



# Install the Shelf and FMECs

This chapter explains how to install the Cisco ONS 15454 SDH shelf assembly. For a summary of the tools and equipment required for installation, see the [“Required Tools and Equipment”](#) section on page 1-2.

## Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs). Read the installation procedures and precautions before you install the ONS 15454 SDH and connect the power source.

1. [NTP-D1 Unpack and Inspect the ONS 15454 SDH Shelf Assembly, page 1-4](#)—Complete this procedure before continuing with the [“NTP-D2 Install the Shelf Assembly”](#) procedure on page 1-5.
2. [NTP-D2 Install the Shelf Assembly, page 1-5](#)—Complete this procedure to install the shelf assembly in a rack.
3. [NTP-D3 Open and Remove the Front Door, page 1-6](#)—Complete this procedure to access the equipment before continuing with other procedures in this chapter.
4. [NTP-D219 Open and Remove the FMEC Cover, page 1-7](#)—Complete this procedure to access the electrical facility connection assembly (EFCA) for the front mount electrical connections (FMECs) before continuing with other procedures in this chapter.
5. [NTP-D220 Install the Power and Signal FMECs, page 1-7](#)—Complete this procedure if you plan to install electrical cards. This procedure is a prerequisite to the [“NTP-D224 Install the Electrical Card Cables on the FMECs”](#) procedure on page 1-16.
6. [NTP-D6 Install the Power and Ground, page 1-10](#)—Complete this procedure before continuing with the [“NTP-D7 Install the Fan-Tray Assembly”](#) procedure on page 1-11.
7. [NTP-D7 Install the Fan-Tray Assembly, page 1-11](#)—Complete this procedure to install the fan-tray assembly in the shelf.
8. [NTP-D222 Install the E1-75/120 Conversion Panel, page 1-13](#)—Complete this procedure if you use the E1-42 card and plan to use 75-ohm unbalanced interfaces.
9. [NTP-D223 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-15](#)—Complete as needed to set up wire-wrap pin connections and craft connections.
10. [NTP-D224 Install the Electrical Card Cables on the FMECs, page 1-16](#)—Complete this procedure if you will install electrical cards.
11. [NTP-D10 Route Electrical Cables, page 1-16](#)—Complete as needed.

12. [NTP-D226 Install and Close the FMEC Cover, page 1-17](#)—Complete this procedure to install the FMEC cover.
13. [NTP-D13 Perform the Shelf Installation Acceptance Test, page 1-18](#)—Complete this procedure to determine if you have correctly completed all other procedures in the chapter.

**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.** Statement 37

**Warning**

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

**Warning**

**A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 91

**Note**

The ONS 15454 SDH is suitable for mounting on concrete or other noncombustible surfaces only.

**Note**

In this chapter, “shelf assembly” refers to the steel enclosure that holds cards and connects power, and “node” refers to the entire hardware and software system.

## Required Tools and Equipment

You need the following tools and equipment to install and test the ONS 15454 SDH.

### Cisco-Supplied Equipment

These materials are required for installation and are supplied with the ONS 15454 SDH. The shipped quantity of each item is in parentheses.

- Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm<sup>2</sup> (#6 AWG) multi-strand copper wire (1)
- M4 x 8 mm pan-head Phillips screws (2)
- M6 x 20 mm socket set screws (2)
- M6 x 20 mm pan-head Phillips screws (8)
- Tie wraps 0.125-inch (3.2 mm) W x 6.0-inch (152 mm) L (24)
- ESD wrist strap (disposable) (1)
- Pinned Allen key for front door (1)
- Hex key 3-mm long arm (1)
- Bottom brackets for the fan-tray air filter

- RJ-45 cable assembly, Ethernet (1)
- Power cable (from fuse and alarm panel to MIC-A/P and MIC-C/T/P) (2)

**Caution**

Only use the power cables that are designed to be used with ONS 15454 SDH. They are sold separately.

