



Shelf Assembly Hardware



Note

The terms “Unidirectional Path Switched Ring” and “UPSR” may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as “Path Protected Mesh Network” and “PPMN,” refer generally to Cisco’s path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This chapter provides a description of Cisco ONS 15327 shelf and backplane hardware. Card and cable descriptions as well as instructions for installing equipment are provided in the *Cisco ONS 15327 Procedure Guide*.

Chapter topics include:

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Note

The Cisco ONS 15327 assembly is intended for use with telecommunications equipment only.



Note

The ONS 15327 is designed to comply with Telcordia GR-1089-CORE Type 2 and Type 4. Install and operate the ONS 15327 only in environments that do not expose wiring or cabling to the outside plant. Acceptable applications include Central Office Environments (COEs), Electronic Equipment Enclosures (EEEs), Controlled Environment Vaults (CEVs), huts, and Customer Premise Environments (CPEs).

1.1 Installation Overview

You can mount the ONS 15327 in a 19- or 23-inch (482.6- or 584.2-mm) rack. Including the fan-tray assembly, the shelf assembly weighs approximately 15 pounds (6.8 kg) without cards installed and 27 pounds (12.2 kg) fully loaded. An ONS 15327 is installed in a rack using reversible mounting brackets on each side of the shelf. The ONS 15327 is powered using –48 VDC power. Positive and negative power terminals are accessible on the front panel.

You can access the ONS 15327 cards, cables, connectors, power feeds, and fan-tray assembly through the front of the shelf assembly only. The CRIT, MAJ, MIN, and REM alarm LEDs visible on the Cross-Connect, Timing, and Control (XTC) card faceplate indicate whether a Critical, Major, Minor, or Remote alarm is present anywhere on the ONS 15327 assembly. These LEDs help you to determine quickly if any alarms are present on the assembly.

When installed in an equipment rack, the ONS 15327 assembly is typically connected to a fuse and alarm panel that provides centralized alarm connection points and distributed power for the ONS 15327. Fuse and alarm panels are third-party equipment and are not described in this documentation. If you are unsure about the requirements or specifications for a fuse and alarm panel, consult the documentation for that product.

**Note**

In this chapter, the terms “ONS 15327” and “shelf assembly” are used interchangeably. In the installation context, these terms have the same meaning. Otherwise, shelf assembly refers to the physical steel enclosure that holds cards and connects power, and ONS 15327 refers to the entire system, both hardware and software.

Install the ONS 15327 in compliance with your local and national electrical codes:

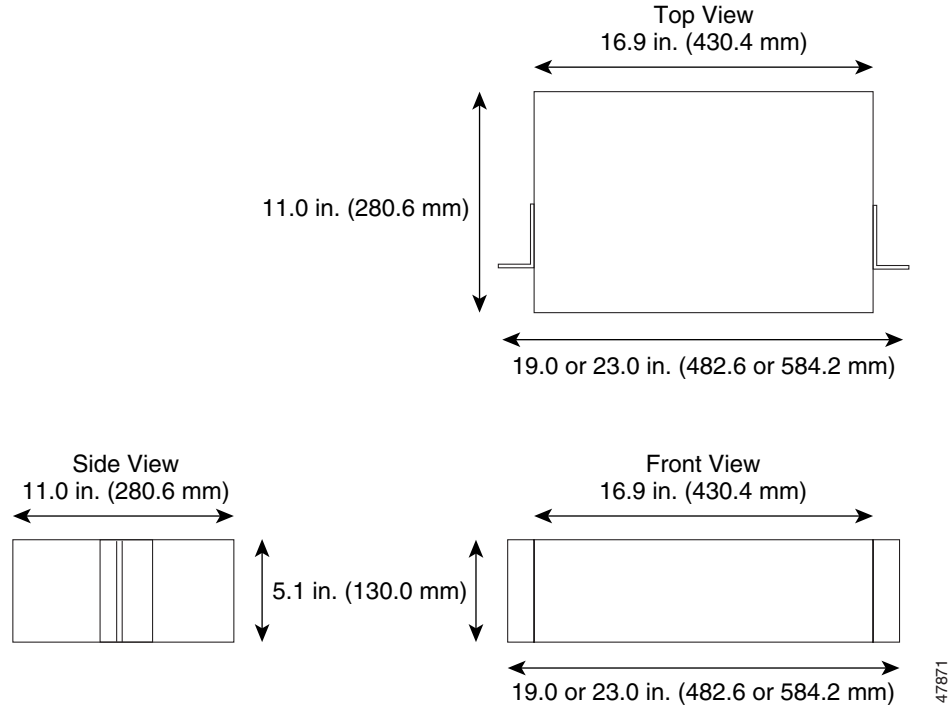
- United States: National Fire Protection Association (NFPA) 70; United States National Electrical Code
- Canada: Canadian Electrical Code, Part I, CSA C22.1
- Other countries: If local and national electrical codes, are not available, refer to IEC 364, Part 1 through Part 7.

1.2 Rack Installation

The ONS 15327 is mounted in a 19- or 23-inch (482.6- or 584.2-mm) equipment rack. The shelf assembly projects two inches from the front of the rack. It mounts in both EIA-standard and Telcordia-standard racks. The shelf assembly is a total of 17 inches (431.8 mm) wide with no mounting ears attached. With the mounting ears attached, the shelf assembly is 19 inches (482.6 mm) wide.

The ONS 15327 measures 5.1 inches high, 19 or 23 inches wide (depending on which way the mounting ears are attached), and 11 inches deep (129.5 x 482.6 or 584.2 x 279.4 mm). [Figure 1-1](#) shows the dimensions of the ONS 15327 shelf assembly.

Figure 1-1 ONS 15327 Shelf Assembly Dimensions



1.2.1 Reversible Mounting Bracket



Caution

Use only the fastening hardware provided with the ONS 15327 to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

