Cisco uBR7200 Series Multipoint Wireless Modem Card and Subsystem Installation

Product Numbers: UBR-MCW-MDA, UBR-MCW-MDA=, UBR-ODD-XXA, UBR-WMF4A=, CISCO-WT2772-MAA=

This document explains how to install the components for a multipoint fixed broadband wireless headend system using a Cisco uBR7200 series universal broadband router (Cisco uBR7223, Cisco uBR7246, and Cisco uBR7246 VXR). For information on how to install and configure the point-to-point fixed broadband wireless system, refer to the *Cisco uBR7200 Series Universal Broadband Router Wireless Modem Card and Subsystem Installation and Configuration* document.

This document includes instructions for installing and verifying the following:

- Wireless modem card
- Power feed panel
- Wireless transverter and duplexer

Note Use this installation note in conjunction with the *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide* and *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide.* These documents shipped with your Cisco uBR7200 series router and are also available online and on the Documentation CD-ROM.

The following sections are included in this document:

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78-10930-03

If You Need More Information

The Cisco IOS software running on your router contains extensive features and functionality. The effective use of many of these features is easier if you have more information. For additional information on configuring and maintaining the Cisco uBR7200 series router, the following documentation resources are available:

- For hardware installation and maintenance information on the Cisco uBR7200 series router, refer to the *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide* that shipped with your Cisco uBR7223, Cisco uBR7246, or Cisco uBR7246 VXR.
- For software configuration information on the Cisco uBR7200 series router, refer to the *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide* that shipped with your Cisco uBR7223, Cisco uBR7246, or Cisco uBR7246 VXR.
- For Cisco IOS software configuration information, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

Note You can access Cisco IOS software configuration documentation on the World Wide Web at http://www.cisco.com, http://www-china.cisco.com, or http://www-europe.cisco.com.

- For international agency compliance, safety, and statutory information for wide-area network (WAN) interfaces for the Cisco uBR7200 series, refer to the "Regulatory Compliance and Safety Information" appendix in the *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide*.
- To obtain general information about documentation, see the "Obtaining Documentation" section on page 91, or call customer service at 800 553-6387 or 408 526-7208. Customer service hours are 5:00 a.m. to 6:00 p.m. Pacific time, Monday through Friday (excluding Cisco-observed holidays). You can also send e-mail to cs-rep@cisco.com, or you can refer to the *Cisco Information Packet* that shipped with your router.

Multipoint Wireless Modem Card and Subsystem Overview

The Cisco high-speed multipoint broadband fixed wireless system provides dedicated, full-duplex, wireless data communication between a single headend site and multiple subscriber sites. The system transmits and receives in the licensed Multichannel Multipoint Distribution Service (MMDS) band (2.150 to 2.162 GHz and 2.500 to 2.690 GHz) or unlicensed U-NII band (5.725 to 5.825 GHz).

Each headend site in a multipoint system is designed to use antennas that broadcast the radio frequency (RF) signal in a portion of a complete circle, or directionally, in what is called a sector. Each headend site can be designed and configured to broadcast in a single sector, or in multiple sectors, depending on the requirements of the network.

Each sector makes use of a common Cisco uBR7200 series universal broadband router (Cisco uBR7223, Cisco uBR7246, or Cisco uBR7246 VXR), a wireless modem card (see Figure 1), and the subsystems required to support the modem card. Each modem card requires a connection to a power feed panel (see Figure 2), which in turn is connected to two wireless transverters (when diversity is used), and two antennas (when diversity is used). Diversity, which minimizes the effects of fading, uses two antennas at each site, with each antenna connected to its own transverter. Diversity is strongly recommended for most multipoint system headend sites.

Note The wireless transverter discussed in this document is manufactured and sold by Cisco Systems for MMDS links. Transverters for links using other frequency bands must be purchased from a third-party vendor. Refer to that vendor's documentation for installation instructions.

Figure 1 Wireless Modem Card

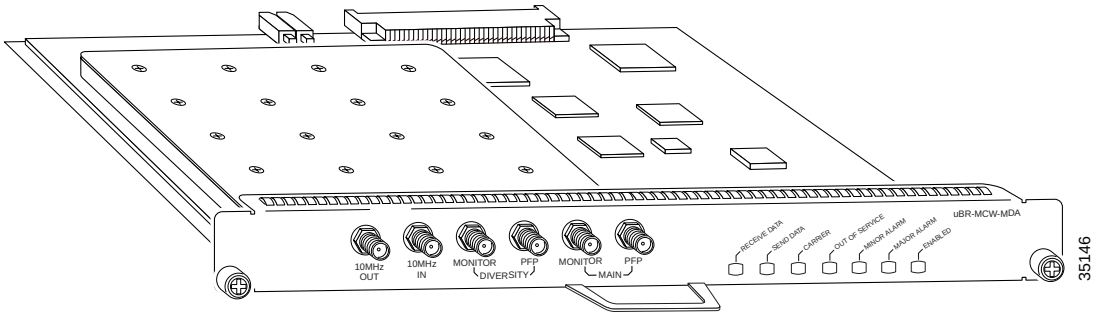
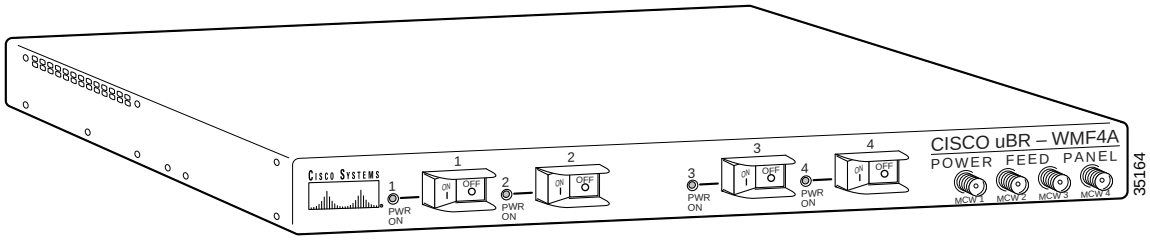


Figure 2 Power Feed Panel



The wireless modem cards are installed in a Cisco uBR7200 series router. Each modem card is cabled to a power feed panel that is installed in the same equipment rack as the router or mounted on a wall.

Cables from the power feed panel are attached to one or two main wireless transverters or to one or two main and diversity transverter pairs (see Figure 3), which are installed on the antenna masts. The system is managed using a command-line interface (CLI) or CiscoView graphical device management application. Figure 4 shows the connections between the components.

Figure 3 Cisco Headend Wireless Transverter for MMDS Band

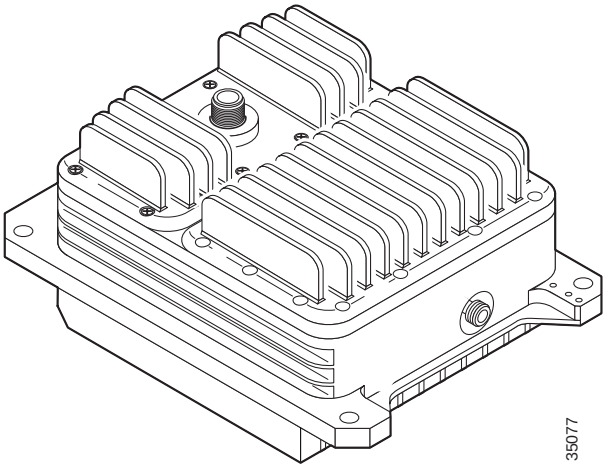
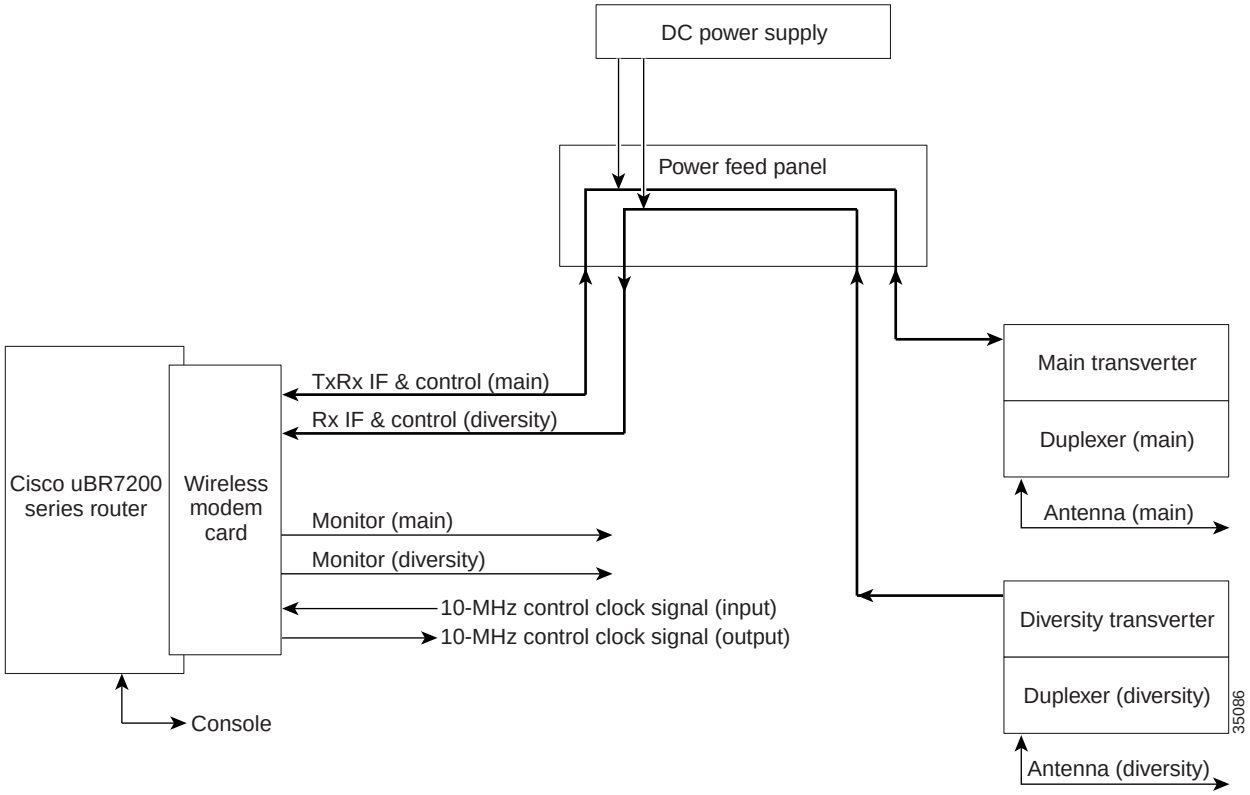


Figure 4 Component Connections



Note The 10-MHz clock connections are optional.

Wireless Modem Card

The wireless modem card provides the control and data interface between the system's digital motherboard and the RF subsystem in the wireless transverter. The card also provides the up/down conversion from baseband to intermediate frequency (IF).

Wireless modem cards consist of the following components:

- Digital motherboard
- IF analog board
- 10-MHz input connection for external reference clock signal (external reference clock is optional)
- 10-MHz output connection for forwarding optional external reference clock signal to another wireless modem card
- Monitor connections for testing and troubleshooting (main and diversity)
- Power feed panel connections (main and diversity)
- Seven LEDs that provide a visual indication of the state of the modem card

Figure 5 shows the connectors and LEDs on the wireless modem card.

Figure 5 Wireless Modem Card Connectors and LEDs

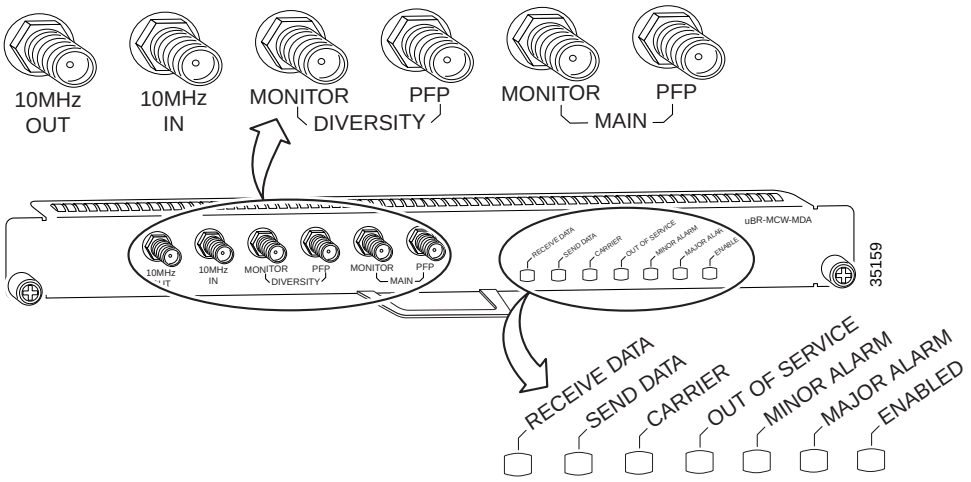


Table 1 describes the functions of the connectors.

Table 1 Wireless Modem Card Connectors

Connector	Type	Input/Output	Function
10-MHz Input	SMA (female)	Input	Connection for optional 10-MHz external reference clock. **Note** The system is guaranteed to meet the Federal Communication Commission's (FCC) MMDS-band frequency accuracy requirement for a period of at least 10 years *without* the use of an external 10-MHz reference. Regardless of the frequency band, if you require greater frequency accuracy, an external clock can be attached to the wireless modem card designated as "master". (For a list of accessory suppliers, refer to the *Cisco Broadband Fixed Wireless Site Planning Guide*.)
10-MHz Output	SMA (female)	Output	Allows signal from a single optional 10-MHz external reference clock to be cascaded, so that more than one wireless modem card can use the signal from a single clock. **Note** For further information about system accuracy, refer to the previous note in the "Function" column of the "10-MHz Input" listing.
Monitor-Diversity	SMA (female)	Output	For connection to spectrum analyzer for test/troubleshooting purposes (when diversity option is used).
PFP-Diversity	SMA (female)	Output	24-MHz reference. Also receives and transmits IF, control, and status signals (when diversity option is used).
Monitor-Main	SMA (female)	Output	For connection to spectrum analyzer for test/troubleshooting purposes.
PFP-Main	SMA (female)	Output	24-MHz reference. Also receives and transmits IF, control, and status signals.

Table 2 describes the functions of the LEDs.

Table 2 Wireless Modem Card LEDs

LED	Function
RECEIVE DATA	Green indicates that data packets are being received by the modem card. When this LED is off, it indicates that no packets are being received. This LED blinks *on* and off (green) during normal operation of the network.
SEND DATA	Green indicates that data packets are being sent by the modem card. When this LED is off, it indicates that no packets are being sent. This LED blinks on and off (green) during normal operation of the network.
CARRIER	Green indicates that the RF link is working, although it might be degraded or service might not be available. (You should check the MINOR ALARM LED to see whether the link is degraded and the OUT OF SERVICE LED to determine whether service is available.) When this LED is off, it indicates that the RF link is not working. This LED remains on (green) during normal operation of the network.
OUT OF SERVICE	Yellow indicates that service has been denied to all users (the headend could be in loopback mode). When service is available to all users, this LED remains off. This LED remains off during normal operation of the network.
MINOR ALARM	Yellow indicates the occurrence of a minor alarm in the radio subsystem. The link is degraded and you might need to take corrective action. When there are no minor alarms, this LED remains off. This LED remains off during normal operation of the modem card.
MAJOR ALARM	Yellow indicates the occurrence of a major alarm in the radio subsystem. Due to an electronics failure or a problem with the RF path, the link is down. When there are no major alarms, this LED remains off. This LED remains off during normal operation of the modem card.
ENABLED	Green indicates that the wireless modem card is on, receiving power from the router midplane, and enabled for operation. When this LED is off, it indicates that the modem card is off, not receiving power, or not enabled for operation. This LED remains on (green) during normal operation of the modem card.

Power Feed Panel

The power feed panel provides the transverters with DC power, IF transmission signals, frequency reference, and control signals. The unit supplies the wireless modem card with IF reception signals, and contains four power/breaker switches for the power connections to four transverters.

The power feed panel consists of the following components:

- Front panel:
  - Four power/breaker switches with power on LED indicators
  - Four female SMA connectors for wireless modem card cables
- Rear panel:
  - Two DC power supply terminal blocks
  - Four female N-type connectors with power on LED indicators for transverter cables
  - One ground lug connection

Figure 6 shows the front panel of the power feed panel.

Figure 6 Power Feed Panel (front panel)

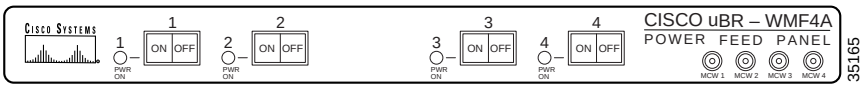


Table 3 describes the functions of the LEDs and connectors on the front panel.

Table 3 Power Feed Panel LEDs and Connectors (front panel)

LED/Connector	Type	Input/Output	Function
PWR ON	LED	—	When *on*, indicates that power is available in the circuit controlled by the associated power/breaker switch.
MCW (4)	SMA connector (female)	Input and Output	IF transmission signal, RF subsystem control signal, and 24-MHz reference signal from the wireless modem card. IF reception signal to the wireless modem card.

Figure 7 shows the rear panel.

Figure 7 Power Feed Panel (rear panel)

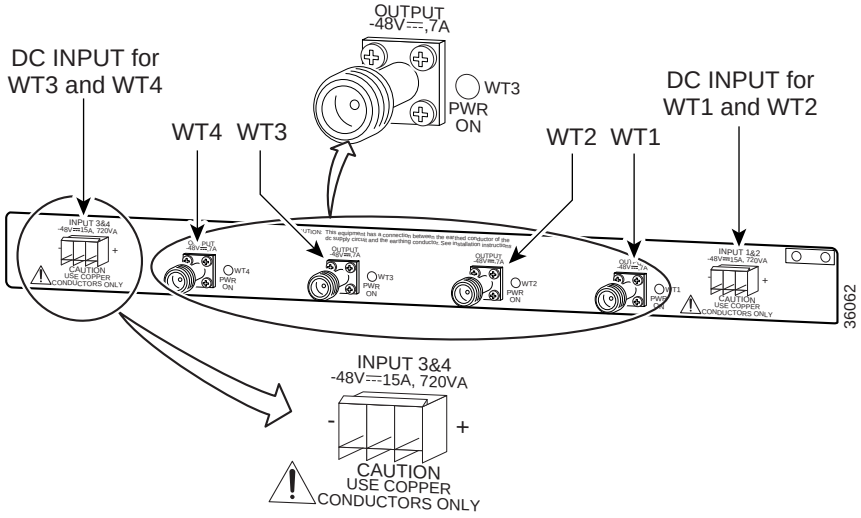


Table 4 describes the functions of the LEDs and connectors on the rear panel.

Table 4 Power Feed Panel LEDs and Connectors (rear panel)

LED/Connector	Type	Input/Output	Function
PWR ON	LED	—	When *on*, indicates that power is going to the transverter connected to the associated circuit.
INPUT (2)	Pluggable terminal block connector (female)	Input	DC power source for the associated transverters.
WT (4)	N-Type connector (female)	Input and Output	IF transmission signal, –48V DC power, RF subsystem control signal, and 24-MHz reference signal to the transverter. IF reception signal from the transverter.

Wireless Transverter

The ruggedized wireless transverter (often called an outdoor unit or ODU) is the outdoor data interface to the indoor subsystems and provides up/down conversion from IF to RF frequencies.

Note The wireless transverter discussed in this document is manufactured and sold by Cisco Systems for MMDS links. Transverters for links using other frequency bands must be purchased from a third-party vendor. Refer to that vendor's documentation for installation instructions.

The Cisco MMDS outdoor unit consists of the following components:

- RF head
- Connector port for IF input/output signal, control signal, and -48 VDC input power

- Duplexer assembly with antenna connection
- Ground lug

Figure 8 shows the connectors on the wireless transverter, and Table 5 describes their use.

