



Text Part Number: 78-6030-01

Cisco uBR7200 Series Universal Broadband Router Wireless Modem Card and Subsystem Installation and Configuration

Product Numbers: UBR-MCW-PDA, UBR-MCW-PDA=, UBR-WPFD, UBR-WPFD=, CISCO-WT2772-PAA, CISCO-WT2772-PAA=, CISCO-WT2772-PBA, CISCO-WT2772-PBA=, UBR-ODD-01A, UBR-ODD-01A=, UBR-ODD-02A, UBR-ODD-02A=, UBR-ODD-03A, UBR-ODD-03A=, UBR-ODD-04A, UBR-ODD-04A=, UBR-ODD-05A, UBR-ODD-05A=, UBR-ODD-06A, UBR-ODD-06A=,

This document explains how to install and configure the components for a high-speed point-to-point fixed broadband wireless system using Cisco uBR7200 series universal broadband routers. It includes instructions for installing a wireless modem card, power feed panel, and wireless transverter, as well as instructions for configuring and verifying the system and troubleshooting the configuration.

The Cisco uBR7200 series consists of the six-slot Cisco uBR7246 (four modem card slots and two port adapter slots) and the three-slot Cisco uBR7223 (two modem card slots and one port adapter slot).

Note Use this configuration note in conjunction with the *Cisco uBR7200 Series Universal Broadband Router Installation and Configuration Guide* and *Regulatory Compliance and Safety Information for the Cisco uBR7200 Series Universal Broadband Router* that shipped with your Cisco uBR7200 series router, and the *Cisco Broadband Fixed Wireless Site Planning Guide*.

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If You Need More Information

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- Command Reference, page 48
- Reading the Data, page 105
- Reference Information, page 123
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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, the following documentation resources are available:

- For hardware installation and maintenance information on the Cisco uBR7200 series, refer to the *Cisco uBR7200 Series Universal Broadband Router Installation and Configuration Guide* that shipped with your Cisco uBR7246 or Cisco uBR7223.
- 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>, <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 document *Regulatory Compliance and Safety Information for the Cisco uBR7200 Series Universal Broadband Router*.
- To obtain general information about documentation, refer to the “Cisco Connection Online” section on page 123, 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.

Wireless Modem Card and Subsystem Overview

The Cisco high-speed point-to-point broadband fixed wireless system provides a fixed, dedicated wireless link from one site to another. This link delivers full-duplex data in the licensed MMDS band (2.500 to 2.690 GHz), or unlicensed U-NII band (5.725 to 5.825 GHz).

The broadband fixed wireless system consists of a Cisco uBR7200 series universal broadband router (Cisco uBR7246 or Cisco uBR7223) and one or more wireless modem cards (see Figure 1), each with a power feed panel (see Figure 2), and one or two wireless transverters (see Figure 3). (The diversity option, which minimizes the effects of fading, uses two wireless transverters, one for each of two antennas.)

Note The wireless transverter discussed in this document is manufactured and sold by Cisco for MMDS links. Transverters for U-NII links must be purchased from third-party vendors. Refer to that vendor's documentation for installation instructions.

Figure 1 Wireless Modem Card

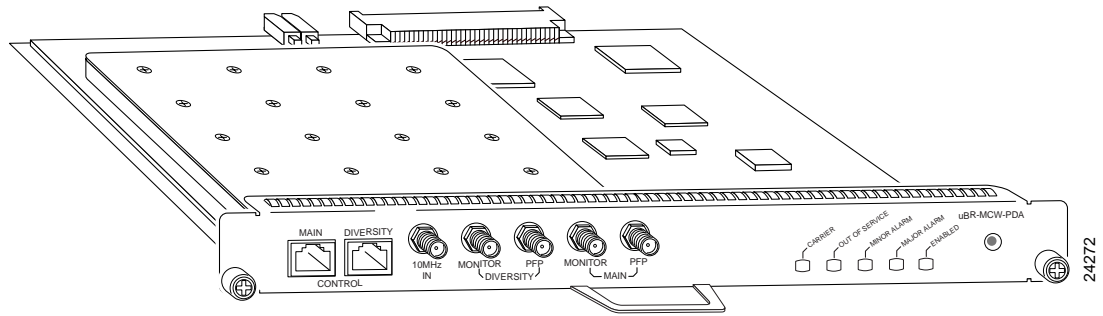


Figure 2 Power Feed Panel

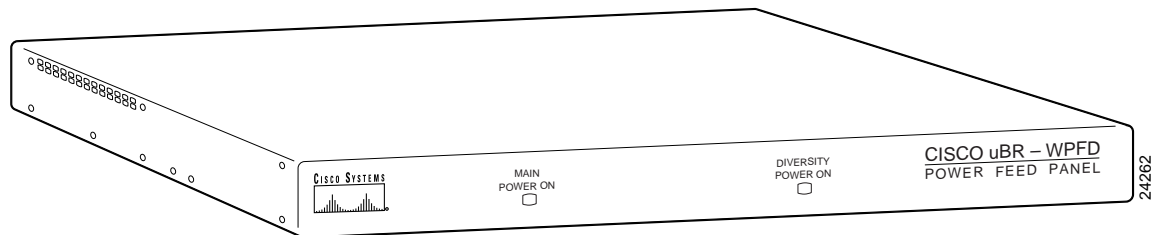
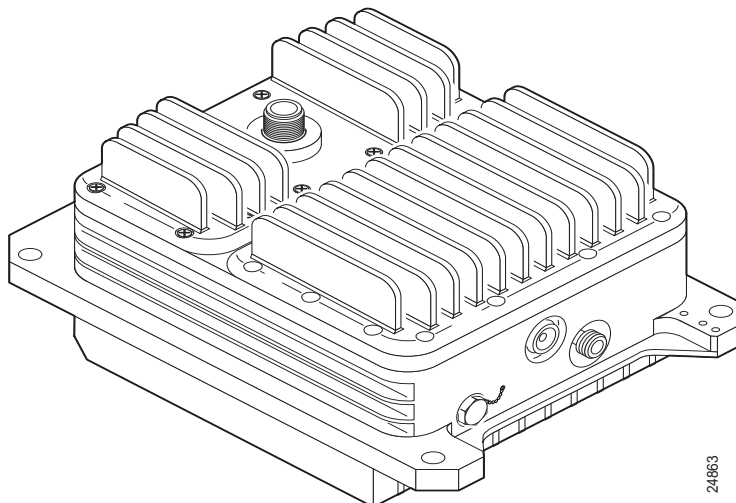


Figure 3 Cisco Wireless Transverter for the MMDS Band

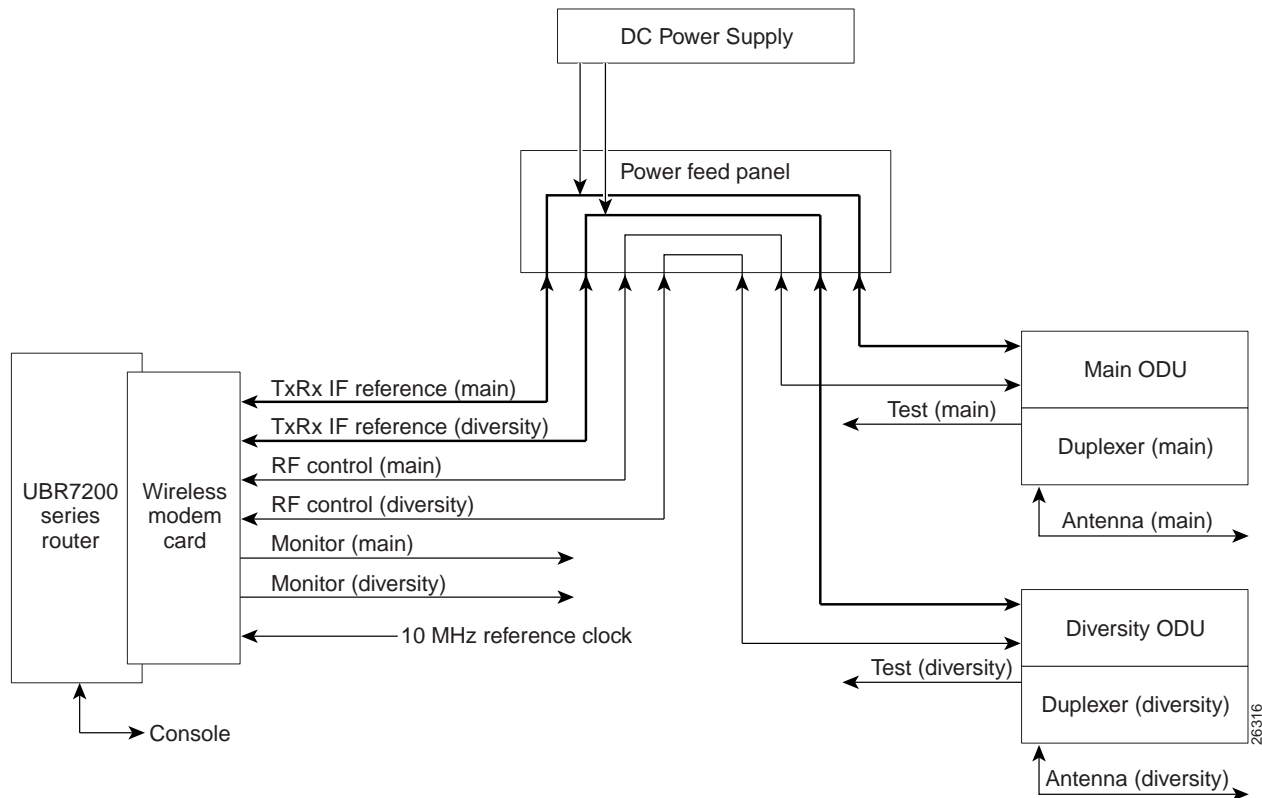


The wireless modem cards are installed in a Cisco uBR7200 series router. Each modem card is cabled to a power feed panel installed either in the same equipment rack as the router or mounted on a wall. Cables from the power feed panel are attached to one or two wireless transverters, which are installed on the antenna mast. The system is managed via a command-line interface (CLI) or CiscoView. Figure 4 shows the connections between the components.