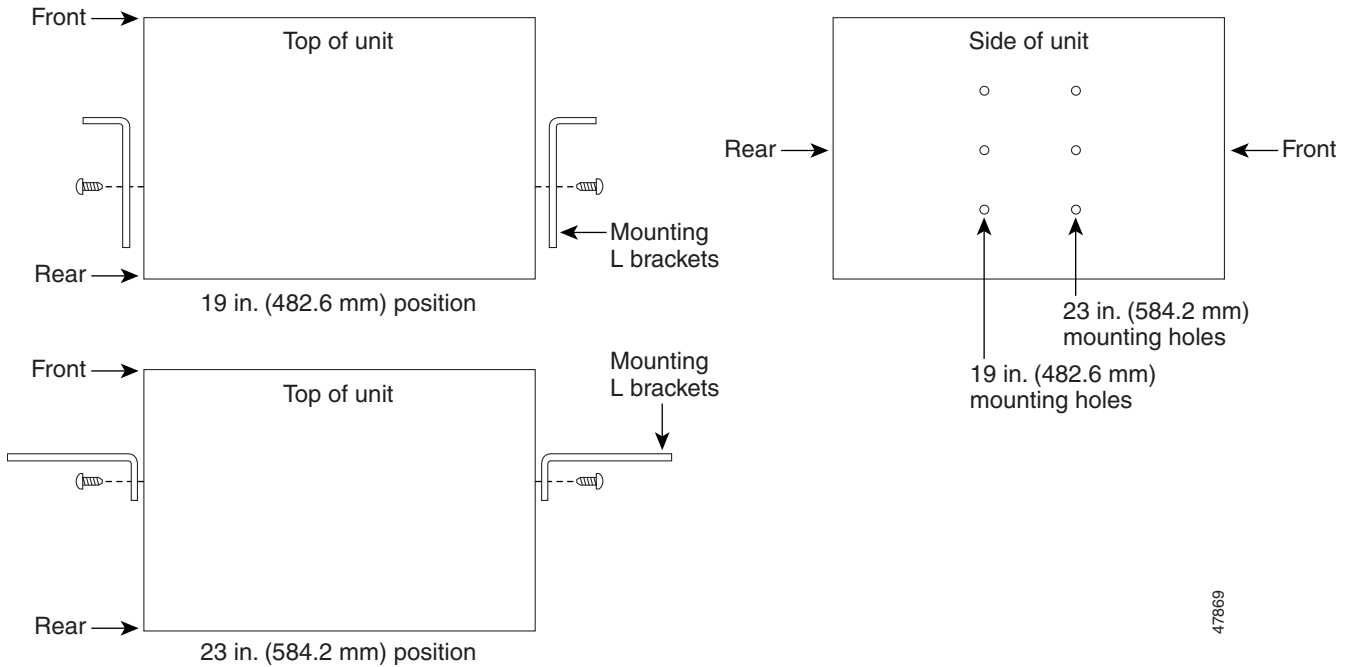


Caution

When mounting the ONS 15327 in a frame with a nonconductive coating (such as paint, lacquer, or enamel) use either the thread-forming screws provided with the ONS 15327 shipping kit or remove the coating from the threads to ensure electrical continuity.

The shelf assembly comes with mounting brackets that can be reversed for use with a 19- or 23-inch (482.6- or 584.2-mm) rack (Figure 1-2).

Figure 1-2 Reversing the Mounting Brackets (23 in. [482.6 mm] Position to 19 in. [584.2 mm] Position)

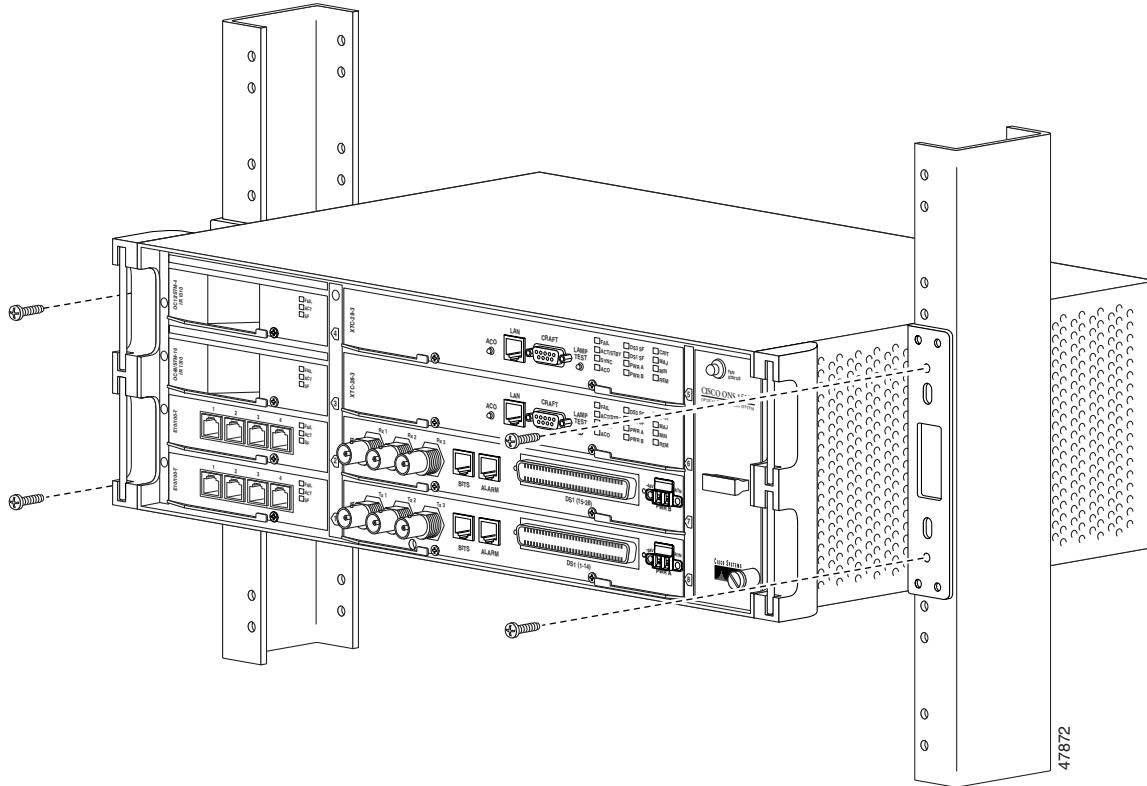


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1.2.2 Mounting a Single Node

Mounting the ONS 15327 in a rack requires a minimum of 5.2 inches (132 mm) of vertical rack space (plus 1 inch [25.4 mm] for air flow). To ensure that the mounting is secure, use two to four #12-24 mounting screws for each side of the shelf assembly. [Figure 1-3](#) shows the rack mounting position for the ONS 15327.

Figure 1-3 Mounting an ONS 15327 in a Rack



1.2.3 Mounting Multiple Nodes

Most standard seven-foot (2.1 m) racks can hold twelve ONS 15327s and a fuse and alarm panel.

1.3 Power and Ground Description

This section describes how to connect the ONS 15327 shelf assembly to the power supply. For detailed procedures, refer to the *Cisco ONS 15327 Procedure Guide*. Terminate the chassis ground to either the office ground or rack ground before you install the power. Use the grounding lug to attach the ground cable to the shelf assembly according to local site practice.

Ground one cable to ground the shelf assembly. Terminate the other end of the rack ground cable to ground according to local site practice.

If the system loses power or both XTC cards are reset, you must reset the ONS 15327 clock unless the node has been previously provisioned to use Simple Network Time Protocol (SNTP) to update the clock over the LAN.



Caution

Always use the supplied ESD wristband when working with a powered ONS 15327. Plug the wristband cable into the ESD jack located between the top high-speed and XTC slots.

Use the following wiring conventions:

- Red wire for battery (–48 VDC) connections
- Black wire for battery return (0 VDC) connections



Note

Use an external disconnect for service purposes and install it according to local site practice.

The ONS 15327 has redundant –48 VDC power terminals on the mechanical interface cards (MICs). The terminals are labeled PWR A and PWR B and are located on the far right-hand side of the MICs if you are facing the shelf assembly. Both MIC A and MIC B must be installed to create redundant power connections.

To install redundant power feeds, use four power cables and one ground cable. For a single power feed, only two power cables and one ground cable are required. Use #12 AWG cable and, to ensure circuit overcurrent protection, use a conductor with low impedance. However, the conductor must have the capability to safely conduct any fault current that might be imposed. Do not use aluminum conductors.

The MIC power connector is shipped with the fastening screws inserted but not tightened. The screws may have tightened due to vibration during shipping. Make sure the screws are loose before attempting to remove the connector.

Figure 1-4 shows the MIC power connector being removed.