Figure 8 Wireless Transverter with Duplexer Assembly Installed

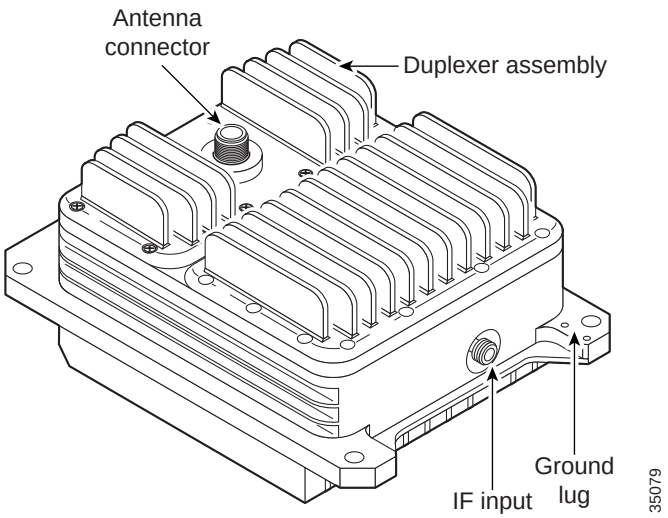


Table 5 Wireless Transverter and Duplexer Assembly Connectors

Connector	Type	Input/Output	Function
Antenna connector	N-type weatherized (female)	Input and Output	Antenna connection
IF input	N-type weatherized (female)	Input and Output	Carries transmit and receive IF signals, input power, and IF reference frequency
Ground lug	Two-hole compression	—	Ground

Field-Replaceable Units

All major components of the multipoint wireless headend, and the major components of the Cisco uBR7200 series routers, are field-replaceable units (FRUs). Each FRU is shipped with instructions for removal and reinstallation.

The following components are available as FRUs:

- Wireless transverter
- Duplexer for the wireless transverter
- Power feed panel
- Wireless modem card
- Cisco uBR7200 series router components:
  - Network processing engine
  - Input/output controller
  - Port adapters

  - Power supplies
  - Fan tray
  - Chassis
  - Subchassis and midplane
  - Flash memory cards
  - Rack mount and cable-management kit

For ordering information, contact a Cisco customer service representative. See the “Cisco.com” section on page 93 for more information.

Installation Prerequisites

This section provides a list of parts and tools that you need to remove and replace a multipoint wireless modem card in the Cisco uBR7200 series router, install the power feed panel in an equipment rack or on the wall, and install the wireless transverter at the antenna site. This section also includes safety and ESD-prevention guidelines to help you avoid injury to yourself and damage to the equipment.

Parts and Tools

The following sections describe the parts and tools required to install each of the components.

Wireless Modem Card

You need the following tools and parts to remove and replace a multipoint headend wireless modem card. If you need additional equipment, contact a service representative for ordering information. (See the “Cisco.com” section on page 93.)

- New wireless modem card
- Number 2 Phillips screwdriver
- Torque wrench for SMA connectors
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, FRUs, and spares
- Antistatic mat or surface
- Static shielding bag

Power Feed Panel

You need the following tools and parts to install the multipoint headend power feed panel in an equipment rack or on a wall. If you need additional equipment, contact a service representative for ordering information. (See the “Cisco.com” section on page 93.)

- Power feed panel
- Number 2 Phillips screwdriver
- Torque driver with number 2 Phillips bit
- Torque wrench for N-type connectors

- Bracket kit (provided)
- Rack or wall mount screws
- 1/8-inch flat-blade screwdriver
- 5/8-inch open-ended wrench
- Torque wrench for SMA connectors
- 50-ohm coaxial cables with N-type (male) connectors for IF interface
- –48V DC power supply
- Two removable wiring blocks
- Ground lug (provided in grounding kit)

Wireless Transverter

You need the following tools and parts to install the Cisco MMDS multipoint headend wireless transverter. If you need additional equipment, contact a service representative for ordering information. (See the “Cisco.com” section on page 93.)

- Wireless transverter
- Duplexer assembly
- Number 2 Phillips screwdriver
- Torque driver with number 2 Phillips bit
- 9/16-inch open-ended wrench
- 13/16-inch open-ended wrench
- Open-end adjustable wrench
- Torque wrench for N-type connectors
- Weatherproofing cable wrap
- Antenna tools (refer to antenna manufacturer’s instructions)
- Mounting kit (provided)
- 50-ohm coaxial cable with N-type (male) connectors to cable the wireless transverter to the antenna
- Cable-making tools
- Lightning surge suppressor for cable (from wireless transverter to power feed panel) at point where cable enters building that meets all local and national electrical codes
- Ground lug (provided in grounding kit)

Note Some N-type connectors require specific tools. Obtain this information from your cable vendor.

Software and Hardware Requirements

For this installation and configuration, you need a configured Cisco uBR7200 series router running Cisco IOS Release 12.1(3)XQ1 or later.

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Safety Warnings

Warning **This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Waarschuwing **Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het gedeelte Regulatory Compliance and Safety Information (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen in dit document.**

Varoitus **Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät tämän asiakirjan Regulatory Compliance and Safety Information -osasta (määräysten noudattaminen ja tietoa turvallisuudesta).**

Attention **Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez la section Regulatory Compliance and Safety Information (Conformité aux règlements et consignes de sécurité) de ce document.**

Warnung **Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Abschnitt "Regulatory Compliance and Safety Information" (Informationen zu behördlichen Vorschriften und Sicherheit) in diesem Dokument.**

Avvertenza **Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nella documento Regulatory Compliance and Safety Information (Conformità alle norme e informazioni sulla sicurezza) nel presente documento.**

Advarsel **Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i avsnittet Regulatory Compliance and Safety Information (Overholdelse av forskrifter og sikkerhetsinformasjon) i dette dokumentet.**

Aviso **Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte a secção Regulatory Compliance and Safety Information (Informação de Segurança e Disposições Reguladoras) neste documento.**

¡Advertencia! **Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar la sección titulada Regulatory Compliance and Safety Information (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que aparece en este documento.**

Varning! **Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Om du vill se översättningar av de varningar som visas i denna publikation, se avsnittet "Efterrättelse av föreskrifter och säkerhetsinformation" i detta dokument.**

Note This installation *must* be made in accordance with all local and national regulations. Special attention *must* be made to Articles 800, 810, and 820 of the US National Electric Code, Sections 54 and 60 of the Canadian electric code, and the equivalent sections of all other local and national regulations that address TV, radio, and/or CATV wiring for the coaxial cable.

Warning **This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never install equipment that appears damaged.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.
- Never install equipment that appears damaged.

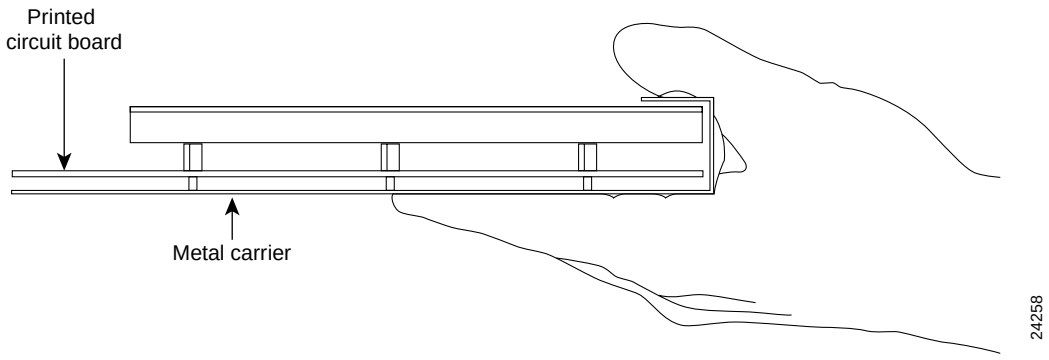
Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damages equipment and impairs electrical circuitry. ESD occurs when printed circuit boards are improperly handled and results in complete or intermittent failures.

The network processing engine, I/O controller, port adapters, and wireless modem cards consist of a printed circuit board that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier. Handle the network processing engine, I/O controller, port adapters, and wireless modem cards by their metal carriers and handles; never touch the printed circuit board when handling any of these components.

Figure 9 shows the location of a printed circuit board when it is installed in a network processing engine, I/O controller, or Cisco uBR7200 series wireless modem card metal carrier. Do not touch the printed circuit board when handling any of these components.

Figure 9 Handling the Cisco uBR7200 Series Wireless Modem Cards—Side View



Although the metal carrier helps to protect the printed circuit boards from ESD, wear a preventive antistatic strap whenever handling the network processing engine, I/O controller, port adapters, or wireless modem cards. Ensure that the strap makes good skin contact and connect the strap's clip to an unpainted chassis surface to safely channel unwanted ESD voltages.

If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution Be sure to tighten the captive installation screws on the network processing engine, the I/O controller, and the wireless modem cards (use a number 2 Phillips screwdriver). These screws prevent accidental removal, provide proper grounding for the router, and help to ensure that the network processing engine, I/O controller, and modem cards are properly seated in the router midplane.

Follow these guidelines to prevent ESD damage:

- Always use an ESD-preventive wrist strap or ankle strap when installing or replacing the network processing engine, I/O controller, port adapters, or modem cards. Ensure that the ESD-preventive strap makes contact with your skin.
- Handle the network processing engine, I/O controller, port adapters, or modem cards by their metal carrier edges and handles only; avoid touching the printed circuit board components or any connector pins.
- When removing the network processing engine, I/O controller, port adapters, or wireless modem cards, place them on an antistatic surface with the printed circuit board components facing upward, or in a static shielding bag. If you are returning an I/O controller, network processing engine, port adapter, or modem card to the factory, immediately place the product in a static shielding bag.

Caution Periodically check the resistance value of the antistatic strap. The measurement should be within the range of 1 through 10 megohm.

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **Read the installation instructions before you connect the system to its power source. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **Care must be given to connecting units to the supply circuit so that wiring is not overloaded. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **This equipment is to be installed and maintained by service personnel only as defined by AS/NZS 3260.**

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Product Disposal

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Compliance with U.S. Export Laws and Regulations Regarding Encryption

This product performs encryption (in the baseline privacy feature) and is regulated for export by the U.S. Government. Following is specific information regarding compliance with U.S. export laws and regulations for encryption products:

- This product is *not* authorized for use by persons located outside the United States and Canada that do not have export license authority from the U.S. Government.
- This product may *not* be exported outside the U.S. and Canada either by physical or electronic means without the *prior* written approval of the U.S. Government.
- Persons outside the U.S. and Canada may *not* reexport, resell, or transfer this product by either physical or electronic means without *prior* written approval of the U.S. Government.

Removing and Installing the Wireless Modem Card

The following sections explain how to:

- Remove and replace a previously installed multipoint headend wireless modem card in a Cisco uBR7200 series router (see the “Removing the Wireless Modem Card” section on page 18).
- Install a multipoint headend wireless modem card in a Cisco uBR7200 series router (see the “Installing or Replacing the Wireless Modem Card” section on page 18).

Removing the Wireless Modem Card

To remove the wireless modem card from a Cisco uBR7200 series router, complete the following steps:

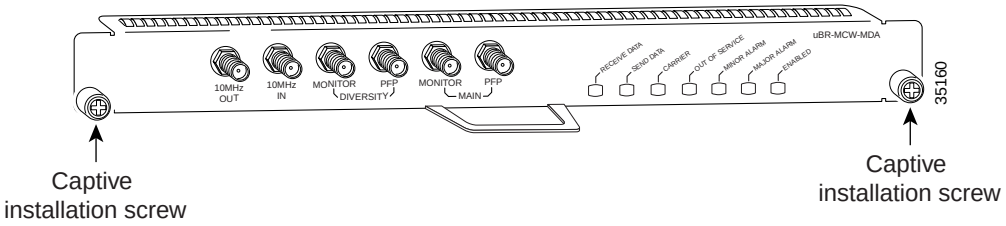
Step 1 Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.

Caution To avoid disruption of normal router operations, do *not* disconnect the cables until the modem card is shut down using the proper commands.

Step 2 Disconnect all cables from the front of the modem card.

Step 3 Unscrew the captive installation screws on the front of the wireless modem card (see Figure 10).

Figure 10 Captive Installation Screws



Step 4 Grasp the handle on the wireless modem card and carefully pull the modem card from the midplane. If you are removing a blank modem card, pull the blank modem card all the way out of the chassis slot.

Caution Always handle the wireless modem card by the metal carrier and handle; never touch the modem card components or connector pins (see Figure 11).

Step 5 Place the modem card on an antistatic surface with its components facing upward, or in a static shielding bag. If you are returning the modem card to the factory, immediately place the card in a static shielding bag.

This completes the procedure for removing a headend wireless modem card from the Cisco uBR7200 series router.

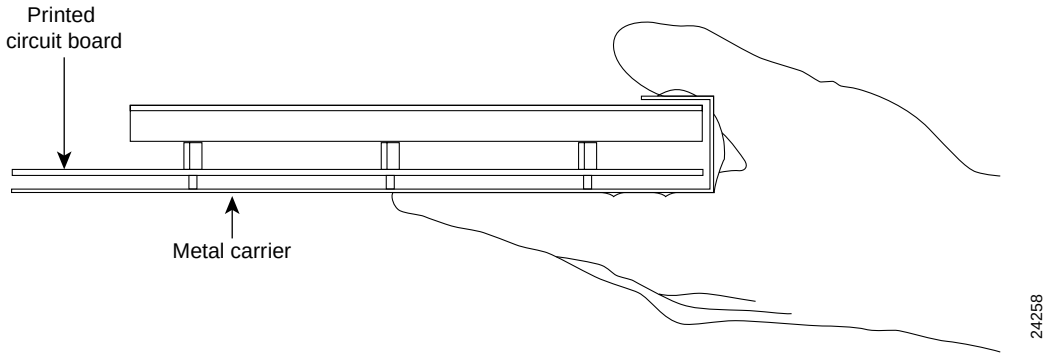
Installing or Replacing the Wireless Modem Card

To install or replace the wireless modem card in the Cisco uBR7200 series router, complete the following steps:

Step 1 Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.

Step 2 Grasp the modem card by its metal carrier and position the modem card as shown in Figure 11.

Figure 11 Handling the Cisco uBR7200 Series Wireless Modem Cards—Side View



Step 3 Align the left and right edges of the wireless modem card metal carrier with the two modem card slot guides in the router (see Figure 12 for the Cisco uBR7223, and Figure 13 for the Cisco uBR7246 and Cisco uBR7246 VXR).

Figure 12 Aligning the Wireless Modem Card Metal Carrier between the Slot Guides (Cisco uBR7223)

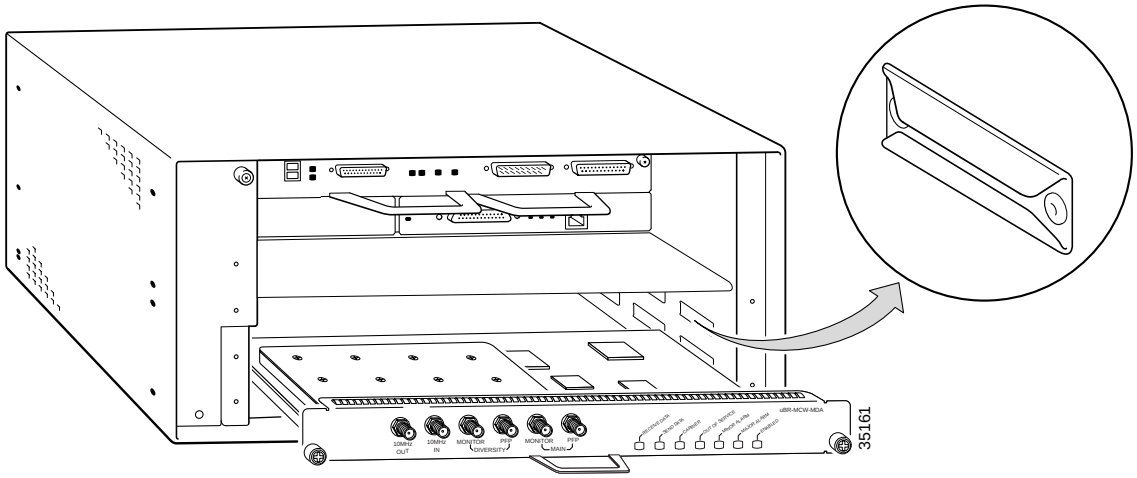
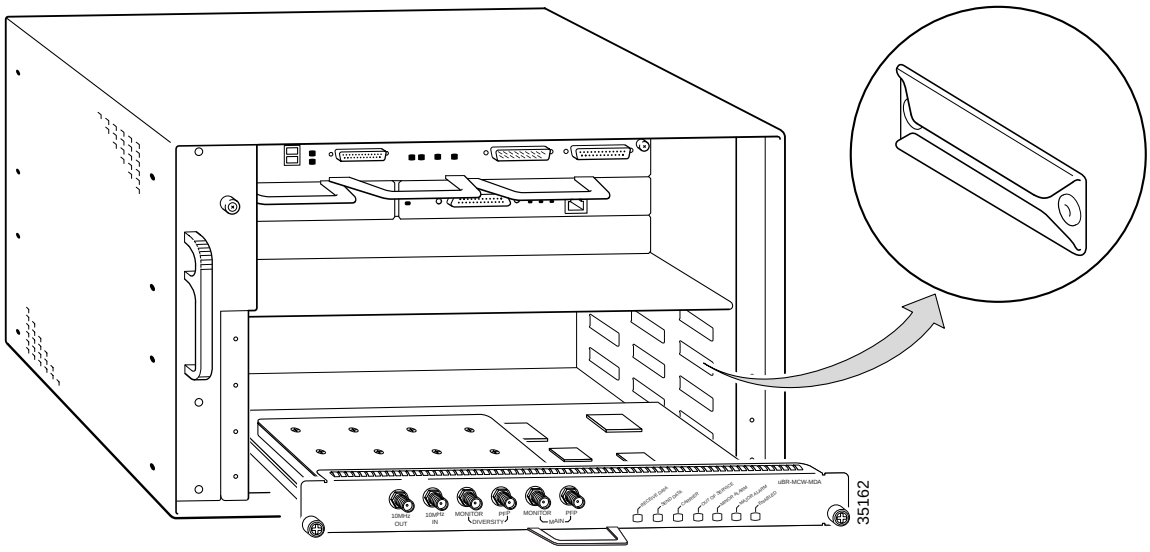


Figure 13 Aligning the Wireless Modem Card Metal Carrier between the Slot Guides (Cisco uBR7246 and Cisco uBR7246 VXR)



Step 4 With the metal carrier aligned in the slot guides, gently slide the modem card into the modem card slot until you feel the card connectors mate with the midplane.

Step 5 With the modem card inserted all the way into the slot, connect all required cables to the front of the modem card (see the "Cabling the Wireless Modem Card" section on page 21).

Caution Care must be taken when installing the wireless modem cards to not overtighten and strip the captive screws. Never use a screw gun or similar device when installing these cards.

Step 6 Tighten the captive installation screws on the modem card (see Figure 10 on page 18).

Note If the modem card captive installation screws do not tighten all the way, the card is not completely seated in the midplane. Carefully pull the modem card halfway out of the slot, reinsert it, and tighten the captive installation screws.

Caution To ensure adequate airflow across the router's modem cards, a modem card or blank modem card (faceplate) must be installed in each modem card slot.

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

This completes the procedure for installing a headend wireless modem card in the Cisco uBR7200 series router.

Cabling the Wireless Modem Card

To attach the cables to the wireless modem card, complete the *applicable* procedures that follow:

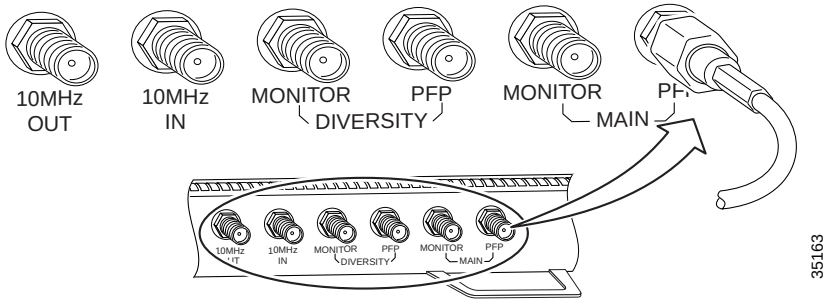
1. Attaching the IF Cables, page 21
2. Attaching the Monitor Cables (Optional), page 22
3. Cabling the 10-MHz Clock (Optional), page 22

Attaching the IF Cables

To attach the IF cables to the wireless modem card, complete the following steps:

Step 1 Connect one end of an IF signal cable to the PFP-Main wireless modem card port (see Figure 14).

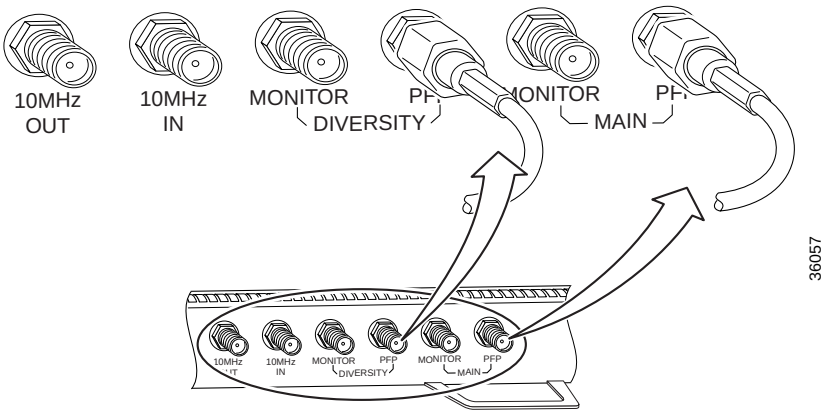
Figure 14 Attaching an IF Cable



Step 2 When diversity is used, connect one end of a *second* IF signal cable to the PFP-Diversity wireless modem card port (see Figure 15).