Table 1-1 lists the different ONS 15454 SDH cable models and their model numbers. The xxx corresponds to the length of the cable, in meters.

**Table 1-1 Cable Models and Model Numbers**

Cable Model Type	Model Number	Description
Power Cables	15454E-PWRCBL-xxx	Power cable assembly, DB-3 connector to unterminated, ONS 15454 SDH
Alarm Cables	15454E-ALMCBL-xxx	Alarm cable assembly, HDB-62 connector to unterminated, ONS 15454 SDH
Timing Cables	15454E-T54 or 1.0/2.3CBL-xxx	E1/E3/DS-3/Timing cable assembly, 75 ohm, T54 or 1.0/2.3 connector to unterminated, ONS 15454 SDH
	15454E-120TMGCBL	120-ohm to 75-ohm converter cable assembly, wire-wrap to T54 or 1.0/2.3, ONS 15454 SDH
E1, E3, DS-3, and Timing Cables	15454E-T54 or 1.0/2.3CBL-xxx	E1/E3/DS-3/Timing cable assembly, 75 ohm, T54 or 1.0/2.3 connector to unterminated, ONS 15454 SDH
E1N-14 Cables	15454E-DBCBL-xxx	E1 cable assembly, 14-pair, 120-ohm, DB37 connector to unterminated, ONS 15454 SDH
E1-42 Cables	15454E-E1-120-xxx	E1 cable assembly, 42-pair, 120-ohm, LFH connector to unterminated, ONS 15454 SDH

## User-Supplied Equipment

The following materials and tools are required for installation but are not supplied with the ONS 15454 SDH:

- Equipment rack (ETSI rack, 2200 mm [86.6 inch] H x 600 mm [23.6 inch] W x 300 mm [11.8 inch] D)
- Fuse and alarm panel
- Copper ground cable 13.3-mm<sup>2</sup> (#6 AWG) stranded, specified for up to 90 degrees Celsius (194 degrees Fahrenheit)
- Alarm cable pairs for all alarm connections, 0.51 mm<sup>2</sup> or 0.64 mm<sup>2</sup> (#22 or #24 AWG), solid-tinned
- Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical cards
- Coaxial cable terminated with 1.0/2.3 miniature coax connectors for FMEC cards
- DB-37 cable
- Shielded building integrated timing supply (BITS) clock coaxial cable terminated with 1.0/2.3 miniature coax connectors
- Labels

**Note**


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Ring runs are not provided by Cisco and can hinder side-by-side shelf installation where space is limited.

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## Tools Needed

To install the ONS 15454 SDH, you need the following tools:

- #2 Phillips Dynamometric screwdriver
- Medium slot-head screwdriver
- Small slot-head screwdriver
- Video fiber connector inspection instrument
- CLETOP cleaning cassette
- Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug.
- Wire stripping tool

## Test Equipment

To install the ONS 15454 SDH, you need the following test equipment:

- Voltmeter
- Power meter (only for use with fiber optics)
- Bit error rate (BER) tester for E1-N-14, E1-42, E3-12, DS3i-N-12, STM1E-12, and FMEC cards

# NTP-D1 Unpack and Inspect the ONS 15454 SDH Shelf Assembly

<b>Purpose</b>	This procedure unpacks the ONS 15454 SDH and verifies the contents.
<b>Tools/Equipment</b>	Pinned hex (Allen) key for front door
<b>Prerequisite Procedures</b>	None
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

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- Step 1** Complete the [“DLP-D1 Unpack and Verify the Shelf Assembly”](#) task on page 17-1.
- Step 2** Complete the [“DLP-D2 Inspect the Shelf Assembly”](#) task on page 17-1.
- Step 3** Continue with the [“NTP-D2 Install the Shelf Assembly”](#) procedure on page 1-5.