Figure 1-4 Removing the MIC Power Connector

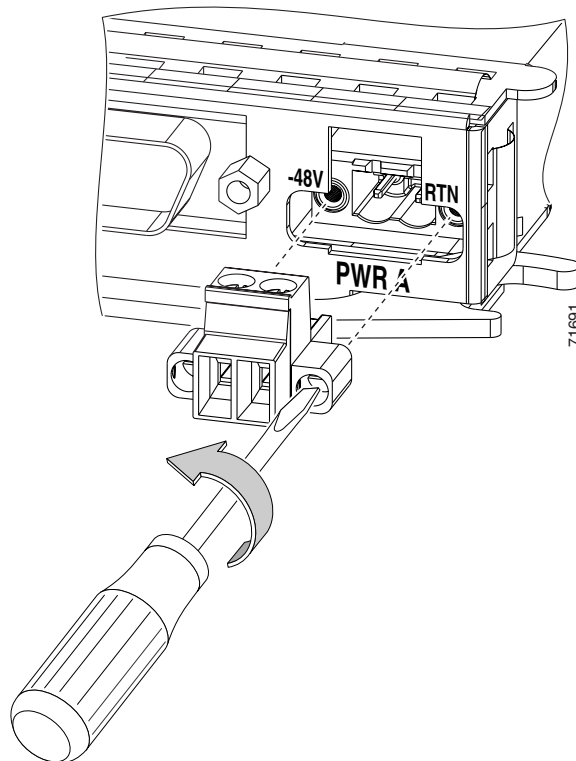


Figure 1-5 shows a power cable being inserted into the MIC power connector.

Figure 1-5 *Inserting a Power Cable into the MIC Power Connector*

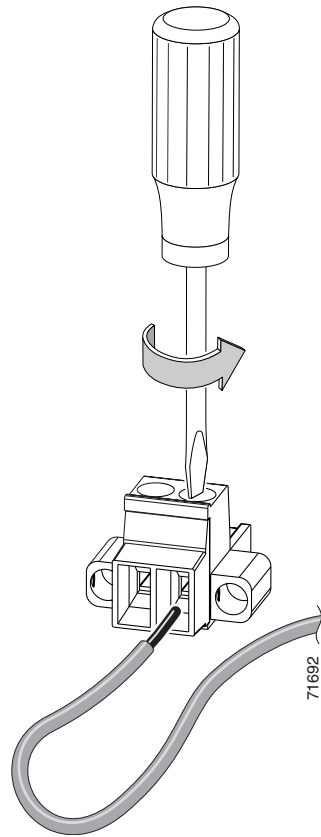


Figure 1-6 shows the MIC power connector being installed.

Figure 1-6 Installing the MIC Power Connector

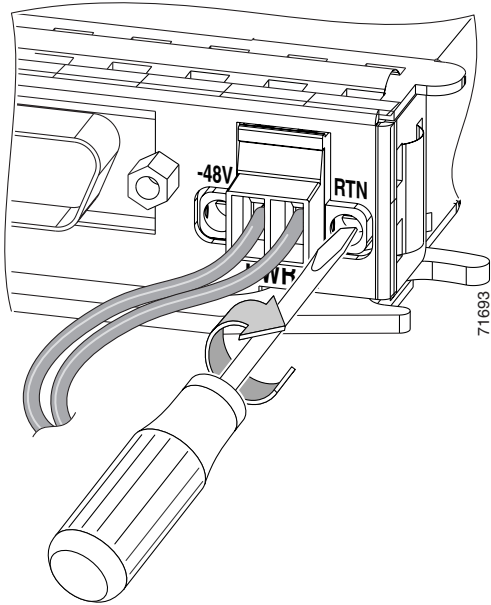
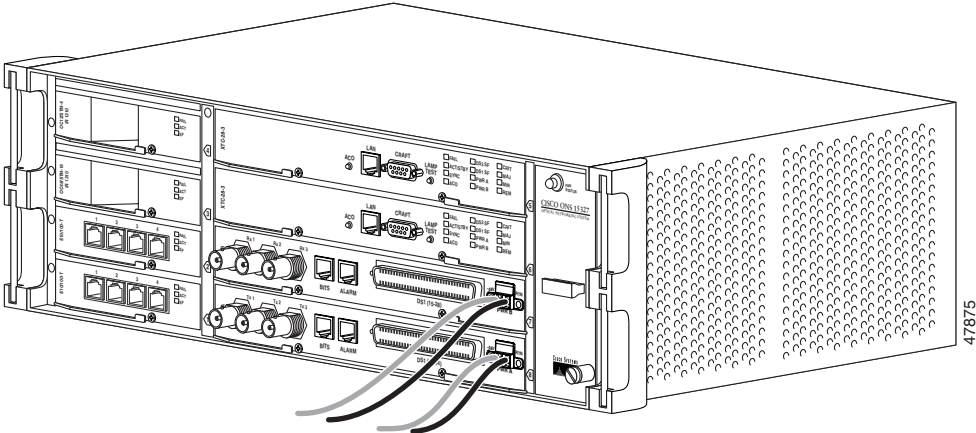


Figure 1-7 shows redundant power feeds connected to an ONS 15327.

Figure 1-7 Redundant Power Feeds Connected to an ONS 15327



1.4 Ferrites

Place third-party ferrites on power cables to dampen electromagnetic interference (EMI) from the ONS 15327. Ferrites must be added to meet the requirements of Telcordia GR 1089. Refer to the ferrite manufacturer documentation for proper use and installation of the ferrites.

1.5 Cable Description and Installation

This section describes fiber-optic, DS-3 (coaxial), DS-1 (Champ), and twisted-pair cables.

1.5.1 Cabling Types

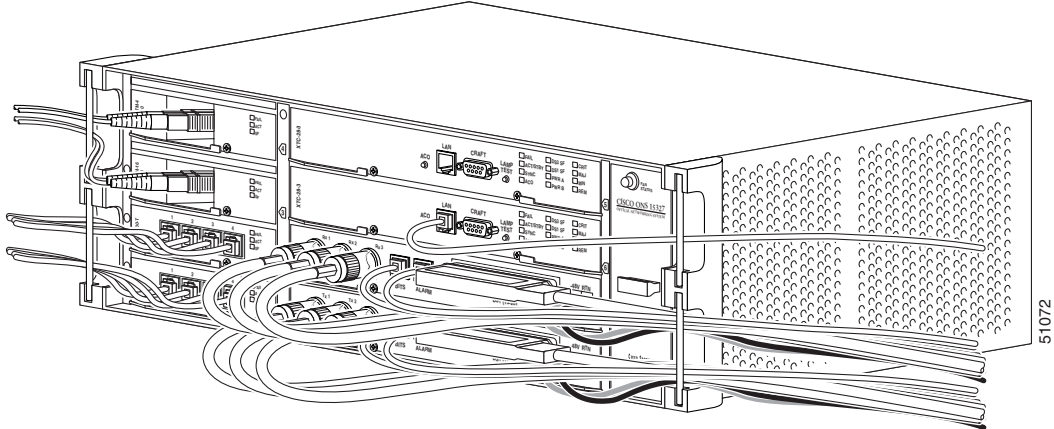
ONS 15327 cables use cable guides at each side of the front of the shelf assembly to economize shelf space and manage cables. The following types of cables are used with the ONS 15327:

- Optical cables—Connect to the SC connectors on the OC-12 and OC-48 card faceplates and the LC connectors on the OC-3 card faceplates. See [“1.5.4 Fiber Cable Installation” section on page 1-12](#) for more information. Make sure the fiber cables do not bend excessively; maintaining a proper bend radius prevents damage to the optical cable.
- Coaxial cables—Connect to the MICs on the ONS 15327 using BNC cable connectors. Coaxial cables carry DS-3 traffic to and from the ONS 15327. The ONS 15327 supports up to three transmit and three receive coaxial connectors on each shelf assembly.
- AMP Champ cables—Connect to MICs on the ONS 15327 using AMP Champ cable connectors. Each Champ connector on the MIC supports one AMP Champ cable connection for a total of two connectors per node. Each Champ connector supports a maximum of 14 DS-1s. See the [“1.5.6 DS-1 Cable Installation” section on page 1-13](#) for more information about the AMP Champ cables and connectors.
- Twisted-pair cables for timing—Connect to the building integrated timing supply (BITS) ports on the MICs. The twisted-pair cables for timing use RJ-45 connectors. Connecting to the BITS ports requires a BITS clock cable and twisted-pair #22 or #24 shielded AWG wire.
- CAT-5 Twisted-Pair cables—Connect to the ports on the E-Series Ethernet card, the alarm ports on the MICs, and the LAN port on the XTC cards. The twisted-pair cables use RJ-45 connectors. The Ethernet ports and the LAN ports use a standard straight-through cable.

