



CHAPTER 2

Install the Cisco ONS 15310-MA

This chapter provides procedures for installing the Cisco ONS 15310-MA shelf, cards, and fiber-optic cable. To view a summary of the tools and equipment required for installation, see the [“Required Tools and Equipment”](#) section on page 2-3.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs).

1. [NTP-C149 Unpack and Inspect the ONS 15310-MA Shelf Assembly, page 2-5](#)—Complete this procedure before continuing with the [“NTP-C150 Install the Shelf Assembly”](#) procedure on page 2-5.
2. [NTP-C150 Install the Shelf Assembly, page 2-5](#)—Complete this procedure to install the shelf assembly in a rack before continuing with the [“NTP-C151 Install the Power and Ground”](#) procedure on page 2-12 or before completing one of the following optional procedures.
3. [NTP-C169 Install the Cable Management Bracket, page 2-6](#)—As needed, complete this procedure to install the cable management bracket.
4. [NTP-C166 Remove the Blank Sheet Metal Covers, page 2-9](#)—As needed, complete this procedure to access the backplane.
5. [NTP-C167 Install the EIAs, page 2-10](#)—As needed, complete this procedure to install the electrical interface assemblies (EIAs) before continuing with the [“NTP-C151 Install the Power and Ground”](#) procedure on page 2-12.
6. [NTP-C151 Install the Power and Ground, page 2-12](#)—Complete this procedure before continuing with the [“NTP-C152 Install the Fan-Tray Assembly”](#) procedure on page 2-14.
7. [NTP-C152 Install the Fan-Tray Assembly, page 2-14](#)—Complete this procedure before continuing with the [“NTP-C153 Install the CTX2500 Cards”](#) procedure on page 2-16.
8. [NTP-C153 Install the CTX2500 Cards, page 2-16](#)—Complete this procedure to install the common-control/cross-connect cards.
9. [NTP-C154 Install the Ethernet Cards, page 2-19](#)—As needed, complete this procedure to install an Ethernet card.
10. [NTP-C155 Install the Electrical Cards, page 2-20](#)—As needed, complete this procedure to install an electrical card.
11. [NTP-C156 Install the Filler Cards, page 2-22](#)—As needed, complete this procedure to install a filler card (blank faceplate) in the expansion slot. If no Ethernet or electrical card is installed in the expansion slot, you must install a filler card.

12. [NTP-C157 Install Wires to Alarm, Timing, Craft, LAN, and UDC Pin Connections, page 2-23](#)—Complete this procedure to install cables for alarms, timing, LAN, craft, and user data channel (UDC) connections.
13. [NTP-C158 Install the Electrical Cables, page 2-24](#)—Complete this procedure to connect and route cables that will carry electrical traffic.
14. [NTP-C173 Install the TST-DSX Card, page 2-25](#)—As needed, complete this procedure to test the DS-1 and DS-3 wiring integrity between an ONS 15310-MA shelf and the associated digital signal cross-connect (DSX) wiring panel.
15. [NTP-C159 Install and Remove SFPs, page 2-27](#)—As needed, complete this procedure to install Small Form-factor Pluggables (SFPs) that provide a fiber-optic interface to the CTX2500 card.
16. [NTP-C160 Install Optical Cables, page 2-28](#)—Complete this procedure to connect and route cables that will carry optical traffic.
17. [NTP-C164 Perform the Shelf Installation Acceptance Test, page 2-29](#)—Complete this procedure to determine if you have correctly completed all other procedures in the chapter.
18. [NTP-C161 Preprovision an SFP Slot, page 2-30](#)—As needed, complete this procedure to preprovision SFPs, which provide a fiber-optic interface to the ONS 15310-MA and can be provisioned for various line rates.
19. [NTP-C162 Preprovision a Card Slot, page 2-31](#)—As needed, complete this procedure to preprovision an empty card slot with a card that will be installed later.
20. [NTP-C163 Remove and Replace a Card, page 2-32](#)—As needed, complete this procedure to remove and replace an ONS 15310-MA card.
21. [NTP-C168 Install the Front Door, page 2-33](#)—As needed, complete this procedure to install the front door.
22. [NTP-C191 Install the Rear Cover, page 2-35](#)—As needed, complete this procedure to install the rear cover.

**Warning**

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.
Statement 1017

**Warning**

Installation of the equipment must comply with local and national electrical codes. Statement 1074

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations.
Statement 1040

**Note**

The ONS 15310-MA is designed to comply with Telcordia GR-1089-CORE Type 2 and Type 4. Acceptable applications include Central Office Environments (COEs), Electronic Equipment Enclosures (EEEs), Controlled Environment Vaults (CEVs), huts, and Customer Premise Environments (CPEs).

**Note**

The Cisco ONS 15310-MA is intended for use with telecommunications equipment only.

**Warning**

The intra-building ports of the ONS15310-MA are suitable only for connecting to intrabuilding or unexposed wiring or cabling. The intra-building ports of ONS15310-MA MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

Required Tools and Equipment

You will need the following tools and equipment to install and test the ONS 15310-MA.

Included Materials

These materials are shipped with the ONS 15310-MA. The number in parentheses provides the quantity of the item included in the package.

- Ground lug (1)
- Screws: panhead, 10-32 x 0.375 (10)
- Screws: panhead, 10-32 x 0.37, green zinc (2)
- Screws: panhead, 12-24 x 0.75 (8)
- Screws: panhead, 10-32 x 0.31 (2)
- Screws: panhead, 8-32 x 0.31 (3)
- Kep nut: 10-32 x 0.170
- Rack mount bracket
- Interconnect plate
- Rack mount bracket for 19-inch rack
- Rack mount bracket for 23-inch rack
- Cable routing bracket

User-Supplied Materials

These materials and tools are required but are not supplied with the ONS 15310-MA.

- Equipment rack (26 inches total width for a 23-inch rack)
- Fuse and alarm panel
- Copper power cable (from fuse and alarm panel to assembly), #12 AWG
- Ground cable, #6 AWG stranded (minimum)
- Alarm In cable, unshielded cable terminated with a DB-37 connector

- Alarm Out cable, shielded cable terminated with a DB-25 connector
- Craft port serial cable, CAT-5 terminated with RJ-45
- BITS timing port cable, CAT-3/CAT-5 terminated with DB-9 connector
- User data channel (UDC) cable: EIA/TIA-232 port cable, CAT-5 terminated with RJ-45
- Management LAN cable, CAT-5 terminated with RJ-45
- Single-mode LC fiber jumpers with UPC polish (55 dB or better) for optical interfaces
- DS1 cabling, shielded, terminated to a 21-pair #26AWG cable, with dual 64-pin CHAMP connectors at far end with separate transmit and receive, straight termination (optional)
- Shielded coaxial cable terminated with BNC connectors for DS-3/EC-1 ports
- Tie wraps and/or lacing cord
- Labels

Tools Needed

The following tools are needed to complete the procedures in this chapter:

- #2 Phillips screw driver
- Medium slot head screw driver
- Small slot head screw driver
- Wire cutters
- Wire strippers

Test Equipment

The following test equipment is needed to complete the procedures in this chapter:

- Volt meter
- Power meter (for use with fiber optics only)
- Bit error rate (BER) tester, DS-1 and DS-3/EC-1



Note

In this chapter, the terms “ONS 15310-MA” 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 15310-MA refers to the entire system, both hardware and software.

NTP-C149 Unpack and Inspect the ONS 15310-MA Shelf Assembly

Purpose	This procedure describes how to unpack the ONS 15310-MA and verify the contents.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

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- Step 1** Complete the “[DLP-C1 Unpack and Verify the Shelf Assembly](#)” task on page 17-1.
- Step 2** Complete the “[DLP-C2 Inspect the Shelf Assembly](#)” task on page 17-1.
- Step 3** Continue with the “[NTP-C150 Install the Shelf Assembly](#)” procedure on page 2-5.
- Stop. You have completed this procedure.**
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NTP-C150 Install the Shelf Assembly

Purpose	This procedure describes how to mount ONS 15310-MA shelf assemblies in a rack.
Tools/Equipment	#2 Phillips screwdriver #12-24 mounting screws (4) #10-32 ear mounting screws (8) Universal mounting ears (2) Dual-assembly plate 19-inch-rack mounting ear 23-inch-rack mounting ear Fuse and alarm panel, if not installed
Prerequisite Procedures	NTP-C149 Unpack and Inspect the ONS 15310-MA Shelf Assembly, page 2-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Note

The ONS 15310-MA installations are suitable for Network Telecommunication facilities and locations where NEC are applicable.

**Warning**

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 149°F (65°C). Statement 1047

**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. Statement 1006

Step 1

Complete the necessary rack mount task:

- [DLP-C248 Mount a Single ONS 15310-MA in a Rack, page 19-58](#)
- [DLP-C249 Mount Dual ONS 15310-MA Shelf Assemblies in a Rack, page 19-61](#)

Step 2

Continue with the “[NTP-C169 Install the Cable Management Bracket](#)” procedure on page 2-6.

Stop. You have completed this procedure.