**Stop. You have completed this procedure.**

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# NTP-D2 Install the Shelf Assembly

<b>Purpose</b>	This procedure reverses the mounting bracket and mounts shelf assemblies in a rack.
<b>Tools/Equipment</b>	#2 Phillips Dynamometric screwdriver Medium slot-head screwdriver Small slot-head screwdriver Pinned hex key Two M6 x 20 socket set screws
<b>Prerequisite Procedures</b>	<a href="#">NTP-D1 Unpack and Inspect the ONS 15454 SDH Shelf Assembly, page 1-4</a>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None



**Warning**

**Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.** Statement 250



**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**

**To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 55°C (113°F).** Statement 1047



**Warning**

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



**Warning**

**Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018



**Warning**

**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 148

**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

**Note**

The shelf, the air ramp, and the E1-75/120 conversion panel are shipped with the ETSI mounting brackets installed as needed for installation in an ETSI rack. If you want to install the node in a 19-inch(482.6-mm) rack, the ETSI mounting brackets of the shelf and the air ramp need to be replaced with the 19-inch (482.6-mm) mounting brackets. The 19-inch (482.6-mm) mounting brackets need to be ordered separately. If required, the mounting brackets of the E1-75/120 conversion panel can be uninstalled, rotated 90 degrees, and reinstalled to enable 19-inch (482.6-mm) rack mounting.

**Step 1** Complete the necessary rack mount task as applicable:

- [DLP-D5 Mount the Shelf Assembly in a Rack \(One Person\)](#), page 17-4
- [DLP-D6 Mount the Shelf Assembly in a Rack \(Two People\)](#), page 17-6
- [DLP-D7 Mount Multiple Shelf Assemblies in a Rack](#), page 17-7

**Step 2** Continue with the “[NTP-D3 Open and Remove the Front Door](#)” procedure on page 1-6.

**Stop. You have completed this procedure.**

## NTP-D3 Open and Remove the Front Door

<b>Purpose</b>	This procedure opens and removes the front door to access the equipment.
<b>Tools/Equipment</b>	Open-end wrench Pinned hex key
<b>Prerequisite Procedures</b>	<a href="#">NTP-D2 Install the Shelf Assembly</a> , page 1-5
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

**Step 1** Complete the “[DLP-D8 Open the Front Cabinet Compartment \(Door\)](#)” task on page 17-9.

- Step 2** Complete the “[DLP-D9 Remove the Front Door](#)” task on page 17-10.
- Step 3** Continue with the “[NTP-D219 Open and Remove the FMEC Cover](#)” procedure on page 1-7.
- Stop. You have completed this procedure.**
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## NTP-D219 Open and Remove the FMEC Cover

<b>Purpose</b>	This procedure opens and removes the FMEC cover. The ONS 15454 SDH has a screw-in panel over the EFCA. The FMEC cover protects the FMEC cards.
<b>Tools/Equipment</b>	Medium slot-head screwdriver
<b>Prerequisite Procedures</b>	<a href="#">NTP-D2 Install the Shelf Assembly, page 1-5</a>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

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- Step 1** Complete the “[DLP-D321 Open the FMEC Cover](#)” task on page 20-10.
- Step 2** Complete the “[DLP-D322 Remove the FMEC Cover](#)” task on page 20-11.
- Step 3** If you plan to install FMEC cards, continue with the “[NTP-D220 Install the Power and Signal FMECs](#)” procedure on page 1-7.
- Stop. You have completed this procedure.**
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## NTP-D220 Install the Power and Signal FMECs

<b>Purpose</b>	This procedure installs the FMECs in the EFCA. The ONS 15454 SDH has an EFCA located at the top of the shelf. The EFCA provides connection for installing power, external alarms, timing input and output, and craft interface terminals.
<b>Tools/Equipment</b>	#2 Phillips Dynamometric screwdriver Medium slot-head screwdriver Small slot-head screwdriver FMEC cards as required
<b>Prerequisite Procedures</b>	<a href="#">NTP-D219 Open and Remove the FMEC Cover, page 1-7</a>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

**Warning**

**Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas.** Statement 166

**Warning**

**For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection: E1, E3, DS-1, DS-3, Ethernet, and STM-n.** Statement 1044

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

**Step 1**

Verify which FMEC is required for your application.