1.5.2 Cable Guides

The ONS 15327 has cable guides located on each side of the front of the shelf assembly ([Figure 1-8](#)). These cable guides ensure that the proper bend radius is maintained in the fibers and that all other cables are properly routed. To remove cable guides, remove the screws that anchor them to the side of the shelf assembly.

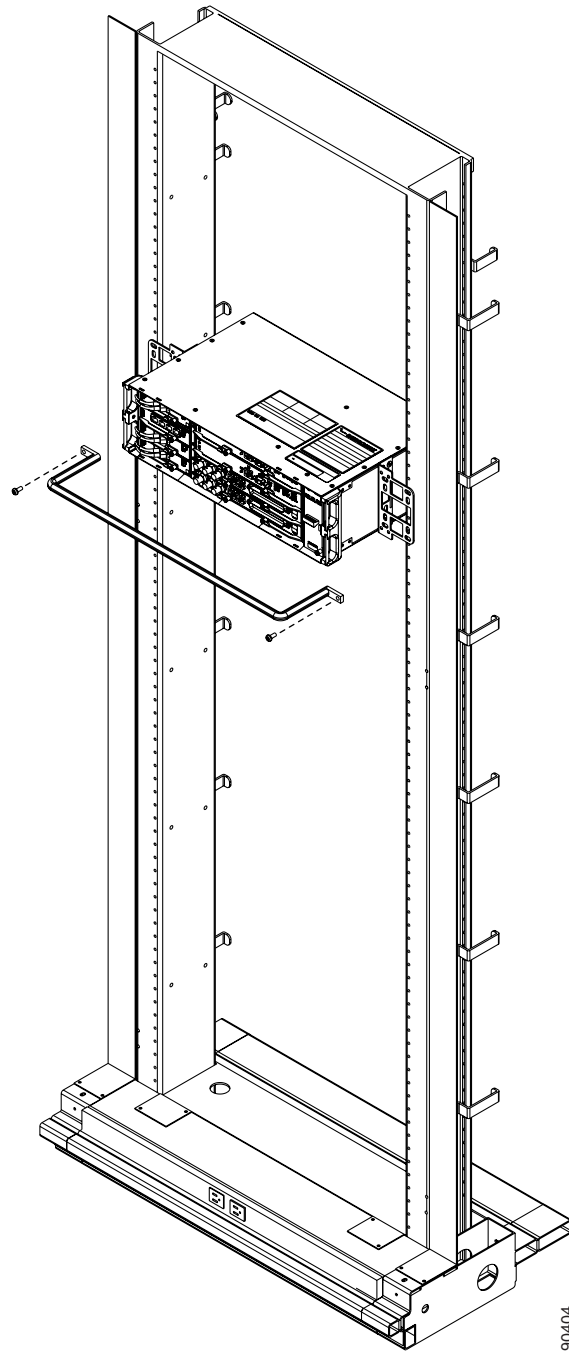
Figure 1-8 Managing Front Panel Cables with Locking Cable Guides



To relieve strain, you can also use the optional tie-down bar to secure the cables using tie-wraps or other site-specific methods.

Figure 1-9 shows the tie-down bar, the ONS 15327, and the rack.

Figure 1-9 Tie-Down Bar



1.5.3 Cabling Sequence and Location

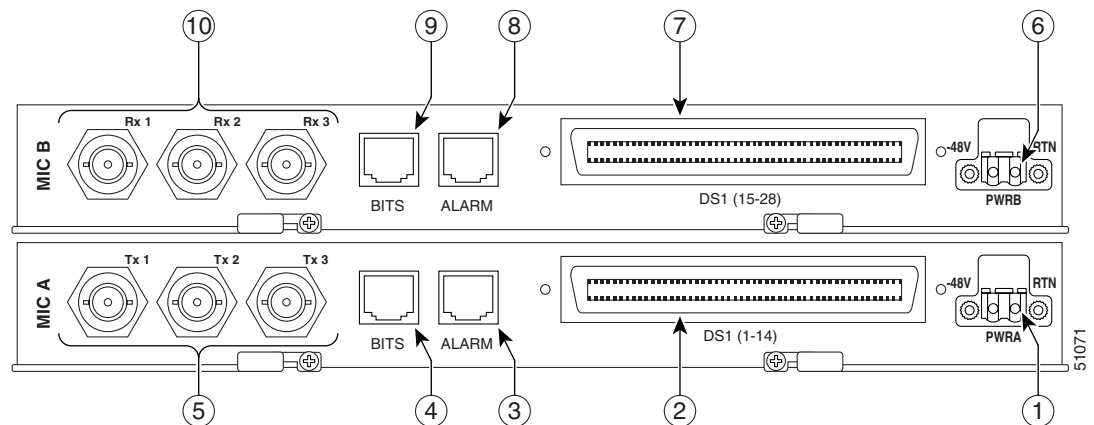
To maintain access to all of the connectors during cable installation, cables must be attached to the MICs in the following order, starting with MIC A (the bottom MIC) and repeating for MIC B:

1. Attach power cables
2. Attach DS-1 (Champ) cables
3. Attach Alarm (RJ-45) cables
4. Attach BITS (RJ-45) cables
5. Attach DS-3 (BNC) cables

After attaching all of the cables to the MICs, route the cables out through the bottom right cable guide and snap it closed. Tie wrap the cables according to local site practice. Leave enough slack to remove the fan-tray assembly and fan filter.

You do not need to connect cables for the XTC cards and traffic cards in any particular order. Route XTC cables through the top-right cable guide. Route electrical and fiber-optic cables out through the corresponding cable guides on the left side of the shelf assembly. [Figure 1-10](#) shows the order in which you should install cables on the ONS 15327.

Figure 1-10 Cable Installation Sequence



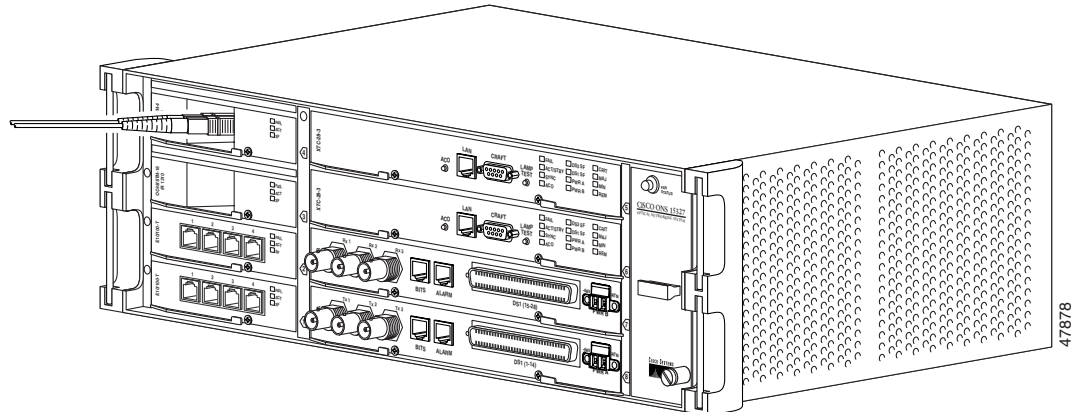
1.5.4 Fiber Cable Installation

ONS 15327 OC-12 and OC-48 cards have SC connectors and the OC-3 and G1000-2 cards have LC connectors. To install fiber-optic cables in the ONS 15327, a fiber cable with the corresponding connector type must be connected to the transmit and receive ports on the ONS 15327 cards ([Figure 1-11](#)). On ONS 15327 OC-12 and OC-48 card ports, the left side connector is the transmit port and the right-side connector is the receive port. Cisco recommends that you label the transmit and receive ports and the working and protection fibers at each end of the fiber span to avoid confusion with cables that are similar in appearance.