NTP-C169 Install the Cable Management Bracket

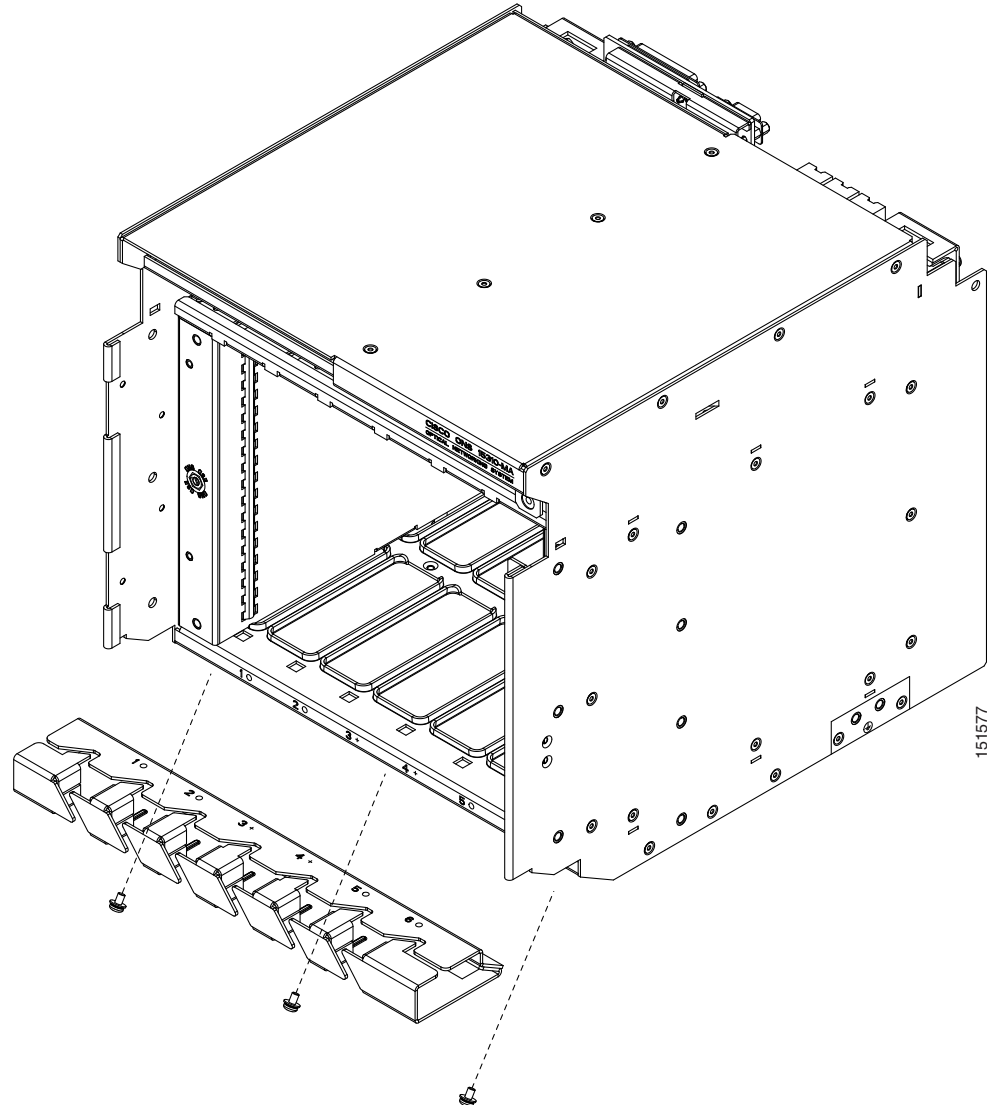
Purpose	This procedure describes how to install the cable management bracket, which is used for routing optical and Ethernet cables.
Tools/Equipment	#2 Phillips screwdriver Standard cable management bracket and three #8-32 x 0.31 inch (0.79 cm) screws (included with the ship kit) or Extended cable management bracket (15310-CBLMGT) and five 8-32 x 0.31 inch (0.79 cm) screws
Prerequisite Procedures	NTP-C150 Install the Shelf Assembly, page 2-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Warning**

The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077

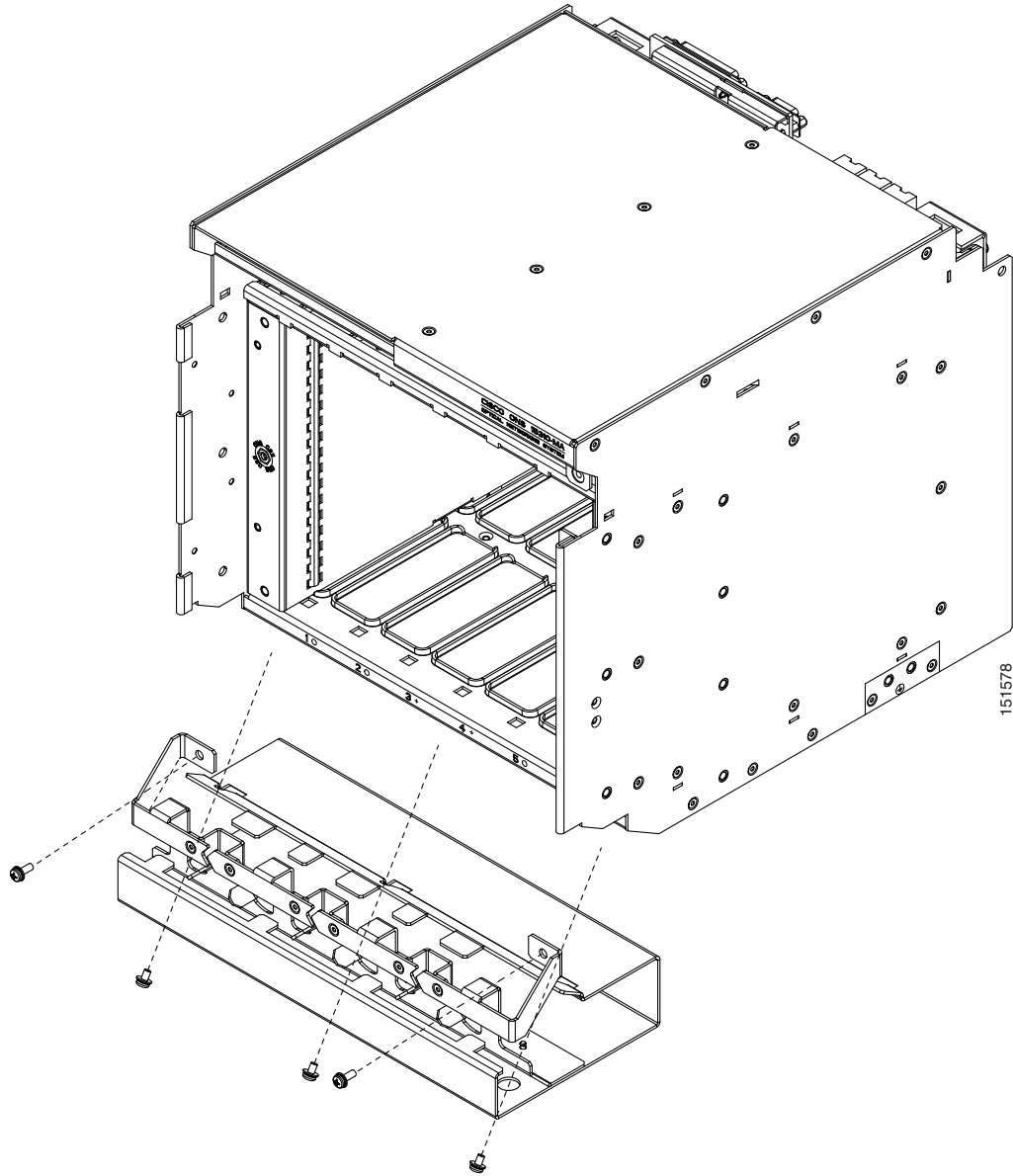
Step 1

Line up the three screw holes on the rear of the bracket with the screw holes at the bottom of the ONS 15310-MA shelf assembly ([Figure 2-1](#)).

Figure 2-1 Installing the Standard Cable Management Bracket

- Step 2** To secure the bracket to the shelf, use the screwdriver to install three 8-32 x 0.31 inch (0.79 cm) screws, torqued to 15 to 18 inch-lbs.
- Step 3** If you are installing the extended bracket, install two 8-32 x 0.31 inch (0.79 cm) screws, torqued to 15 to 18 inch-lbs, through the top of the bracket directly into the ESD faceplates adjacent to Slots 1 and 6 on either side of shelf ([Figure 2-2](#)).

Figure 2-2 Installing the Extended Cable Management Bracket



Step 4 If you plan to install electrical interface assemblies (EIAs), continue with the [“NTP-C166 Remove the Blank Sheet Metal Covers”](#) procedure on page 2-9 to access the backplane. If not, continue with the [“NTP-C151 Install the Power and Ground”](#) procedure on page 2-12.

Stop. You have completed this procedure.

NTP-C166 Remove the Blank Sheet Metal Covers

Purpose	This procedure describes how to access the backplane by removing the blank sheet metal covers. The backplane has two sheet metal covers (one on either side).
Tools/Equipment	#2 Phillips screwdriver
Prerequisite Procedures	NTP-C150 Install the Shelf Assembly, page 2-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