The ONS 15454 SDH EFCA has 12 FMEC slots numbered sequentially from left to right. Slots 18 to 22 and 25 to 29 provide electrical connections for the corresponding slots. The FMEC-E1, FMEC-DS1/E1, FMEC E1-120NP, and FMEC E1-120PROA cards can be installed in Slots 18 to 21. The FMEC E1-120PROB card can be installed in Slots 26 to 29. FMEC-E3/DS3, FMEC STM1E NP, FMEC STM1E 1:1, and FMEC STM1E 1:3 cards can be installed in Slots 18 to 21 or Slots 26 to 29.

Slot assignment is as follows:

- FMEC Slot 18 supports an electrical card in Slot 1.
- FMEC Slot 19 supports an electrical card in Slot 2.
- FMEC Slot 20 supports an electrical card in Slot 3.
- FMEC Slot 21 supports an electrical card in Slot 4.
- FMEC Slot 22 supports an electrical card in Slot 5.
- FMEC Slot 23 supports the MIC-A/P.
- FMEC Slot 24 supports the MIC-C/T/P.
- FMEC Slot 25 supports an electrical card in Slot 13.
- FMEC Slot 26 supports an electrical card in Slot 14.
- FMEC Slot 27 supports an electrical card in Slot 15.
- FMEC Slot 28 supports an electrical card in Slot 16.
- FMEC Slot 29 supports an electrical card in Slot 17.

**Note**

Refer to the *Cisco ONS 15454 SDH Reference Manual* for a list of FMEC ports, line rates, connector options, and connector locations.

**Note**

FMEC E1-120PROA has no access from the FMEC in Slot 20 to the main board in Slot 3.  
FMEC E1-120PROB has no access from the FMEC in Slot 27 to the main board in Slot 15.

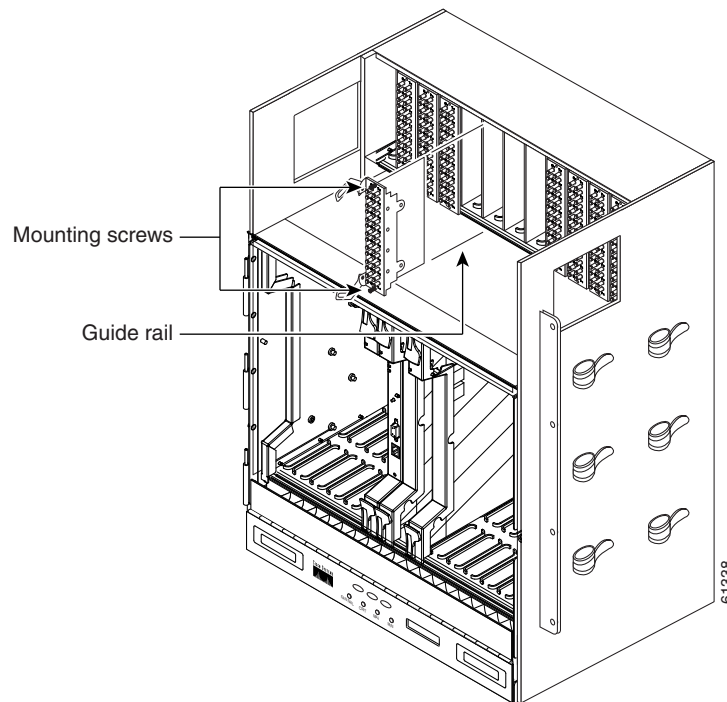
**Step 2** Hold the FMEC by the faceplate.