Note

Clean all fiber connectors thoroughly. Dust particles can degrade performance. Put caps on any fiber connectors that you do not use.

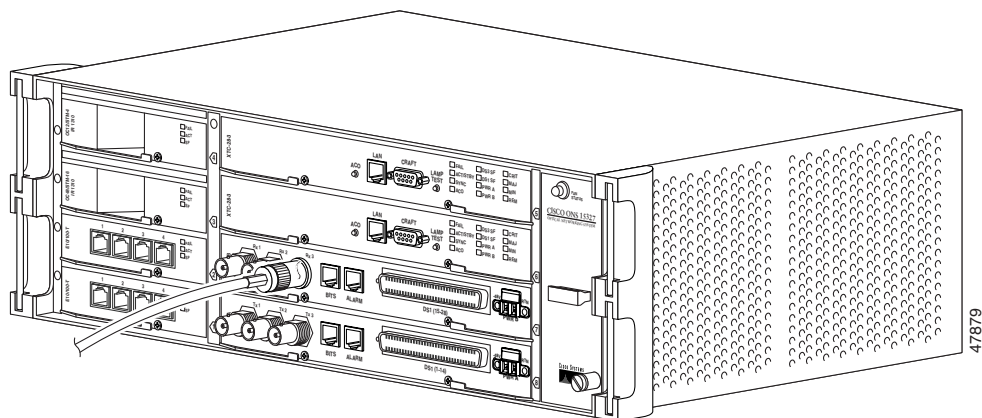
Figure 1-11 *Installing a Fiber-Optic Cable*

1.5.5 Coaxial Cable Installation

For DS-3 traffic, the ONS 15327 uses coaxial cables and connectors. Cisco recommends connecting an RG-59/U cable to a patch panel; RG-59/U cable is designed for long runs of up to 450 feet (137.16 meters). Use a compatible straight male BNC connector to connect the cable to the DS-3 ports on the MICs. The transmit (TX) ports on MIC A and the receive (RX) ports on MIC B use the same type of connector.

The electromagnetic compatibility (EMC) performance of the node depends on good-quality DS-3 coaxial cables, such as Shuner Type G 03233 D, or the equivalent.

Figure 1-12 shows a coaxial cable connected to the ONS 15327 MIC.

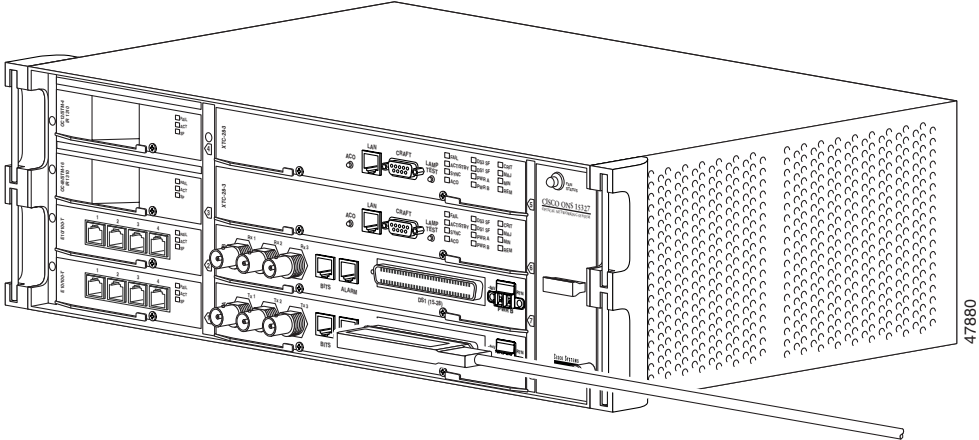
Figure 1-12 *Installing a Coaxial Cable with BNC Connectors*

1.5.6 DS-1 Cable Installation

The MIC uses AMP Champ connector cabling for DS-1 connections. Installing AMP Champ connector DS-1 cables requires 64-pin bundled cable connectors with a 64-pin male AMP Champ connector.

Figure 1-13 shows DS-1 cable installation.

Figure 1-13 Installing a DS-1 Cable



1.5.6.1 Straight DS-1 Cable Connectors

Cisco-supplied AMP Champ DS-1 cables include a straight (180-degree) connector for use with the 19-inch (482.6-mm) Cisco tie-down bar (P/N 15327-TIE-BAR-19=) or 23-inch (584.2-mm) Cisco tie-down bar (P/N 15327-TIE-BAR-23=). Cisco offers four DS-1 cables with a straight AMP Champ connector. [Table 1-1](#) lists the cable product numbers and lengths.

Table 1-1 Cisco-Supplied DS-1 Cables With Straight AMP Champ Connector

Cisco Product Number	Length of Cable (ft)
15327-AMP-WW-30=	30
15327-AMP-WW-50=	50
15327-AMP-WW-100=	100
15327-AMP-WW-250=	250

In addition to the Cisco-supplied DS-1 cables, the MIC-A-1-T and MIC-B-1-T can use the CHAMP #552285-1 and 180 degree shell housing CHAMP #552082-1 for DS-1 cabling with a straight AMP Champ connector.

1.5.6.2 90-Degree DS-1 Cable Connectors

A 90-degree angled connector is recommended for lower front profile applications. Cisco does not supply 90-degree connectors. [Table 1-2](#) lists compatible third-party DS-1 cables with 90-degree connectors.

Table 1-2 *Third-Party DS-1 Cables With 90-degree DS-1 Connectors*

MIC-28-3 Version	End of Sale	Third-party DS1 Connector
15327-MIC-28-3-A 15327-MIC-28-3-A= 15327-MIC-28-3-B 15327-MIC-28-3-B=	June 2002	"Bail loop" type DS1 connector requires CHAMP #552276-1 and a 90-degree shell housing #1-552496-1, or functional equivalents.
15327-MIC-A-T 15327-MIC-A-T= 15327-MIC-B-T 15327-MIC-B-T=	October 2003	"Screw down/lock" type connector requires CHAMP #552285-1 and 90-degree shell housing #1-552496-1, or functional equivalents.
15327-MIC-A-1-T 15327-MIC-A-1-T= 15327-MIC-B-1-T 15327-MIC-B-1-T=	Current production	<p>"Screw down/lock" type connector requires one of the following:</p> <ul style="list-style-type: none"> • Amphenol #GCA70 <ul style="list-style-type: none"> • GCA70 03006 RSE (30-ft [9.1-m] cable) • GCA70 03007 RSE (50-ft [15.2-m] cable) • GCA70 03008 RSE (100-ft [30.5-m] cable) • GCA70 03009 RSE (250-ft [76.2-m] cable) • Volex #VLX979 <ul style="list-style-type: none"> • VLX979-30 (30-ft [9.1-m] cable) • VLX979-50 (0-ft [15.2-m] cable) • VLX979-100 (100-ft [30.5-m] cable) • VLX979-250 (250-ft [76.2-m] cable) • Functional equivalent

Contact information for 90-degree cables:

- Alpine Electronics (distributor for Amphenol)
Phone number: 408 278 7171
- Volex Inc.
Phone number: 510 360 5250

**Note**

The 90-degree connectors/cables that were compatible with previous versions of the MICs can interfere with the power connector on the newest version of the MICs. Customers who are replacing an older version MIC with a spare new version MIC and use the same/existing cables as the old MIC can remove the 90-degree shell housing and replace it with 180 degree shell housing 552082-1 to avoid interference with the power connector.