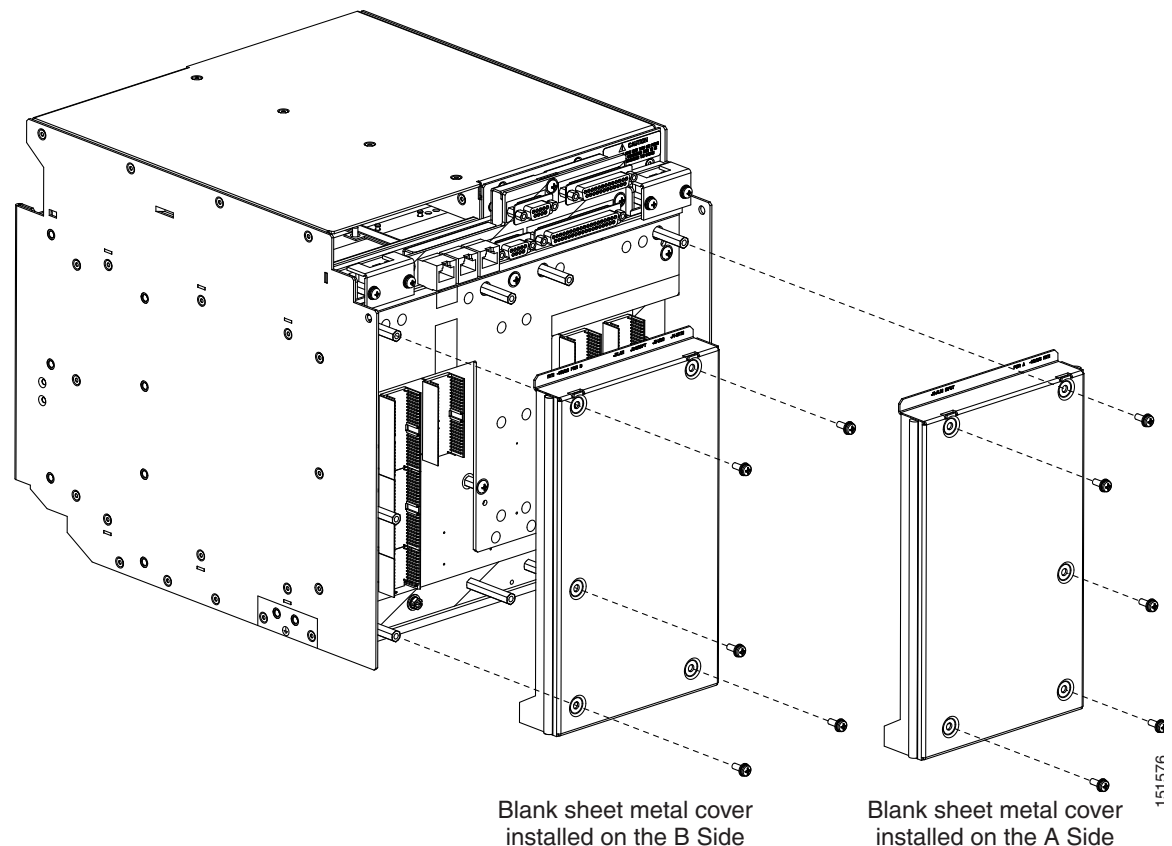


Warning

The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077

- Step 1** Use a Phillips screwdriver to remove the five screws holding each sheet metal cover in place. [Figure 2-3](#) shows the screw locations of the sheet metal covers installed on the A-side and B-side of the ONS 15310-MA.

Figure 2-3 Blank Sheet Metal Covers



- Step 2** Store the panels for later use. Attach the backplane cover(s) whenever EIA(s) are not installed.

Step 3 If you plan to install electrical interface assemblies (EIAs), continue with the “[NTP-C167 Install the EIAs](#)” procedure on page 2-10. If not, continue with the “[NTP-C151 Install the Power and Ground](#)” procedure on page 2-12.

Stop. You have completed this procedure.

NTP-C167 Install the EIAs

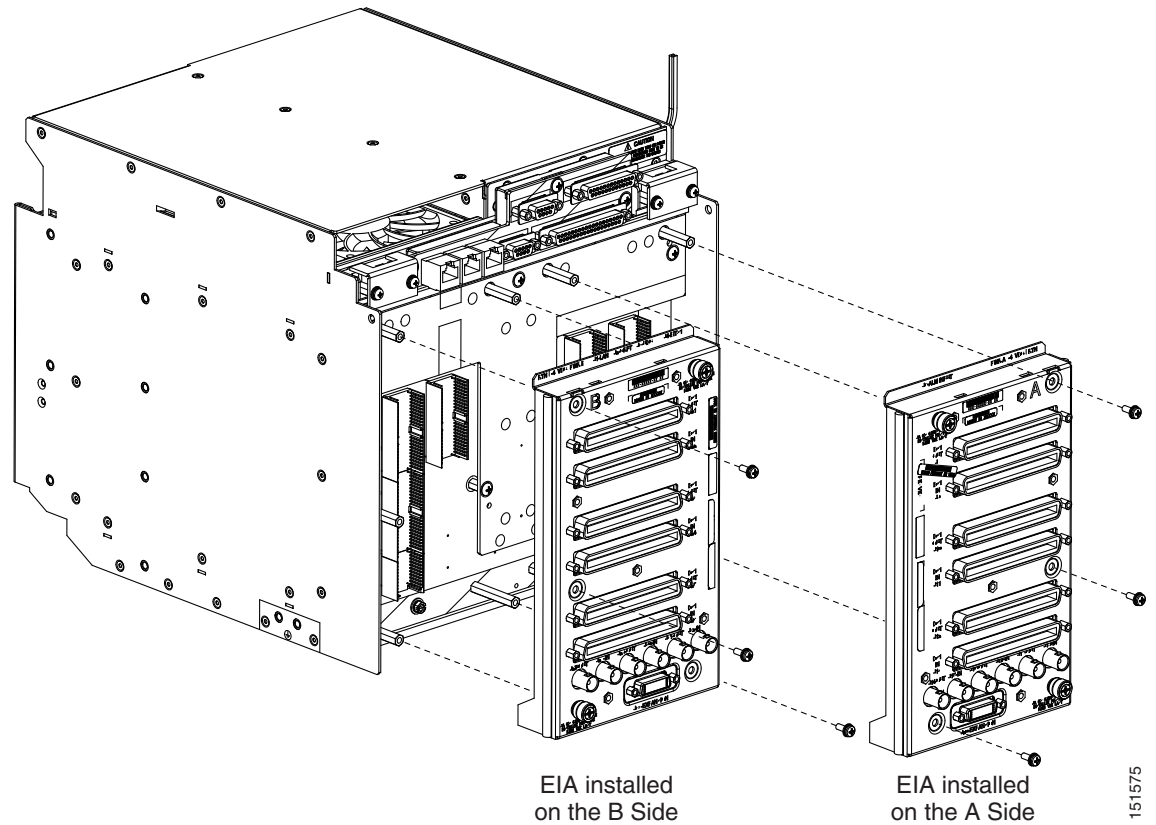
Purpose	This procedure describes how to install electrical interface assemblies (EIAs). Refer to the <i>Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual</i> for descriptions of the EIAs.
Tools/Equipment	#2 Phillips screwdriver High-density EIA(s) 6-32 x 5/16-inch pan head screws (3, included with EIA)
Prerequisite Procedures	NTP-C169 Install the Cable Management Bracket, page 2-6
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Caution

Connect only SELV services to the high-density EIAs on the ONS 15310-MA.

Step 1 Determine which high-density EIA is designed for installation on the B Side and which is designed for installation on the A Side ([Figure 2-4](#)).

Figure 2-4 High-Density EIA Installation

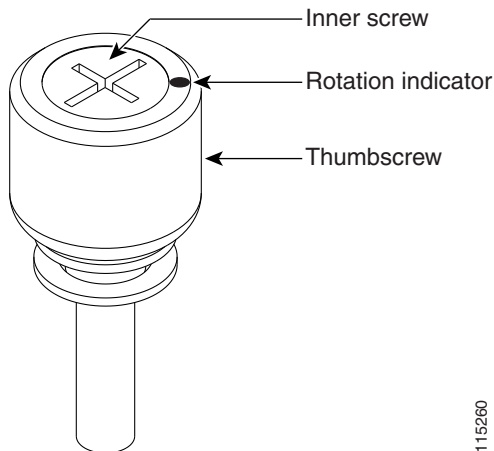
- Step 2** Align the connectors on the EIA you want to install with the mating connectors on the backplane, using the plastic guide posts on the connectors.



Caution Do not firmly apply pressure to the EIA; this could damage the EIA and backplane connectors.

- Step 3** Seat the EIA as flat as possible by gently exerting enough pressure with your hands to only partially seat the connectors. Do not try and fully insert the EIA.
- Step 4** Locate the two jack screws on the EIA, which are found on the opposite corners ([Figure 2-4 on page 2-11](#)). (For example, on the B-side EIA, the screws are located in the top right and bottom left corners.)
- Step 5** Starting with either jack screw, tighten the thumb screw turn five full turns, then turn the other thumb screw five full turns ([Figure 2-5](#)). Alternate between the jack screws until the EIA is full seated onto the chassis and the jack screws are hand tight. The EIA is fully mated when both jack screws are fully threaded into the chassis.

Figure 2-5 EIA Jack Screw



115260

**Caution**

Threading one jack screw completely before threading the other jack screw might result in connector misalignment and damage to the EIA. Do not overtighten the jack screws.

- Step 6** Install the remaining three 6-32 x 5/16-inch pan head screws onto the EIA and torque to 8 to 10 in-lbs.
- Step 7** Repeat Steps 2 through 6 to install the other EIA, as necessary.
- Step 8** Continue with the [“NTP-C151 Install the Power and Ground” procedure on page 2-12](#).
- Stop. You have completed this procedure.**

NTP-C151 Install the Power and Ground

Purpose	This procedure describes how to install power feeds and how to ground the ONS 15310-MA.
Tools/Equipment	Ground cable, #6 AWG stranded copper conductors, minimum 90 degrees C (194 degrees F) Copper power cable (from fuse and alarm panel to assembly), #12 AWG stranded copper conductors, minimum 90 degrees C (194 degrees F)
Prerequisite Procedures	NTP-C150 Install the Shelf Assembly, page 2-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**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. Statement 1045

**Warning**

Read the installation instructions before connecting the system to the power source. Statement 1004

**Warning**

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

**Warning**

This equipment must be grounded. Never defeat the ground conductor or operate 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. Statement 1024

**Warning**

Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

**Warning**

Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements under IEC 60950-1 based safety standards. Statement 1033

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Warning**

Use copper conductors only. Statement 1025

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

-
- Step 1** Verify that the proper fuse panel is installed (20-amp fuse per shelf minimum). If not, install one according to manufacturer instructions.
- Step 2** Complete the [“DLP-C250 Connect the Office Ground to the ONS 15310-MA”](#) task on page 19-65.
- Step 3** Complete the [“DLP-C251 Connect Office Power to the ONS 15310-MA”](#) task on page 19-68.
- Step 4** Complete the [“DLP-C252 Turn On and Verify Office Power to the ONS 15310-MA”](#) task on page 19-69.
- Step 5** Continue with the [“NTP-C152 Install the Fan-Tray Assembly”](#) procedure on page 2-14.
- Stop. You have completed this procedure.**
-

NTP-C152 Install the Fan-Tray Assembly

Purpose	This procedure installs the air filter and fan-tray assembly in the ONS 15310-MA.
Tools/Equipment	#2 Phillips screwdriver Fan-tray assembly Fan filter
Prerequisite Procedures	NTP-C151 Install the Power and Ground, page 2-12
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None


Caution

Do not operate an ONS 15310-MA without a fan-tray air filter. A fan-tray air filter is mandatory in order to comply with Telcordia GR-63-CORE.