**Step 3** Slide the FMEC along the guide rails into the desired FMEC slot or slots.



- Step 4** Push the FMEC gently into the connector. The ONS 15454 SDH FMECs plug into electrical connectors on the back panel of the shelf assembly when the screws are tightened. [Figure 1-1](#) shows FMEC installation.

**Figure 1-1** *Installing FMECs on the ONS 15454 SDH*



- Step 5** Tighten the faceplate screws with 1.0Nm torque.
- Step 6** Continue with the “[NTP-D6 Install the Power and Ground](#)” procedure on page 1-10.
- Stop. You have completed this procedure.**
-

# NTP-D6 Install the Power and Ground

<b>Purpose</b>	This procedure installs power feeds and grounds the ONS 15454 SDH.
<b>Tools/Equipment</b>	<p>#2 Phillips Dynamometric screwdriver</p> <p>Medium slot-head screwdriver</p> <p>Small slot-head screwdriver</p> <p>Screws</p> <p>Power cable (from fuse panel to MIC-A/P and to MIC-C/T/P), shipped with the ONS 15454 SDH</p> <p>Ground cable 13.3-mm<sup>2</sup> (#6 AWG) stranded</p> <p>Two-hole grounding lug, shipped with the ONS 15454 SDH</p> <p>Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for 8.36-mm<sup>2</sup> (#8 AWG) copper conductors</p> <p>Wire cutters</p> <p>Wire strippers</p> <p>Crimp tool</p> <p>Fuse panel</p>
<b>Prerequisite Procedures</b>	<p><a href="#">NTP-D219 Open and Remove the FMEC Cover, page 1-7</a></p> <p><a href="#">NTP-D220 Install the Power and Signal FMECs, page 1-7</a> (for MIC-A/P and MIC-C/T/P)</p>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None



**Warning**

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



**Caution**

Tighten the faceplate screws of the MIC-A/P and MIC-C/T/P cards with 1.0Nm torque.



**Warning**

**This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.** Statement 39



**Warning**

**Use copper conductors only.** Statement 1025



**Warning**

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

  
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

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

  
Warning

**Use copper conductors only.** Statement 1025

  
Warning

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

  
Caution

Always use the supplied ESD wristband when working with a powered ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

  
Note

The ONS 15454 SDH is powered using –48 VDC power.

- Step 1** Verify that the chassis fuses rating does not exceed 30A.
- Step 2** Complete the [“DLP-D16 Connect the Office Ground to the ONS 15454 SDH”](#) task on page 17-13.
- Step 3** Complete the [“DLP-D17 Connect Office Power to the ONS 15454 SDH Shelf”](#) task on page 17-15.
- Step 4** Complete the [“DLP-D18 Turn On and Verify Office Power”](#) task on page 17-16.
- Step 5** Continue with the [“NTP-D7 Install the Fan-Tray Assembly”](#) procedure on page 1-11.
- Stop. You have completed this procedure.**

## NTP-D7 Install the Fan-Tray Assembly

<b>Purpose</b>	This procedure installs the fan-tray assembly.
<b>Tools/Equipment</b>	#2 Phillips Dynamometric screwdriver Medium slot-head screwdriver Small slot-head screwdriver
<b>Prerequisite Procedures</b>	<a href="#">NTP-D3 Open and Remove the Front Door</a> , page 1-6 <a href="#">NTP-D6 Install the Power and Ground</a> , page 1-10
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

**Caution**

Do not operate an ONS 15454 SDH without a fan-tray air filter. A fan-tray air filter is mandatory.

**Note**

Error messages appear on the TCC2/TCC2P card, on the fan-tray LED, and in the CTC when the fan-tray assembly is removed from the shelf or when one fan is not working.

**Step 1**

Install the air filter. The air filter can be installed internally between the fan tray and shelf assembly, or externally by mounting the air filter bracket on the bottom of the shelf assembly. Slide the air filter into the bracket.

**Step 2**

Install the fan-tray assembly. The fan-tray assembly has locks on the outer edges. Press and hold the locks as you slide the fan-tray assembly into the shelf assembly. The electrical plug at the rear of the tray should plug into the corresponding receptacle on the assembly.