1.5.7 Alarm Cable Installation

The alarm cables attach to the MICs using twisted-pair cables terminated with an RJ-45 connector that plugs into the ALARM port. The other end of the cable plugs into the alarm-collection equipment. Terminate this end of the cable according to local site practice.

The pins on the ALARM port correspond to the six external alarm inputs and the two external alarm outputs (controls) that you can define using Cisco Transport Controller (CTC). Alarms 2, 4, and 6 correspond to MIC A and alarms 1, 3, and 5 correspond to MIC B. Alarm output 1 corresponds to MIC B and alarm output 2 corresponds to MIC A. [Table 1-3](#) lists the input alarm pinouts and the corresponding alarm function numbers assigned to each MIC port.

Table 1-3 Alarm Input (External Alarm) Pin Assignments

Alarm Input Number (MIC A)	Alarm Input Number (MIC B)	RJ-45 Pin Number	Function
2	1	5	Alarm 2+
		6	Alarm 2-
4	3	3	Alarm 1+
		4	Alarm 1-
6	5	1	Alarm 0+
		2	Alarm 0-

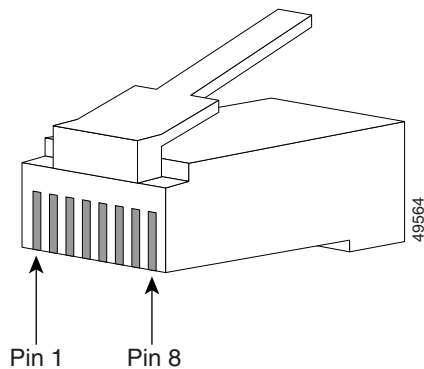
[Table 1-4](#) lists the output alarm pinouts.

Table 1-4 Alarm Output (External Control) Pin Assignments

Alarm Output Number (MIC A)	Alarm Output Number (MIC B)	RJ-45 Pin Number	Function
2	1	7	Contact+
		8	Contact-

[Figure 1-14](#) shows RJ-45 pin numbering.

Figure 1-14 Pins 1 and 8 on the RJ-45 Connector



1.5.8 BITS Cable Installation

The building integrated timing supply (BITS) cables attach to the MICs using BITS clock cable and twisted-pair #22 or #24 shielded AWG wire terminated with an RJ-45 connector that plugs into the BITS port. The other end of the cable plugs into the BITS clock. Terminate this end of the cable according to local site practice.

Each MIC has one BITS input and one BITS output. The BITS inputs and outputs have corresponding pins on the RJ-45 BITS ports. The BITS 1 inputs and outputs are on MIC A and the BITS 2 inputs and outputs are on MIC B. When connecting BITS cable to the ONS 15327, refer to [Table 1-5](#) for the BITS cable pin assignments.

Table 1-5 BITS Cable Pin Assignments

MIC A	MIC B	RJ-45 Pin Number	Function
BITS 1 In	BITS 2 In	3	BITS Input+
		4	BITS Input-
BITS 1 Out	BITS 2 Out	7	BITS Output+
		8	BITS Output-

[Figure 1-15](#) shows the BITS In pins on the RJ-45 connector.

Figure 1-15 BITS In Pins on the RJ-45 Connector

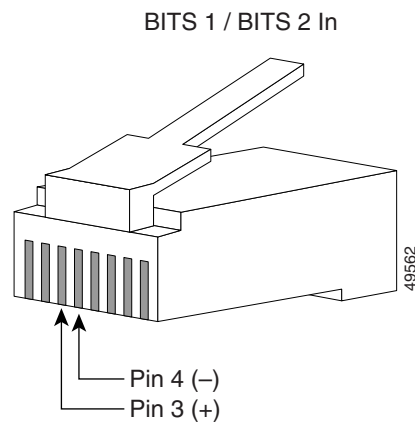
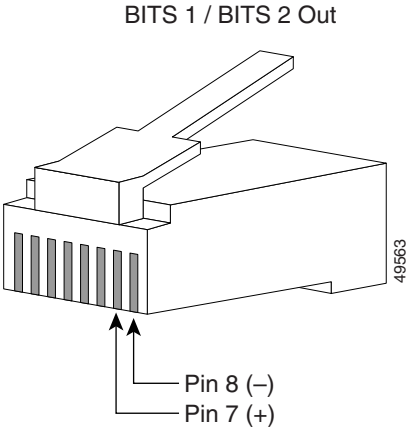


Figure 1-16 shows the BITS Out pins on the RJ-45 connector.

Figure 1-16 BITS Out Pins on the RJ-45 Connector



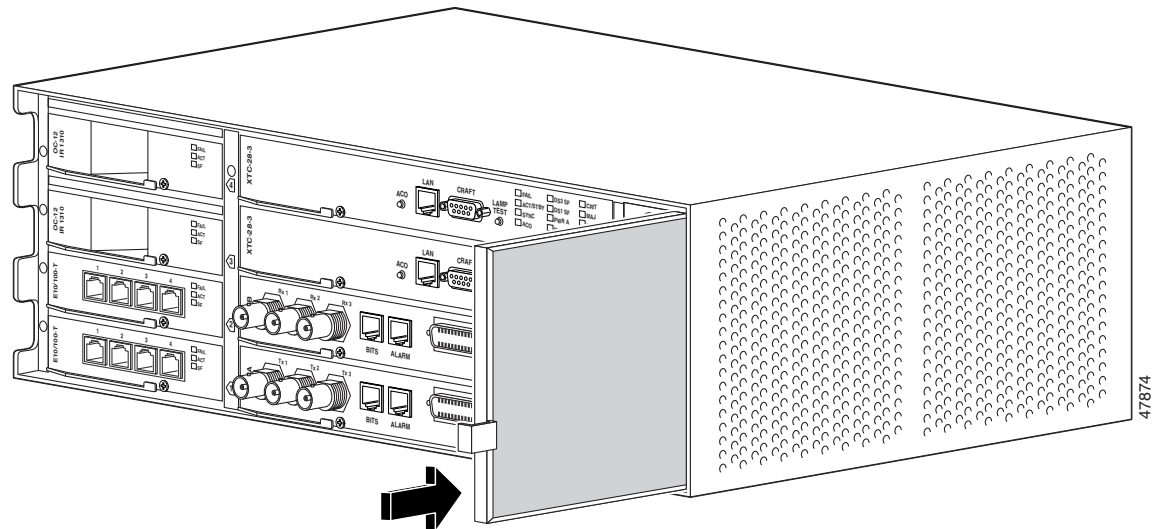
1.6 Fan-Tray Assembly

Facing the front of the ONS 15327, the fan-tray assembly is located on the far right side. The fan-tray assembly is a removable drawer that holds fans and fan-control circuitry for the ONS 15327. After you install the fan-tray assembly, you should not need to remove it unless a fan failure occurs.