Caution

You must place the edge of the air filter flush against the front of the fan-tray assembly compartment when installing the fan tray on top of the filter. Failure to do so could result in damage to the filter, the fan tray, or both.


Caution

Do not force a fan-tray assembly into place. Doing so can damage the connectors on the fan tray and/or the connectors on the back panel of the shelf assembly.

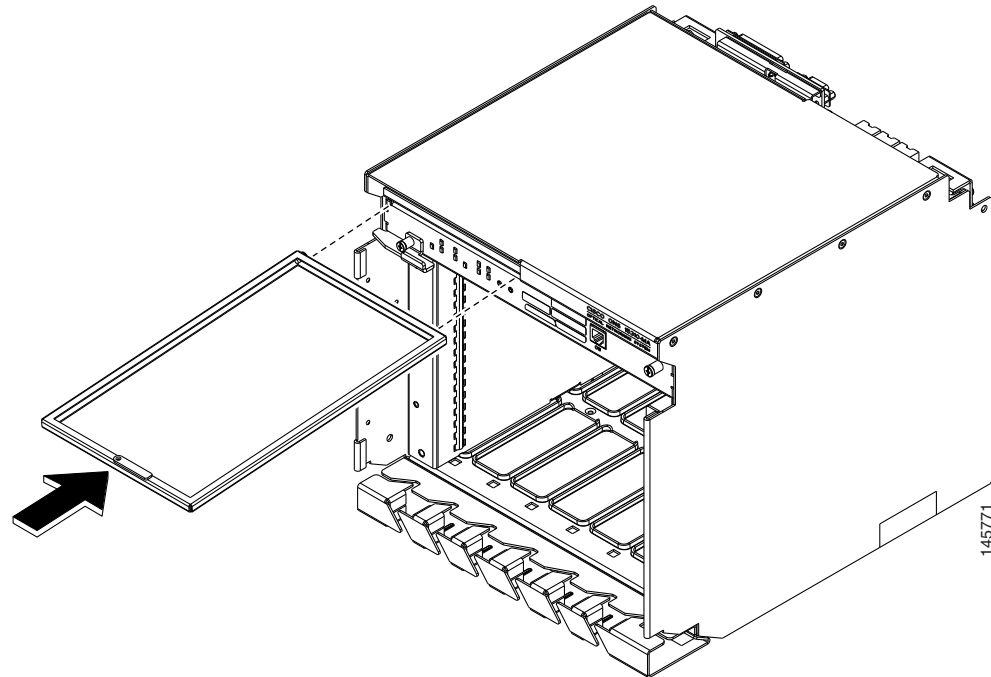

Warning

Order Wire (OW) port is an intra-building wiring port used only for maintenance purposes and is not connected during normal operation. This port must NOT be connected to any telecommunication network.

Step 1

Install the air filter. The air filter is installed internally in the slot at the top left of the shelf assembly ([Figure 2-6](#)). Pull the tab, located at the center of the front of the fan filter, toward you. Make sure the tab is facing up before you install the fan filter.

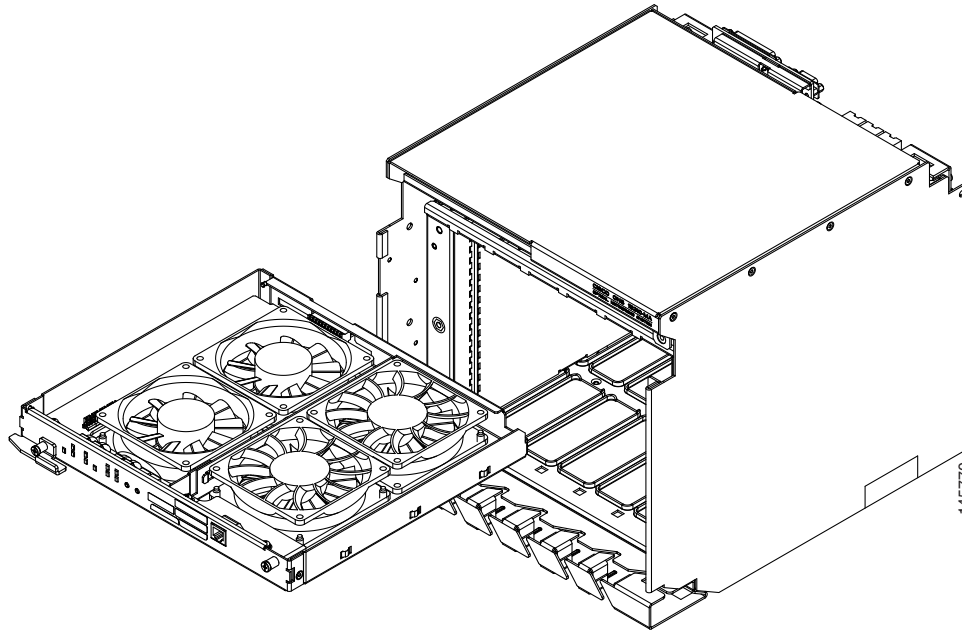
Figure 2-6 Installing the Fan-Tray Air Filter



- Step 2** Slide the air filter into the bracket, and push the tab closed
- Step 3** Pull the fan tray ejector all the way out.
- Step 4** Use the ejector to slide the fan tray into the shelf assembly until the electrical plug at the rear of the tray plugs into the corresponding receptacle on the backplane.
- Step 5** Close the ejector.
- Step 6** Use a Phillips screwdriver to tighten the screws at either end of the fan-tray assembly.
- Step 7** To verify that the tray has plugged into the backplane, look at the fan tray and listen to determine that the fans are running.

[Figure 2-7](#) shows the location of the fan-tray assembly.

Figure 2-7 Installing the Fan-Tray Assembly



- Step 8** Continue with the “[NTP-C153 Install the CTX2500 Cards](#)” procedure on page 2-16.
Stop. You have completed this procedure.

NTP-C153 Install the CTX2500 Cards

Purpose	This procedure installs CTX2500 cards in the ONS 15310-MA.
Tools/Equipment	None
Prerequisite Procedures	DLP-C8 Turn On and Verify DC Office Power on the ONS 15310-CL , page 17-11
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Retrieve or higher



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.

Statement 1029



Warning

During this procedure, wear grounding wrist straps to avoid electrostatic discharge (ESD) damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

**Warning**

Invisible laser radiation could be emitted from the end of the unterminated fiber cable or connector. Do not stare into the beam directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm could pose an eye hazard. Statement 1056

**Warning**

Class I (CDRH) and Class 1M (IEC) laser products. Statement 1055

**Warning**

Use of controls, adjustments, or performing procedures other than those specified may result in hazardous radiation exposure. Statement 1057

**Warning**

The Ethernet ports and the LAN port on CTX2500 cards of ONS15310-MA are intra-building ports and are suitable only for connecting to cat-5 shielded (STP) cabling grounded at both ends. Statement 1084

**Warning**

The CRAFT ports of ONS15310-MA are intra-building ports used only for setup and maintenance purposes by trained personnel and are not connected during normal operation. Statement 1085

**Caution**

Do not install a CTX2500 card in an ONS 15310-MA if the ambient temperature exceeds 149 degrees F (65 degrees C).

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

**Note**

If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Step 1

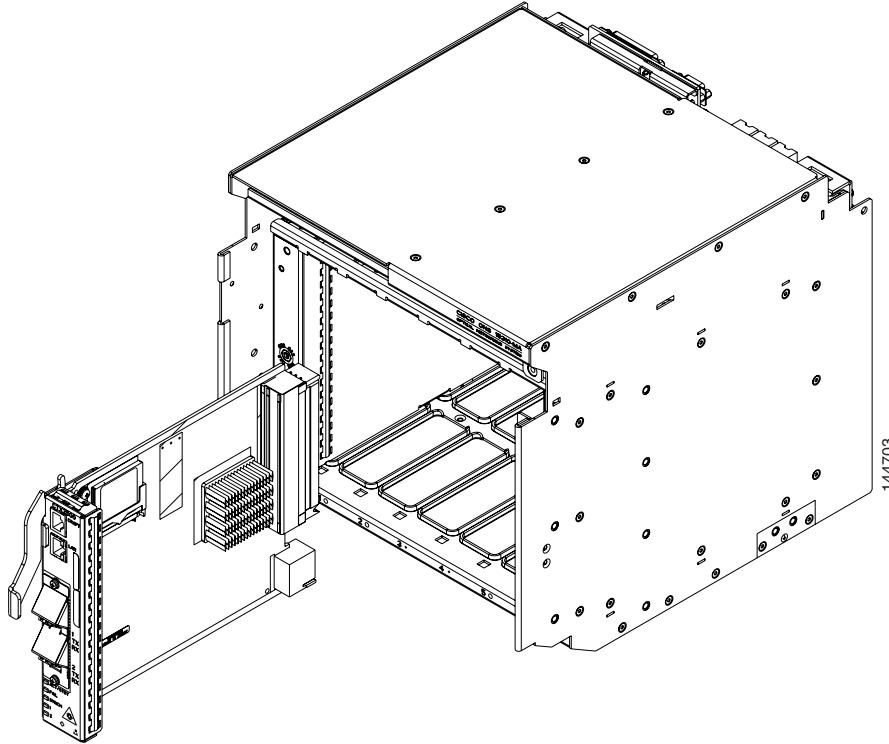
Install a CTX2500 card in Slot 3 or 4 ([Figure 2-8](#)):

- a. Open the card ejector.
- b. Use the ejector at the top of the card and firmly slide the card along the guide rails until the card plugs into the receptacle at the back of the slot.
- c. Verify that the card is inserted correctly and close the ejector on the card.