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Wireless Modem Card and Subsystem Overview

Figure 4 Component Connections



Wireless Modem Card

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

Wireless modem cards consist of the following components:

- Main and diversity serial interface control connectors.
- 10-MHz external reference clock connection.
- Monitor and Power Feed Panel connectors (Main and Diversity)
- Light-emitting diodes (LEDs), which provide a visual indication of the state of the modem card.

Figure 5 shows the connectors and LEDs on the wireless modem card. Table 1 describes the functions of the connectors, and Table 2 describes the functions of the LEDs.

Figure 5 Wireless Modem Card Connectors and LEDs

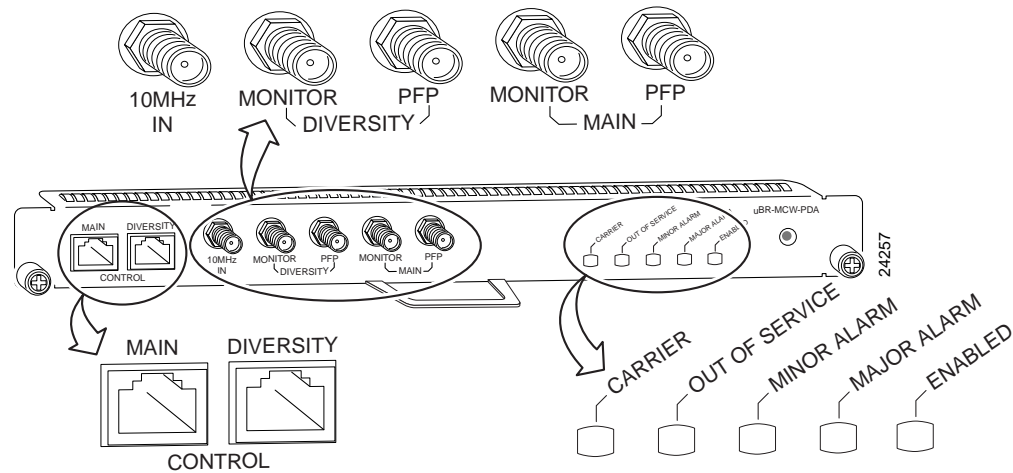


Table 1 Wireless Modem Card Connectors

Connector	Type	Input/O utput	Function
Control - Main	8-pin RJ-45 (female)	Output	Physical connection to Power Feed Panel for RF subsystem interface control channel (main antenna).
Control - Diversity	8-pin RJ-45 (female)	Output	Physical connection to Power Feed Panel for RF subsystem interface control channel (diversity antenna when diversity option is used).
10 MHz Input	SMA (female)	Input	Connection for 10-MHz external reference clock. Note The system is guaranteed to meet the FCC's MMDS-band frequency accuracy requirement for a period of at least 10 years, without the use of an external 10 MHz reference. However, 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 <i>Cisco Broadband Fixed Wireless Site Planning Guide</i> .)
Diversity - Monitor	SMA (female)	Output	For connection to spectrum analyzer for test/troubleshooting purposes (when diversity option is used).
Diversity - PFP	SMA (female)	Output	48 MHz reference, receive and transmit IF signals (when diversity option is used).
Main - Monitor	SMA (female)	Output	For connection to spectrum analyzer for test/troubleshooting purposes.
Main - PFP	SMA (female)	Output	48 MHz reference, receive and transmit IF signals.
Debug Port	For factory use only.		

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Wireless Modem Card and Subsystem Overview

Table 2 Wireless Modem Card LEDs

LED	Function
Carrier LED	Indicates the state of the radio link. When green, the radio link is synchronized and the line protocol is up. When yellow, indicates loss of link synchronization.
Out of Service LED	Indicates the service availability of the radio link. When yellow, the radio link is still up, but not available for use (typically in a test or loopback mode).
Minor Alarm LED	When yellow, indicates the occurrence of a minor alarm in the radio subsystem. The link is degraded and may need maintenance action or, one or more user-defined event thresholds have been exceeded.
Major Alarm LED	When yellow, indicates the occurrence of a major alarm in the radio subsystem. The link is down.
Enabled LED	When green, indicates that the wireless modem card is on, receiving power from the router midplane, and enabled for operation. This LED remains on during normal operation of the Cisco uBR7200 series router.

Power Feed Panel

The power feed panel provides DC power, transmit and receive IF signals, frequency reference, and control signals to the wireless transverter. The unit contains circuit breakers for the DC power, as well as secondary lightning protection circuitry for the control cables. Local or national codes may require you to install primary lightning protection for the IF cable and the control cable.

The power feed panel consists of the following components:

- Power LEDs on front and rear panel
- Connector ports
 - Coaxial cable connection to the wireless modem card and the wireless transverter (main and diversity)
 - Control cable connection ports to the wireless modem card and wireless transverter (main and diversity)
- Power ON/OFF breaker switches (main and diversity)
- DC power supply terminal block
- Ground lug

Figure 6 shows the front panel and Figure 7 shows the rear panel of the power feed panel. Table 3 describes the functions of the LEDs. Table 4 describes the functions of the connectors.

Figure 6 Power Feed Panel (Front Panel)



Table 3 Power Feed Panel LEDs

LED	Function
Main Power On (visible on front and rear panel)	When lit, indicates that there is power going to the main transverter.
Diversity Power On (visible on front and rear panel)	When lit, indicates that there is power going to the diversity transverter.

Figure 7 Power Feed Panel (Rear Panel)

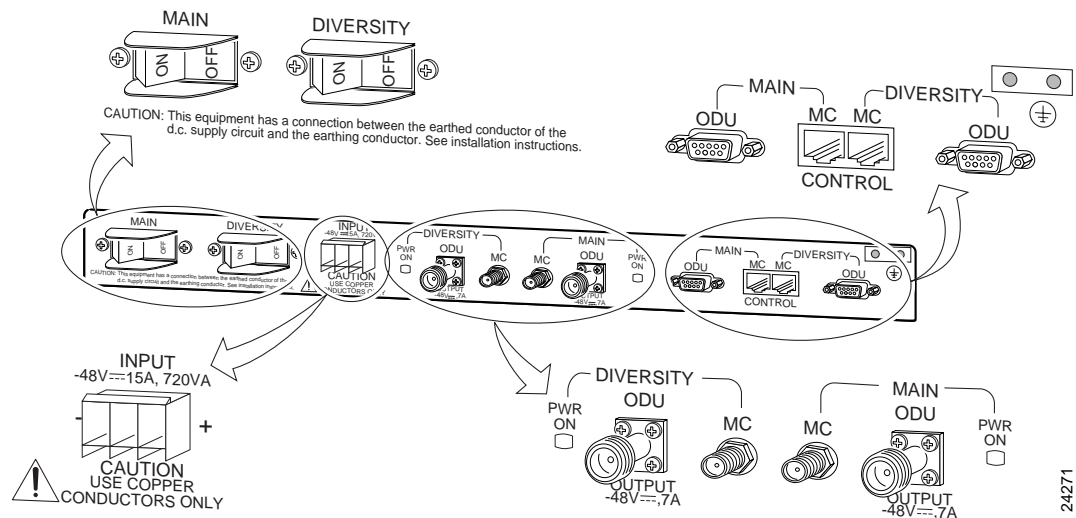


Table 4 Power Feed Panel Connectors

Connector	Type	Input/Output	Function
DC Power Input	Pluggable terminal block	Input	Power source connection for the main and diversity transverters.
Diversity ODU Output	N-Type (female)	Input and Output	Provides -48V power to the diversity transverter, 24-MHz reference, receive and transmit IF signal from/to the wireless modem card (if the diversity option is used).
Diversity MC (modem card)	SMA (female)	Input and Output	Provides 24-MHz reference, receive and transmit IF signals from/to the wireless modem card (if the diversity option is used).
Main ODU Output	N-Type (female)	Input and Output	Provides -48V power to the main transverter, 24-MHz reference receive and transmit IF signal from/to the wireless modem card.
Main MC (modem card)	SMA (female)	Input and Output	Provides 24-MHz reference, receive and transmit IF signals from/to the wireless modem card.

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Wireless Modem Card and Subsystem Overview

Table 4 **Power Feed Panel Connectors (continued)**

Connector	Type	Input/Output	Function
Main ODU Control	DB9 (female)	Input and Output Bidirectional data communications between the wireless modem card and the main transverter.	Physical connection to the main transverter for RF subsystem control interface.
Main MC (modem card) Control	8-pin RJ-45 (female)	Input and Output Bidirectional data communications between the wireless modem card and the main transverter.	Physical connection for RF subsystem control interface from the wireless modem card.
Diversity ODU Control	DB9 (female)	Input and Output Bidirectional data communications between the wireless modem card and the diversity transverter.	Physical connection to the diversity transverter for RF subsystem control interface (if the diversity option is used).
Diversity MC (modem card) Control	8-pin RJ-45 (female)	Input and Output Bidirectional data communications between the wireless modem card and the diversity transverter.	Physical connection for RF subsystem control interface from the wireless modem card (if the diversity option is used).

Wireless Transverter

The ruggedized wireless transverter is the control and data interface to the indoor subsystems. It provides up/down conversion from IF to RF frequencies and power amplification.