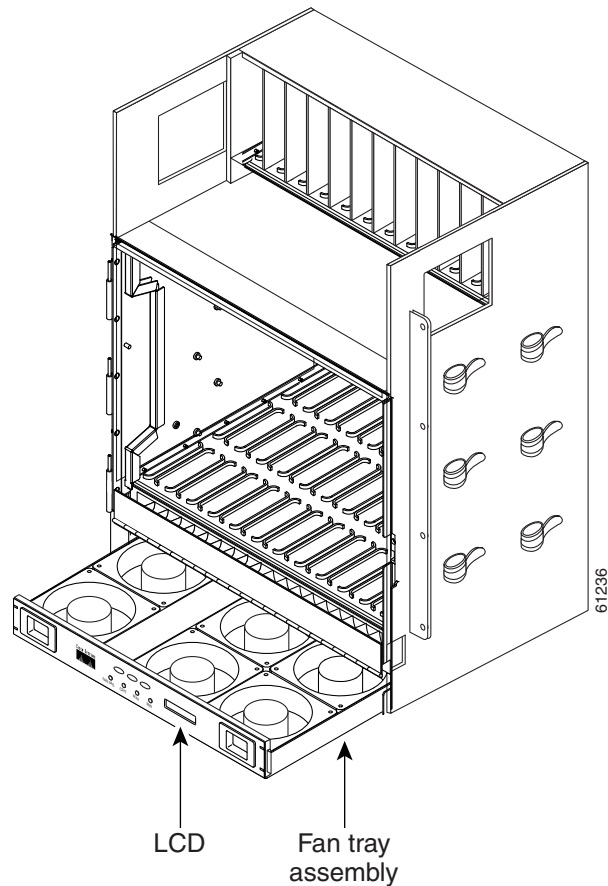
**Caution**

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

**Step 3**

To verify that the tray has plugged into the assembly, look at the fan tray and listen to determine that the fans are running. [Figure 1-2](#) shows the fan-tray location.

**Figure 1-2** *Installing the Fan-Tray Assembly*



- Step 4** Continue with the “[NTP-D222 Install the E1-75/120 Conversion Panel](#)” procedure on page 1-13.  
**Stop. You have completed this procedure.**

## NTP-D222 Install the E1-75/120 Conversion Panel

<b>Purpose</b>	This procedure installs the E1-75/120 conversion panel. You need an E1-75/120 conversion panel if you want to convert the balanced 120-ohm interfaces of the E1-42 card and the corresponding FMECs to unbalanced 75-ohm interfaces.
<b>Tools/Equipment</b>	#2 Phillips Dynamometric screwdriver Medium slot-head screwdriver Small slot-head screwdriver 96-conductor cables with Molex 96-pin LFH connectors
<b>Prerequisite Procedures</b>	<a href="#">NTP-D2 Install the Shelf Assembly, page 1-5</a> <a href="#">NTP-D3 Open and Remove the Front Door, page 1-6</a>

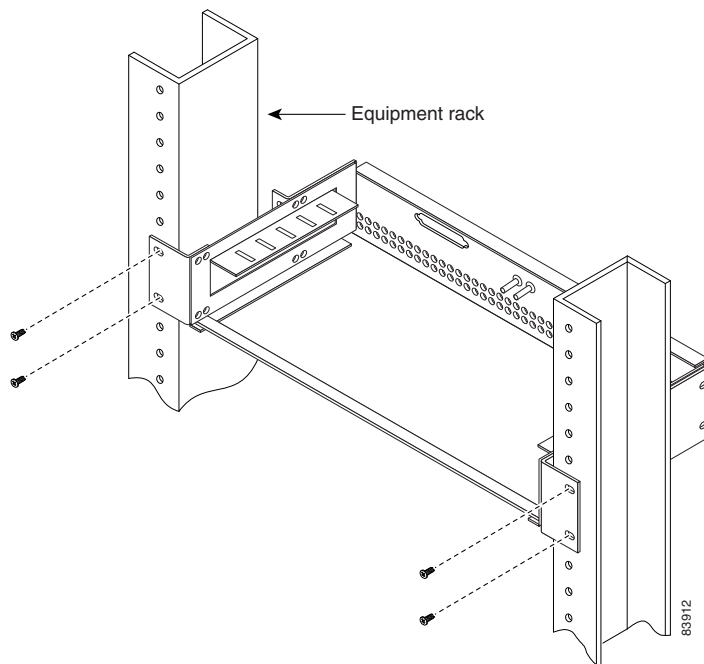
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