The fan-tray assembly has an air filter on the right side of the fan-tray assembly that you can install and remove by hand. Remove and visually inspect this filter every 30 days. For inspection procedures, refer to the *Cisco ONS 15327 Procedure Guide*. Spare filters should be kept in stock. If you are replacing the air filter, you must first move aside the cables that cross in front of it. You must install the air filter with its metal bracing against the fan-tray assembly.

Figure 1-17 shows the location of the fan-tray air filter.

Figure 1-17 Fan-Tray Air Filter

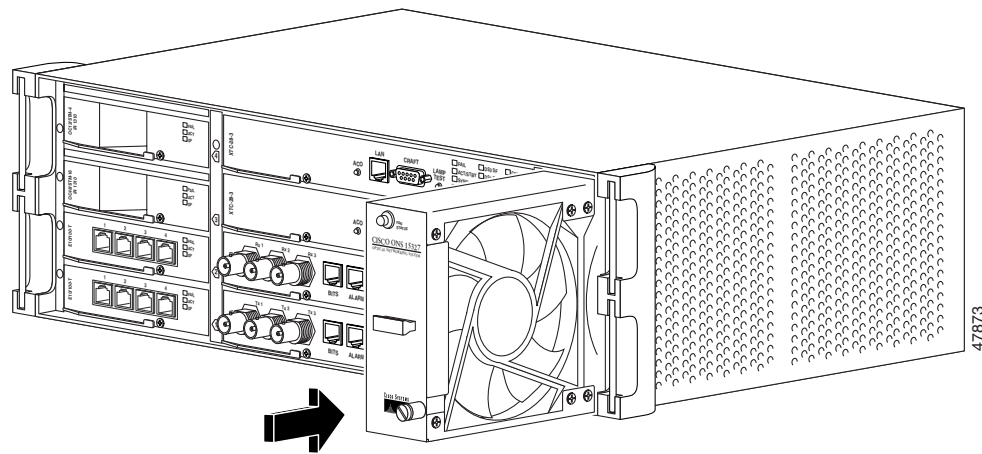


Caution

Do not force the fan-tray assembly into place while installing it. Forcing the fan-tray assembly into place can damage the connectors on the fan tray or the connectors on the back panel of the shelf assembly.

Figure 1-18 shows the location of the fan-tray assembly.

Figure 1-18 Fan-Tray Assembly



1.7 Alarm Cutoff

Visual and audible alarms are typically wired to trigger an alarm light at a central alarm collection point when the corresponding contacts are closed. The alarm cutoff (ACO) function turns off the alarm signal being transmitted to the alarm collection point.

To activate the ACO function, press the ACO button on the XTC card faceplate. The ACO button clears all audible alarm indications. After clearing the audible alarm indication, the alarm is still present on the Alarms tab in CTC and appropriate action is needed to clear the alarm. For information about connecting to alarm collection equipment, refer to the *Cisco ONS 15327 Procedure Guide*. To clear alarms, refer to the *Cisco ONS 15327 Troubleshooting Guide*.

1.8 Timing Installation

The ONS 15327 supports two BITS clock interfaces. The physical connection is provided through an RJ-45 connector on each MIC. Two pins on each RJ-45 are used for BITS timing. BITS 1 In (MIC A) and BITS 2 In (MIC B) use Pins 3 and 4. BITS 1 Out (MIC A) and BITS 2 Out (MIC B) use Pins 7 and 8. The BITS 1 pins support output and input from the first external timing device. The BITS 2 pins perform the identical functions for the second external timing device. [Table 1-6](#) lists the pin assignments for the BITS timing pin fields. For more information about connecting BITS timing to the ONS 15327, refer to the *Cisco ONS 15327 Procedure Guide*.

Table 1-6 External Timing Pin Assignments for BITS

External Device	Contact	RJ-45 Pin	Tip & Ring	Function
First external device (MIC A)	BITS 1 Out	7	Primary ring (-)	Output to external device
	BITS 1 Out	8	Primary tip (+)	Output to external device
	BITS 1 In	3	Secondary ring (-)	Input from external device
	BITS 1 In	4	Secondary tip (+)	Input from external device
Second external device (MIC B)	BITS 2 Out	7	Primary ring (-)	Output to external device
	BITS 2 Out	8	Primary tip (+)	Output to external device
	BITS 2 In	3	Secondary ring (-)	Input from external device
	BITS 2 In	4	Secondary tip (+)	Input from external device



Note

Refer to Telcordia SR-NWT-002224 for rules about how to provision timing references.

1.9 Cards and Slots



Caution

Always use the supplied ESD wristband when working with a powered ONS 15327. Plug the wristband cable into the ESD jack located between the top high-speed and XTC slots.

ONS 15327 cards have electrical plugs at the back that plug into electrical connectors on the shelf assembly backplane. When the ejectors are fully closed, the card plugs into the assembly backplane. [Figure 1-19 on page 1-22](#) shows the slot numbering.

**Note**

DS-1 and DS-3 interfaces are not intended for direct connection to the network. These interfaces should be connected to the network via a channel service unit/data service unit (CSU/DSU) that has the proper certification.

1.9.1 Slot Requirements

The ONS 15327 shelf assembly has eight card slots: four traffic card slots (Slots 1 to 4), two XTC slots (Slots 5 and 6), and two MIC slots (Slots 7 and 8). The wider slots host the XTC cards and MICs. The narrower slots host Ethernet, OC-3, OC-12, and OC-48 (traffic) cards.

The XTC slots host both XTC-14 and XTC-28-3 cards. XTC cards are required for system operation. The MIC slots host MIC A and MIC B cards. The MIC slots are keyed to ensure that you install the MICs in the correct slot. Install MIC A in the bottom MIC slot (Slot 8) and MIC B in the top MIC slot (Slot 7). MICs are also required for system operation. Make DS-1 and DS-3 connections using the connectors on the MICs. Refer to [Chapter 2, “Card Reference”](#) for more information about ONS 15327 cards.

[Table 1-7](#) lists the number of ports, line rates, connector options, and connector locations for ONS 15327 electrical, Ethernet, and optical interfaces.

Table 1-7 Port Line Rates, Connector Types, and Locations

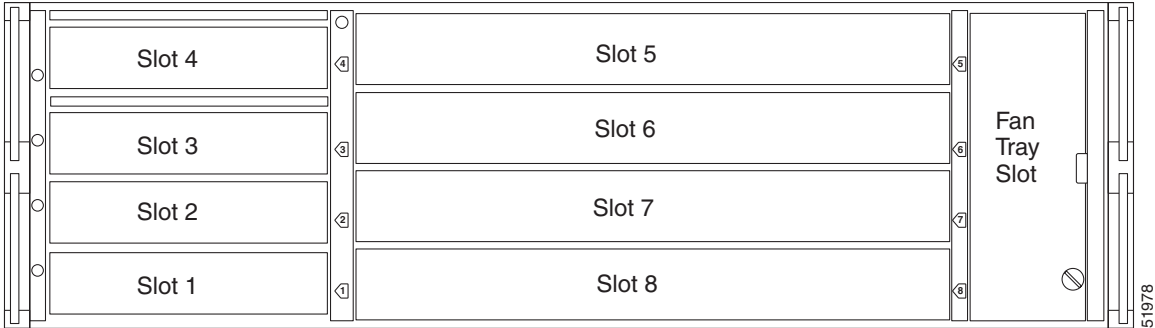
Interface	Ports	Line Rate per Port	Connector Types	Connector Location
DS-1	1–28	1.544 Mbps	CHAMP Connector	MIC faceplate
DS-3	3	44.736 Mbps	BNC	MIC faceplate
E10/100-4	4	10/100 Mbps	RJ-45	E10/100-4 card faceplate
G1000-2	2	1000 Mbps	LC (GBIC)	G1000-2 card faceplate
OC-3 IR 1310	4	155.52 Mbps (STS-3)	LC	OC-3 IR 1310 card faceplate
OC-12 IR 1310	1	622.08 Mbps (STS-12)	SC	OC-12 IR 1310 card faceplate
OC-12 LR 1550	1	622.08 Mbps (STS-12)	SC	OC-12 LR 1550 card faceplate
OC-48 IR 1310	1	2488.32 Mbps (STS-48)	SC	OC-48 IR 1310 card faceplate
OC-48 LR 1550	1	2488.32 Mbps (STS-48)	SC	OC-48 LR 1550 card faceplate