The outdoor unit consists of the following components:

- RF head
- Connector ports for IF input/output, control, and test
- 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 and Duplexer Assembly Connectors

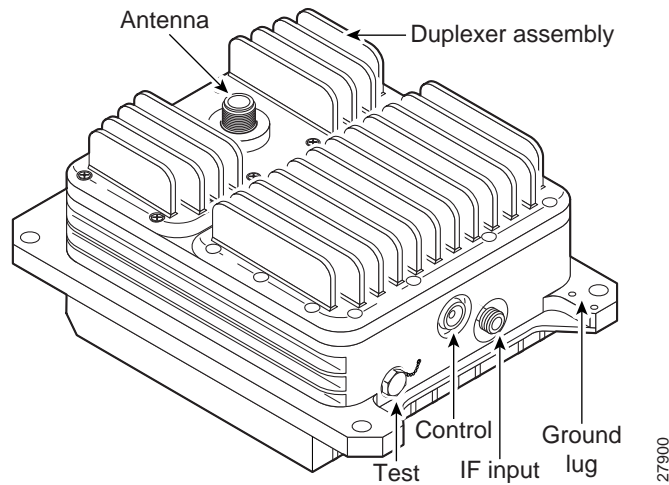


Table 5 Wireless Transverter and Duplexer Assembly Connectors

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 receive and transmit IF signals and power
Control	LEMO (8-pin, R, 1K series)	Input and Output	Provides RF subsystem control interface
Test	Mono phone (female) 3.5 mm	Output	Measures voltage for antenna alignment

Field-Replaceable Units

All major components of the broadband fixed wireless system, as well as the major components of the 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 Wireless Transverter
- Power Feed Panel
- Wireless Modem Card
- uBR7200 Series Router Components:
 - Network Processing Engine
 - Input/Output Controller
 - Port Adapters
 - Power Supplies
 - Fan Tray
 - Chassis

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Installation Prerequisites

- Subchassis and Midplane
- Flash Memory Cards
- Rack Mount and Cable-Management Kit

For ordering information, contact a Cisco customer service representative. See the “Cisco Connection Online” section on page 123 for more information.

Installation Prerequisites

This section provides a list of parts and tools you need to remove and replace a 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. If you need more detailed information regarding cables or connectors, refer to the *Cisco Broadband Fixed Wireless Site Planning Guide*.

Wireless Modem Card

You need the following tools and parts to remove and replace a wireless modem card. If you need additional equipment, contact a service representative for ordering information.

- New wireless modem card
- Number 2 Phillips screwdriver
- 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
- Shielded CAT-5 cable with RJ-45 connectors and plenum-rated coaxial cable with SMA connectors for connections between the modem card and the power feed panel. (Standard sets of these cables can be purchased from Cisco.)

Power Feed Panel

You need the following tools and parts to install the power feed panel in an equipment rack or on a wall. If you need additional equipment, contact a service representative for ordering information.

- Power feed panel
- Number 2 Phillips screwdriver
- Bracket kit (provided)
- Rack or wall mount screws
- 1/8-inch flat-blade screwdriver
- 5/16-inch open-end wrench
- 50-ohm coaxial cables with N-type (male) connectors for IF control

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Software and Hardware Requirements

- Shielded CAT-5 outdoor-rated control cables with DB-9 (male) and LEMO (8 pin, P, 1K series) connectors (LEMO connector provided)

Note If a lightning protection device is installed between the DB-9 and LEMO connectors, there may be one *logical* cable, but two *physical* cables. The portion of the cable that is located indoors does not need to be outdoor rated.

- –48VDC power supply
- Ground lug (in grounding kit provided)

Wireless Transverter

You need the following tools and parts to install the wireless transverter. If you need additional equipment, contact a service representative for ordering information.

Note Installation of some N-type connectors requires specific tools. Obtain this information from your cable vendor.

- Wireless transverter
- Duplexer assembly
- Number 2 Phillips screwdriver
- Soldering iron/gun
- 9/16-inch open end wrench
- Open end adjustable wrench
- Cable wrap
- Antenna tools (refer to the antenna manufacturer's instructions)
- Mounting kit (provided)
- 50-ohm coaxial cable with N-type (male) connectors to cable the wireless transverter to the antenna
- Digital voltmeter with 3.5 mm mono phone plug to use for antenna alignment tasks
- Ground lug (in grounding kit provided)

Software and Hardware Requirements

For this installation and configuration, you need a configured Cisco uBR7200 series router running Cisco IOS Release 12.0(6)XR or a later 12.0X release, or 12.0(6)T or a later 12.0T release.

Safety Guidelines

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

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Installation Prerequisites

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 være 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.

Warning! 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 equivalent sections of other local and national regulations that address telecommunications wiring for the control cable, and TV, Radio, and CATV wiring for the control cable and 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.



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

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.

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

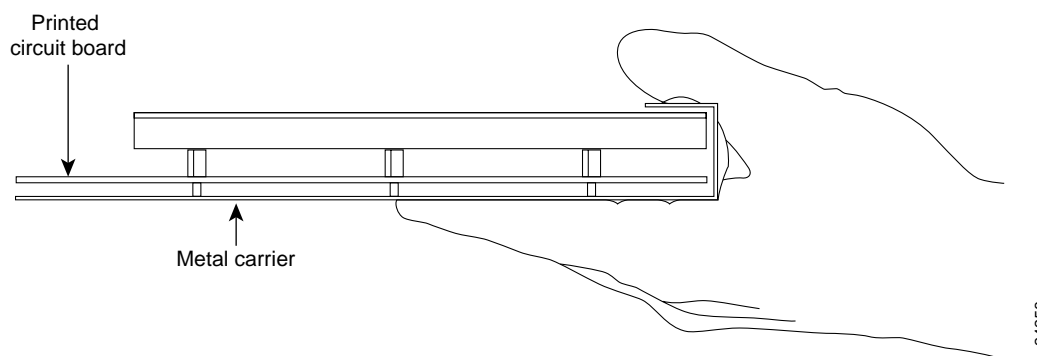
The network processing engine, I/O controller, port adapters, and wireless modem cards consist of a printed circuit board that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier. Handle the network processing engine,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

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Installation Prerequisites

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 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.

Following are guidelines for preventing 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 it in a static shielding bag.



Caution Periodically check the resistance value of the antistatic strap. The measurement should be within the range of 1 to 10 megohms (Mohm).



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



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



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.



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



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.

Product Disposal



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

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 a Wireless Modem Card

The following sections explain how to remove and replace or install a wireless modem card in a Cisco uBR7200 series router.

Removing a Wireless Modem Card

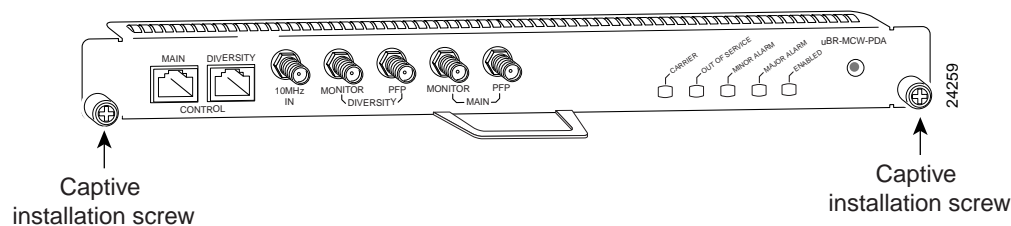
The following procedures explain how to remove a wireless modem card from a Cisco uBR7200 series router:

- Step 1** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 2** Unscrew the captive installation screws on the front of the wireless modem card. (See Figure 10.)

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Removing and Installing a Wireless Modem Card

Figure 10 Captive Installation Screws



Step 3 Grasp the handle on the wireless modem card and carefully pull the modem card from the midplane, about halfway out of its slot. If you are removing a blank modem card, pull the blank modem card all the way out of the chassis slot.

Step 4 With the wireless modem card halfway out of the slot, disconnect all cables from the front of the modem card.

Note Do not disconnect the cables until the modem card is pulled halfway out of its slot. Doing so can disrupt normal operation of the router.

Step 5 After disconnecting the cables, pull the modem card from its chassis slot.



Caution Always handle the wireless modem card by the carrier edges and handle; never touch the modem card's components or connector pins. (See Figure 9.)

Step 6 Place the modem card on an antistatic surface with its components facing upward, or in a static shielding bag. If the modem card will be returned to the factory, immediately place it in a static shielding bag.

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

Installing or Replacing a Wireless Modem Card

Complete the following steps to install or replace a wireless modem card in the Cisco uBR7200 series router:

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 edges and position the modem card as shown in Figure 9.

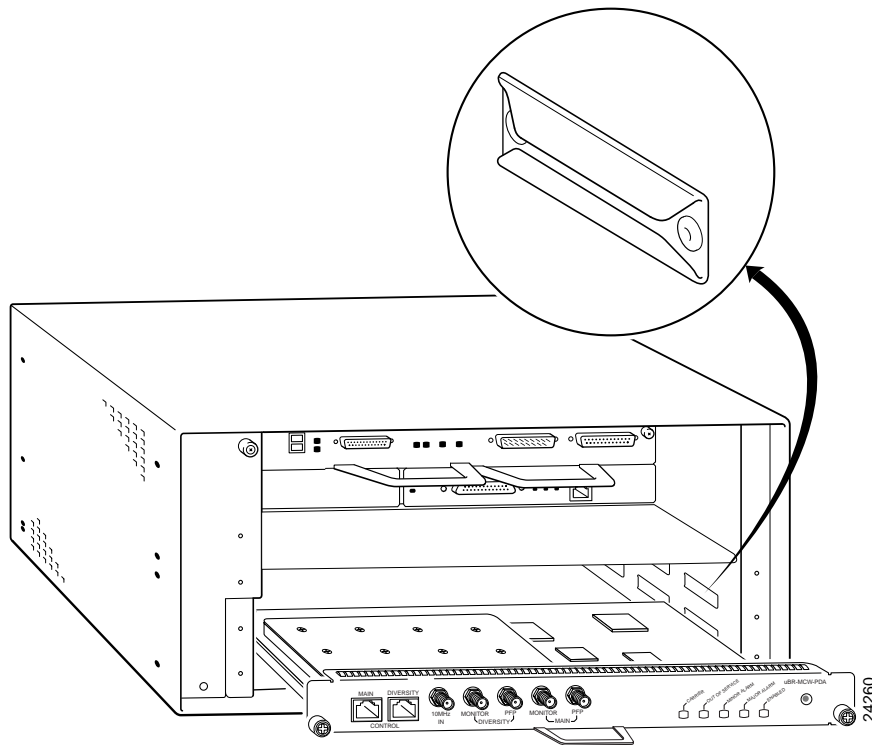
Step 3 Align the left and right edges of the modem card metal carrier between the guides in the modem card slot. (For the Cisco uBR7246, see Figure 11. For the Cisco uBR7223, see Figure 12.)