**Note**

For more information about the E1-75/120 conversion panel, refer to the *Cisco ONS 15454 SDH Reference Manual*.

- Step 1** Lift the E1-75/120 conversion panel to the desired rack position.  
[Figure 1-3](#) shows the rack-mounting for the E1-75/120 conversion panel.

**Figure 1-3** *Mounting the E1-75/120 Conversion Panel in a Rack*



- Step 2** Align the screw holes on the mounting ears with the mounting holes in the rack.
- Step 3** Install one mounting screw in each side of the assembly.
- Step 4** When the E1-75/120 conversion panel is secured to the rack, install the remaining mounting screws if necessary.
- Step 5** Continue with the [“NTP-D223 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections” procedure on page 1-15.](#)

**Stop. You have completed this procedure.**

# NTP-D223 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections

<b>Purpose</b>	This procedure installs alarm, timing, LAN, and craft wires.
<b>Tools/Equipment</b>	Connectors according to function Twisted 0.51 mm <sup>2</sup> or 0.64 mm <sup>2</sup> (#22 or #24 AWG) shielded wires for LAN or craft 75-ohm coaxial cable with 1.0/2.3 miniature coax connector 0.51 mm <sup>2</sup> or 0.64 mm <sup>2</sup> (#22 or #24 AWG) alarm wires
<b>Prerequisite Procedures</b>	<a href="#">NTP-D220 Install the Power and Signal FMECs, page 1-7</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None



## Caution

Always use the supplied ESD wristband when working with a powered ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

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- Step 1** Complete the “[DLP-D324 Install Alarm Cables on the MIC-A/P](#)” task on page 20-12 as necessary.
  - Step 2** Complete the “[DLP-D325 Install Timing Cables on the MIC-C/T/P](#)” task on page 20-15 as needed. Timing wires are necessary to provision external timing.
  - Step 3** Complete the “[DLP-D326 Install LAN Wires on the MIC-C/T/P](#)” task on page 20-16 as needed. LAN wires (or the LAN port on the TCC2/TCC2P card) are necessary to create an external LAN connection.
  - Step 4** Complete the “[DLP-D78 Install the TL1 Craft Interface on the MIC-C/T/P](#)” task on page 17-69 as needed. Craft wires (or the EIA/TIA-232 port on the TCC2/TCC2P cards) are required to access Transaction Language One (TL1) using the craft interface.
  - Step 5** Continue with the “[NTP-D224 Install the Electrical Card Cables on the FMECs](#)” procedure on page 1-16.

**Stop. You have completed this procedure.**

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## NTP-D224 Install the Electrical Card Cables on the FMECs

<b>Purpose</b>	This procedure installs cables for electrical cards via the FMECs. You will install the electrical cards in <a href="#">Chapter 2, “Install Cards and Fiber-Optic Cable.”</a>
<b>Tools/Equipment</b>	Coaxial cable with 1.0/2.3 miniature coax connectors according to the electrical traffic cards in use  Shielded 120-ohm cables with connectors according to the electrical traffic cards in use
<b>Prerequisite Procedures</b>	<a href="#">NTP-D220 Install the Power and Signal FMECs, page 1-7</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None