Note Recommended torque for attaching connectors to SMA ports is 7 to 9 inch-pounds.

Figure 15 Attaching the Second IF Signal Cable



Attaching the Monitor Cables (Optional)

To use a spectrum analyzer to test or troubleshoot the wireless modem card signals, attach the analyzer to the Monitor-Main or Monitor-Diversity port (when diversity is used) on the wireless modem card, depending on the signal that you want to monitor.

Cabling the 10-MHz Clock (Optional)

When you use a 10-MHz clock, you can use it with a single wireless modem card, or with multiple wireless modem cards, depending on the requirements of the site. When cabling the clock to a single card, refer to the "Cabling the 10-MHz Clock with a Single Wireless Modem Card" section on page 22. When cabling the clock to more than one card, refer to the "Cabling the 10-MHz Clock with Multiple Wireless Modem Cards" section on page 22.

Cabling the 10-MHz Clock with a Single Wireless Modem Card

To connect a 10-MHz clock to one wireless modem card, connect an SMA to BNC adapter to the 10-MHz IN connector port of the wireless modem card, then attach the clock cable BNC connector to the adapter.

This completes the procedure for cabling a wireless modem card.

Cabling the 10-MHz Clock with Multiple Wireless Modem Cards

To connect a 10-MHz clock to more than one wireless modem card, complete the following steps:

Step 1 Connect an SMA to BNC adapter to the 10-MHz IN connector port of the *first* wireless modem card.

Note Recommended torque for attaching connectors to SMA ports is 7 to 9 inch-pounds.

Step 2 Attach the clock cable BNC connector to the adapter connected to the *first* wireless modem card.

Step 3 Use an SMA cable to connect the 10-MHz OUT connector port of the *first* wireless modem card to the 10-MHz IN connector port of the *second* wireless modem card.

Step 4 Continue this "cascading" procedure to any other wireless modem cards that must share the signal from the 10-MHz clock. Always connect the cable *from* the 10-MHz OUT connector port of the *previous* wireless modem card to the 10-MHz IN connector port of the *next* wireless modem card.

This completes the procedure for cabling the wireless modem card.

Installing the Power Feed Panel

To install the power feed panel, complete the following procedures:

1. Mounting the Power Feed Panel, page 23
2. Attaching the Ground Lug, page 26
3. Wiring the DC Power, page 27
4. Cabling the Power Feed Panel, page 31

Mounting the Power Feed Panel

The multipoint headend power feed panel can be mounted in a 19-inch rack or mounted on a wall. Depending on your site requirements, the unit can be colocated with the router or placed at an indoor location near the bulkhead opening leading to the outdoor wireless transverter.

Note When rack-mounting the headend power feed panel, allow at least one rack unit space between the Cisco uBR7200 series router and the power feed panel or between multiple power feed panels.

Rack-Mounting the Power Feed Panel

The power feed panel can be mounted in a standard rack with either the front panel or the rear panel of the unit facing forward, depending on the cable handling requirements of your site. The power feed panel can also be mounted in a center-mount telco rack. The power LEDs are visible on both the front and rear panels.

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

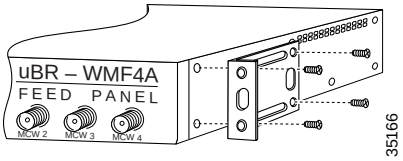
To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Attaching the Brackets

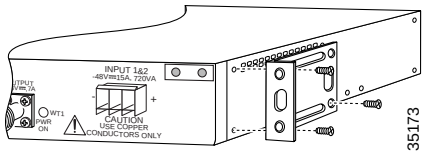
To install the power feed panel in a standard rack with the front panel facing forward, attach the brackets to both sides of the unit near the front panel (see Figure 16).

Figure 16 Attaching the Brackets (front panel forward)



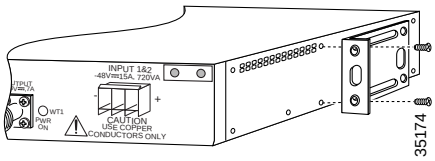
To install a power feed panel in a standard rack with the rear panel facing forward, attach the brackets to both sides of the unit near the rear panel (see Figure 17).

Figure 17 Attaching the Brackets (rear panel forward)



To install a power feed panel in a center-mount telco rack, attach the brackets to both sides of the unit about half way between the front and rear panels (see Figure 18).

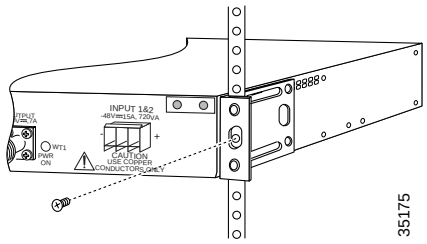
Figure 18 Attaching the Telco Center-Mount Brackets (rear panel forward)



Installing the Power Feed Panel in the Equipment Rack

After the brackets are secured, attach the brackets on both sides of the power feed panel to the equipment rack (see Figure 19).

Figure 19 Attaching the Power Feed Panel to an Equipment Rack



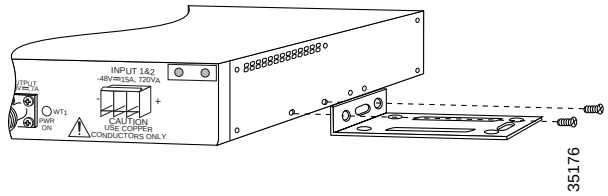
Wall-Mounting the Power Feed Panel

To wall-mount the unit, use the same brackets as those that are used to install the power feed panel in an equipment rack. However, in the wall-mounting procedure, the brackets are installed in a different position (see Figure 20).

To wall-mount the power feed panel, complete the following steps:

Step 1 Attach the brackets to both sides of the power feed panel (see Figure 20).

Figure 20 Attaching the Wall-Mount Brackets

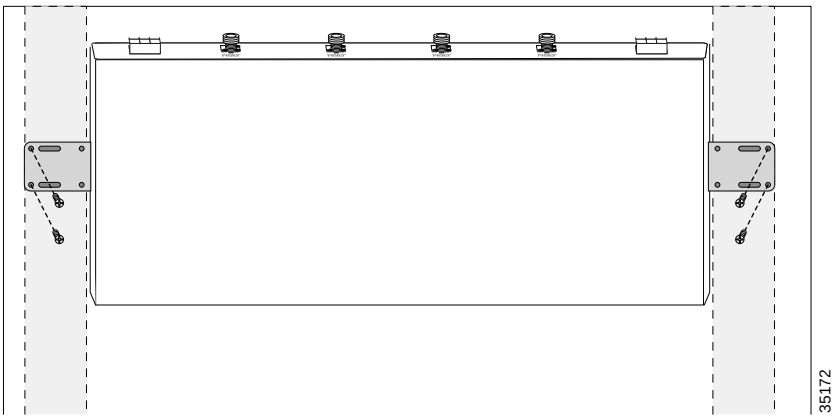


Step 2 Take out the screws and anchors that you intend to use. (Cisco does *not* provide these fasteners.)

Note To meet safety requirements, the power feed panel must be installed with the rear panel connectors facing up.

Step 3 While supporting the power feed panel, attach it to the wall with the rear panel connectors pointing up (see Figure 21) with your screws and anchors. To best support the power feed panel and cables, make sure that the power feed panel is attached securely to a vertical wall stud or to a firmly attached plywood mounting backboard. This will prevent the unit from pulling away from the wall when the cables are attached.

Figure 21 Wall-Mounting the Power Feed Panel



Attaching the Ground Lug

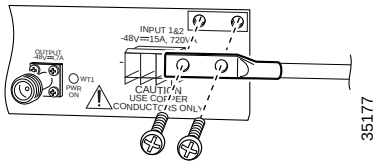
A ground lug kit is provided with the power feed panel. To attach the ground lug to the power feed panel chassis, complete the following steps:

Step 1 Attach a ground wire that meets the requirements of all national and local electrical codes to the ground lug.

Step 2 Locate the two ground lug threaded holes on the upper right of the rear panel.

Step 3 Align the ground lug with the threaded holes and fasten it to the chassis using the two screws included in the kit and a torque driver with a number 2 Phillips bit (see Figure 22). Tighten the screws to between 16 and 20 inch-pounds of torque.

Figure 22 Attaching the Ground Lug



Wiring the DC Power

Wiring the DC power consists of attaching the wires of the DC power source to a removable wiring block, then plugging that block into the connection on the power feed panel.

Note The color coding of DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for –48V return, and red or white is used for –48V. Make certain that the lead color coding you choose for the DC-input power supply matches lead color coding at the DC power source.

Warning **This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **This equipment has a connection between the earthed conductor of the DC supply circuit and the earthing conductor. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

- This equipment shall be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment shall be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source is to be located within the same premises as this equipment.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the point of connection on the earthing electrode conductor.

Warning **Secure all power cabling when installing this unit to avoid disturbing field-wiring connections. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **When installing the unit, the ground connection must always be made first and disconnected last. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **Figure 24 shows the DC power supply terminal block. Wire the DC power supply using the appropriate wire terminations at the wiring end, as illustrated. The proper wiring sequence is ground to ground, positive to positive (line to L), and negative to negative**

(neutral to N). Note that the ground wire should always be connected first and disconnected last. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning Use copper conductors only. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning The customer 48 volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning Connect the unit only to a DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950 based safety standards. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

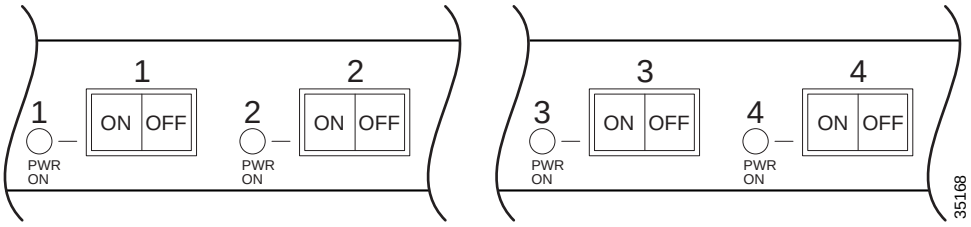
Warning Use 10 AWG wire with insulation rated for 75 C (167 F) or higher to wire the DC input power supply to the power feed panel. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.

To wire the DC power to the power feed panel, complete the following steps for each DC power connector:

Step 1 Ensure that the leads are disconnected from the power source.

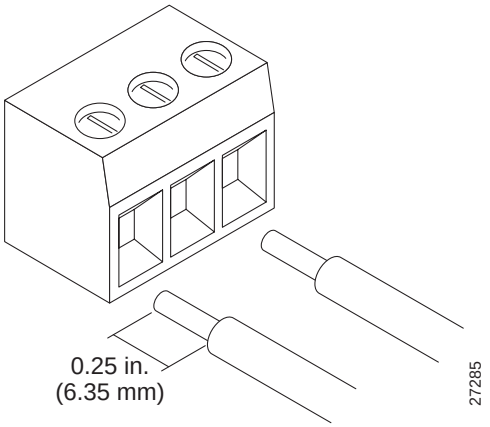
Step 2 Ensure that all four power/breaker switches on the power feed panel are in the OFF position (see Figure 23).

Figure 23 Wireless Transverter Power/Breaker Switches



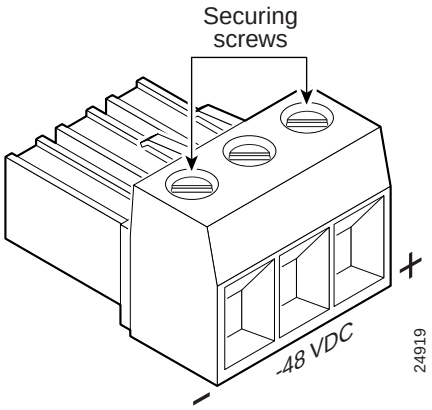
Step 3 Using a wire stripper, strip approximately 0.25 inch (6.35 mm) from the two leads (see Figure 24).

Figure 24 Stripping the Wire



Step 4 Insert the stripped ends of the wire in the removable wiring block according to the scheme in Figure 25, which illustrates the polarity of each connection. The terminal on the left is for the minus (–) wire. The terminal on the right is for the positive (+) return wire.

Figure 25 Wiring Connections



Step 5 Secure the wires in the terminal block by using the 1/8-inch flat-blade screwdriver to tighten the screws in the top of the block (see Figure 25).

Step 6 Make sure that *no* exposed wire extends out of the terminal block.

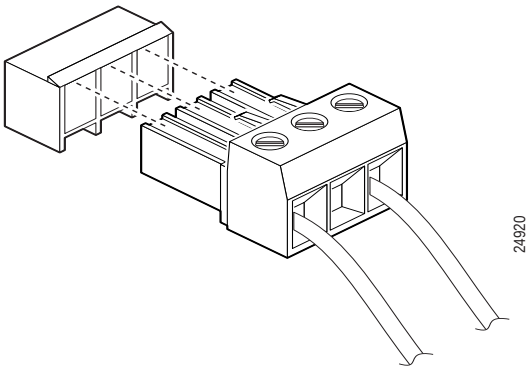
Step 7 Make sure that the DC power source is still *without* power.

Step 8 Connect the DC input wiring to the DC power source.

Warning **For personal safety, the ground wire must connect to safety (earth) ground at both the equipment and supply side of the DC wiring (unless the local electrical code requirements are different). To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Step 9 Plug the terminal block into the receptacle on the power feed panel (see Figure 26).

Figure 26 Plugging the Terminal Block into the Receptacle



Note Additional terminal blocks (part number 1804917) can be obtained from Phoenix Contact Inc., USA. Telephone: 800-888-7388. World Wide Web: http://www.phoenixcon.com.

Cabling the Power Feed Panel

To attach the cables to the power feed panel, complete the following procedures:

- Connecting the IF Cables from the Wireless Modem Card, page 31
- Connecting the IF Cables to the Wireless Transverter, page 33

Warning **Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Note It is not necessary to terminate unused connectors.

Connecting the IF Cables from the Wireless Modem Card

A single power feed panel can support one or two wireless modem cards. Refer to the “Connecting the IF Cables from a Single Wireless Modem Card” section on page 31, when the power feed panel is supporting only one modem card. Refer to the “Connecting the IF Cables from Two Wireless Modem Cards” section on page 32, when the power feed panel is supporting two modem cards.

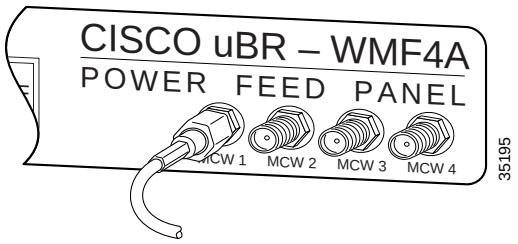
Note Maximum allowable cable loss for the IF cables is 15 dB including the connectors and the power feed panel. Cable length depends on the cable type used. DC resistance should not exceed 1.6 ohm including the inner conductor and the shielding.

Connecting the IF Cables from a Single Wireless Modem Card

To connect the IF cables from a single wireless modem card to the power feed panel, complete the following steps:

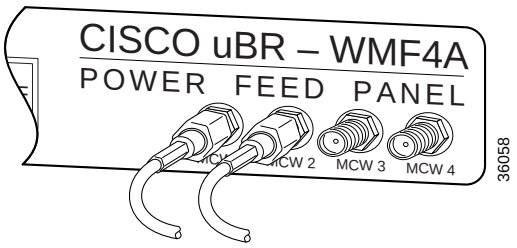
Step 1 Connect the cable coming from the PFP-Main port of the wireless modem card to the MCW 1 port on the front of the power feed panel (see Figure 27).

Figure 27 Connecting the IF Cable Coming from the Wireless Modem Card



Step 2 When diversity is used, connect the cable coming from the PFP-Diversity port of the modem card to the MCW 2 port on the front of the power feed panel (see Figure 28).

Figure 28 Connecting the Diversity IF Cable



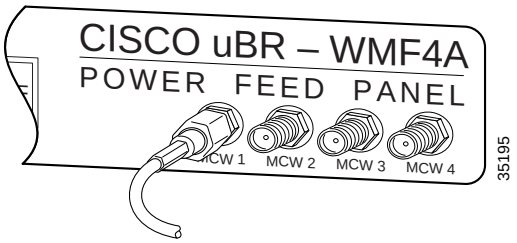
Note Recommended torque for attaching connectors to SMA ports is 7 to 9 inch-pounds.

Connecting the IF Cables from Two Wireless Modem Cards

To connect the IF cables from two wireless modems card to the power feed panel, complete the following steps:

Step 1 Connect the cable coming from the PFP-Main port of the *first* wireless modem card to the MCW 1 port on the front of the power feed panel (see Figure 29).

Figure 29 Connecting the IF Cable Coming from the Wireless Modem Card



Step 2 When diversity is used, connect the cable coming from the PFP-Diversity port of the *first* modem card to the MCW 2 port on the front of the power feed panel.

Step 3 Connect the cable coming from the PFP-Main port of the *second* modem card to the MCW 3 port on the front of the power feed panel.

Step 4 When diversity is used, connect the cable coming from the PFP-Diversity port of the *second* modem card to the MCW 4 port on the front of the power feed panel.

Note Recommended torque for attaching connectors to SMA ports is 7 to 9 inch-pounds.

Note If diversity is used, be sure to use the main/diversity combination of MCW1/MCW2 or MCW3/MCW4.

Connecting the IF Cables to the Wireless Transverter

A single power feed panel can support as many as four wireless transverters. Refer to the "Connecting the IF Cables to Two Wireless Transverters" section on page 33, when the power feed panel is supporting only two transverters. Refer to the "Connecting the IF Cables to Four Wireless Transverters" section on page 34, when the power feed panel is supporting four transverters.

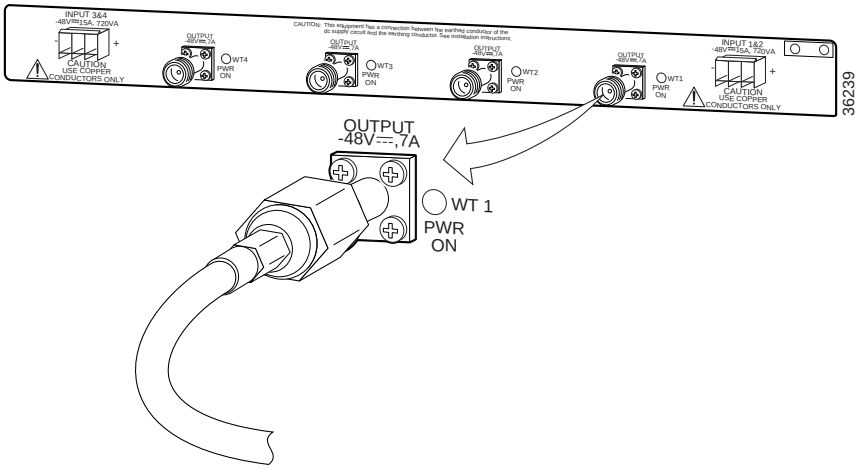
Connecting the IF Cables to Two Wireless Transverters

To connect the IF cables from the power feed panel to two transverters (main and diversity), complete the following steps:

Step 1 Attach one end of the IF cable to the WT1 connector on the back of the power feed panel (see Figure 30). When stiff coaxial cable is being used for the connection, first attach a "pigtail" adapter using flexible coaxial cable.

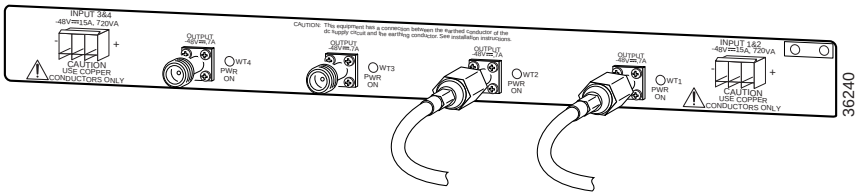
Warning **Use 50-ohm coaxial cable with a center conductor size of 10 AWG or larger (for example, LMR-400, 3/8-inch FSJ Superflex Heliax, or larger). Failure to do so can result in overheating, fire, or long-term failure. Local and national electrical codes must be observed. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Figure 30 Connecting the Main IF Cable Going to the Wireless Transverter



Step 2 Attach one end of a *second* IF cable to the WT2 connector on the back of the power feed panel (see Figure 31). As noted in Step 1, use a flexible coaxial cable "pigtail" adapter, if necessary.