A detailed line drawing of the internal chassis of the device. The front panel is shown partially open, revealing the internal components. A circular callout provides a close-up view of the front panel latch mechanism, which is a small, rectangular component with a circular hole. The latch is shown in its open position, ready to be inserted into the front panel.

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Removing and Installing a Wireless Modem Card

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



Step 4 With the metal carrier aligned in the slot guides, gently slide the modem card halfway into the modem card slot.



Caution Do not slide the modem card all the way into the slot until you have connected all required cables. Trying to do so will disrupt normal operation of the router.

Step 5 With the modem card halfway in the slot, connect all required cables to the front of the modem card. (See the “Cabling a Wireless Modem Card” section on page 19.)

Step 6 After connecting all required cables, carefully slide the modem card all the way into the slot until you feel the card’s connectors mate with the midplane.

Step 7 Tighten the captive installation screws on the modem card. (See Figure 10.)

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 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.



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.

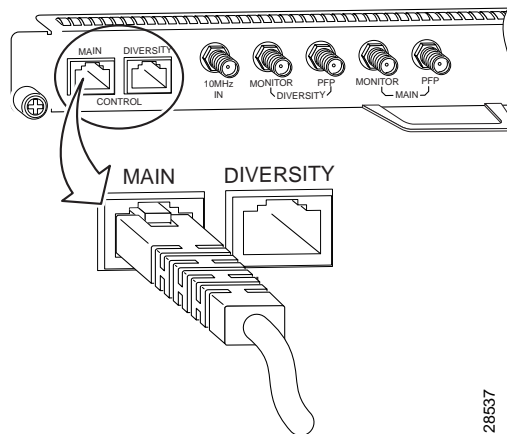
This completes the procedure for installing a wireless modem card in the Cisco uBR7200 series router.

Cabling a Wireless Modem Card

Attaching the RF Control Cable

Insert the RJ-45 connector on the control cable into the Main Control connector port. (See Figure 13.)

Figure 13 Attaching the RF Control Cable



If you will be using the diversity option, use a second cable and attach it to the Diversity Control connector port.

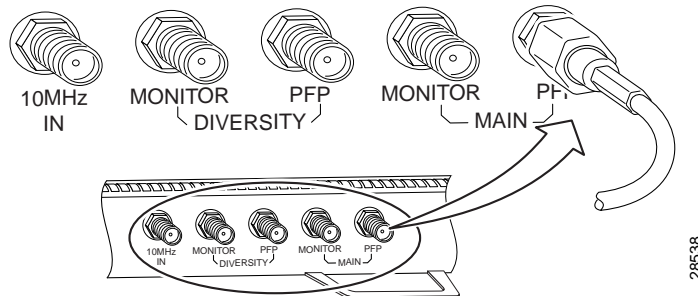
Attaching the IF Cable

Connect one end of the IF signal cable to the Main PFP (power feed panel) port. (See Figure 14.)

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Installing a Power Feed Panel

Figure 14 Attaching the IF Cable



If you will be using the diversity option, use a second cable and attach it to the Diversity PFP port.

(Optional) Attaching the Monitor Cable

To use a spectrum analyzer to test or troubleshoot the signal on the modem card, attach it to the Main Monitor port or Diversity Monitor port.

(Optional) Cabling the 10 MHz Clock

To connect to a 10 MHz clock to the master wireless modem card, connect an SMA to BNC adapter to the 10 MHz IN connector port. Attach the clock cable's BNC connector to the adapter.

Note Recommended torque for attaching connectors to SMA ports is 7 to 10 inch pounds.

This completes the procedure for cabling a wireless modem card.

Installing a Power Feed Panel

A 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 co-located with the router or placed at an indoor location near the bulkhead opening leading to the outdoor wireless transverter.

Note When rack mounting the power feed panel, allow at least one rack unit space between the uBR and the power feed panel or between multiple power feed panels.

Rack-Mounting a Power Feed Panel

A power feed panel can be rack-mounted with either the front panel or the rear panel facing forward depending on the cable handling requirements of your site, or 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.

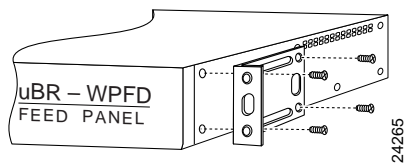


Warning This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

Attaching the Brackets

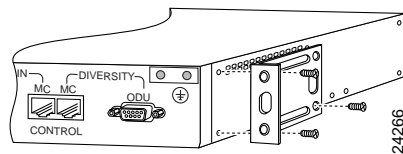
To install a power feed panel with the front panel facing forward, attach the brackets to both sides of the unit. (See Figure 15.)

Figure 15 **Bracket Installation - Front Panel Forward**



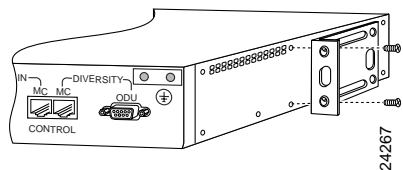
To install a power feed panel with the rear panel facing forward, attach the brackets to both sides of the unit. (See Figure 16.)

Figure 16 **Bracket Installation - Rear Panel Forward**



To install a power feed panel in a center-mount telco rack, attach the brackets to both sides of the unit. (See Figure 17.)

Figure 17 **Telco Center-Mount Bracket Installation - Rear Panel Forward**



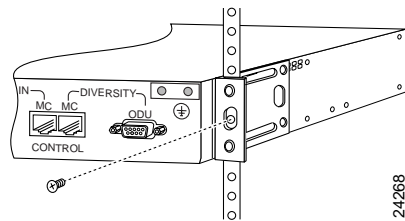
Installing the Power Feed Panel in the Equipment Rack

After the brackets are secured, attach the brackets on both sides of the power feed panel to the equipment rack. (See Figure 18.)

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Installing a Power Feed Panel

Figure 18 Attaching the Power Feed Panel to an Equipment Rack



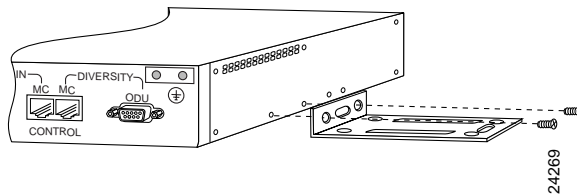
Wall-Mounting the Power Feed Panel

To wall-mount the unit, use the same brackets as those used to install the power feed panel in an equipment rack.

Use the following steps to wall-mount the power feed panel:

Step 1 Attach the brackets to both sides of the power feed panel. (See Figure 19.)

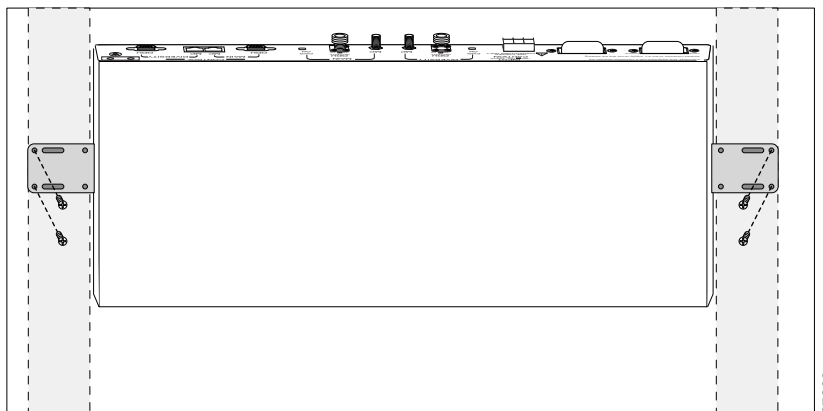
Figure 19 Attaching the Wall Mount Brackets



Step 2 Attach the power feed panel to the wall (see Figure 20), using screws and anchors you provide. To best support the power feed panel and cables, make sure the power feed panel is attached securely to a vertical wall stud or to a firmly attached plywood mounting backboard. This position will prevent the unit from pulling away from the wall when the cables are attached.

Note To allow the proper air flow through the unit when attached to a wall, the power feed panel must be installed with the rear panel connectors pointing up.

Figure 20 Wall-Mounting the Power Feed Panel

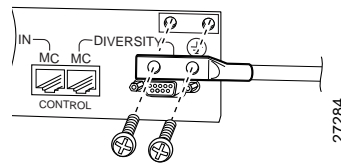


Attaching the Ground Lug

A ground lug kit is provided with the power feed panel. Use the following steps to attach the ground lug to the power feed panel chassis.

- Step 1** Attach an approved ground wire 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. (See Figure 21.)

Figure 21 Attaching the Ground Lug



- Step 4** Using a number 2 Phillips screwdriver, tighten the screws.

Wiring the DC Power

Follow the procedures in this section to wire the DC power.

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 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.



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

1) 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.

2) 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.

3) The DC supply source is to be located within the same premises as this equipment.

4) 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.

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Installing a Power Feed Panel



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



Warning Figure 23 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.



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



Warning Use copper conductors only.



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.



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



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.



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.