**Note**

The CTX2500 cards are hot-pluggable, which means they can be inserted or removed without turning off the power to the ONS 15310-MA.

Figure 2-8 Installing a CTX2500 Card



- Step 2** Verify the CTX2500 card LED activity:
- a. The red FAIL LED turns on for 30 to 45 seconds. It then turns off for 5 seconds, and turns back on for 30 seconds.
 - b. The red FAIL LED blinks for 20 seconds, and turns off for 5 seconds.
 - c. All LEDs turn on for 2 seconds.
 - d. The ACT/STBY LED turns on. It is green if the card is active, or amber if the card is standby.
- Step 3** When you log into CTC, verify that the card appears properly in CTC node view.
- Step 4** As necessary, continue with the [“NTP-C154 Install the Ethernet Cards” procedure on page 2-19](#).
- Stop. You have completed this procedure.**
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NTP-C154 Install the Ethernet Cards

Purpose	This procedure installs the Ethernet cards (CE-100T-8 or ML-100T-8) in the ONS 15310-MA. Ethernet cards can be installed in any traffic card slot (Slot 1, 2, 5, or 6).
Tools/Equipment	None
Prerequisite Procedures	DLP-C8 Turn On and Verify DC Office Power on the ONS 15310-CL, page 17-11
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Retrieve or higher



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.

Statement 1029



Warning

To comply with the Telcordia GR-1089 Network Equipment Building Systems (NEBS) standard for electromagnetic compatibility and safety, connect the copper Ethernet ports to intrabuilding or nonexposed wiring and cabling only.



Warning

The Ethernet ports and the LAN port on CTX2500 cards of ONS15310-MA are intra-building ports and are suitable only for connecting to cat-5 shielded (STP) cabling grounded at both ends. Statement 1084



Warning

The CRAFT ports of ONS15310-MA are intra-building ports used only for setup and maintenance purposes by trained personnel and are not connected during normal operation. Statement 1085



Caution

Do not install an Ethernet card in an ONS 15310-MA if the ambient temperature exceeds 149 degrees F (65 degrees C).



Caution

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.



Note

If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Step 1

Install an Ethernet card (CE-100T-8 or ML-100T-8) in a traffic card slot:

- a. Open the card ejector.

- b. Use the ejector at the top of the card and firmly slide the card along the guide rails until the card plugs into the receptacle at the back of the slot.
- c. Verify that the card is inserted correctly and close the ejector on the card.



Note The Ethernet cards are hot-pluggable, which means they can be inserted or removed without turning off the power to the ONS 15310-MA.

- Step 2** Verify the Ethernet card LED activity:
- a. Verify that the red FAIL LED is off.
 - b. Verify that the green ACT LED is on.
- Step 3** When you log into CTC, verify that the card appears properly in CTC node view.
- Step 4** As necessary, continue with the [“NTP-C155 Install the Electrical Cards” procedure on page 2-20](#).
- Stop. You have completed this procedure.**

NTP-C155 Install the Electrical Cards

Purpose	This procedure installs electrical cards (DS1-28/DS3-EC1-3 or DS1-84/DS3-EC1-3) in the ONS 15310-MA. Electrical cards can be installed in any traffic card slot (Slot 1, 2, 5, or 6).
Tools/Equipment	None
Prerequisite Procedures	DLP-C8 Turn On and Verify DC Office Power on the ONS 15310-CL, page 17-11
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Retrieve or higher



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.

Statement 1029



Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94



Warning

The DS1/DS3 ports on the ONS15310-MA are intra-building ports and are suitable for connection only to shielded cabling grounded at both ends. Statement 1084

**Caution**

Ensure that the patch panel is grounded before installing the DS1-28 or DS1-84 electrical cards on the Cisco ONS 15310-MA chassis.

**Warning**

When installing the unit, always make the ground connection first and disconnect it last. Statement 42.

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

**Caution**

Do not install an electrical card in an ONS 15310-MA if the ambient temperature exceeds 149 degrees F (65 degrees C).

**Note**

If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Step 1

Install an electrical card (DS1-28/DS3-EC1-3 or DS1-84/DS3-EC1-3) in a traffic card slot:

- a. Open the card ejector.
- b. Use the ejector at the top of the card and firmly slide the card along the guide rails until the card plugs into the receptacle at the back of the slot.
- c. Verify that the card is inserted correctly and close the ejector on the card.

**Note**

The electrical cards are hot-pluggable, which means they can be inserted or removed without turning off the power to the ONS 15310-MA.

Step 2

Verify the electrical card LED activity:

- a. All LEDs (FAIL, ACT/STBY, DS1 SF, DS3 SF) turn on for 5 seconds, then turn off.
- b. The green ACT/STBY and red FAIL LED turn on for 15 seconds.
- c. The red FAIL LED flashes for 10 seconds, then becomes steady red for 30 seconds.
- d. While the red FAIL LED is on, the ACT/STBY LED turns green for three seconds, then turns amber. During this time, the DS1 SF and DS3 SF LEDs are amber.
- e. All LEDs turn off.
- f. The ACT/STBY LED turns green (active) or amber (standby).

Step 3

When you log into CTC, verify that the card appears properly in CTC node view.

Step 4

As necessary, continue with the [“NTP-C156 Install the Filler Cards” procedure on page 2-22](#).

Stop. You have completed this procedure.

NTP-C156 Install the Filler Cards

Purpose	This procedure installs the filler cards (blank faceplates) in any unused ONS 15310-MA traffic or CTX2500 card slot. The filler cards are detectable in CTC.
Tools/Equipment	Filler card(s) for empty traffic card slots (15310-EXP-FILLER) and/or a filler card for empty CTX2500 card slots (15310-CTX-FILLER)
Prerequisite Procedures	DLP-C8 Turn On and Verify DC Office Power on the ONS 15310-CL, page 17-11
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Retrieve or higher



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.

Statement 1029



Caution

Make sure you install the appropriate filler card for the slot where you are installing the card. Filler card(s) for empty traffic card slots have the product ID 15310-EXP-FILLER, and filler cards for empty CTX2500 card slots have the product ID 15310-CTX-FILLER.

- Step 1** Open the card ejector at the top of the card.
- Step 2** Slide the card along the guide rails into the slot.
- Step 3** Close the ejector by firmly pushing it downward.




Note The filler cards are hot-pluggable, so they can be inserted or removed without turning off the power to the ONS 15310-MA.

- Step 4** When you log into CTC, verify that the card appears properly in CTC node view.
- Step 5** Continue with the [“NTP-C157 Install Wires to Alarm, Timing, Craft, LAN, and UDC Pin Connections” procedure on page 2-23.](#)

Stop. You have completed this procedure.

NTP-C157 Install Wires to Alarm, Timing, Craft, LAN, and UDC Pin Connections

Purpose	This procedure installs alarm, timing, craft (for TL1), LAN (for CTC), and UDC wires.
Tools/Equipment	Alarm In cable, unshielded cable terminated with a DB-37 connector Alarm Out cable, unshielded cable terminated with a DB-25 connector Craft port serial cable, CAT-5 terminated with RJ-45 BITS timing port cable, CAT-3/CAT-5 terminated with DB-9 connector BITS timing port cable, CAT-3/CAT-5 terminated with DB9BIT=BB9 to wire wrap adapter
 Note	The cable shield must be wire-wrapped to the GND pin of the wire wrap adapter.
	User data channel (UDC) cable: EIA/TIA-232 port cable, CAT-5 terminated with RJ-45 Management LAN cable, CAT-5 terminated with RJ-45
Prerequisite Procedures	NTP-C150 Install the Shelf Assembly, page 2-5
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Warning

The Alarm, Timing (BITS), Craft, LAN and UDC ports of ONS15310-MA are intra-building ports. The CRAFT and LAN ports (rear side) of ONS15310-MA are intra-building ports used only for setup and maintenance purposes by trained personnel and are not connected during normal operation. The BITS ports are suitable only for connecting to shielded cabling grounded at both ends.



Caution

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

- Step 1** Complete the [“DLP-C253 Install External Alarm Cables on the ONS 15310-MA” task on page 19-70](#) as needed. An alarm cable is necessary to provision external alarms and external controls.
- Step 2** Complete the [“DLP-C254 Install Timing Cables on the ONS 15310-MA” task on page 19-72](#) as needed. Timing cables are necessary to provision external timing.
- Step 3** Complete the [“DLP-C255 Install the Serial Cable for TL1 Craft Interface on the ONS 15310-MA” task on page 19-73](#) as needed. A craft cable is required to use Transaction Language One (TL1) through the craft interface.
- Step 4** Complete the [“DLP-C256 Install the UDC Cable on the ONS 15310-MA” task on page 19-73](#) to enable UDC circuits. A UDC circuit allows you to create a dedicated data channel between nodes.
- Step 5** Complete the [“DLP-C257 Install the LAN Cable for the CTC Interface on the ONS 15310-MA” task on page 19-74](#) to provide access to the CTC graphical user interface (GUI).

- Step 6** Continue with the “[NTP-C158 Install the Electrical Cables](#)” procedure on page 2-24.
Stop. You have completed this procedure.
-

NTP-C158 Install the Electrical Cables

Purpose	This procedure describes how to install the electrical DS-1 (64-pin Champ) and DS-3/EC-1 (coaxial) cables. To carry electrical traffic on the ONS 15310-MA, you must install electrical cables.
Tools/Equipment	Shielded coaxial cable terminated with BNC connectors for DS-3/EC-1 ports 64-pin Champ connector terminated to shielded, twisted-pair cable
Prerequisite Procedures	NTP-C157 Install Wires to Alarm, Timing, Craft, LAN, and UDC Pin Connections , page 2-23
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Caution

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

- Step 1** Complete the “[DLP-C258 Install CHAMP Cables for DS-1 Connection](#)” task on page 19-75 as needed.
- Step 2** Complete the “[DLP-C259 Install DS-3/EC-1 Cables](#)” task on page 19-78 as needed.
- Step 3** Complete the “[DLP-C260 Route Cables](#)” task on page 19-79 as needed.
- Step 4** If you need to verify the wiring continuity of DS-1 or DS-3 connections between the node and the DSX panel, continue with the “[NTP-C173 Install the TST-DSX Card](#)” procedure on page 2-25. Otherwise, continue with the “[NTP-C159 Install and Remove SFPs](#)” procedure on page 2-27.