Figure 31 Connecting the Diversity IF Cable Going to the Wireless Transverter



Note To connect two *main* wireless transverters, use connectors WT1 and WT3.

Note Recommended torque for attaching the cables to the N-type ports is 35 to 40 inch-pounds.

Caution Over-tightening the N-type connectors can damage them.

This completes the procedure for cabling and installing the power feed panel.

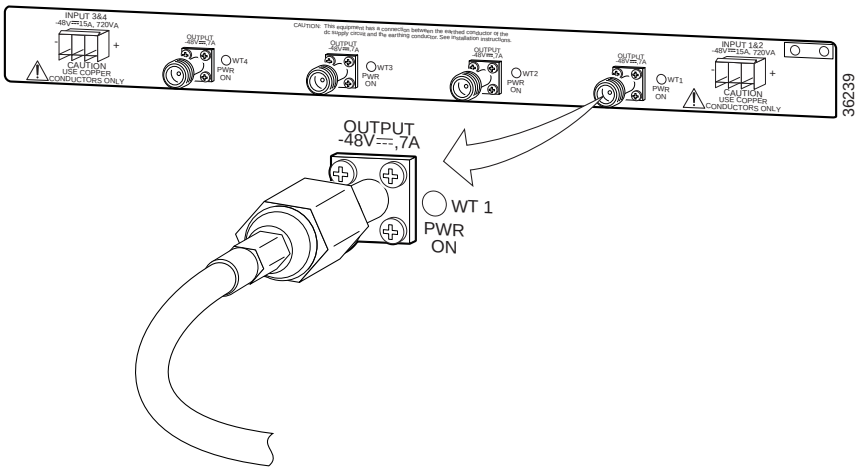
Connecting the IF Cables to Four Wireless Transverters

To connect the IF cables from the power feed panel to four transverters, complete the following steps:

Step 1 Attach one end of the IF cable to the WT1 connector on the back of the power feed panel (see Figure 32). When stiff coaxial cable is being used for the connection, first attach a “pigtail” adapter using flexible coaxial cable.

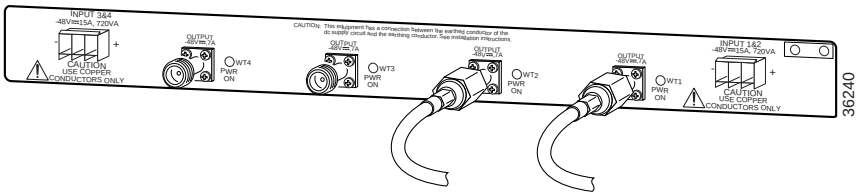
Warning **Use 50-ohm coaxial cable with a center conductor size of 10 AWG or larger (for example, LMR-400, 3/8-inch FSJ Superflex Heliax, or larger). Failure to do so can result in overheating, fire, or long-term failure. Local and national electrical codes must be observed. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Figure 32 Connecting the IF Cable Going to the Wireless Transverter



Step 2 Attach one end of a *second* IF cable to the WT2 connector on the back of the power feed panel (see Figure 33). As noted in Step 1, use a flexible coaxial cable “pigtail” adapter, if necessary.

Figure 33 Connecting the Second IF Cable Going to the Wireless Transverter



Step 3 Attach one end of a *third* IF cable to the WT3 connector on the back of the power feed panel (see Figure 33). As noted, use a flexible coaxial cable "pigtail" adapter, if necessary.

Step 4 Attach one end of a *fourth* IF cable to the WT4 connector on the back of the power feed panel (see Figure 33). As noted, use a flexible coaxial cable "pigtail" adapter, if necessary.

Note Recommended torque for attaching the cables to the N-type ports is 35 to 40 inch-pounds.

Caution Over-tightening the N-type connectors can damage them.

This completes the procedure for cabling and installing the power feed panel.

Installing the Wireless Transverter

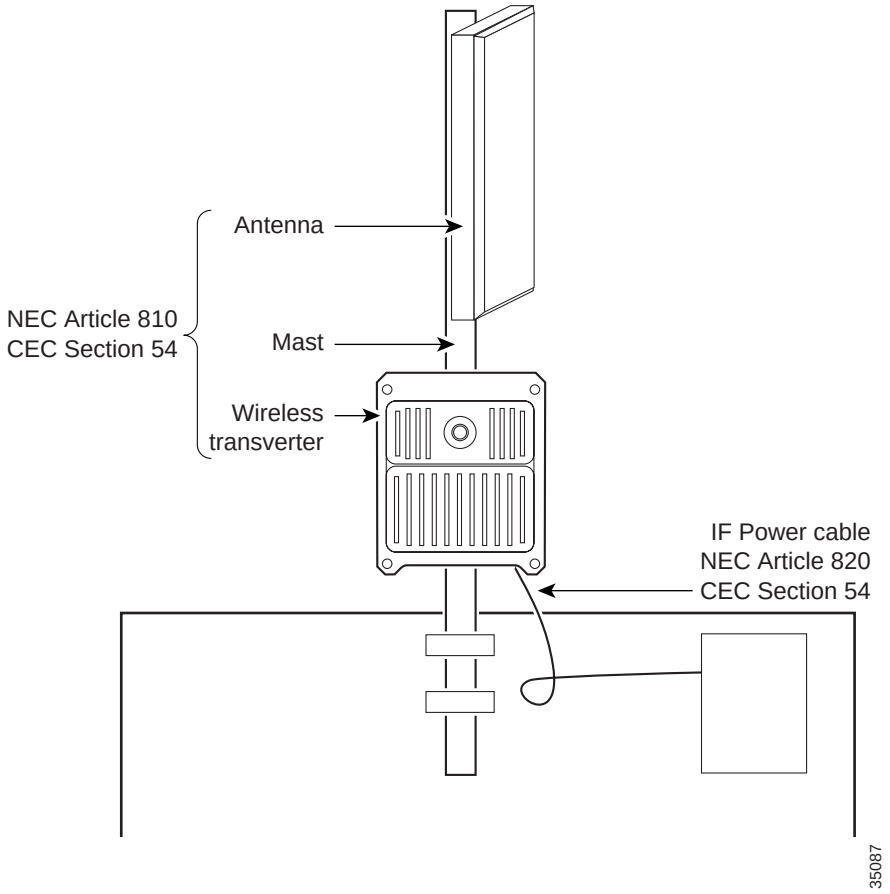
Note These instructions apply to the MMDS transverter manufactured and supplied by Cisco Systems. If you have purchased a transverter from another vendor, refer to that vendor's instructions for installation.

To install the wireless transverter, complete the following procedures:

1. Installing the Duplexer in the Wireless Transverter, page 37
2. Assembling the Shock Mounts, page 41
3. Attaching the Shock Mounts to the Transverter, page 42
4. Mounting the Transverter on the Antenna Mast, page 44
5. Cabling the Transverter, page 47
6. Reinstating the Power, page 50

Warning **Do not locate the transverter near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits (see Figure 34). When installing the transverter, take extreme care not to come into contact with such circuits, as they may cause serious injury and death. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Figure 34 Roof Installation Considerations



Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **When installing the unit, the ground connection must always be made first and disconnected last. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Warning **A radiation hazard may exist within a specific radius around the center point of the antenna. Table 6 associates antenna gain (in dBi) with a minimum acceptable distance according to FCC rules. Determine the gain of the antenna and use Table 6 to locate the minimum acceptable distance from the center point of the antenna. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

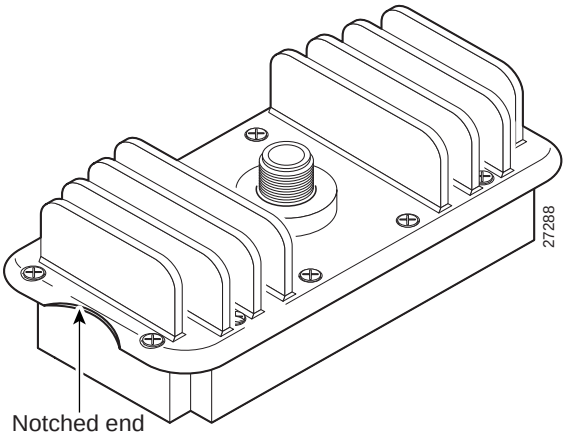
Table 6 Radiation Hazard Calculation (transmitter power = 33 dBm)

Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Minimum Acceptable Distance under FCC Rules – Uncontrolled Environment (m)	Minimum Acceptable Distance under FCC Rules – Controlled Environment (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Installing the Duplexer in the Wireless Transverter

Installation of the wireless transverter requires that a duplexer assembly (see Figure 35) be installed in the transverter prior to mounting it on the antenna mast. The duplexer acts as an isolation filter and separates the transmitted (Tx) signals from the received (Rx) signals. The orientation of the duplexer assembly when installed in the transverter determines its transmit and receive frequency.

Figure 35 Duplexer Assembly



The duplexer assembly is shipped as a separate unit, based on the RF channel plan you have selected for your installation.

To install the duplexer in the transverter, complete the following steps:

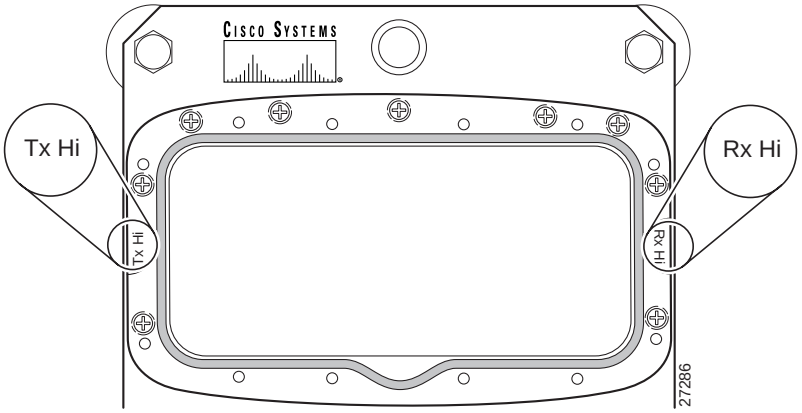
Step 1 Determine if you will use the high-frequency band for transmitting or receiving.

Step 2 Detach the bottom portion of the label affixed to the underside of the duplexer, and record the duplexer orientation (see Figure 36). This label can be attached to equipment records and used for reference when configuring the system or performing maintenance.

Figure 36 Frequency Assignment Label

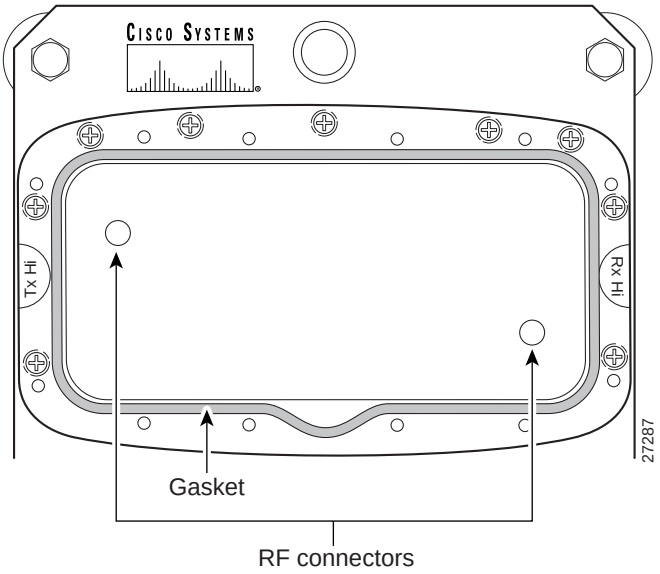
Step 3 Depending on whether that sector is transmitting or receiving on the high-frequency band, match the notched end of the duplexer with either the Tx Hi or Rx Hi side of the duplexer receptacle on the wireless transverter (see Figure 37).

Figure 37 Duplexer Receptacle in the Wireless Transverter



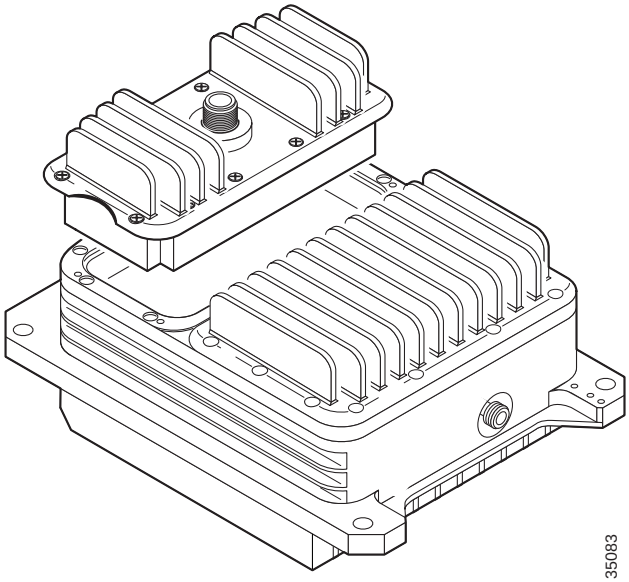
Step 4 Verify that the gasket is aligned in the groove in the transverter chassis (see Figure 38).

Figure 38 Gasket in the Transverter Chassis



Step 5 Carefully line up the duplexer, then plug it in to the chassis. Be careful to keep the internal RF connectors properly aligned (see Figure 39).

Figure 39 Plugging the Duplexer Assembly into the Chassis

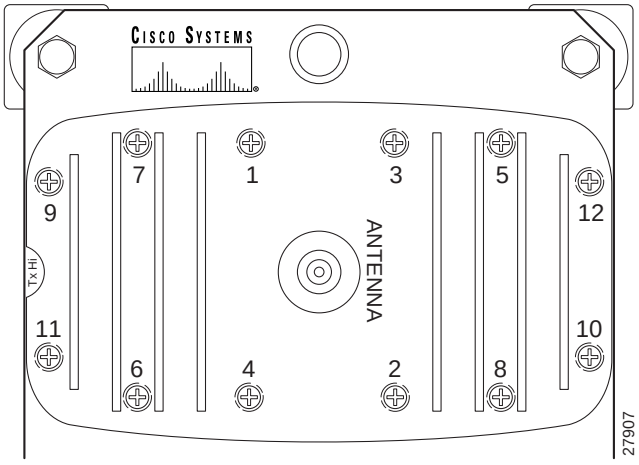


Step 6 Verify that the cover of the duplexer housing is flush with the transverter housing.

Caution If the cover is not flush, check the alignment of the internal RF connectors. In order to avoid damage, do *not* tighten the screws if the cover is *not* flush.

Step 7 Using the torque driver with the number 2 Phillips bit, follow the numeric tightening sequence shown in Figure 40, and lightly seat the screws.

Figure 40 Tightening Sequence



Step 8 Repeat the sequence in Figure 40, tightening the screws to between 16 and 20 inch-pounds of torque.

Assembling the Shock Mounts

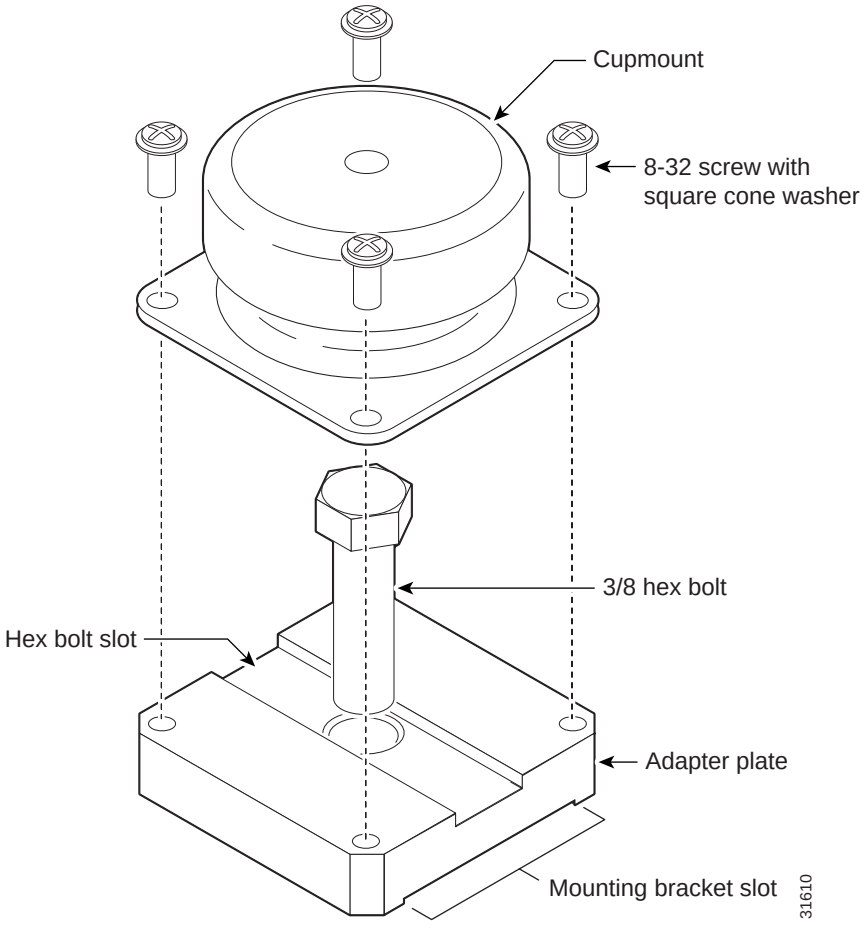
Four shock mounts are included in the wireless transverter mounting kit. These mounts must be assembled and attached to the transverter, one on each corner, to insulate it from vibrations that might otherwise be transferred from the antenna to the transverter.

To assemble each of the four shock mounts, complete the following steps:

Step 1 Place the hex bolt in the hole in the center of the hex bolt slot in the adapter plate, making sure that the head of the hex bolt is fully seated in the slot so that it will *not* spin when a nut is attached (see Figure 41).

Note The hex bolt slot holds the head of the bolt in place when the nut is fastened to the bolt.

Figure 41 Shock Mount Assembly



Step 2 Place the cupmount on top of the adapter plate, lining up the four corner holes in each.

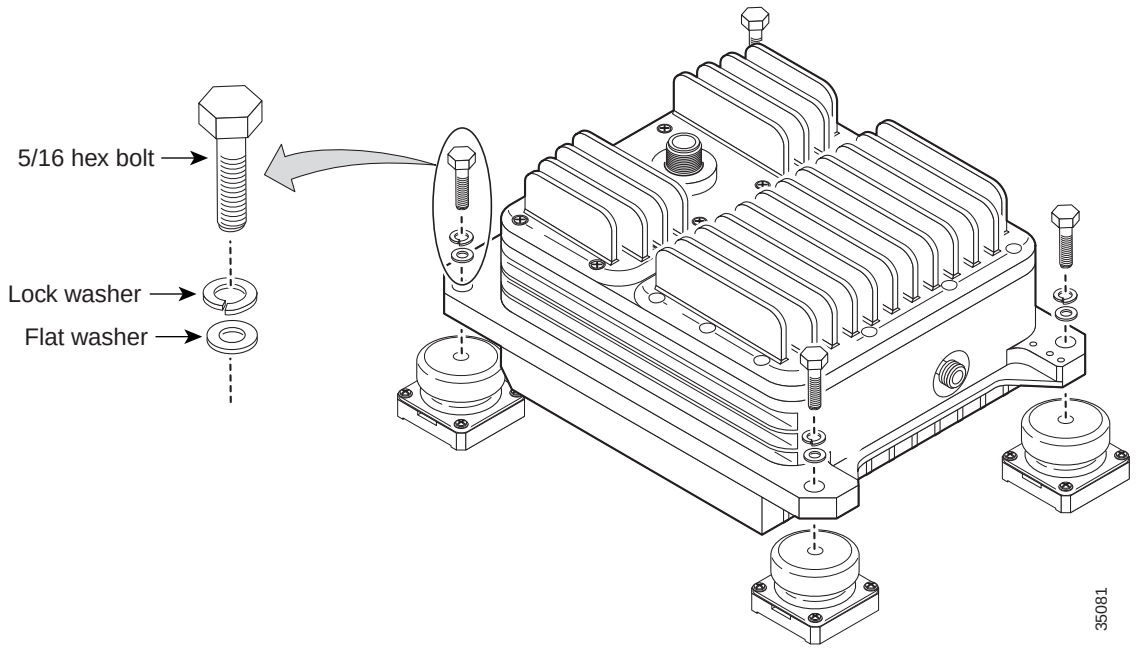
Step 3 Use the four screws with the square cone washers to attach the cupmount to the adapter plate. Using the torque driver with the number 2 Phillips bit, tighten the screws to between 16 and 20 inch-pounds of torque.