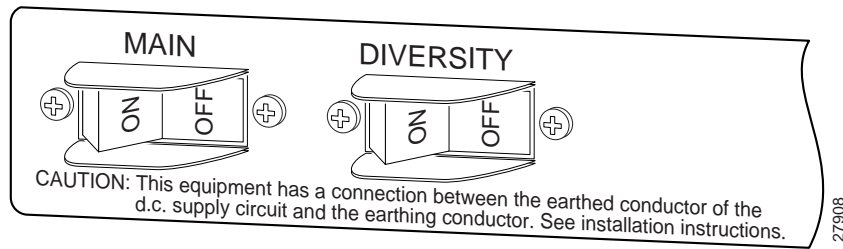
Wiring the DC power consists of attaching the wires of the DC power source to a removable wiring block, then plugging that block into the connection on the power feed panel. Refer to Figure 24 and Figure 25 and follow these steps.

Note Use 14 AWG or larger wire to wire the DC input power supply to the power feed panel.

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

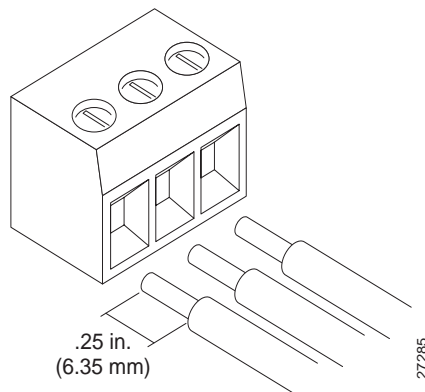
Step 2 Ensure that the power/breaker switch for both main and diversity are in the OFF position. (See Figure 22.)

Figure 22 Wireless Transverter Power/Breaker Switches



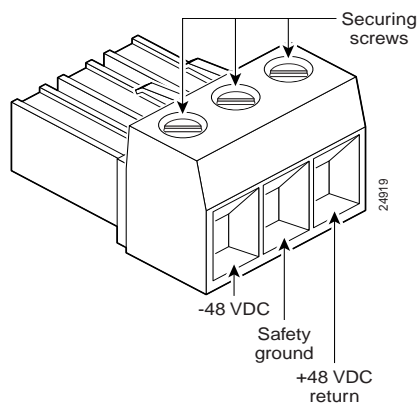
Step 3 Using a wire stripper, strip approximately 0.25 inch (6.35 mm) from the +48V, –48V, and ground leads.

Figure 23 Stripping the Wire



Step 4 Insert the stripped ends of the wire in the removable wiring block according to the scheme in Figure 24. Figure 24 illustrates the polarity of each connection. The connection on the left is for the –48 VDC wire, the middle connection is for safety ground. The connection on the right is for the positive return wire.

Figure 24 Wiring Connections



Secure the wires using the 1/8-inch blade screwdriver to tighten the screws in the top of the terminal block.

Step 5 Connect the DC input wiring to the DC source.

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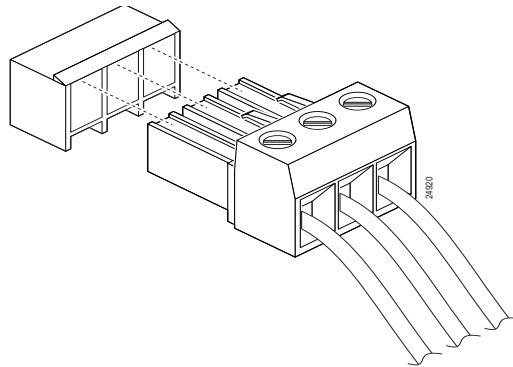
Installing a Power Feed Panel



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).

Step 6 Plug the terminal block into the receptacle on the power feed panel. (See Figure 25.)

Figure 25 Plugging the Terminal Block into the Receptacle



Cabling the Power Feed Panel

This section describes the cabling of the power feed panel.



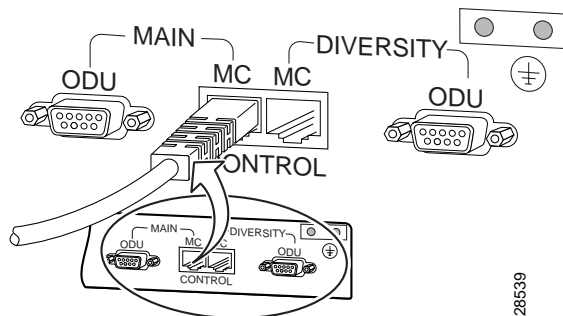
Warning Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Note It is not necessary to terminate unused connectors.

Connecting the Control Cable (from the Wireless Modem Card)

Attach the end of the control cable coming from the Control-Main port on the modem card to the Control-Main/MC port on the power feed panel. (See Figure 26.)

Figure 26 Connecting the Control Cable (from the Wireless Modem Card)



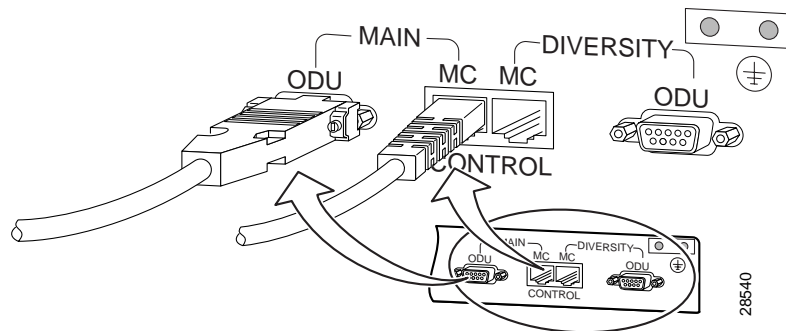
28539

If you will be using the diversity option, also attach the second control cable coming from the Control-Diversity port on the modem card to the Control-Diversity/MC port on the power feed panel.

Connecting the Control Cable (to the Wireless Transverter)

Attach a cable with a DB-9 connector to the Control-Main/ODU port on the power feed panel. (See Figure 27.)

Figure 27 Connecting the Control Cable (to the Wireless Transverter)



If you will be using the diversity feature, attach a second cable to the Control-Diversity/ODU port.

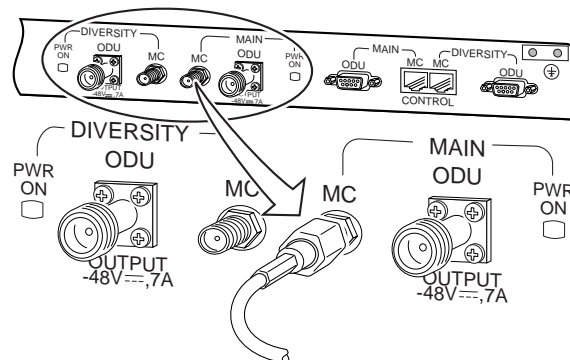


Warning To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Connecting the IF Cable (from the Wireless Modem Card)

Connect the cable coming from the Main/PFP port of the modem card to the Main/MC port on the power feed panel. If stiff coaxial cable has been used for the connection, first attach a “pigtail” adapter using flexible coaxial cable. (See Figure 28.)

Figure 28 Connecting the IF Cable (from the Wireless Modem Card)



If you will be using the diversity feature, also connect the cable coming from the Diversity/PFP port of the modem card to the Diversity/MC port on the power feed panel.

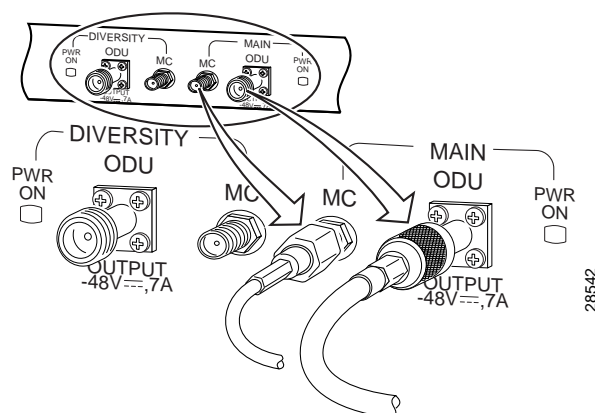
Connecting the IF Cable (to the Wireless Transverter)

Attach one end of the IF cable to the Main-ODU/Output connector. (See Figure 29.) If stiff coaxial cable is being used for the connection, first attach a “pigtail” adapter using flexible coaxial cable.



Warning Use RG-214 or similar size 50-ohm coaxial cable with a center conductor size of 14 AWG or larger. Failure to do so can result in overheating and long-term failure.

Figure 29 Connecting the IF Cable (to the Wireless Transverter)



If you will be using the diversity feature, attach a second cable to the Diversity-ODU/Output connector.

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

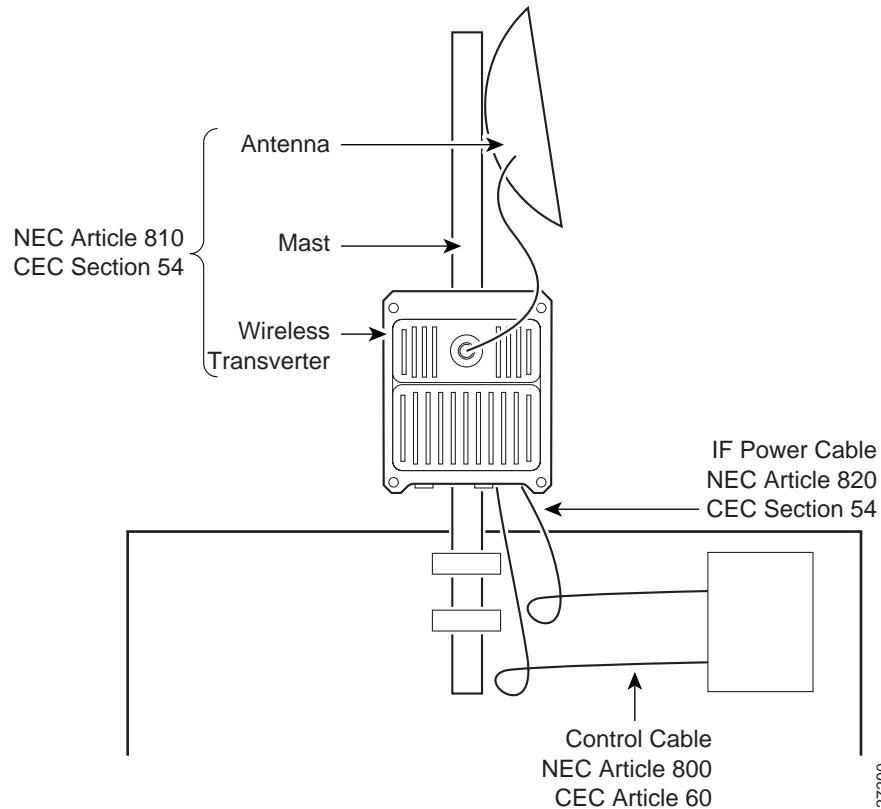
Installing a Wireless Transverter

This section provides instructions for installing the duplexer assembly in the transverter chassis, then installing the transverter on the antenna mast.