Stop. You have completed this procedure.

NTP-C173 Install the TST-DSX Card

Purpose	Use this procedure to install the TST-DSX card and associated equipment. The TST-DSX test card enables you to verify the wiring continuity of DS-1 and DS-3/EC-1 electrical connections between the ONS 15310-MA and the external frame or DSX panel.
Tools/Equipment	<p>Cisco ONS 15310-MA DSX Wiring Verification kit</p> <ul style="list-style-type: none"> • TST-DSX card • Handheld Receiver • AC to DC power supply • DS3 patch cords <ul style="list-style-type: none"> – 75-ohm male BNC connector to male WEC0 440A male connector – 75-ohm male BNC connector to WEC0 358 male connector – 75-ohm male BNC connector to 75-ohm male BNC connector – 75-ohm male BNC connector to LCP connector • DS1 patch cords <ul style="list-style-type: none"> – 100-ohm male Bantam connector to 100-ohm male Bantam connector – 100-ohm male Bantam connector to 100-ohm 310 connector • 9-pin, EIA-232 female connector to 9-pin, EIA-232 female connector
Prerequisite Procedures	NTP-C158 Install the Electrical Cables, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Note

Used with a remote receiver, the TST-DSX card indicates whether the wiring connections are valid, which allows users to take corrective action prior to turning up service. The TST-DSX card is normally used in systems where there are no working services and likely no power applied. A hand-held remote receiver module is used with the TST-DSX card and is plugged into the DSX panel during testing using the provided cables. The receiver allows the user to initiate tests, display test status and errors, and store test results that can be transferred to a PC over an EIA-232 connection.



Caution

The goal of this procedure is to test the wiring between the DSX and an empty Cisco ONS 15310-MA shelf assembly. The wiring type is DS-1 or DS-3. There must be no DS-1 or DS-3 traffic on the side of the shelf being tested. The TST-DSX card disrupts service if it is plugged into a shelf side where a DS-1 or DS-3 card is carrying traffic.

- Step 1** Insert the TST-DSX card into one of the expansion slots on the shelf (either Side A, Slot 1 or 2, or Side B, Slot 5 or 6).
- Step 2** If the shelf power is on, continue with [Step 3](#). If the shelf power is not on, plug the supplied AC-to-DC adaptor into a wall outlet and plug the barrel connector of the power cable into the 48 VDC jack on the TST-DSX card faceplate.

Step 3 Set the TST-DSX card faceplate switch to the NORMAL position.

Step 4 Verify the state of the LEDs on the faceplate:

- POWER is steady on.
- ACTIVE blinks slowly, indicating that the TST-DSX is functional.
- LOOP is off.

Step 5 Verify that the backplane wiring and connectors have been installed.



Note If the ACTIVE LED is blinking rapidly, the Backplane Interface Connector (BIC) is not present.

Step 6 Turn on the power switch of the handheld receiver and observe the display.

The first display shows the receiver version number. The next display shows the following:

MANUAL TEST MODE

DS3; A; 310

The last display shows either the DS-1 or DS-3 test mode and the status of the test.

Step 7 If the display indicates 454 instead of 310 as the shelf mode, press the **MENU** key six times, press **DISPLAY** to change from 454 to 310 shelf mode, and then press the **ENTER/ACCEPT** key to save the setting.

Step 8 To change from one cable type to another (DS-1 or DS-3), press the **MENU** key once, press **DISPLAY** to change the setting, and then press **ENTER/ACCEPT** to store the setting.

Step 9 At the DSX wiring panel, insert an appropriate patch cord into the handheld receiver.

Step 10 Insert the other end of the patch cord into a port on the DSX wiring panel. The control unit's screen continuously shows the test result of any detected signal.



Note For more detailed information on using the TST-DSX card to verify and troubleshoot wiring between the ONS 15310-MA shelf and the DSX wiring panel, see the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide*.

Stop. You have completed this procedure.

NTP-C159 Install and Remove SFPs

Purpose	This procedure installs and removes SFPs. SFPs are hot-swappable input/output devices that plug into SFP slots on the ONS 15310-MA faceplate to link the port with the fiber-optic network. SFPs are known as pluggable port modules (PPMs) in CTC. You can preprovision the multirate SFPs using the “DLP-C192 Provision a Multirate Pluggable Port Module” task on page 18-92.
Tools/Equipment	SFPs appropriate to the ONS 15310-MA. SFP types include OC-3, OC-12, OC-48, Ethernet, Gigabit Ethernet, and Fast Ethernet. Refer to the “Card Reference” chapter in the <i>Cisco ONS 15310-CL and Cisco ONS 15310-MA Reference Manual</i> for SFP compatibility.
Prerequisite Procedures	NTP-C151 Install the Power and Ground, page 2-12
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Warning

Class 1 laser product. Statement 1008



Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051



Warning

For copper SFPs, the Ethernet ports of ONS15310-MA are intra-building ports and are suitable only for connecting to cat-5 shielded (STP) cabling grounded at both ends.

- Step 1** Complete the [“DLP-C16 Install SFP Connectors” task on page 17-22](#) as needed.
- Step 2** Complete the [“DLP-C17 Remove SFP Connectors” task on page 17-23](#) as needed.
- Step 3** Continue with the [“NTP-C160 Install Optical Cables” procedure on page 2-28.](#)

Stop. You have completed this procedure.

NTP-C160 Install Optical Cables

Purpose	This procedure describes how to install fiber-optic cables in SFPs on the ONS 15310-MA.
Tools/Equipment	Single-mode fiber jumpers with LC connectors Fiber boot Optical power meter Optical attenuators, as necessary
Prerequisite Procedures	DLP-C16 Install SFP Connectors, page 17-22
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None


Warning

Class 1 laser product. Statement 1008


Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051


Caution

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.


Note

You can install the fiber immediately after installing the SFPs, or wait until you are ready to turn up the network. See [Chapter 5, “Turn Up a Network.”](#)


Note

Inspect and clean all fiber connectors thoroughly. See the [“NTP-C109 Clean Fiber Connectors” procedure on page 15-10](#) for instructions. Dust particles can degrade performance. Put caps on any fiber connectors that are not used.


Note

To install fiber-optic cables in the ONS 15310-MA, a fiber cable with the corresponding connector type must be connected to the transmit and receive ports on the SFPs. On ONS 15310-MA ports, the transmit and receive fiber for each optical signal are contained within a single SFP port.

Step 1

Measure the optical receive levels using an optical power meter, compare the results with the allowable optical power levels for the installed SFPs, and attenuate accordingly. See [Table 2-1](#) for the minimum and maximum levels for each SFP type.

Table 2-1 Optical Transmit and Receive Levels

SFP	Interface	Transmitter Output Power Min/Max (dBm)	Receiver Input Power Min/Max (dBm)
ONS-SI-155-L1	OC-3	-5.0 to 0	-34 to -10
ONS-SI-155-L2	OC3	-5.0 to 0	-34 to -10
ONS-SI-155-I1	OC-3	-15 to -8.0	-28 to -8
ONS-SI-622-L1	OC-12	-3.0 to 2.0	-28 to -8
ONS-SI-622-L2	OC-12	-3.0 to 2.0	-28 to -8
ONS-SI-622-I1	OC-12/OC-3	-15 to -8.0	-28 to -8
ONS-SE-155-1470 through ONS-SE-155-1610	OC-3	0 to +5	-34 to -3 (at BER 10 ⁻¹⁰)
ONS-SE-622-1470 through ONS-SE-622-1610	OC-12	0 to +5	-28 to -3 (at BER 10 ⁻¹⁰)
ONS-SI-2G-I1=	OC-48	-5.0 to 0	-18 to -0
ONS-SI-2G-L1=	OC-48	-3 to +2	-27 to -9
ONS-SI-2G-L2=	OC-48	-3 to +2	-28 to -9
ONS-SI-2G-S1=	OC-48	-10 to -3	-18 to -3
ONS-SC-2G-30.3= through ONS-SC-2G-60.6=	OC-48	0 to +4	-28 to -9

- Step 2** As needed, complete the “[DLP-C18 Install Fiber-Optic Cables in a 1+1 Configuration](#)” task on [page 17-24](#).
- Step 3** As needed, complete the “[DLP-C19 Install Fiber-Optic Cables for Path Protection Configurations](#)” task on [page 17-25](#).
- Step 4** As needed, gently route the fiber cables away from the shelf. You might want to use the optional tie-down bar.
- Step 5** Continue with the “[NTP-C164 Perform the Shelf Installation Acceptance Test](#)” procedure on [page 2-29](#).
- Stop. You have completed this procedure.**

NTP-C164 Perform the Shelf Installation Acceptance Test

Purpose	Use this procedure to perform a shelf installation acceptance test.
Tools/Equipment	Voltmeter
Prerequisite Procedures	Applicable procedures in Chapter 2, “Install the Cisco ONS 15310-MA”
Required/As Needed	Required

Onsite/Remote	Onsite
Security Level	Retrieve or higher

Step 1 Complete [Table 2-2 on page 2-30](#) by verifying that each procedure was completed.