Attaching the Shock Mounts to the Transverter

To attach each of the four shock mounts to the transverter, complete the following steps:

Step 1 Put a split lock washer and a flat washer on each of the four 5/16-hex bolts. The split lock washer goes on first (see Figure 42).

Figure 42 Attaching the Shock Mounts to the Transverter

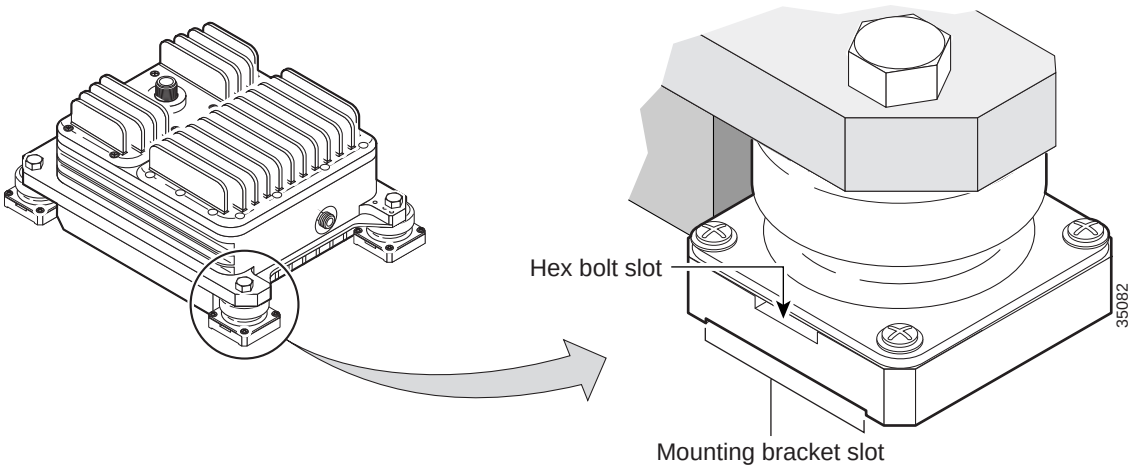


Step 2 Line up the center hole in each cupmount with a mounting hole at the corner of the transverter.

Step 3 Attach each shock mount to the transverter with the hex bolt and washers (see Figure 42), but do *not* fully tighten the bolts until after the shock mounts are properly aligned. The mounting brackets seat correctly in the mounting bracket slots *only* when the shock mounts are properly aligned. Improper alignment prevents the mounting bracket from seating correctly, which could allow the shock mount to slide across the mounting bracket and move the transverter.

Step 4 Align each shock mount so that the mounting bracket slot on the shock mount (see Figure 43) is parallel to one of the shorter sides of the transverter. The mounting bracket slots on the upper shock mounts must be parallel to the top of the transverter. The mounting bracket slots on the lower shock mounts must be parallel to the bottom of the transverter.

Figure 43 Shock Mount Alignment

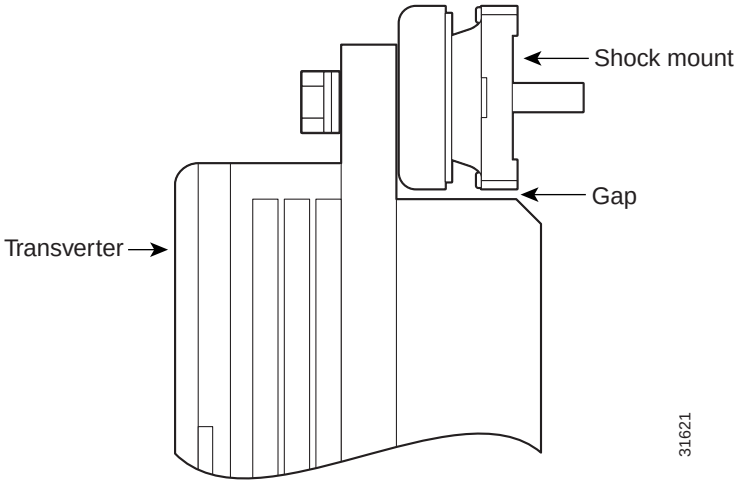


Step 5 Tighten each hex bolt to between 7 and 8 foot-pounds of torque.

Step 6 Make sure that the mounting bracket slot on each shock mount is still positioned correctly.

Step 7 When the shock mounts are attached to the transverter, they must *not* touch the fins on the back of the transverter. Check all four shock mounts to make sure that none of them is touching the transverter fins (see Figure 44).

Figure 44 Shock Mount Positioning



Mounting the Transverter on the Antenna Mast

A mounting kit is included for mounting the wireless transverter on the antenna mast.

Note In case of loss, extra hardware is provided in the mounting kit.

Note This mounting kit requires a mast with an outside diameter size of 2-3/8 to 4-1/2 inches.

Note These instructions apply to the MMDS transverter manufactured and supplied by Cisco. If you have purchased a transverter from another vendor, refer to that vendor's instructions for installation.

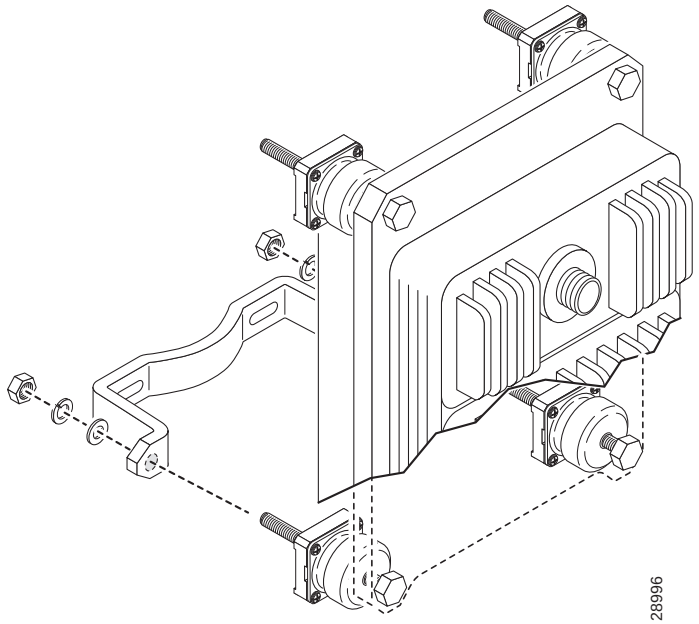
Caution *Never* leave the transverter unattended with the fasteners removed.

Note Each transverter at a headend site with multiple antennas should be installed far enough from *all* antennas (see Table 6 on page 37) so that any transverter can be replaced without having to shut down the transmission signal from another antenna.

To mount the transverter on an antenna mast, complete the following steps:

Step 1 Insert the 3/8-hex bolts extending from the lower shock mounts into the two holes in one of the mounting brackets (see Figure 45).

Figure 45 Attaching the Lower Mounting Bracket



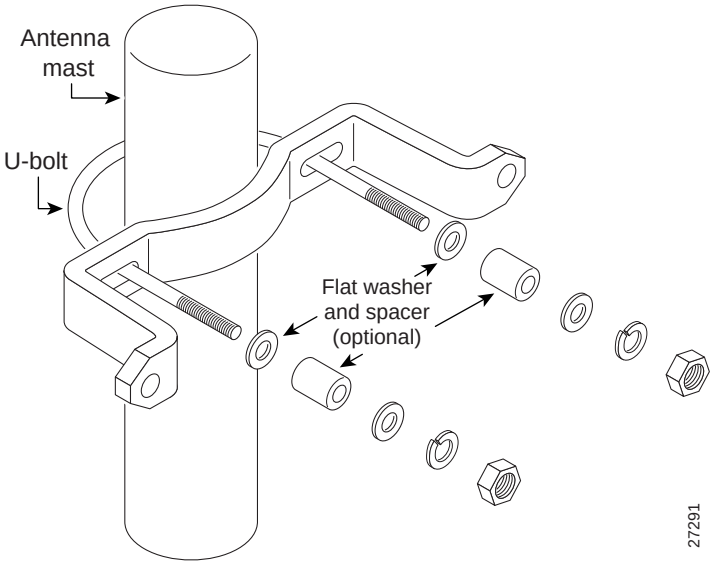
Step 2 Make sure that the mounting brackets are seated correctly in the corresponding mounting bracket slots on all four shock mounts. If a mounting bracket does *not* seat correctly in the slot on any shock mount, you must realign that shock mount then secure it again to between 7 and 8 foot-pounds of torque (refer to the "Attaching the Shock Mounts to the Transverter" section on page 42).

Step 3 Make sure that the head of each hex bolt is still seated correctly (refer to the "Assembling the Shock Mounts" section on page 41).

Step 4 Secure the bracket to the transverter by putting a flat washer, then a lock washer, then the nut on each of the two 3/8-inch shock mount bolts (see Figure 45). However, do *not* fully tighten the nuts.

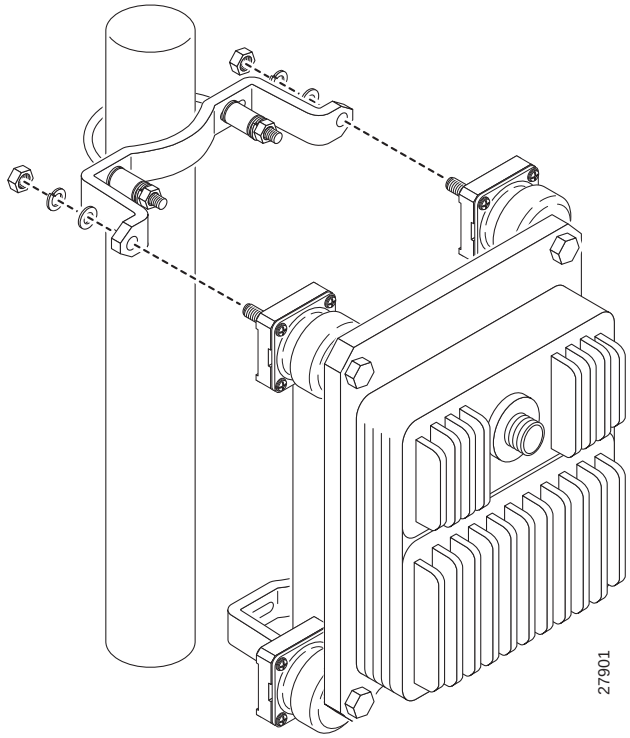
Step 5 Select the appropriate U-bolt from the mounting kit and attach the remaining bracket, which will be the upper bracket, to the antenna mast using a flat washer, then a lock washer, then a nut on each of the two U-bolt shafts (see Figure 46). If necessary, use one of the provided spacers and one of the additional lock washers on each shaft.

Figure 46 Attaching the Top Mounting Bracket to the Antenna Mast



Step 6 Insert the 3/8-hex bolts extending from the upper shock mounts into the two holes in the upper mounting bracket (see Figure 47). Next, place a lock washer, a flat washer, and a nut on each bolt. However, do *not* fully tighten the nuts.

Figure 47 Attaching the Transverter to the Top Mounting Bracket



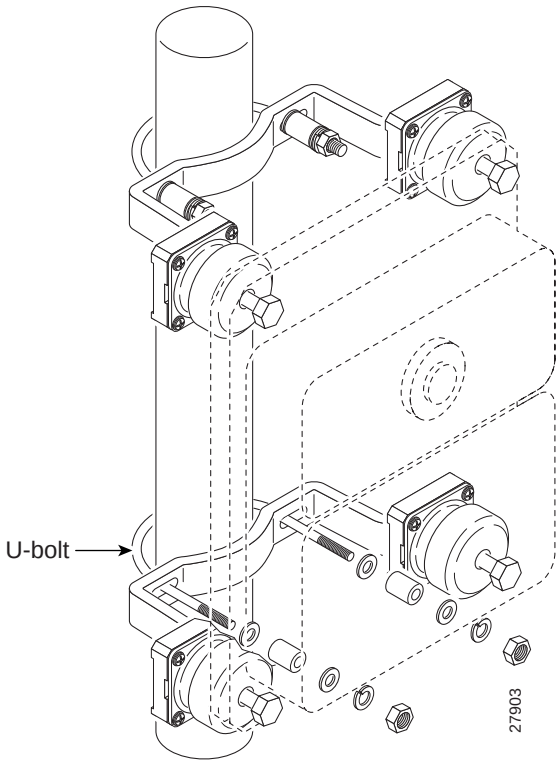
Caution Do not leave the transverter unattended until after you tighten all the fasteners.

Step 7 Make sure that the mounting brackets are still seated correctly in the mounting bracket slots on the two shock mounts.

Step 8 Secure each nut with a 9/16-inch wrench.

Step 9 Secure the lower mounting bracket to the mast (see Figure 48) with a U-bolt (refer to Step 5).

Figure 48 Attaching the Bottom Mounting Bracket to the Antenna Mast



Step 10 Keeping the shock mounts properly aligned, tighten all fasteners to 15 foot-pounds of torque.

Cabling the Transverter

Note These instructions apply to the MMDS transverter manufactured and supplied by Cisco. If you have purchased a transverter from another vendor, refer to that vendor's instructions for installation.

Cables leading to the wireless transverter may require through-bulkhead connectors, lightning protection, or other accessories. For more detailed information concerning these items, refer to the *Cisco Broadband Fixed Wireless Site Planning Guide*.

To cable the wireless transverter, complete the following procedures:

1. Attaching the Ground Lug, page 48
2. Connecting the IF Cable, page 48
3. Connecting the Antenna Cable, page 49

Warning **Before performing any of the following procedures, ensure that DC power to the transverter you will be working on is turned OFF. To ensure that the power to the specific transverter is OFF, locate the power/breaker switch on the front of power feed panel that services that transverter, push the switch into the OFF position, then tape the switch in the OFF position. To see translations of the warnings that appear in this publication, refer to the "Regulatory Compliance and Safety Information" section in this document.**

Attaching the Ground Lug

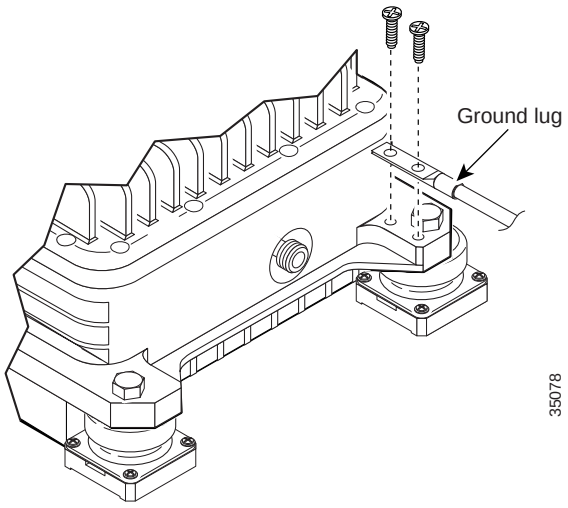
A ground lug kit is provided with the transverter. To attach the ground lug to the transverter chassis, complete the following steps:

Step 1 Attach an approved ground wire to the ground lug.

Step 2 Locate the two ground lug threaded holes on the lower-right mounting bracket of the transverter chassis.

Step 3 Align the ground lug with the threaded holes and fasten it to the chassis using the two screws included in the kit (see Figure 49).

Figure 49 Attaching the Ground Lug



Step 4 Using a torque driver with a number 2 Phillips bit, tighten the screws to between 16 and 20 inch-pounds of torque.

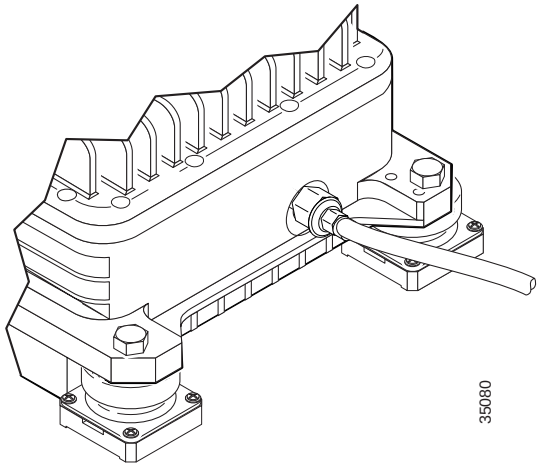
Connecting the IF Cable

To connect the IF cables to the transverters, complete the following steps:

Step 1 Connect a lightning surge suppressor, that meets all national and local electrical codes, to the end of the IF cable from the PFP-Main power feed panel port.

Step 2 Connect the PFP-Main cable, with the lightning surge suppressor on the end, to the IF input connector on the bottom of the main transverter (see Figure 50).

Figure 50 Connecting the IF Cable (lightning surge suppressor not shown)



Step 3 Tighten the main transverter cable connection to 30 to 40 inch-pounds of torque.

Step 4 When diversity is used:

a. Connect a lightning surge suppressor, that meets all national and local electrical codes, to the end of the IF cable from the PFP-Diversity power feed panel port.

b. Connect the PFP-Diversity cable, with the lightning surge suppressor, on the end to the IF input connector on the bottom of the diversity transverter (see Figure 50).

c. Tighten the diversity transverter cable connection to 30 to 40 inch-pounds of torque.

Step 5 *After* testing the performance of the system to make sure that it is operating properly, apply weatherproofing material to the IF cable connectors.

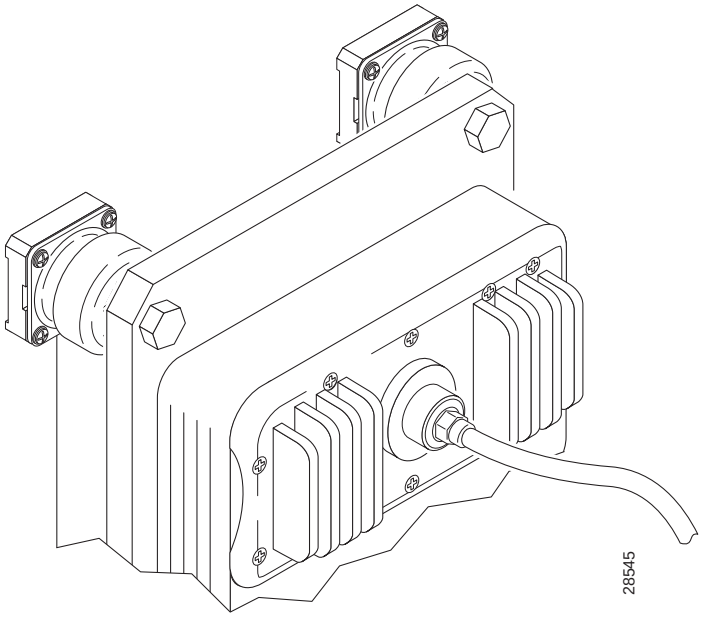
Note It is best to wait until the system has been tested and determined to be operating properly before applying the weatherproofing material. This material can be difficult to remove.

Connecting the Antenna Cable

To connect the antenna cables to the transverters, complete the following steps:

Step 1 Connect the RF cable leading to the main antenna to the N-type connector on the main transverter duplexer (see Figure 51), and tighten the cable connection to 35 to 40 inch-pounds of torque.

Figure 51 Connecting the Antenna Cable



Step 2 When diversity is used, connect the RF cable leading to the diversity antenna to the N-type connector on the diversity transverter duplexer, and tighten the cable connection to 35 to 40 inch-pounds of torque.

Caution Over-tightening the N-type connectors can damage them.

Step 3 *After* testing the performance of the system to make sure that it is operating properly, apply weatherproofing material to the N-type connectors.

Note It is best to wait until the system has been tested and determined to be operating properly before applying the weatherproofing material. This material can be difficult to remove.

Note If you have ordered the optional hail shields, install them now. Refer to the instructions that were shipped with the shields.

Reinstating the Power

After cabling, reinstate the DC power to the power feed panel. After reinstating the DC power, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.

Note To test the installation and create an initial configuration for the wireless modem card, you must understand basic Cisco uBR7200 series router operation and be familiar with the Cisco IOS software application.

This completes the procedure for installing and cabling a wireless transverter. Consult the instructions provided by your antenna manufacturer for additional instructions on cabling antennas.

Testing the Installation and Creating an Initial Configuration

After you have installed or replaced a headend wireless modem card, or a wireless modem card and subsystem, you need to determine whether the installation is assembled correctly and working properly. You must test the installation to verify the following:

- Power from the power feed panel is reaching the transverter
- Completed signal paths, both control and data, exist between the wireless modem card and the transverter
- Hardware is seated properly
- Analog and signal processing portions of the wireless modem card are functioning as expected
- Transverter is operating correctly

When you know that the system is working properly, you must create an initial configuration. During the initial configuration, complete the following tasks:

- Set the power levels
- Configure the automatic level control
- Configure the modulation profile for the link
- Verify the configuration
- Verify the signals

Note You must log in to and create a basic configuration for the Cisco uBR7200 series router before testing the installation and configuring the wireless modem card. Refer to the *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide* that shipped with your router for more information.