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.



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 30.) When installing the transverter, take extreme care not to come into contact with such circuits, as they may cause serious injury and death.

Figure 30 **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.



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



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.



Warning A radiation hazard may exist within a specific radius around the center point of the antenna. The table below associates antenna gain (in dB) with a minimum acceptable distance. Determine the gain of the antenna and use Table 6 to locate the minimum acceptable distance from the center point of the antenna. (Transmitter Power = 33 dB_i.)

Table 6 **Radiation Hazard Calculation (continued)**

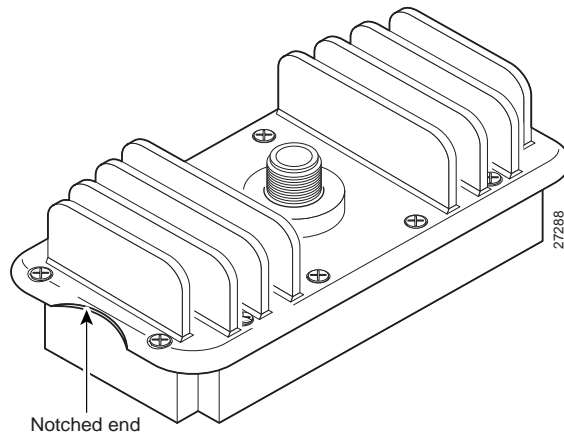
Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Minimum Acceptable Distance under FCC Rules – Uncontrolled Environment (m)	Minimum Acceptable Distance under FCC Rules – Controlled Environment (m)
14	47	50.1	0.6	0.3
15	48	63.1	0.7	0.3
16	49	79.4	0.8	0.4
17	50	100.0	0.9	0.4
18	51	125.9	1.0	0.4
19	52	158.5	1.1	0.5
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

Installing a wireless transverter requires the installation of the duplexer assembly prior to mounting the transverter on the antenna mast.

The duplexer acts as a filter for Tx/Rx isolation. The duplexer assembly is shipped as a separate unit based on the RF channel plan you have selected for your installation.

Note The channel selection must be entered using the **radio operating band** command from the command-line interface. See “show interfaces radio (arq)” section on page 66.

Figure 31 Duplexer Assembly

Installing the Duplexer Assembly in the Wireless Transverter

The orientation of the duplexer assembly when installed in the transverter will determine its transmit and receive frequency.

Note The orientation of one end of a point-to-point link must be opposite to that of the other end of the link. In addition, the choice of Tx Hi or Rx Hi must match the frequencies configured for the wireless modem card using the command-line interface or CiscoView.

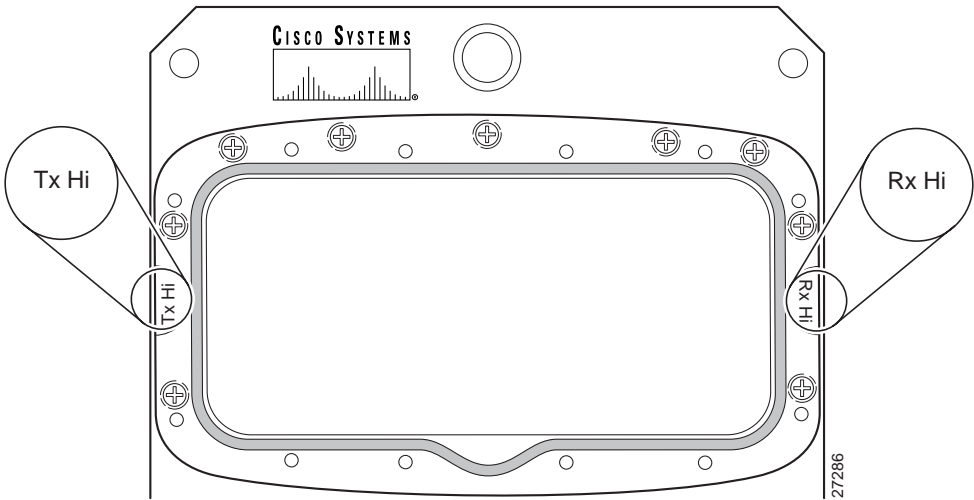
Use the following steps to install the duplexer in the transverter.

- Step 1** Determine if you will be using the high frequency band for transmitting or receiving.
- Step 2** Detach the bottom portion of the label affixed to the under side of the duplexer, and record the duplexer orientation. (See Figure 32.) This label can be attached to equipment records and used for reference when configuring the system or performing maintenance.

Figure 32 Frequency Assignment Label

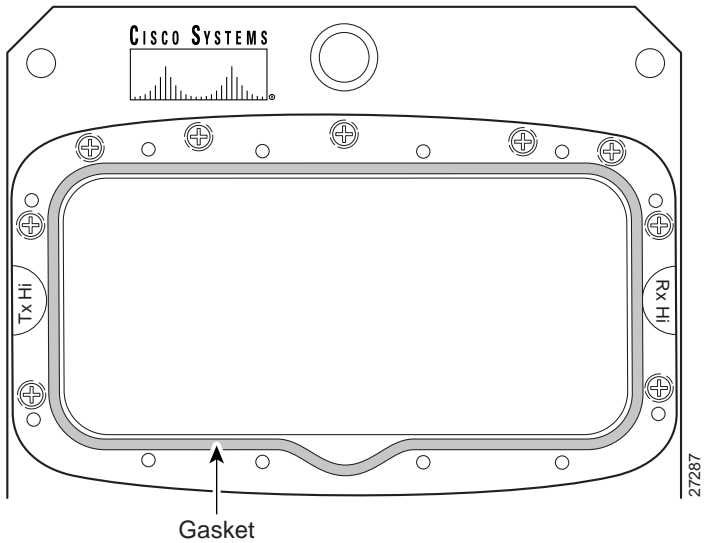
- Step 3** Match the notched end of the duplexer with either the Tx Hi or Rx Hi side of the duplexer receptacle in the wireless transverter. (See Figure 33.)

Figure 33 Duplexer Receptacle in the Wireless Transverter



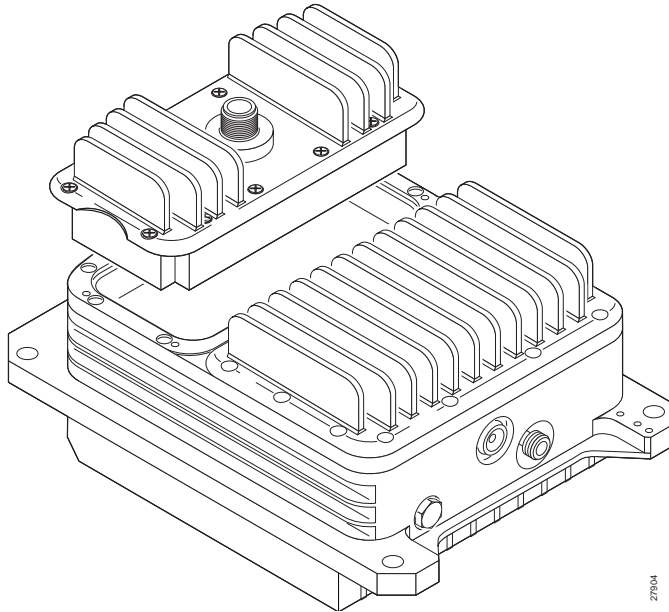
Step 4 Verify that the gasket is aligned in the groove in the transverter chassis. (See Figure 34.)

Figure 34 Gasket in the Transverter Chassis



Step 5 Carefully line up the duplexer and plug it into the chassis, being careful that the internal RF connectors are properly aligned.

Figure 35 Plugging the Duplexer Assembly into the Chassis



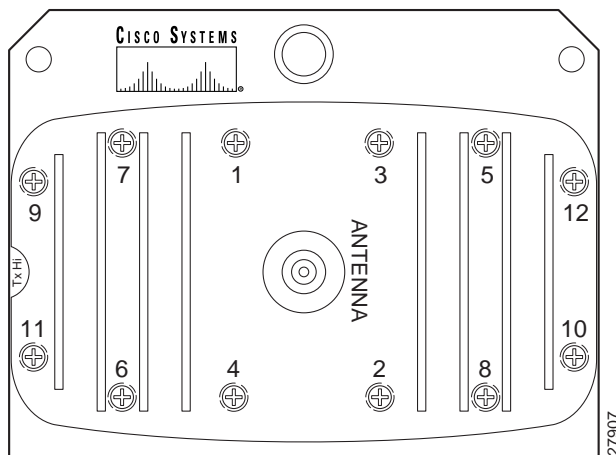
Step 6 Verify that the cover of the duplexer housing is flush with the transverter housing.



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 number 2 Phillips screwdriver, follow the threading sequence shown in Figure 36 and start tightening the screws.