Table 2-2 ONS 15310-MA Shelf Installation Task Summary

Description	Completed
NTP-C149 Unpack and Inspect the ONS 15310-MA Shelf Assembly, page 2-5	
NTP-C150 Install the Shelf Assembly, page 2-5	
NTP-C169 Install the Cable Management Bracket, page 2-6	
NTP-C167 Install the EIAs, page 2-10	
NTP-C151 Install the Power and Ground, page 2-12	
NTP-C152 Install the Fan-Tray Assembly, page 2-14	
NTP-C153 Install the CTX2500 Cards, page 2-16	
NTP-C154 Install the Ethernet Cards, page 2-19	
NTP-C155 Install the Electrical Cards, page 2-20	
NTP-C156 Install the Filler Cards, page 2-22	
NTP-C157 Install Wires to Alarm, Timing, Craft, LAN, and UDC Pin Connections, page 2-23	
NTP-C158 Install the Electrical Cables, page 2-24	
NTP-C173 Install the TST-DSX Card, page 2-25	
NTP-C159 Install and Remove SFPs, page 2-27	
NTP-C160 Install Optical Cables, page 2-28	

Step 2 Check each wire and cable connection to make sure all cables are locked securely. If a wire or cable is loose, return to the appropriate procedure in this chapter to correct it.

Step 3 Complete the “[DLP-C20 Measure Voltage](#)” task on [page 17-28](#).

Stop. You have completed this procedure.

NTP-C161 Preprovision an SFP Slot

Purpose	This procedure preprovisions SFPs, which are referred to as pluggable port modules (PPMs) in CTC. OC-3, OC-12, OC-48, and multirate (OC-3/OC-12) PPMs are compatible with the ONS 15310-MA. The SFP slots are located on the CTX2500 card.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Connect the PC and Log into the GUI”
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

-
- Step 1** Complete the “[DLP-C29 Log into CTC](#)” task on page 17-44 to log into an ONS 15310-MA on the network.
- Step 2** Click the **Alarms** tab:
- Verify that the alarm filter is not turned on. See the “[DLP-C88 Disable Alarm Filtering](#)” task on page 17-109 as necessary.
 - Verify that no unexplained conditions appear on the network. If unexplained conditions appear, resolve them before continuing. Refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide*.
 - Complete the “[DLP-C223 Export CTC Data](#)” task on page 19-20 to export alarm and condition information.
- Step 3** In node view, double-click the CTX2500 card.
- Step 4** Click the **Provisioning > Pluggable Port Modules** tabs.
- Step 5** In the Pluggable Port Modules pane, click **Create**. The Create PPM dialog box appears.
- Step 6** In the Create PPM dialog box, complete the following:
- PPM—Click the slot number where the SFP is installed from the drop-down list.
 - PPM Type—Click the number of ports supported by your SFP from the drop-down list. If only one port is supported, **PPM (1 port)** is the only option.
- Step 7** Click **OK**. The newly created port appears on the Pluggable Port Modules pane. The row on the Pluggable Port Modules pane turns light blue and the Actual Equipment Type column lists the preprovisioned PPM as unknown until the actual SFP is installed. After the SFP is installed, the row on the pane turns white and the column lists the equipment name.
- Step 8** Verify that the PPM appears in the list on the Pluggable Port Modules pane. If it does not, repeat Steps 5 through 7.
- Step 9** Repeat Steps 5 through 8 to provision a second PPM.
- Step 10** Click **OK**.
- Step 11** When you are ready to install the SFP, complete the “[DLP-C16 Install SFP Connectors](#)” task on page 17-22. If you preprovisioned a multirate SFP, you must select the line rate using the “[DLP-C193 Provision the Optical Line Rate](#)” task on page 18-92.

Stop. You have completed this procedure.

NTP-C162 Preprovision a Card Slot

Purpose	This procedure describes how to preprovision a slot in the software before physical card installation.
Tools/Equipment	None
Prerequisite Procedures	Chapter 3, “Connect the PC and Log into the GUI”
Required/As Needed	As needed

Onsite/Remote	Onsite or remote
Security Level	Provisioning or higher

- Step 1** Complete the “[DLP-C29 Log into CTC](#)” task on page 17-44 at the node where you want to preprovision the slot. If you are already logged in, continue with [Step 2](#).
- Step 2** Right-click the empty slot where you will later install a card.
- Step 3** From the Add Card shortcut menu, navigate to Ethernet or DS_n and choose the card type you want (CE-100T-8 or ML-100T-8 for Ethernet; DS1-28/DS3-EC1-3 or DS1-84/DS3-EC1-3 for DS_n).



Note When you preprovision a slot, the card appears purple in the CTC shelf display. When you physically install a card in the slot, the card appears white in the CTC shelf display.

Stop. You have completed this procedure.

NTP-C163 Remove and Replace a Card

Purpose	This procedure describes how to remove and replace cards in the ONS 15310-MA shelf.
Tools/Equipment	None
Prerequisite Procedures	NTP-C154 Install the Ethernet Cards, page 2-19 NTP-C158 Install the Electrical Cables, page 2-24
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Provisioning or higher



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.

Statement 1029

- Step 1** If you are not logged into CTC and you need to remove a card, continue with [Step 3](#). When you log into CTC, troubleshoot the mismatched equipment (MEA) or Improper Removal (IMPRMVL) alarm using the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide*.
- Step 2** If you are logged into CTC, on the node view shelf graphic right-click the card that you want to remove and choose **Delete Card**.

You cannot delete a card if any of the following conditions apply:

- The card is a CTX2500 card. To replace a CTX2500 card, refer to the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Troubleshooting Guide*.
- The card is part of an optical protection group; see the “[DLP-C138 Delete a Protection Group](#)” task on page 18-43.



Note 1:1 electrical protection groups are created automatically in the ONS 15310-MA and can only be deleted after the protect card of a 1:1 protection group is deleted.

- The card has circuits; see the “[DLP-C120 Delete Overhead Circuits](#)” task on page 18-28 and the “[DLP-C115 Delete Circuits](#)” task on page 18-21.
- The card is being used for timing; see the “[DLP-C139 Change the Node Timing Source](#)” task on page 18-44.
- The card has a data communications channel (DCC) termination; see the “[DLP-C154 Delete a Section DCC Termination](#)” task on page 18-56 or the “[DLP-C155 Delete a Line DCC Termination](#)” task on page 18-57.



Note If you do not remove a card from the shelf after you delete it in CTC, it will reboot and reappear in CTC.

- Step 3** Physically remove the card:
- Open the card latches/ejectors.
 - Use the latches/ejectors to pull the card forward and away from the shelf.

Step 4 Insert the new card using one of the following procedures:

- [NTP-C153 Install the CTX2500 Cards](#), page 2-16
- [NTP-C154 Install the Ethernet Cards](#), page 2-19
- [NTP-C155 Install the Electrical Cards](#), page 2-20

Stop. You have completed this procedure.

NTP-C168 Install the Front Door

Purpose	This procedure replaces the front door and door ground strap after installing cards and fiber-optic cables.
Tools/Equipment	Front-door kit (53-2617-XX) <ul style="list-style-type: none"> • Door hinge • Door striker • 4-40 screws (8) • Ground cable • Hex nuts (2)
Prerequisite Procedures	NTP-C150 Install the Shelf Assembly , page 2-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Caution**

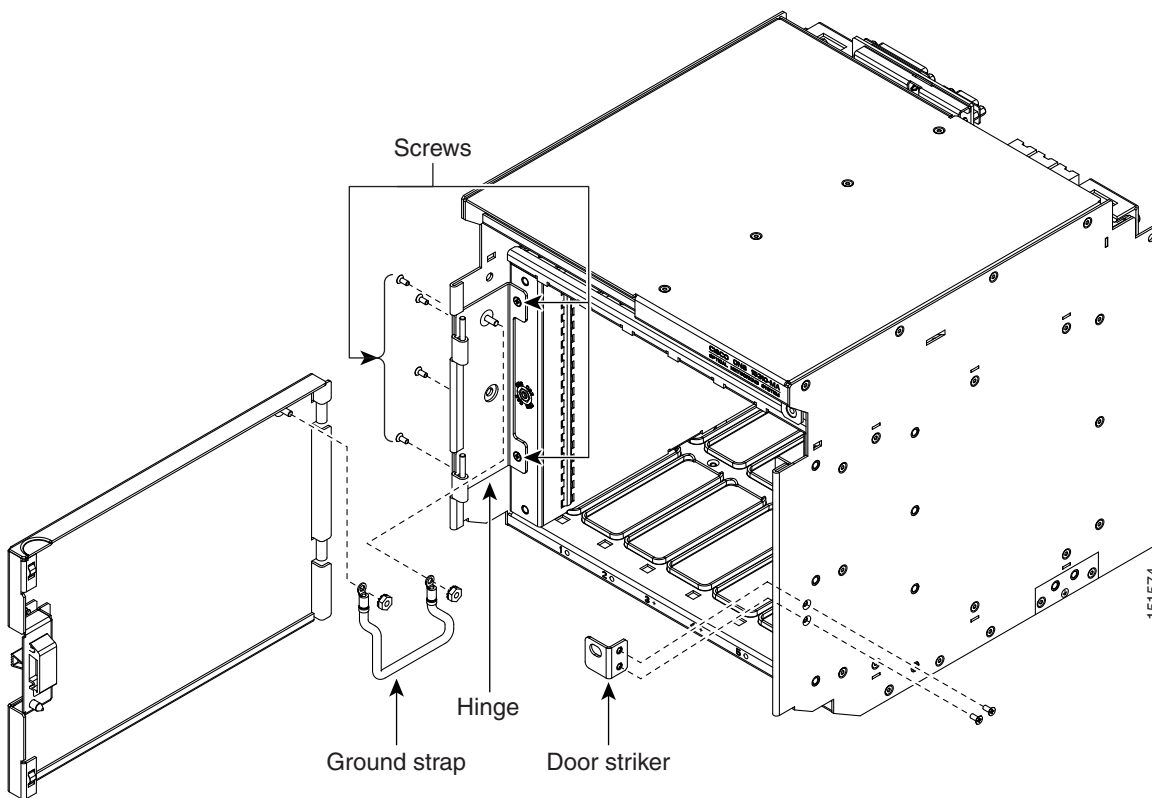
Be careful not to crimp any fiber-optic cables that are connected to the optical cards. Some might not have the fiber boot attached.