Required Information

Before testing the installation and creating an initial configuration for the wireless modem card, you must have the following information:

- Number of sectors
- Duplexer information
- Transmit and receive frequencies
- IP address and subnet mask of the wireless modem card
- Transmit power

- Target receive power
- Modulation profile settings (upstream and downstream)
- Microcode path

Note The microcode for the headend system can be downloaded from Cisco.com at the following URL: http://www.cisco.com/cgi-bin/tablebuild.pl/rhe. The microcode for the subscriber units can be downloaded from Cisco.com at the following URL: http://www.cisco.com/cgi-bin/tablebuild.pl/rsu.

- Configuration file name and location
- Dynamic Host Configuration Protocol (DHCP) server address

Testing the Installation

To test the installation, complete the following tasks:

- Storing the Duplexer Information
- Displaying the Transverter Information
- Configuring IF Loopback (Optional)
- Configuring RF Loopback (Optional)
- Verifying the Cable Loss

Note IF loopback and RF loopback are optional, but strongly recommended.

Storing the Duplexer Information

You must store the duplexer information, or "burn" it in to the transverter. Store the duplexer information in the transverter with the **radio int r** *slot*/**0 rf-update duplexer** command.

Displaying the Transverter Information

Displaying a readout of the transverter information confirms a successful power and control signal path to the transverter from the power feed panel. You display readout of the transverter information with the **show controller radio** *slot*/**0 rf** command.

Configuring IF Loopback (Optional)

An IF loopback confirms that the hardware is seated properly in the chassis and that the analog and signal processing portions of the wireless modem card are functioning as expected. When two antennas are employed, each receive path must be tested individually.

IF loopback does *not* test forward error correction (FEC), or the MAC-layer interface of the wireless modem card. Other tests must be done for these portions of the card.

To initiate the IF loopback, shut down the radio link. Enter the following commands:

```
Router(config-if)# shut
Router(config-if)# loopback local if main 2
Router(config-if)# no shut
Router(config-if)# shut
Router(config-if)# loopback local if main 3
Router(config-if)# no shut
Router(config-if)# no loopback
```

When a second antenna is employed, its receive path should also be tested. Issue the **show running-configuration** command to see the IF configuration. To configure and test the second antenna, enter the following commands:

```
Router(config-if)# shut
Router(config-if)# loopback local if diversity 2
Router(config-if)# no shut
Router(config-if)# shut
Router(config-if)# loopback local if diversity 3
Router(config-if)# no shut
Router(config-if)# no loopback
```

Configuring RF Loopback (Optional)

An RF loopback confirms that the cabling to the transverter is correct, the communication of the data signal between the power feed panel and transverter has been established, and the transverter is operating correctly. It also measures the cable loss. The path to each transverter must be tested separately because there is only one transmit path.

RF loopback does *not* test the duplexer, which is the final stage before the signal is sent to the antenna. Also, loopback does *not* test forward error correction (FEC), or the MAC-layer interface of the wireless modem card. Other tests must be done for these portions of the card.

To configure the RF loopback, enter the following commands:

```
Router(config-if)# shut
Router(config-if)# loopback local rf main 2
Router(config-if)# no shut
Router(config-if)# shut
Router(config-if)# loopback local RF main 3
Router(config-if)# no shut
Router(config-if)# shut
Router(config-if)# loopback local RF diversity 2
Router(config-if)# loopback local RF diversity 3
Router(config-if)# no shut
Router(config-if)# shut
Router(config-if)# no loopback
```

After completing the last command, use the **show running-configuration** command to display the RF configuration.

Verifying the Cable Loss

Use the **show controller radio** *slot*/**0 rf** command to display the transverter data, which contains the cable loss information.

Creating an Initial Configuration

Note You must log in to and create a basic configuration for the Cisco uBR7200 series router before configuring the wireless modem card. Refer to the *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide* that shipped with your router for more information.

Creating an initial configuration for the wireless modem card includes the following tasks:

Setting the Channels, Frequencies, Power Levels, and Modulation Profiles

The channels, frequencies, and power levels, both upstream and downstream, must be set correctly to ensure correct operation and compliance with the governing regulatory bodies, such as the FCC. Consult the RF engineers planning your network for this information.

Downstream

When you have the information, enter the following commands to configure the downstream channel, frequency, power level, and modulation profile:

```
Router(config-if)# radio transmit-power power-level
Router(config-if)# radio downstream frequency freq width width
Router(config-if)# radio downstream subchannel sc modulation-profile p
```

Upstream

When you have the power levels, enter the following commands to configure the upstream channel, frequency, power level, and modulation profile:

```
Router(config-if)# radio upstream frequency freq width width
Router(config-if)# radio upstream usportnum subchannel sn modulation-profile p
Router(config-if)# radio transmit-power power-level
Router(config-if)# radio upstream usportnum target-receive-power power-level
Router(config-if)# radio upstream usportnum shutdown
```

Note The upstream signal reception is shut down after configuration, to prevent subscribers from establishing a link before the configuration is complete.

Configuring the Automatic Level Control

The automatic level control (ALC) module governs the individual transmit power levels of all subscriber units. ALC ensures that the target receive power at the headend is maintained over time, by taking power measurements of all subscribers several times each second. Taking power measurements in small

intervals results in better resilience to the fading environment, but also consumes more upstream bandwidth. ALC can be disabled, but this is *not* recommended because it results in poor upstream link performance. The current system allows only one interval setting for an entire sector. The default interval is 96 milliseconds.

Enter the following commands to activate the ALC and configure it to 96 milliseconds:

```
Router# configure terminal
Router(config)# interface radio 6/0
Router(config-if)# radio alc interval 96
Router(config-if)# end
Router# show interface radio 6/0 alc
```

Configuring the Modulation Profile for a Wireless Link

The modulation profile describes the physical layer configuration of a wireless channel. Determining the correct settings requires extensive site planning and quality of service models. Consult the RF engineers planning your network for this information.

The specified settings are stored in the router as profiles. These profile settings are entered in the router only once, but can be applied to multiple wireless modem cards in the router.

Enter the following commands to configure the modulation profile:

```
Router# show radio capability modulation-profile int radio 6/0
Router# configure terminal
Router(config-if)# radio modulation-profile p bandwidth width throughput x.y
  mulipath-robust high burst-length medium
Router(config-if)# end
Router# show radio modulation-profile
Router# configure terminal
Router(config-if)# interface radio 6/0
Router(config-if)# radio upstream 0 subchannel sn modulation-profile p
```

Verifying the Wireless Modem Card Configuration

To verify the configuration, complete the following steps:

Step 1 Enter the **show running-configuration** privileged EXEC command to display the configuration currently in effect on the Cisco uBR7200 series router.

Step 2 Enter the **show startup-configuration** privileged EXEC command to display the system startup configuration.

Step 3 If you reissue the **show running-configuration** command, the dual antenna IF loopback is selected. This is appropriate even if you are using a single antenna system.

Step 4 If you are using two antennas and problems occur with the dual antenna command, reissue the command specifying **loopback local if main** or **loopback local if diversity** to help isolate the problem.

Step 5 It can also be helpful to run a power-on self test (POST), either the first time the link is initiated or each time the link is initiated. Enter the following commands to configure a POST that runs the *first* time a **no shut** command is entered:

```
Router(config-if)# shut
Router(config-if)# radio self-test
Router(config-if)# no shut
```

Verifying the Headend Signal

You must set up at least one “dummy” subscriber site to make sure that the headend is broadcasting the correct signal. To verify the headend signal, you must use the **radio histogram** command at the “dummy” subscriber site. This command displays the Signal-to-Interference and Noise Ratio (SINR) histogram for that site. A good signal has a *minimum* SINR of 30 dB.

Verifying the Subscriber Signal

You must set up at least one “dummy” subscriber site to make sure that the headend will receive the correct subscriber signal. To verify the headend reception of the subscriber signal, you must use the **radio histogram** command at the headend while the “dummy” subscriber site is broadcasting. This command displays the Signal-to-Interference and Noise Ratio (SINR) histogram for the headend reception of the subscriber signal. A good signal has a *minimum* SINR of 30 dB.

Regulatory Compliance and Safety Information

This section provides international agency compliance, safety, and statutory information regarding the installation of the Cisco point-to-multipoint headend wireless modem card and subsystem, and contains translations of the safety warnings used in the document.

FCC Registration and Requirements

The following paragraph describes requirements and information based on FCC rules.

This Cisco product has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 and Part 21 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, can cause harmful interference to radio transmissions.

Translated Safety Warnings

This section provides translations of the warnings found in this document.

Short-Circuit Protection Warning

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.**

Waarschuwing **Voor dit product moet kortsluitbeveiliging (overstroombeveiliging) deel uitmaken van de installatie in het gebouw. De installatie moet voldoen aan de nationale en lokale bedradingvoorschriften.**

Varoitus **Tämä tuote vaatii suojauksen oikosulkuja (ylivirtaa) vastaan osana asennusta rakennukseen. Asenna ainoastaan kansallisten ja paikallisten johdotussäännösten mukaisesti.**

Attention **La protection de ce produit contre les courts-circuits (surtensions) doit être assurée par la configuration électrique du bâtiment. Vérifiez que l'installation a lieu uniquement en conformité avec les normes de câblage en vigueur au niveau national et local.**

Warnung **Für dieses Produkt ist eine Kurzschlußsicherung (Überstromsicherung) erforderlich, die als Teil der Gebäudeinstallation zur Verfügung gestellt wird. Die Installation sollte nur in Übereinstimmung mit den nationalen und regionalen Vorschriften zur Verkabelung erfolgen.**

Avvertenza **Questo prodotto richiede una protezione contro i cortocircuiti, da fornirsi come parte integrante delle dotazioni presenti nell'edificio. Effettuare l'installazione rispettando le Norme CEI pertinenti.**

Advarsel **Dette produktet krever beskyttelse mot kortslutninger (overspenninger) som en del av installasjonen. Bare installer utstyret i henhold til nasjonale og lokale krav til ledningsnett.**

Aviso **Este produto requer proteção contra curto-circuitos (sobreintensidade de corrente), que deve estar instalada nos edifícios. Instale apenas de acordo com as normas de instalação elétrica nacionais e locais.**

Advertencia **Este producto necesita estar conectado a la protección frente a cortacircuitos (sobretensiones) que exista en el edificio. Instálelo únicamente en conformidad con las regulaciones sobre cableado, tanto locales como nacionales, a las que se tenga que atener.**

Varning! **Denna produkt kräver att kortslutningsskydd (överström) tillhandahålles som en del av byggnadsinstallationen. Installera bara i enlighet med nationella och lokala kabeldragningsbestämmelser.**

Disconnect Device Warning

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.**

Waarschuwing **Er moet een gemakkelijk toegankelijke, tweepolige stroomverbreker opgenomen zijn in de vaste bedrading.**

Varoitus **Kiinteään johdotukseen on liitettävä kaksinapainen kytkinlaite, johon on helppo päästä käsiksi.**

Attention **Un disjoncteur bipolaire facile d'accès doit être intégré dans le câblage fixe.**

Warnung **Die feste Verdrahtung muß eine leicht zugängliche, zweipolige Trennvorrichtung enthalten.**

Avvertenza **Nei cablaggi fissi va incorporato un sezionatore a due poli facilmente accessibile.**

Advarsel **En lett tilgjengelig, topolet frakoblingsenhet må være innebygd i det faste ledningsnettet.**

Aviso **Deverá incorporar-se um dispositivo de desconexão de dois pólos de acesso fácil, na instalação eléctrica fixa.**

Advertencia **El cableado fijo debe incorporar un dispositivo de desconexión de dos polos y de acceso fácil.**

Varning! **En lättillgänglig tvåpolig frånkopplingsenhet måste ingå i den fasta kopplingen.**

Lightning Activity Warning

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.**

Waarschuwing **Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.**

Varoitus **Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.**

Attention **Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.**

Warnung **Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.**

Avvertenza **Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.**

Advarsel **Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.**

Aviso **Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).**

¡Advertencia! **No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.**

Varning! **Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.**

Installation Warning

Warning Read the installation instructions before you connect the system to its power source.

Waarschuwing Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

Varoitus Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Attention Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

Avvertenza Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

¡Advertencia! Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Varning! Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Jewelry Removal Warning

Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Waarschuwing Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

Varoitus Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitäntänapoihin.

Attention **Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.**

Warnung **Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.**

Avvertenza **Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.**

Advarsel **Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.**

Aviso **Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.**

¡Advertencia! **Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.**

Varning! **Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.**

Supply Circuit Warning

Warning **Care must be given to connecting units to the supply circuit so that wiring is not overloaded.**

Waarschuwing **Let erop dat de toestellen op voedingscircuits worden aangesloten zonder het vermogen van de bedrading te overschrijden.**

Varoitus **Laiteyksiköt on yhdistettävä huolellisesti syöttöpiiriin niin, että johdot eivät ole ylikuormitettuja.**

Avertissement **Veillez à bien connecter les unités au circuit d'alimentation afin de ne pas surcharger les connections.**

Achtung **Beim Anschließen der Geräte an das Stromnetz ist darauf zu achten, daß die Schaltverbindungen nicht überlastet werden.**

Avvertenza **Fare attenzione quando si collegano le unità al circuito di alimentazione, per non sovraccaricare i cablaggi.**

Advarsel **Vær nøye med å koble enheter til strømforsyningskretsen slik at ledningene ikke overbelastes.**

Aviso **Deverá ter precaução ao ligar unidades ao circuito de fornecimento de energia, para não sobrecarregar a instalação.**

¡Atención! **Poner mucho cuidado al conectar los equipos al circuito de alimentación a fin de no sobrecargar el cableado.**

Varning **Var noga vid anslutning av enheter till matarströmkretsen så att ledningarna inte överbelastas.**

Service Personnel Warning

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**

Waarschuwing **Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door bevoegd geschoold personeel.**

Varoitus **Tämän laitteen saa asentaa, vaihtaa tai huoltaa ainoastaan koulutettu ja laitteen tunteva henkilökunta.**

Attention **Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.**

Warnung **Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.**

Avvertenza **Questo apparato può essere installato, sostituito o mantenuto unicamente da un personale competente.**

Advarsel **Bare opplært og kvalifisert personell skal foreta installasjoner, utskiftninger eller service på dette utstyret.**

Aviso **Apenas pessoal treinado e qualificado deve ser autorizado a instalar, substituir ou fazer a revisão deste equipamento.**

¡Advertencia! **Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.**

Varning! **Endast utbildad och kvalificerad personal bör få tillåtelse att installera, byta ut eller reparera denna utrustning.**

Product Disposal Warning

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.**

Waarschuwing **Het uiteindelijke wegruimen van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.**

Varoitus **Tämä tuote on hävitettävä kansallisten lakien ja määräysten mukaisesti.**

Attention **La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.**

Warnung **Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.**

Avvertenza **Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e regolazioni locali.**

Advarsel **Endelig kassering av dette produktet skal være i henhold til alle relevante nasjonale lover og bestemmelser.**

Aviso **Deitar fora este produto em conformidade com todas as leis e regulamentos nacionais.**

¡Advertencia! **Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.**

Varning! **Vid deponering hanteras produkten enligt gällande lagar och bestämmelser.**

Faceplates and Cover Panel Requirement

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.**

Waarschuwing **Lege vlakplaten en afdekpanelen vervullen drie belangrijke functies: ze voorkomen blootstelling aan gevaarlijke voltages en stroom binnenin het frame, ze bevatten elektromagnetische storing (EMI) hetgeen andere apparaten kan verstoren en ze leiden de stroom van koellucht door het frame. Het systeem niet bedienen tenzij alle kaarten, vlakplaten en afdekkingen aan de voor- en achterkant zich op hun plaats bevinden.**

Varoitus **Tyhjillä tasolaikoilla ja suojapaneeleilla on kolme tärkeää käyttötarkoitusta: Ne suojaavat asennuspohjan sisäisille vaarallisille jännitteille ja sähkövirralle altistumiselta; ne pitävät sisällään elektromagneettisen häiriön (EMI), joka voi häiritä muita laitteita; ja ne suuntaavat tuuletusilman asennuspohjan läpi. Järjestelmää ei saa käyttää, elleivät kaikki tasolaikat, etukannet ja takakannet ole kunnolla paikoillaan.**

Attention **Ne jamais faire fonctionner le système sans que l'intégralité des cartes, des plaques métalliques et des panneaux avant et arrière ne soient fixés à leur emplacement. Ceux-ci remplissent trois fonctions essentielles : ils évitent tout risque de contact avec des tensions et des courants dangereux à l'intérieur du châssis, ils évitent toute diffusion d'interférences électromagnétiques qui pourraient perturber le fonctionnement des autres équipements, et ils canalisent le flux d'air de refroidissement dans le châssis.**

Warnung **Blanke Faceplates und Abdeckungen haben drei wichtigen Funktionen: (1) Sie schützen vor gefährlichen Spannungen und Strom innerhalb des Chassis; (2) sie halten elektromagnetische Interferenzen (EMI) zurück, die andere Geräte stören könnten; (3) sie lenken den kühlenden Luftstrom durch das Chassis. Das System darf nur betrieben werden, wenn alle Karten, Faceplates, Voder- und Rückabdeckungen an Ort und Stelle sind.**

Avvertenza **Le piattaforme bianche e i panelli di protezione hanno tre funzioni importanti: Evitano l'esposizione a voltaggi e correnti elettriche pericolose nello chassis, trattengono le interferenze elettromagnetiche (EMI) che potrebbero scombussolare altri apparati e dirigono il flusso di aria per il raffreddamento attraverso lo chassis. Non mettete in funzione il sistema se le schede, le piattaforme, i panelli frontali e posteriori non sono in posizione.**

Advarsel **Blanke ytterplater og deksler sørger for tre viktige funksjoner: de forhindrer utsettelse for farlig spenning og strøm inni kabinettet; de inneholder elektromagnetisk forstyrrelse (EMI) som kan avbryte annet utstyr, og de dirigerer luftavkjølingsstrømmen gjennom kabinettet. Betjen ikke systemet med mindre alle kort, ytterplater, frontdeksler og bakdeksler sitter på plass.**

Aviso **As faces furadas e os painéis de protecção desempenham três importantes funções: previnem contra uma exposição perigosa a voltagens e correntes existentes no interior do chassis; previnem contra interferência electromagnética (EMI) que poderá danificar outro equipamento; e canalizam o fluxo do ar de refrigeração através do chassis. Não deverá operar o sistema sem que todas as placas, faces, protecções anteriores e posteriores estejam nos seus lugares.**

¡Advertencia! **Las placas frontales y los paneles de relleno cumplen tres funciones importantes: evitan la exposición a niveles peligrosos de voltaje y corriente dentro del chasis; reducen la interferencia electromagnética (EMI) que podría perturbar la operación de otros equipos y dirigen el flujo de aire de enfriamiento a través del chasis. No haga funcionar el sistema a menos que todas las tarjetas, placas frontales, cubiertas frontales y cubiertas traseras estén en su lugar.**

Varning! **Tomma framplattor och skyddspaneler har tre viktiga funktioner: de förhindrar att personer utsätts för farlig spänning och ström som finns inuti chassit; de innehåller elektromagnetisk interferens (EMI) som kan störa annan utrustning; och de styr riktningen på kylluftsflödet genom chassit. Använd inte systemet om inte alla kort, framplattor, fram- och bakskydd är på plats.**

Chassis—Rack-Mounting and Servicing Warning

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Waarschuwing **Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:**

- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

Varoitus **Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:**

- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.
- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

Attention **Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel :**

- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

Warnung **Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:**

- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

Avvertenza **Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:**

- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
- Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
- Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

Advarsel **Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:**

- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.
- Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
- Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

Aviso **Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:**

- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

¡Advertencia! **Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:**

- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

Varning! **För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:**

- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Restricted Area Warning

Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.**

Waarschuwing **Dit toestel is bedoeld voor installatie op plaatsen met beperkte toegang. Een plaats met beperkte toegang is een plaats waar toegang slechts door servicepersoneel verkregen kan worden door middel van een speciaal instrument, een slot en sleutel, of een ander veiligheidsmiddel, en welke beheerd wordt door de overheidsinstantie die verantwoordelijk is voor de locatie.**

Varoitus **Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Paikka, johon pääsy on rajoitettua, tarkoittaa paikkaa, johon vain huoltohenkilöstö pääsee jonkin erikoistyökalun, lukkoon sopivan avaimen tai jonkin muun turvalaitteen avulla ja joka on paikasta vastuussa olevien toimivaltaisten henkilöiden valvoma.**

Attention **Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. L'accès aux zones de sécurité est sous le contrôle de l'autorité responsable de l'emplacement.**

Warnung **Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Ein Bereich mit beschränktem Zutritt ist ein Bereich, zu dem nur Wartungspersonal mit einem Spezialwerkzeugs, Schloß und Schlüssel oder anderer Sicherheitsvorkehrungen Zugang hat, und der von dem für die Anlage zuständigen Gremium kontrolliert wird.**

Avvertenza **Questa unità deve essere installata in un'area ad accesso limitato. Un'area ad accesso limitato è un'area accessibile solo a personale di assistenza tramite un'attrezzo speciale, lucchetto, o altri dispositivi di sicurezza, ed è controllata dall'autorità responsabile della zona.**

Advarsel **Denne enheten er laget for installasjon i områder med begrenset adgang. Et område med begrenset adgang gir kun adgang til servicepersonale som bruker et spesielt verktøy, lås og nøkkel, eller en annen sikkerhetsanordning, og det kontrolleres av den autoriteten som er ansvarlig for området.**

Aviso **Esta unidade foi concebida para instalação em áreas de acesso restrito. Uma área de acesso restrito é uma área à qual apenas tem acesso o pessoal de serviço autorizado, que possua uma ferramenta, chave e fechadura especial, ou qualquer outra forma de segurança. Esta área é controlada pela autoridade responsável pelo local.**

¡Advertencia! **Esta unidad ha sido diseñada para instalarse en áreas de acceso restringido. Área de acceso restringido significa un área a la que solamente tiene acceso el personal de servicio mediante la utilización de una herramienta especial, cerradura con llave, o algún otro medio de seguridad, y que está bajo el control de la autoridad responsable del local.**

Varning! **Denna enhet är avsedd för installation i områden med begränsat tillträde. Ett område med begränsat tillträde får endast tillträdas av servicepersonal med ett speciellt verktyg, lås och nyckel, eller annan säkerhetsanordning, och kontrolleras av den auktoritet som ansvarar för området.**

Earthed Conductor Warning

Warning **This equipment has a connection between the earthed conductor of the DC supply circuit and the earthing conductor.**

- This equipment shall be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment shall be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source is to be located within the same premises as this equipment.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the point of connection on the earthing electrode conductor.