Figure 36 Tightening Sequence



Step 8 Repeat the sequence and finish tightening the screws to between 16 and 20 inch pounds of torque.

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Installing a Wireless Transverter

Mounting the Wireless Transverter

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

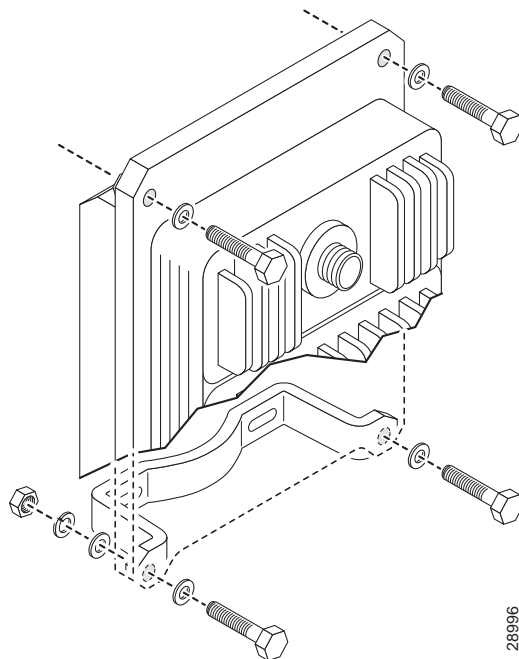
Note This mounting kit requires a mast with an outside diameter size of 2 3/8 to 4 1/2 inches. If the antenna you are using requires a mast smaller than 2 3/8 inches, attach a pipe of the proper diameter to the antenna mast using a pipe-to-pipe clamp set.

Use the following steps to mount the transverter on an antenna mast:

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.

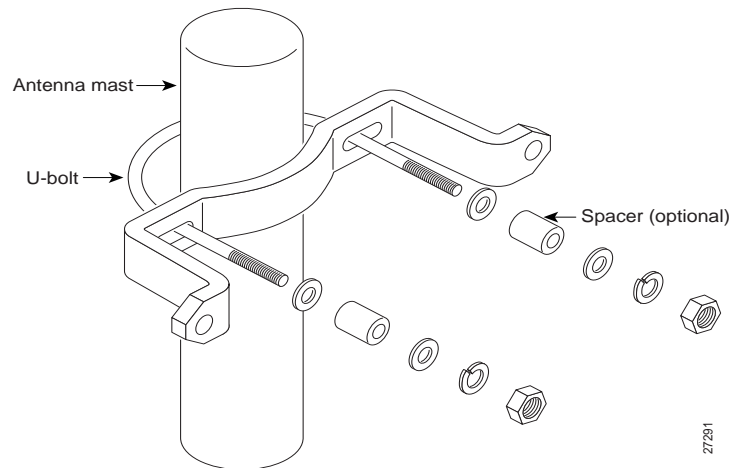
- Step 1** Attach one mounting bracket to the lower portion of the wireless transverter. (See Figure 37.)
- Step 2** Thread two hex bolts and washers through the mounting holes at the top of the transverter. (See Figure 37.)

Figure 37 Attaching the Lower Mounting Bracket and Upper Bracket Hardware



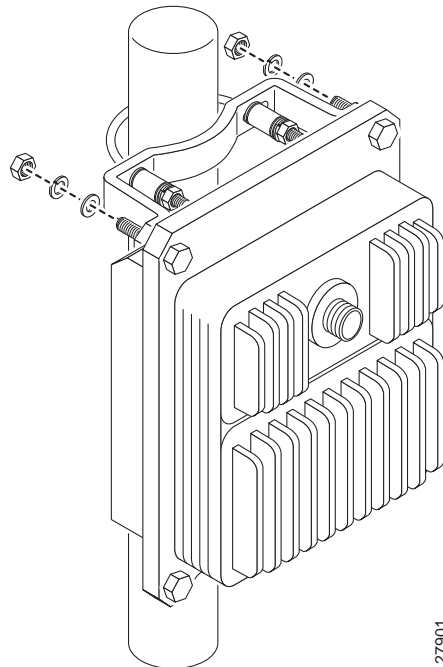
- Step 3** Select the appropriate size U-bolt from the mounting kit and attach the remaining bracket to the antenna mast and tighten the nuts. (See Figure 38.) If necessary, use the provided spacers. This will be the bracket that mounts to the top of the transverter.

Figure 38 Attaching the Top Mounting Bracket to the Antenna Mast



Step 4 Using a 9/16-inch wrench, attach the transverter to the top mounting bracket. (See Figure 39.)

Figure 39 Attaching the Transverter to the Top Mounting Bracket



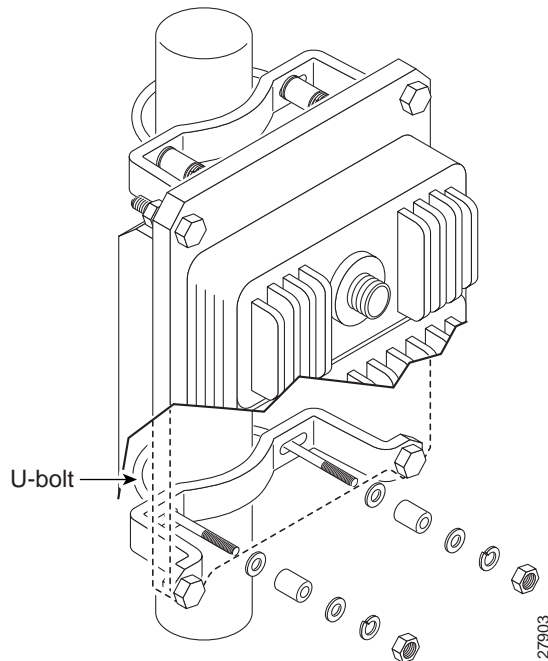
Caution Do not leave the transverter unattended until all the fasteners have been tightened.

Step 5 Attach the U-bolt to the bottom bracket (see Figure 40), and tighten.

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Installing a Wireless Transverter

Figure 40 **Attaching the Bottom U-Bolt**



Step 6 Tighten all fasteners to 15 foot pounds of torque.

Cabling the Wireless 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.



Warning Ensure that the power/breaker switches (on the power feed panel) for both the Main and Diversity transverter are in the OFF position. (See Figure 22.)

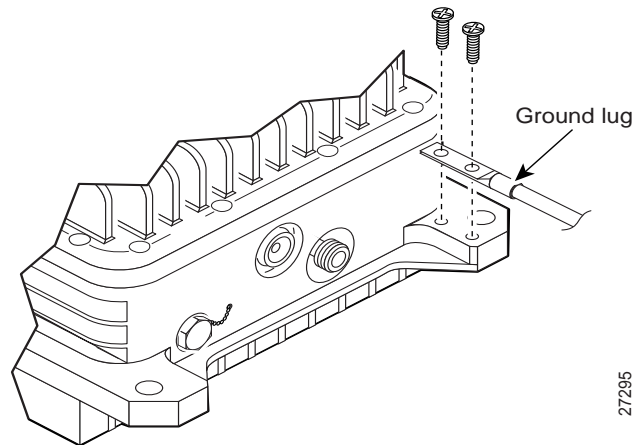
Cables leading to the wireless transverter may require through-bulkhead connectors, lightning protection, or other accessories. For more detailed information concerning these items, refer to the *Cisco Broadband Fixed Wireless Site Planning Guide*.

Attaching the Ground Lug

A ground lug kit is provided with the transverter. Use the following steps to attach the ground lug to the transverter chassis.

- 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 41.)

Figure 41 Attaching the Ground Lug



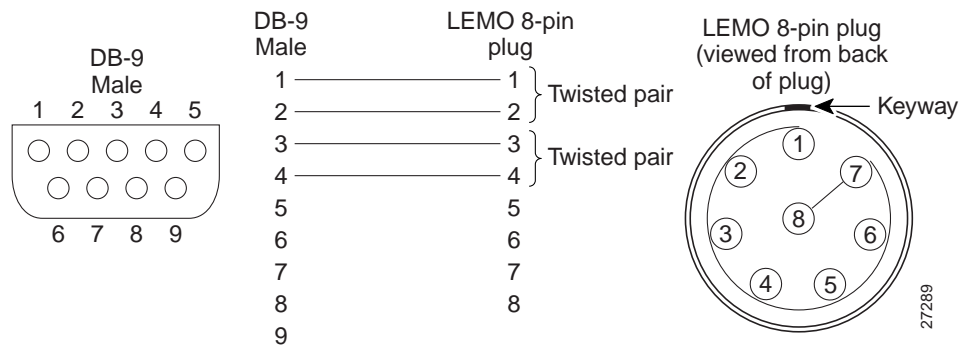
Step 4 Using a number 2 Phillips screwdriver, tighten the screws.

Attaching the LEMO Connector to the Control Cable

An 8-pin LEMO plug designed to be used with a .24-inch or less outside diameter jacket cable with braided shielding is provided to attach the control cable to the wireless transverter. Using Figure 42 as a guide, use the following instructions to wire the connector to the control cable coming from the power feed panel.

Note If a cable with a larger outside diameter is used, alternate sealing hardware must be used (not supplied).

Figure 42 DB-9 to 8-Pin Lemo Wiring

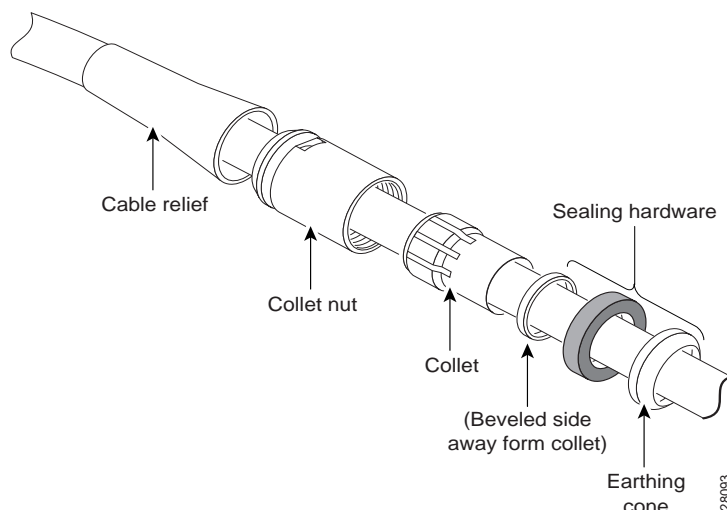


Note The cable shield must be grounded to the connector housing.