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15310-MA. Plug the wristband cable into either of the ESD jacks, on the far left and right faceplates in the shelf.

- Step 1** Place the door hinge flush against the inside of the ONS 15310-MA chassis flange on the left (Figure 2-9).

Figure 2-9 Installing the Front Door



- Step 2** Line up the four screw holes on the door hinge with the corresponding screw holes on the flange of the shelf assembly. Make sure the other two holes on the hinge line up with the two holes on the ESD faceplate on the left side of the shelf.
- Step 3** Approaching the shelf assembly from the left side, install four 4-40 screws to attach the door hinge to the chassis flange.
- Step 4** Install two 4-40 screws through the hinge into the ESD faceplate.
- Step 5** Attach the door striker to the right side of the chassis using the remaining two 4-40 screws.
- Step 6** Slide the front door downward onto the hinge pins.

Step 7 Using the 5/16-inch nut driver, attach the ground cable to the threaded studs on the door and hinge with two hex nuts. Ensure the ground cable is looped or bent downward to avoid being pinched or caught when the door is closed.

Step 8 Close the front door.

**Caution**

Be careful not to crimp any cables that are connected to the installed cards.

Stop. You have completed this procedure.

NTP-C191 Install the Rear Cover

Purpose	This procedure explains how to install the rear cover on an ONS 15310-MA shelf.
Tools/Equipment	<ul style="list-style-type: none"> • #2 Phillips screwdriver • 1/4-inch nut driver • Six 1/4-inch hexagonal standoffs 6-32 x 3.3.25
Prerequisite Procedures	NTP-C158 Install the Electrical Cables, page 2-24
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Caution**

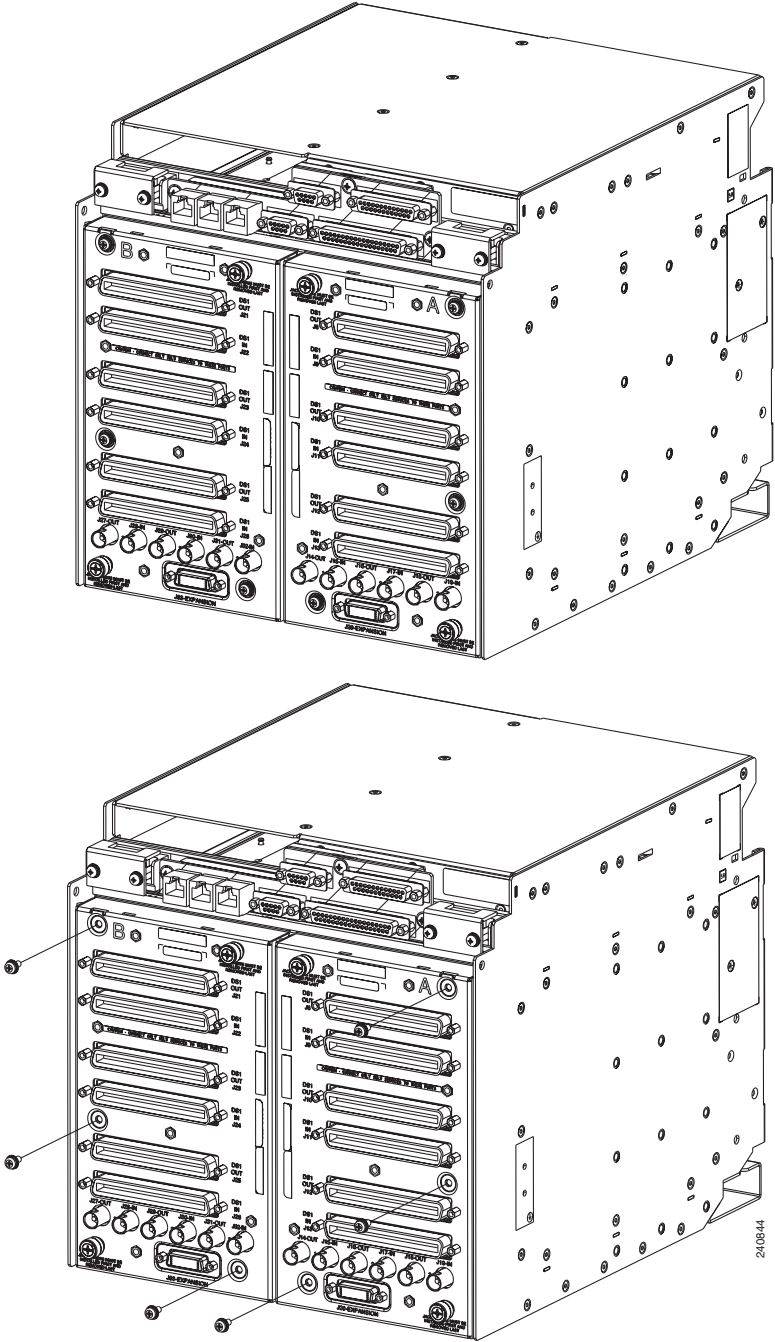
Always use the supplied ESD wristband when working with a powered ONS 15310-MA. For detailed instructions on how to wear the ESD wristband, refer to the [Cisco ONS Electrostatic Discharge \(ESD\) and Grounding Guide](#).

**Note**

Connect all cables on the backplane before installing the rear cover.

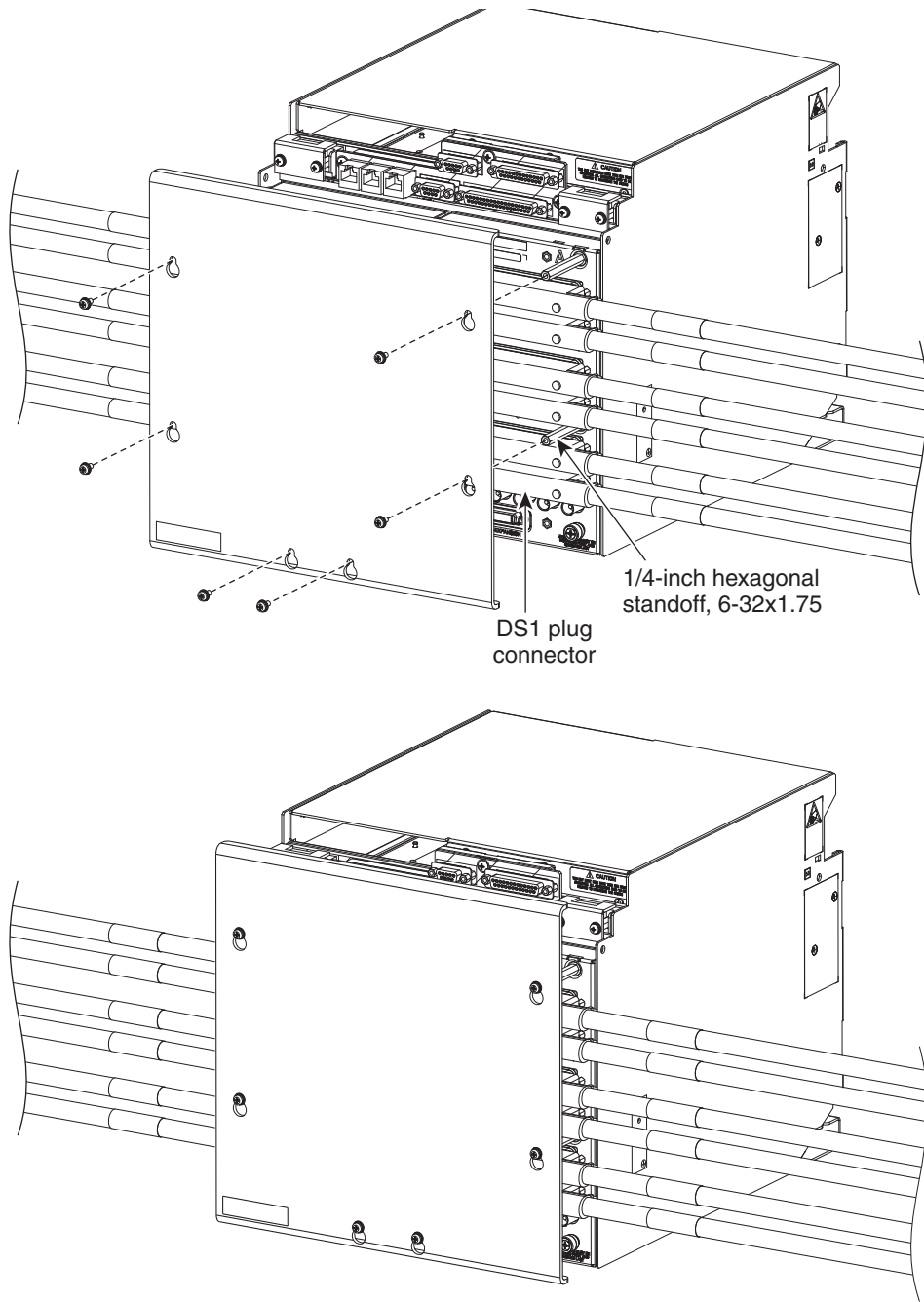
Step 1 Using a #2 Phillips screw driver, remove the six panhead screws from the Electrical Interface Assemblies (EIAs) located on the A-side and B-side of the backplane [Figure 2-10](#).

Figure 2-10 Removing the Panhead Screws



- Step 2** Using the 1/4-inch nut driver, install the six hexagonal standoffs onto the mounting holes that held the six panhead screws.
- Step 3** Align the holes on the rear cover with the hexagonal standoffs.

Figure 2-11 Installing the Rear Cover



Step 4 Install and tighten the six panhead screws onto the holes on the hexagonal standoffs.



Note You can also reverse the order of the procedure, and install the panhead screws onto the hexagonal standoffs first, place the rear cover on the standoffs, and finally tighten the panhead screws. The rear cover has oval cut-outs to allow this operation.

Stop. You have completed this procedure.

