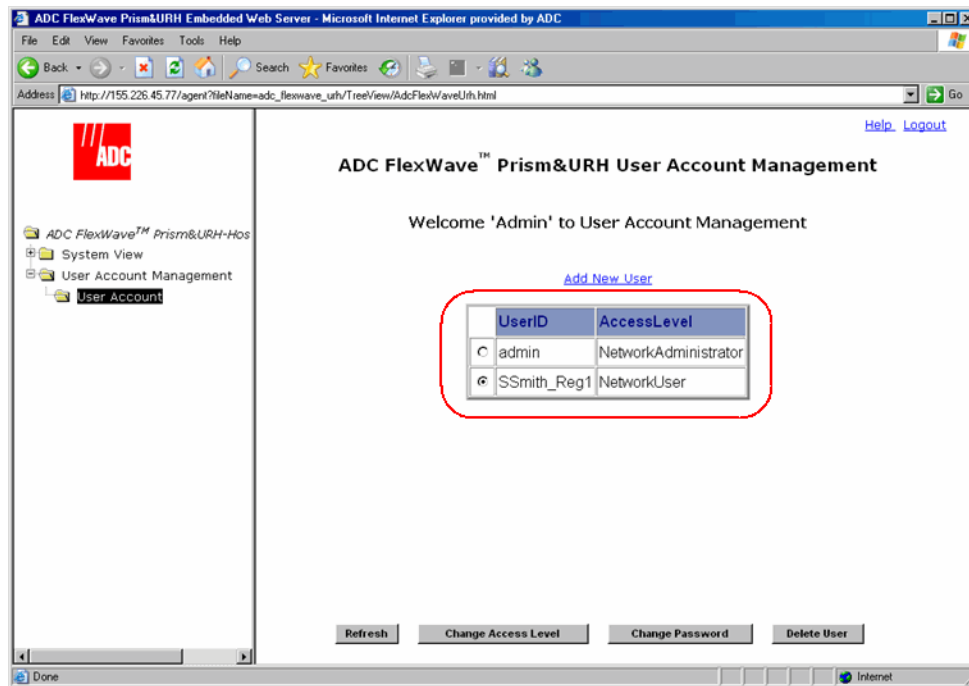
- 1 In the Function Explorer Tree, click on **User Account Management**, **User Account** to open the **User Account Management** view in the EMS View Frame.
- 2 Click the radio button that corresponds to the user account to be deleted.
- 3 Click **Delete User**.



- 4 In the confirmation dialog, verify that you selected the correct user to delete, and then click **OK**.



The user account is removed from the EMS.



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