Step 1 Slide the cable relief, collet nut, collet, and sealing hardware onto the cable. (See Figure 43.)

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Figure 43 Sliding the Hardware on the Cable



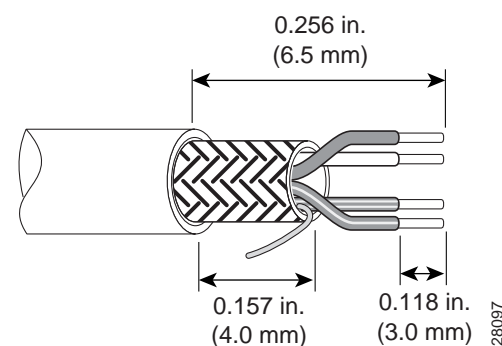
Step 1 Strip the cable jacket to expose the shielding. (See Figure 44.)

Figure 44 Stripping the Cable Jacket



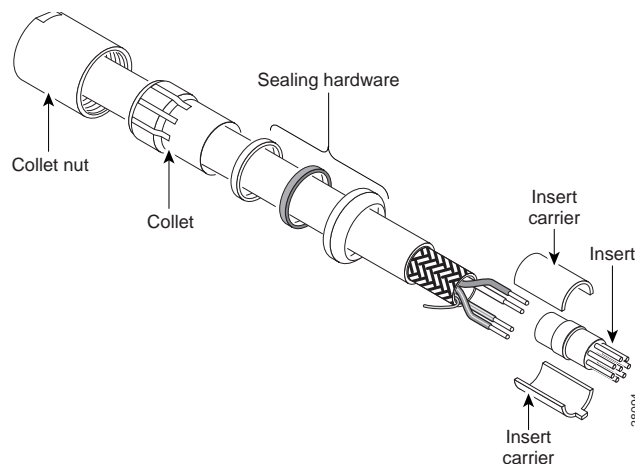
Step 2 Strip the conductor insulation to the dimensions shown in Figure 45.

Figure 45 Stripping the Conductor Insulation



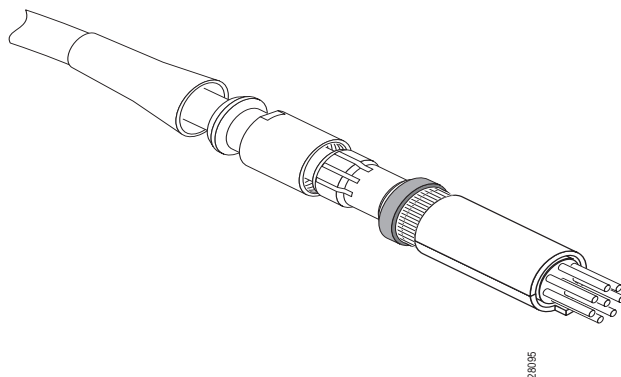
Step 3 Solder the contacts, then position the midpieces on the insert. (See Figure 46.) Make sure the insert key appears through the midpiece window.

Figure 46 Positioning the Midpieces



Step 4 Position the collet and sealing hardware. (See Figure 47.) Trim the foil and plastic inner foil. Fold the ground wire over the earthing cone, making sure not to exceed the beveled edge.

Figure 47 Positioning the Collet and Sealing Hardware

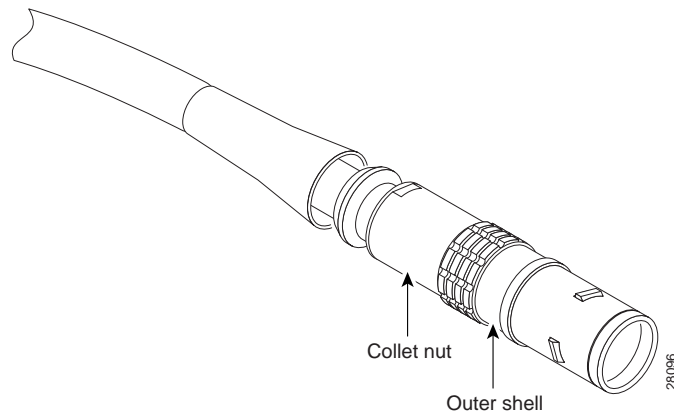


Step 5 Line up the key on the insert carrier with the notch in the housing. Install the outer shell and tighten the collet nut to 5 inch-pounds of torque using a plug securing wrench over the nozzle and a torque wrench on the collet nut. (See Figure 48.)

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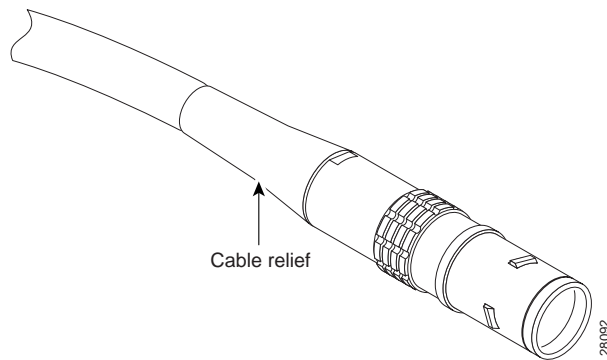
Installing a Wireless Transverter

Figure 48 **Tightening the Collet Nut**



Step 6 To complete the assembly, attach the cable relief to the back nut on the collet nut. (See Figure 49.)

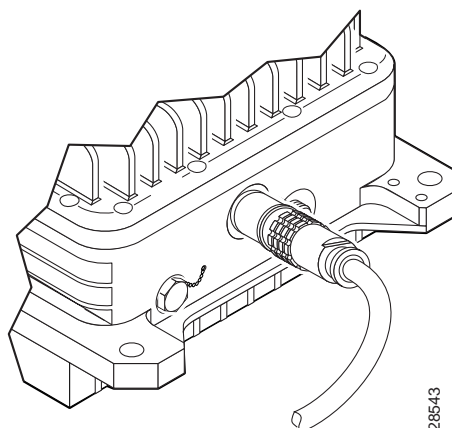
Figure 49 **Cable Relief Attached to Collet Nut**



Connecting the Control Cable

Connect the control cable from the power feed panel port marked Main/ODU to the Control connector on the Main transverter. (See Figure 50.)

Figure 50 **Connecting the Control Cable**

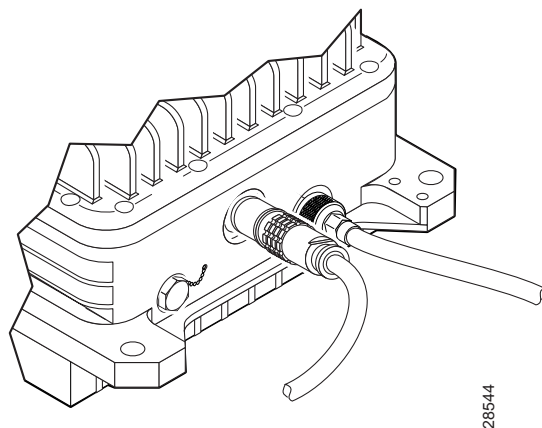


If the diversity feature is being used, connect the control cable from the power feed panel port marked Diversity/ODU to the Control connector on the diversity transverter.

Connecting the IF Cable

Connect the IF cable from the power feed panel port marked Main-ODU/Output to the IF Input connector on the main transverter. (See Figure 51.) Tighten the connection with an adjustable wrench or pliers.

Figure 51 **Connecting the IF Cable**



If the diversity feature is being used, connect the IF cable from the power feed panel port marked Diversity-ODU/Output to the IF Input connector on the diversity transverter, and tighten with an adjustable wrench or pliers.

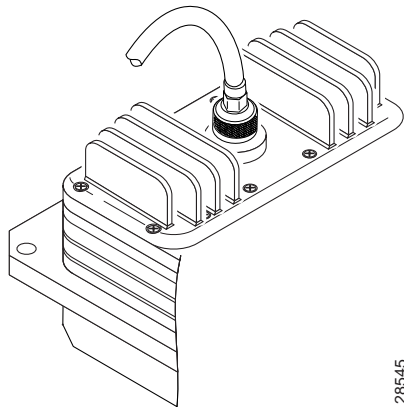
Connecting the Antenna Cable

Connect the RF cable leading to the Main antenna to the N-type connector on the duplexer on the main transverter. (See Figure 52.)

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Configuring a Wireless Modem Card

Figure 52 **Connecting the Antenna Cable**



If the diversity feature is being used, connect the RF cable leading to the diversity antenna to the N-type connector on the duplexer on the diversity transverter.

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.



Warning After cabling, reinstate power to the power feed panel.



Warning 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.

Configuring a Wireless Modem Card

After you have installed or replaced a wireless modem card and subsystem, use the Cisco IOS software command-line interface (CLI) to configure the modem card for operation. Initial startup requirements and examples, as well as the commands to log in to the router and complete the initial configuration are described in this section.

Note You must perform a basic configuration of the Cisco uBR7200 series router before configuring the wireless modem cards. Refer to the *Cisco uBR7200 Series Universal Broadband Router Installation and Configuration Guide* publication that shipped with your Cisco uBR7246 or Cisco uBR7223 for more information.

login

Use the steps in Table 7 to log in to the router and enter the required modes to start the configuration process.