Attention **Cet appareil comporte une connexion entre le conducteur relie à la terra du circuit d'alimentation c.c. et son conducteur de terre.**

- Ce matériel doit être reccordé directement au conducteur de la prise de terre du circuit d'alimentation c.c. ou à une tresse de mise à la masse reliée à une barre omnibus de terre laquelle est raccordée à l'électrode de terre du circuit d'alimentation c.c.
- Les appareils don't les conducteurs de terre respectifs sont raccordés au conducteur de terre du même circuit d'alimentation c.c. doivent être installés à proximité les uns des autres (p.ex., dans des armoires adjacentes) et à proximite de la prise de terre du circuit d'alimentation c.c. Le circuit d'alimentation c.c. ne doit comporter aucune autre prise de terre.
- La source d'alimentation du circuit c.c. doit être située dans la même pièce que le matérial.
- Il ne doit y avoir aucun dispositif de commutation ou de sectionnement entre le point de raccordement au conducteur de la source d'alimentation c.c. st le point de raccordement à la prise de terre.

Power Cabling Warning

Warning **Secure all power cabling when installing this unit to avoid disturbing field-wiring connections.**

Waarschuwing **Zet alle stroomkabels vast wanneer dit toestel wordt geïnstalleerd om te voorkomen dat de verbindingen van de veldbedrading worden verstoord.**

Varoitus **Kiinnitä kaikki voimakaapelit tiukkaan tätä laitetta asentaessasi, jotta vältät kentän johdinkytkentöjen vioittumista.**

Attention **Lors de l'installation de cet appareil, fixer tous les câbles d'alimentation pour éviter de provoquer des perturbations aux raccordements des câblages propres au site.**

Warnung **Bei der Installation dieser Einheit die Netzverkabelung befestigen, um die Störung von Feldkabelanschlüssen zu vermeiden.**

Avvertenza **In fase di installazione dell'unità, assicurare tutti i cablaggi di alimentazione per evitare di alterare i collegamenti degli avvolgimenti di campo.**

Advarsel **Når denne enheten installeres, må alle kraftledninger sikres for å unngå at feltkabelkoblingene forstyrres.**

Aviso **Para evitar problemas com as ligações de rede de campanha, prenda todos os cabos de corrente quando instalar esta unidade.**

¡Advertencia! **Sujetar todo el cableado de alimentación cuando se instale este equipo para evitar que se mezcle con las conexiones del cableado "in situ".**

Varning! **Fäst allt starkströmskablage vid installation av denna enhet så att fältkopplingen inte rubbas.**

Ground Connection Warning

Warning **When installing the unit, the ground connection must always be made first and disconnected last.**

Waarschuwing **Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.**

Varoitus **Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.**

Attention **Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.**

Warnung **Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.**

Avvertenza **In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.**

Advarsel **Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.**

Aviso **Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.**

¡Advertencia! **Al instalar el equipo, conectar la tierra la primera y desconectarla la última.**

Varning! **Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.**

Power Supply Wiring Warning

Warning **The illustration shows the DC power supply terminal block. Wire the DC power supply using the appropriate wire terminations at the wiring end, as illustrated. The proper wiring sequence is ground to ground, positive to positive (line to L), and negative to negative (neutral to N). Note that the ground wire should always be connected first and disconnected last.**

Waarschuwing **De figuur toont de aansluitstrip van de gelijkstroomvoeding. Breng de bedrading aan voor de gelijkstroomvoeding met behulp van de juiste draadaansluitingen aan het draadeinde zoals aangegeven. De juiste bedradingsvolgorde is aarde naar aarde, positief naar positief (lijn naar L) en negatief naar negatief (neutraal naar N). Let op dat de aarddraad altijd het eerst verbonden en het laatst losgemaakt wordt.**

Varoitus **Kuva esittää tasavirran pääterasiaa. Liitä tasavirtalähde johdon avulla käyttäen sopivia johdinliitäntöjä johdon päässä kuvan esittämällä tavalla. Oikea kytkentäjärjestys on maajohto maajohtoon, positiivinen positiiviseen (johto L:ään) ja negatiivinen negatiiviseen (nollajohto N:ään). Ota huomioon, että maajohto on aina yhdistettävä ensin ja irrotettava viimeisenä.**

Attention **La figure illustre le bloc de connexion de l'alimentation en courant continu. Câbler l'alimentation en courant continu en fixant les extrémités de fil qui conviennent aux extrémités câblées conformément au schéma. La séquence de câblage à suivre est terre-terre, positif-positif (ligne sur L), et négatif-négatif (neutre sur N). Noter que le fil de masse doit toujours être connecté en premier et déconnecté en dernier.**

Warnung **Die Abbildung zeigt den Terminalblock des Gleichstrom-Netzgeräts. Verdrahten Sie das Gleichstrom-Netzgerät unter Verwendung von geeigneten Kabelschuhen am Verdrahtungsende (siehe Abbildung). Die richtige Verdrahtungsfolge ist Erde an Erde, positiv an positiv (Leitung an L) und negativ an negativ (neutral an N). Beachten Sie bitte, daß der Erdungsdraht immer als erster verbunden und als letzter abgetrennt werden sollte.**

Avvertenza **L'illustrazione mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.**

Advarsel **Figuren viser likestrømforsyningsenhetens tilkoplingsterminal. Likestrømforsyningsenheten tilkoples ved hjelp av ledningsavslutningene, slik som vist i figuren. Riktig tilkoplingssekvens er jord til jord, positiv til positv (linje til L), og negativ til negativ (nøytral til N). Husk at jordingsledningen alltid bør tilkoples først og frakoples sist.**

Aviso **A figura mostra o bloco do terminal de fornecimento de corrente contínua. Ligue o fornecimento de corrente contínua recorrendo aos terminadores localizados na extremidade do cabo, conforme ilustrado. A sequência correcta de instalação é terra-a-terra, positivo-positivo (linha para L), e negativo-negativo (neutro para N). Note que o fio de terra deverá ser sempre o primeiro a ser ligado, e o último a ser desligado.**

¡Atención! **La figura muestra la caja de bornes de la fuente de alimentación de corriente continua. Cablear la fuente de alimentación de corriente continua, usando los terminales apropiados, en el extremo del cable tal como se muestra. Las conexiones deben realizarse en el siguiente orden: tierra con tierra, positivo con positivo (la línea con la L) y negativo con negativo (el neutro con la N). Tenga en cuenta que el conductor de tierra siempre tiene que conectarse el primero y desconectarse el último.**

Varning! **Illustrationen visar anslutningsplinten för likströmförsörjningsenheten. Koppla ledningarna till strömförsörjningsenheten med lämpliga ledningsavslutningar som bilden visar. Korrekt kopplingssekvens är jord till jord, positiv till positiv (linje till L) och negativ till negativ (neutral till N). Observera att jordledningen alltid skall anslutas först och kopplas bort sist.**

Copper Conductors Warning

Warning **Use copper conductors only.**

Waarschuwing **Gebruik alleen koperen geleiders.**

Varoitus **Käytä vain kuparijohtimia.**

Attention **Utilisez uniquement des conducteurs en cuivre.**

Warnung **Verwenden Sie ausschließlich Kupferleiter.**

Avvertenza **Usate unicamente dei conduttori di rame.**

Advarsel **Bruk bare kobberledninger.**

Aviso **Utilize apenas fios condutores de cobre.**

¡Advertencia! **Emplee sólo conductores de cobre.**

Varning! **Använd endast ledare av koppar.**

Exposed DC Power Wire Warning

Warning **An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug.**

Waarschuwing **Een blootgestelde verbindingsdraad van een ingangsgelijkstroombron kan gevaarlijke elektriciteitsniveaus geleiden. Zorg ervoor dat geen blootgesteld deel van het draad van de ingangsgelijkstroombron zich uitstrekt vanuit het aansluitblok van de terminal.**

Varoitus **Tasavirtalähteestä tuleva avoin johto voi johtaa vaarallisen määrän sähköä. Varmista, ettei kaapelikengän pistokkeesta tule esille lainkaan tasavirtajohdon avointa osaa.**

Attention **Pour éviter tout risque de choc électrique, vérifiez que les câbles d'alimentation secteur sont protégés par une gaine. Aucun fil dénudé ne doit apparaître hors du bloc d'alimentation du terminal.**

Warnung **Eine ungeschützte Kabelleitung von einer Gleichstrom-Eingangsspannungsquelle kann schädliche Elektrizitätslevel führen. Achten Sie darauf, daß von dem Klemmleistenstecker aus kein ungeschütztes Eingangsgleichstromkabel freiliegt.**

Avvertenza **Un cavo elettrico scoperto proveniente da un alimentatore DC-INPUT può trasmettere scariche elettriche ad elevata tensione. Assicuratevi che i cavi in uscita dall'alimentatore DC-input non presentino punti scoperti.**

Advarsel **En avdekket ledning fra en likestrømskilde kan lede farlig elektrisitet. Kontroller at ingen avdekkede deler av ledningen til likestrømskilden stikker ut av terminalens koblingsblokk.**

Aviso **Um fio condutor exposto de uma unidade de entrada de DC (corrente contínua) pode transportar níveis perigosos de electricidade. Certifique-se de que nenhuma secção exposta de um fio condutor da fonte de energia de entrada de DC se extende a partir da ficha da placa de terminais.**

¡Advertencia! **Un cable desnudo de una fuente de entrada de alimentación de corriente directa (DC) puede conducir niveles de electricidad peligrosos. Asegúrese de que ninguna parte del cable de la fuente de alimentación de DC de entrada sale del enchufe del bloque de terminal.**

Varning! **En blottad trådledning från en likströmsförsörjningsenhet kan utgöra en ledare för skadliga elektricitetsnivåer. Se till att inte någon blottad ledningsdel från likströmsförsörjningsenheten sticker ut från stiftplinten.**

48 VDC Power System Warning

Warning **The customer 48 volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output.**

Waarschuwing **Het 48 volt stroomsysteem van de klant dient versterkte isolatie tussen de primaire wisselstroom en de 48 VDC-uitgang te verschaffen.**

Varoitus **Asiakkaan 48 voltin virtajärjestelmän on tarjottava vahvistettu eriste ensisijaisen vaihtovirtalähteen ja 48 voltin tasavirtaliitännän välille.**

Attention **Le bloc d'alimentation 48 volts du client doit assurer une isolation renforcée entre l'alimentation CA principale et la sortie 48 V CC.**

Warnung **Das 48-Volt-Stromsystem des Kunden muß eine verstärkte Isolierung zwischen dem primären Wechselstrom und dem 48 VDC-Output aufweisen.**

Avvertenza **Il sistema elettrico di 48 volt del cliente deve avere un isolamento fra l'alimentatore elettrico AC e il VDC 48 di output.**

Advarsel **Kundens eget 48 volts strømopplegg må ha forsterket isolasjon mellom den primære vekselstrømskilden og den 48 volts likestrømsutgangen.**

Aviso **O sistema habitual de corrente de 48 volts deverá fornecer isolamento reforçado entre a corrente alternada (AC) principal e a saída de 48 VDC (tensão em corrente contínua).**

¡Advertencia! **Aviso: El sistema del cliente de 48 voltios debe proporcionar aislamiento reforzado entre la energía principal AC y la potencia de salida de 48 VDC.**

Varning! **Kundens 48-volt strömsystem måste vara försett med förstärkt isolering mellan den primära växelströmmen och utmatningen av 48 V likström.**

SELV-IEC 60950 DC Power Supply Warning

Warning **Connect the unit only to DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950 based safety standards.**

Waarschuwing **Sluit de eenheid alleen maar aan op een gelijkstroombron die voldoet aan de veiligheidsvereisten voor extra-laag voltage (SELV) in de op IEC 60950 gebaseerde veiligheidsnormen.**

Varoitus **Liitä laite ainoastaan tasavirtalähteesen, joka on yhdenmukainen IEC 60950:n suojattujen erittäisen alhaisen jännitteen (SELV) turvavaatimusten kanssa.**

Attention **Connectez l'unité uniquement à une alimentation CC compatible avec les recommandations SELV (Safety Extra-Low Voltage) des normes de sécurité IEC 60950.**

Warnung **Schließen Sie die Einheit nur an eine Gleichstrom-Stromquelle an, die mit den Safety Extra-Low Voltage (SELV)-Anforderungen in den auf IEC 60950 basierenden Sicherheitsstandards übereinstimmen.**

Avvertenza **Collegare l'unità esclusivamente a una presa di corrente continua rispondente ai requisiti SELV (Safety Extra-Low Voltage) in base alle norme di sicurezza IEC 60950.**

Advarsel **Koble bare enheten til en likestrømsforsyning som er i henhold til kravene for lavspenning (SELV) i IEC 60950-baserte sikkerhetsstandarder.**

Aviso **Conecte a unidade apenas à fonte da energia de CC que se encontra em conformidade com os requisitos dos circuitos de segurança de baixa tensão (SELV) constantes dos padrões de segurança baseados no IEC 60950.**

¡Advertencia! **Conecte la unidad sólo en una fuente de energía DC que cumpla con los requisitos de voltaje extra bajo (SELV - Extra-Low Voltage) en los estándares de seguridad IEC 60950.**

Varning! **Anslut enheten endast till en likströmsförsörjningsenhet som uppfyller kraven för SELV (skyddskretsar för mycket låg spänning) i IEC 60950-baserade säkerhetsstandarder.**

DC Power Disconnection Warning

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.**

Waarschuwing **Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.**

Varoitus **Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.**

Attention **Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.**

Warnung **Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.**

Avvertenza **Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.**

Advarsel **Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.**

Aviso **Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.**

¡Advertencia! **Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).**

Varning! **Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.**

DC Input Wiring Warning

Warning **Use 10 AWG wire with insulation rated for 75˚ C (167˚ F) or higher to wire the DC input power supply to the power feed panel.**

Waarschuwing **Gebruik kabels van 10 AWG (American Wire Gauge) met een isolering voor tenminste 75˚ celsius om de gelijkstroomvoedingseenheid op de netvoeding aan te sluiten.**

Varoitus **Käytä 10 AWG:n johdinta, jonka eristys kestää vähintään 75 ˚C, kun vedät johdot virtalähteestä virransyöttöpaneeliin.**

Attention **Utilisez un câble isolé de 10 AWG (American Wire Gauge) conçu pour une température d'au moins 75˚ C (167˚ F) pour relier la source d'alimentation en courant continu au panneau d'alimentation.**

Warnung **Verwenden Sie ein 10 AWG (American Wire Gauge) Kabel mit Isolierung für mindestens 75˚ C, um das Eingangsgleichstrom-Netzgerät mit dem Power Feed Panel zu verdrahten.**

Avvertenza **Per collegare l'alimentazione di corrente continua in entrata al pannello di alimentazione, usare un cavo 10 AWG con capacità di coibentazione per 75˚ C (167˚ F) o superiore.**

Advarsel **Bruk en 10 isolert AWG-ledning beregnet på 75˚ C eller mer for å koble strømforsyningen til strømpanelet.**

Aviso **Utilize fio 10 AWG com isolamento indicado para 75˚ C (167˚ F) ou superior para ligar o fornecimento de alimentação de entrada de corrente contínua ao painel de alimentação de energia.**

¡Advertencia! **Utilice un cable 10 AWG (American Wire Gauge) con un aislamiento cualificado para 75˚ C (167˚ F) o superior al conectar la entrada de corriente continua al panel de alimentación.**

Varning! **Använd 10 AWG-kabel med isolering som klarar minst 75˚ C för likströmsförsörjningen till strömpanelen.**

Ground Wire Connection Warning

Warning **For personal safety, the ground wire must connect to safety (earth) ground at both the equipment and supply side of the DC wiring (unless the local electrical code requirements are different).**

Waarschuwing **Om veiligheidsredenen moet de gebruikte gelijkstroomkabel aan beide zijden, zowel waar deze is aangesloten op de apparatuur als waar deze is aangesloten op de netvoeding, voorzien zijn van aarding (tenzij de ter plaatse geldende elektricteitsvoorschriften anders bepalen).**

Varoitus **Turvallisuussyistä on maadoitusjohdon oltava kytketty maadoitukseen sekä laitteessa että virtalähteessä (ellei sähkösäännöksissä vaadita muuta).**

Attention **Pour votre sécurité, le fil de masse doit être relié à la terre au niveau de l'équipement et de la source d'alimentation du câblage d'alimentation en courant continu (sauf si les normes électriques locales sont différentes).**

Warnung **Zu Ihrer eigenen Sicherheit muss der Erdungsdraht sowohl am Gerät als auch an der Stromquelle der Gleichstromverkabelung sicher geerdet sein (es sei denn, die örtlichen Sicherheitsstandards lauten anders).**

Avvertenza **Per garantire l'incolumità personale, il cavo di messa a terra deve essere collegato alla terra dalla parte sia dell'apparecchiatura che dell'alimentazione dei cavi di corrente continua (a meno che i requisiti dei codici elettrici locali indichino diversamente).**

Advarsel **For å beskytte person må jordingsledningen være koblet til jord både på utstyrssiden og strømforsyningssiden av strømledningen (med mindre lokale forskriftskrav er annerledes).**

Aviso **Por razões de segurança, o fio terra deve ter ligação terra no equipamento e no fornecimento de energia dos fios de corrente contínua (a não ser que os requisitos eléctricos locais seja diferentes).**

¡Advertencia! **Para mayor seguridad, el cable de toma de tierra debe conectarse a una toma de tierra segura tanto en el equipo como en la parte del cableado de CC (a no ser que las normas eléctricas locales establezcan algo distinto).**

Varning! **Jordkabeln måste, för personsäkerhetens skull, vara jordad både vid utrustningen och uttaget för likströmskablaget (om inte de lokala elföreskrifterna säger annorlunda).**

Ground Conductor Warning

Warning **Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.**

Waarschuwing **De aardingsleiding mag nooit buiten werking gesteld worden en de apparatuur mag nooit bediend worden zonder dat er een op de juiste wijze geïnstalleerde aardingsleiding aanwezig is. Neem contact op met de bevoegde instantie voor elektrische inspecties of met een elektricien als u er niet zeker van bent dat er voor passende aarding gezorgd is.**

Varoitus **Älä koskaan ohita maajohdinta tai käytä laitteita ilman oikein asennettua maajohdinta. Ota yhteyttä asianmukaiseen sähkötarkastusviranomaiseen tai sähköasentajaan, jos olet epävarma maadoituksen sopivuudesta.**

Attention **Ne jamais rendre inopérant le conducteur de masse ni utiliser l'équipement sans un conducteur de masse adéquatement installé. En cas de doute sur la mise à la masse appropriée disponible, s'adresser à l'organisme responsable de la sécurité électrique ou à un électricien.**