1.9.2 Card Installation

The procedure for installing ONS 15327 cards is slightly different for each card. Before installing any XTC or traffic cards, install at least one MIC and apply power to the shelf assembly. First install MIC A in Slot 8. After successfully connecting the power to MIC A, install MIC B followed by the XTC cards. Install any traffic cards after you have successfully installed and turned up the XTC cards and MICs.

Figure 1-19 shows the location and number of each card slot.

Figure 1-19 ONS 15327 Slot Numbering



Note

Because all traffic cards boot from the working XTC card, at least one XTC card must be installed in order to boot any traffic cards.

Figure 1-20 shows XTC card installation.

Figure 1-20 Installing an XTC Card (XTC 28-3)

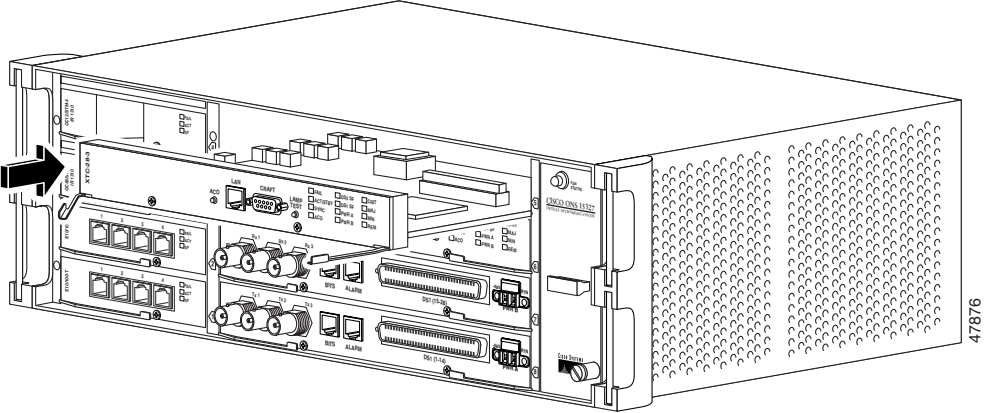
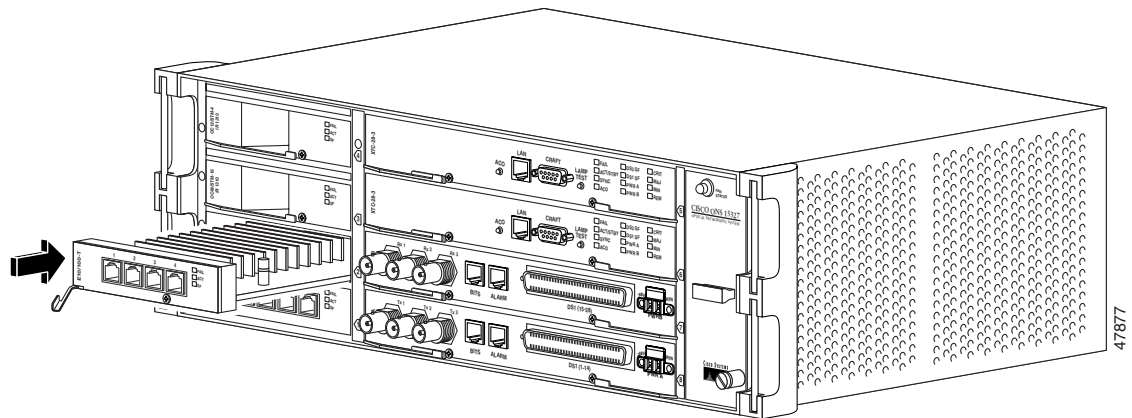


Figure 1-21 shows an Ethernet card used as an example for traffic card installation.

Figure 1-21 Installing an Ethernet Traffic Card



1.10 Hardware Specifications

The following sections list the hardware specifications for the ONS 15327 shelf assembly.

1.10.1 Slot Assignments

- Total card slots: 8
- Traffic slots (E10/100-4, G1000-2, OC-3, OC-12, and OC-48): Slots 1 to 4
- XTC slots: Slots 5, 6
- MIC slots: Slots 7, 8

1.10.2 Cards

- XTC-14
- XTC-28-3
- MIC A
- MIC B
- E10/100-4
- G1000-2
- OC-3 IR 4 1310
- OC-12 IR 1310
- OC-12 LR 1550
- OC-48 IR 1310
- OC-48 LR 1550

1.10.3 Configurations

- Point-to-point terminal
- Add-drop multiplexer
- Two-fiber path protection
- Path-protected mesh network (PPMN)
- Two-fiber bidirectional line-switched ring (BLSR, OC-12 and OC-48 cards only)

1.10.4 Cisco Transport Controller

- 10BaseT
- XTC access: RJ-45 connector

1.10.5 External LAN Interface

- 10BaseT Ethernet

1.10.6 TL1 Craft Interface

- Speed: 9600 bps
- XTC access: EIA/TIA-232 DB-9 type connector

1.10.7 Modem Interface

- Hardware flow control
- XTC: EIA/TIA-232 DB-9 type connector

1.10.8 Alarm Interface

- Visual: Critical, Major, Minor, Remote
- Audible: Critical, Major, Minor, Remote
- Alarm contacts: 0.045 mm, -48 V, 50 mA

1.10.9 Database Storage

- Nonvolatile memory: 96 MB, flash memory

1.10.10 BITS Interface

- 2 DS-1 BITS inputs
- 2 derived DS-1 outputs

1.10.11 System Timing

- Stratum 3, compliant with Telcordia GR-253-CORE
- Free running accuracy: +/-4.6 ppm
- Holdover stability: 3.7×10^{-7} /day, including temperature (< 255 slips in first 24 hours)
- Reference: External BITS, line, internal

1.10.12 Power Specifications

- Input power: -48 VDC
- Power consumption: 260 W (maximum draw with cards)
- Power requirements: -42 to -56 VDC
- Power terminals: Removable screw-locking (#12-14 AWG)

1.10.13 Environmental Specifications

- Operating temperature: 0 to +55 degrees Celsius (32 to 131 degrees Fahrenheit)
- Operating humidity: 5 to 95%, noncondensing

The Fan-Tray Assembly is required to fulfill environmental specifications.

1.10.14 Dimensions

- Height: 5.1 in. (13 cm)
- Width: 19 or 23 in. (48.3 or 58.4 cm) with mounting ears attached
- Depth: 11 in. (28 cm)
- Weight: 15 lb empty (with fan-tray assembly); 27 lb maximum