Warnung **Auf keinen Fall den Erdungsleiter unwirksam machen oder das Gerät ohne einen sachgerecht installierten Erdungsleiter verwenden. Wenn Sie sich nicht sicher sind, ob eine sachgerechte Erdung vorhanden ist, wenden Sie sich an den zuständigen elektrischen Fachmann oder einen Elektriker.**

Avvertenza **Non escludere mai il conduttore di protezione né usare l'apparecchiatura in assenza di un conduttore di protezione installato in modo corretto. Se non si sa con certezza che è disponibile un collegamento di messa a terra adeguato, esaminare le Norme CEI pertinenti o rivolgersi a un elettricista qualificato.**

Advarsel **Omgå aldri jordingslederen og bruk aldri utstyret uten riktig montert jordingsleder. Ta kontakt med det riktige organet for elektrisk inspeksjon eller en elektriker hvis du er usikker på om det finnes velegnet jording.**

Aviso **Nunca anule o condutor à terra nem opere o equipamento sem ter um condutor à terra adequadamente instalado. Em caso de dúvida em relação ao sistema de ligação à terra, contacte os serviços locais de inspecção eléctrica ou um electricista qualificado.**

Advertencia **No inhabilitar nunca el conductor de tierra ni hacer funcionar el equipo si no existe un conductor de tierra instalado correctamente. Póngase en contacto con una autoridad apropiada de inspección eléctrica o con un electricista competente si no está seguro de que hay una conexión a tierra adecuada.**

Varning! **Koppla aldrig från jordledningen och använd aldrig utrustningen utan en på lämpligt sätt installerad jordledning. Om det föreligger osäkerhet huruvida lämplig jordning finns skall elektrisk besiktningsauktoritet eller elektriker kontaktas.**

Coaxial Cable Specification Warning

Warning **Use 50-ohm coaxial cable with a center conductor size of 10 AWG or larger (for example, LMR-400, 3/8-inch FSJ Superflex Heliax, or larger). Failure to do so can result in overheating, fire, or long-term failure. Local and national electrical codes must be observed.**

Waarschuwing **Gebruik coaxiale kabels van 50 ohm met een centrale ader van tenminste 10 AWG (American Wire Gauge), bijvoorbeeld LMR-400, 3/8-inch FSJ Superflex Heliax, of groter. Bij gebruik van andere kabels kan oververhitting optreden of kunnen zich op lange termijn systeemproblemen voordoen. Plaatselijke en nationale voorschriften op het gebied van elektriciteitsvoorzieningen moeten in acht worden genomen.**

Varoitus **Käytä 50 ohmin koaksiaalikaapelia, jonka keskijohdin on kooltaan vähintään 10 AWG (esim. LMR-400, 3/8 tuuman FSJ Superflex Heliax tai suurempi). Ellet tee niin, voi seurauksena olla ylikuumeneminen, tulipalo tai pitkäaikainen häiriö. On noudatettava paikallisia ja kansallisia sähkösäännöksiä.**

Attention **Utilisez un câble coaxial de 50 ohm doté d'un conducteur central d'au moins 10 AWG (American Wire Gauge), par exemple, LMR-400 ou FSJ Superflex Heliax d'au moins 3/8 de pouce. Autrement, il y a risque de surchauffe, d'incendie ou de défaillance grave. Vous devez respecter les normes électriques locales et nationales.**

Warnung **Verwenden Sie ein 50-Ohm-Koaxialkabel mit einem Zentralleiter von mindestens 10 AWG (beispielsweise LMR-400, 3/8-Zoll FSJ Superflex Heliax oder größer). Andernfalls besteht die Gefahr von Überhitzung, Brand oder langfristigen Schäden. Örtliche und nationale Sicherheitsstandards müssen eingehalten werden.**

Avvertenza **Usare un cavo coassiale da 50 ohm con dimensione di conduttore centrale di 10 AWG o superiore (ad esempio, LMR-400, FSJ Superflex Heliax 3/8 di pollice o superiore). La mancata osservanza di queste indicazioni può risultare in surriscaldamento, incendio o eventuale malfunzionamento. È necessario osservare le normative in materia elettrica locali e nazionali.**

Advarsel **Bruk en 50 ohms koakskabel med en senterleder med en størrelse på 10 AWG eller større (f.eks. LMR-400, 3/8 tommers FSJ Superflex Heliax, eller større). Hvis ikke dette gjøres, kan det føre til overoppheting, brann eller langvarige driftsfeil. Lokale og nasjonale elektrisitetsforskrifter må følges.**

Aviso **Utilize um cabo coaxial de 50-ohm com um condutor central de 10 AWG ou superior (por exemplo, LMR-400, FSJ Superflex Heliax 3/8 pol., ou superior). O incumprimento pode ter como resultado sobreaquecimento, incêndio ou falhas a longo prazo. Devem ser respeitados os preceitos eléctricos locais e nacionais.**

¡Advertencia! **Utilice cable axial de 50 ohmios con un conductor central de 10 AWG (American Wire Gauge) de tamaño o superior (por ejemplo, LMR-400, Superflex Heliax FSJ de 3/8 pulgadas o superior). De lo contrario se puede producir sobrecalentamiento, incendios o fallos de funcionamiento a largo plazo. Se deben seguir las normas eléctricas locales y nacionales.**

Varning! **Använd en koaxialkabel på 50 ohm med en central ledningsyta på minst 10 AWG (t.ex. LMR-400, 3/8-tums FSJ Superflex Heliax eller större). Underlåtenhet att göra det kan orsaka överhettning, brand eller långvarigt funktionsavbrott. De lokala och nationella elföreskrifterna måste följas.**

Transverter Location Warning

Warning **Do not locate the transverter near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits (see Figure 34). When installing the transverter, take extreme care not to come into contact with such circuits, as they may cause serious injury and death.**

Waarschuwing **Zorg dat de transverter niet in de buurt wordt geplaatst van langs het plafond lopende stroomkabels of andere voorzieningen voor licht of elektriciteit of op een plaats waar contact met dergelijke stroomvoorzieningen mogelijk is. (Zie Figuur 34.) Wees bij het installeren van de transverter uiterst voorzichtig dat u niet in contact komt met hierboven bedoelde stroomvoorzieningen, aangezien dit kan leiden tot ernstig letsel, de dood tot gevolg hebbende.**

Varoitus **Älä sijoita muunninta lähelle voimajohtoja, muita sähkövalo- tai virtapiirejä tai paikkaa, jossa se voi joutua kosketuksiin sellaisten piirien kanssa. (Katso kuva 34.) Kun asennat muunninta, pidä huolta, ettet joudu kosketuksiin mainittujen piirien kanssa, sillä seurauksena voi olla vakava vamma tai kuolema.**

Attention **Ne placez pas la commutatrice à proximité d'une ligne aérienne ou d'autres circuits d'éclairage ou d'alimentation, ou dans un endroit où elle risque d'être en contact avec des circuits de ce type. (Voir Figure 34].) Lors de son installation, assurez-vous bien qu'elle ne touche pas de tels circuits car cela risquerait d'entraîner des blessures graves voire mortelles.**

Warnung **Plazieren Sie den Transverter nicht in der Nähe von Starkstrom-Freileitungen oder Schwach- bzw. Starkstromkreisen oder an Stellen, wo er damit in Kontakt kommen könnte. (Siehe Abbildung 34) Gehen Sie bei der Installation des Transverters besonders vorsichtig vor, damit Sie nicht in Kontakt mit derartigen Stromkreisen kommen, da dies zu schweren Verletzungen sogar mit Todesfolge führen kann.**

Avvertenza **Non posizionare il transverter nelle vicinanze di cavi di corrente o di circuiti di illuminazione o di alimentazione, o dove potrebbe venire in contatto con tali circuiti (vedere la figura 34). Durante l'installazione del transverter prestare estrema attenzione a non entrare in contatto con tali circuiti, dal momento che potrebbero causare seri danni e morte.**

Advarsel **Plasser ikke tverrlederen nær de overliggende strømledningene eller andre lys- eller strømkretser, eller der den kan komme i kontakt med slike kretser. (Se Figure 34) Ved installering av tverrlederen, må du være ytterst forsiktig slik at du ikke kommer i kontakt med slike kretser. Dette kan føre til alvorlig skade eller dødsulykke.**

Aviso **Não coloque o transformador perto de linhas de corrente suspensas ou outros circuitos de luz eléctrica ou de corrente, ou onde possa ter contacto com esses circuitos. (Consultar Figure 34) Ao instalar o transformador tenha muito cuidado para não tocar nesses circuitos, visto que podem provocar ferimentos graves ou até morte.**

¡Advertencia! **No coloque el transverter cerca de cables de tendido eléctrico u otros circuitos, ni donde pueda entrar en contacto con dichos circuitos. (Ver Figura 34) Al instalar el transverter, extreme las precauciones para no entrar en contacto con circuitos de esas características, ya que puede sufrir heridas graves e incluso la muerte.**

Varning! **Placera inte transvertern nära överhängande kraftledningar, andra elljus- eller strömkretsar eller där den kan komma i kontakt med sådana kretsar. (Se Bild 34) Vid installation av transvertern måste du vara mycket försiktig så att du inte kommer i kontakt med sådana kretsar, eftersom de kan orsaka allvarlig kroppsskada och dödsfall.**

Potential Radiation Hazard Warning

Warning **A radiation hazard may exist within a specific radius around the center point of the antenna. The table associates antenna gain (in dBi) with a minimum acceptable distance according to FCC rules. Determine the gain of the antenna and use the table to locate the minimum acceptable distance from the center point of the antenna.**

Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Minimum Acceptable Distance under FCC Rules – Uncontrolled Environment (m)	Minimum Acceptable Distance under FCC Rules – Controlled Environment (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3

Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Minimum Acceptable Distance under FCC Rules – Uncontrolled Environment (m)	Minimum Acceptable Distance under FCC Rules – Controlled Environment (m)
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Waarschuwing **Binnen een bepaalde afstand tot het centrale punt van de antenne kan sprake zijn van stralingsgevaar. In tabel ziet u de verhouding tussen antennevermogen (in dBi) en minimaal aan te houden afstand volgens FCC-voorschriften. Bepaal het vermogen van de antenne en kijk vervolgens in de tabel welke afstand tot het centrale punt van de antenne minimaal moet worden aangehouden.**

Antennevermogen (dBi)	EIRP (dBm)	EIRP (W)	Minimaal aan te houden afstand volgens FCC-voorschriften – Ongecontroleerde omgeving (meters)	Minimaal aan te houden afstand volgens FCC-voorschriften – Gecontroleerde omgeving (meters)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4

Antenneve rmogen (dBi)	EIRP (dBm)	EIRP (W)	Minimaal aan te houden afstand volgens FCC-voorschriften – Ongecontroleerde omgeving (meters)	Minimaal aan te houden afstand volgens FCC-voorschriften – Gecontroleerde omgeving (meters)
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Varoitus **Tietyllä etäisyydellä antennin ympärillä voi olla säteilyvaara. Taulukossa yhdistetään antennin vahvistus (dBi) FCC:n sääntöjen mukaiseen hyväksyttävään vähimmäisetäisyyteen. Määritä antennin vahvistus ja katso taulukosta hyväksyttävä vähimmäisetäisyys antennin keskiöstä.**

Antennin vahvistus (dBi)	EIRP (dBm)	EIRP (W)	FCC:n sääntöjen mukainen hyväksyttävä vähimmäisetäisyys – valvomaton ympäristö (m)	FCC:n sääntöjen mukainen hyväksyttävä vähimmäisetäisyys – valvottu Ympäristö (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6

Antennin vahvistus (dBi)	EIRP (dBm)	EIRP (W)	FCC:n sääntöjen mukainen hyväksyttävä vähimmäisetäisyys – valvomaton ympäristö (m)	FCC:n sääntöjen mukainen hyväksyttävä vähimmäisetäisyys – valvottu Ympäristö (m)
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Attention **Des risques d'irradiation sont possibles dans un rayon spécifique autour de l'antenne. Le tableau associe le gain d'antenne (exprimé en dBi) à une distance minimale acceptable conformément aux normes de la FCC. Évaluez le gain d'antenne et utilisez le tableau pour déterminer la distance minimale acceptable de l'antenne.**

Gain d'antenne (dBi)	PIRE (dBm)	PIRE (W)	Distance minimale acceptable conformément aux normes de la FCC – Environnement non contrôlé (m)	Distance minimale acceptable conformément aux normes de la FCC – Environnement contrôlé (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8

Gain d'antenne (dBi)	PIRE (dBm)	PIRE (W)	Distance minimale acceptable conformément aux normes de la FCC – Environnement non contrôlé (m)	Distance minimale acceptable conformément aux normes de la FCC – Environnement contrôlé (m)
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Warnung **In einem bestimmten Umkreis des Antennenmittelpunkts besteht Strahlungsgefahr. In Tabelle ist die Antennenverstärkung (in dBi) in Zusammenhang mit der zulässigen Mindestentfernung laut Bestimmungen der FCC (Bundes-Kommunikations-Kommission der USA) angegeben. Bestimmen Sie die Verstärkung der Antenne, und finden Sie anhand von Tabelle die zulässige Mindestentfernung vom Antennenmittelpunkt heraus.**

Antennenverstärkung (dBi)	EIRP (dBm)	EIRP (W)	Zulässige Mindestentfernung nach FCC-Bestimmungen – Unkontrollierte Umgebung (m)	Zulässige Mindestentfernung nach FCC-Bestimmungen – Kontrollierte Umgebung (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0

Antennenverstärkung (dBi)	EIRP (dBm)	EIRP (W)	Zulässige Mindestentfernung nach FCC-Bestimmungen – Unkontrollierte Umgebung (m)	Zulässige Mindestentfernung nach FCC-Bestimmungen – Kontrollierte Umgebung (m)
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Avvertenza **Potrebbe esistere un pericolo di radiazione all'interno di un raggio specifico attorno al punto centrale dell'antenna. La tabella associa l'aumento di potenza dell'antenna (in dBi) con una distanza accettabile minima secondo i regolamenti FCC. Determinare l'aumento di potenza dell'antenna e usare la tabella per individuare la distanza accettabile minima dal punto centrale dell'antenna.**

Aumento di potenza dell'antenna (dBi)	EIRP (dBm)	EIRP (W)	Distanza minima accettabile secondo i regolamenti FCC – Ambiente non controllato (m)	Distanza minima accettabile secondo i regolamenti FCC – Ambiente controllato (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4

Aumento di potenza dell'antenna (dBi)	EIRP (dBm)	EIRP (W)	Distanza minima accettabile secondo i regolamenti FCC – Ambiente non controllato (m)	Distanza minima accettabile secondo i regolamenti FCC – Ambiente controllato (m)
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Advarsel **Det kan være strålingsfare innen en viss radius rundt senterpunktet av antennen. Tabell sammenligner antennens kraft (in dBi) med den minste akseptable avstanden i henhold til FCC-direktivene. Finn ut antennens kraft og bruk Tabell til å lokalisere den minste akseptable avstanden fra senterpunktet av antennen.**

Antennekraft (dBi)	EIRP (dBm)	EIRP (W)	Minste akseptable avstand ihht. FCC-direktiv – Ukontrollert miljø (m)	Minste akseptable avstand ihht. FCC-direktiv – Kontrollert Miljø (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Aviso **Pode existir perigo de radiação dentro de um raio específico no ponto central da antena. A Tabela associa o ganho de antena (em dBi) a uma distância mínima aceitável de acordo com as normas FCC. Determine o ganho da antena e utilize a Tabela para localizar a distância mínima aceitável a partir do ponto central da antena.**

Ganho de antena (dBi)	EIRP (dBm)	EIRP (W)	Distância mínima aceitável ao abrigo das normas FCC – Ambiente não controlado (m)	Distância mínima aceitável ao abrigo das normas FCC – Ambiente controlado (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

¡Advertencia! **Existe riesgo de radiación en un área específica alrededor del punto central de la antena. La Tabla asocia la ganancia de antena (en dBi) con una distancia mínima aceptable de acuerdo con las normas de la FCC. Determina la ganancia de la antena y utiliza la Tabla para establecer la distancia mínima aceptable desde el punto central de la antena.**

Ganancia de la antena (dBi)	PIRE (dBm)	PIRE (W)	Distancia mínima aceptable según las normas de la FCC – Entorno sin control (m)	Distancia mínima aceptable según las normas de la FCC – Entorno controlado (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

Varning! **Strålningsrisk kan finnas inom en angiven omkrets runt antennens mittpunkt. Tabell visar riktfaktor (i dBi) med ett minsta godtagbart avstånd enligt FCC-reglerna. Avgör antennens riktfaktor och använd Tabell för att hitta minsta godtagbara avstånd från antennens mittpunkt.**

Riktfaktor (dBi)	EIRP (dBm)	EIRP (W)	Minsta godtagbara avstånd enligt FCC-reglerna – Ej kontrollerad miljö (m	Minsta godtagbara avstånd enligt FCC-reglerna – Kontrollerad miljö (m)
10	43	20.0	0.4	20 cm
11	44	25.1	0.4	20 cm
12	45	31.6	0.5	20 cm
13	46	39.8	0.6	0.3

Riktfaktor (dBi)	EIRP (dBm)	EIRP (W)	Minsta godtagbara avstånd enligt FCC-reglerna – Ej kontrollerad miljö (m	Minsta godtagbara avstånd enligt FCC-reglerna – Kontrollerad miljö (m)
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
20	53	199.5	1.3	0.6
21	54	251.2	1.4	0.6
22	55	316.2	1.6	0.7
23	56	398.1	1.8	0.8
24	57	501.2	2.0	0.9
25	58	631.0	2.2	1.0
26	59	794.3	2.5	1.1
27	60	1000.0	2.8	1.3
28	61	1258.9	3.2	1.4
29	62	1584.9	3.6	1.6
30	63	1995.3	4.0	1.8

DC Power Disconnection Warning

Warning **Before performing any of the following procedures, ensure that DC power to the transverter you will be working on is turned OFF. To ensure that the power to the specific transverter is OFF, locate the power/breaker switch on the front of power feed panel that services that transverter, push the switch into the OFF position, then tape the switch in the OFF position.**

Waarschuwing **Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom op het gelijkstroomcircuit is uitgeschakeld. Om u ervan te verzekeren dat alle stroom is UITgeschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait u de stroomverbreker naar de UIT positie en plakt u de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.**

Varoitus **Varmista ennen seuraavien toimenpiteiden suorittamista, että tasavirtapiirin virta on KATKAISTU. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin. Käännä suojakytkin KATKAISTU-asentoon. Teippaa suojakytkimen varsi niin, että kytkin pysyy KATKAISTU-asennossa.**

Attention **Avant d'effectuer l'une des procédures décrites ci-dessous, vérifiez que le circuit alimenté en courant continu n'est plus sous tension. Pour vous en assurer, localisez le disjoncteur situé sur le panneau de service du circuit en courant continu, désactivez-le (OFF) et, à l'aide d'un ruban adhésif, bloquez la poignée du disjoncteur en position OFF.**

Warnung **Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß der Transverter, mit dem Sie arbeiten, nicht mit Strom versorgt wird. Um sicherzustellen, daß der Strom abgestellt ist, machen Sie auf der Vorderseite der Schalttafel den Stromschalter für den Transverter ausfindig, stellen Sie den Schalter auf AUS, und kleben Sie den Schaltergriff mit Klebeband in der AUS-Stellung fest.**

Avvertenza **Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito in corrente continua non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.**

Advarsel **Før du utfører noen av disse prosedyrene, må du kontrollere at strømtilførselen til transformatoren du skal bruke, er slått AV. Dette gjøres ved å lokalisere strømbryteren foran på brytertavlen som betjener transformatoren, deretter trykker du bryteren inn i AV-stilling og fester bryteren med teip i AV-stilling.**

Aviso **Antes de executar qualquer um dos seguintes procedimentos, certifique-se de que a fonte de alimentação de corrente contínua para o transversor em que irá trabalhar está DESLIGADA. Para se certificar de que toda a alimentação para esse transversor foi DESLIGADA, localize o disjuntor no painel que alimenta esse transversor e coloque-o na posição OFF (Desligado) e, em seguida, segure o disjuntor nessa posição com fita isoladora.**

¡Advertencia! **Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) con el que se va a trabajar esté cortada (OFF). Para ello, localizar el interruptor de corriente en la parte frontal del panel que alimenta al circuito, cambiar el interruptor automático a la posición de Apagado (OFF) y sujetar con cinta adhesiva la palanca del interruptor automático en posición de Apagado (OFF).**

Varning! **Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.**

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Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

http://www.cisco.com/tac

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

http://www.cisco.com/register/

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

http://www.cisco.com/tac/caseopen

Contacting TAC by Telephone

If you have a priority level 1(P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

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This document is to be used in conjunction with the *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide* and *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide*.