### Caution

Always use the supplied ESD wristband when working with a powered ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

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- Step 1** Complete the “[DLP-D328 Install 75-Ohm E-1, E-3, or STM-1 Coaxial Cables](#)” task on [page 20-17](#) as needed.
- Step 2** Complete the “[DLP-D329 Install 120-Ohm E-1 Cables with DB-37 Connectors to the FMECs](#)” task on [page 20-18](#) as needed.
- Step 3** Complete the “[DLP-D330 Install 120-Ohm E-1 Cables with Molex 96-Pin LFH Connectors](#)” task on [page 20-20](#) as needed.
- Step 4** Continue with the “[NTP-D10 Route Electrical Cables](#)” procedure on [page 1-16](#).

**Stop. You have completed this procedure.**

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## NTP-D10 Route Electrical Cables

<b>Purpose</b>	This procedure routes and manages electrical cables. You will install the electrical cards in <a href="#">Chapter 2, “Install Cards and Fiber-Optic Cable.”</a>
<b>Tools/Equipment</b>	Coaxial or twister-pair cables
<b>Prerequisite Procedures</b>	<a href="#">NTP-D224 Install the Electrical Card Cables on the FMECs, page 1-16</a>
<b>Required/As Needed</b>	As needed
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

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- Step 1** To route coaxial cables, tie wrap or lace the coaxial cables according to local site practice and route the cables through the side cutouts on either side of the ONS 15454 SDH. The rubber-coated edges of the side cutouts prevent the cables from chafing.



- Step 2** To route twisted-pair cables, tie-wrap or lace the twisted-pair cables according to local site practice and route the cables into the side cutouts on either side of the ONS 15454 SDH.
- Step 3** Continue with the “[NTP-D226 Install and Close the FMEC Cover](#)” procedure on page 1-17 as needed.
- Stop. You have completed this procedure.**
- 

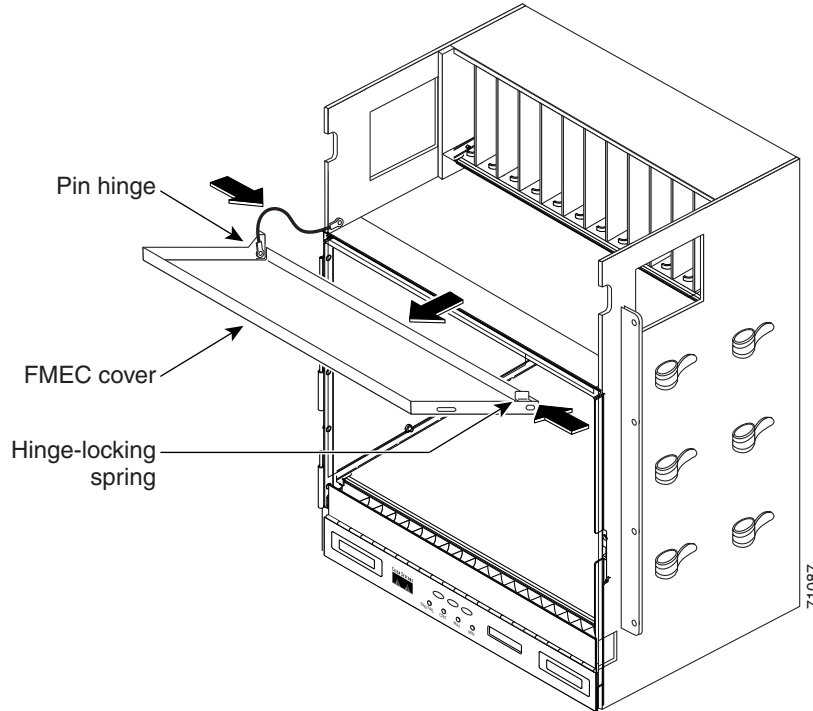
## NTP-D226 Install and Close the FMEC Cover

<b>Purpose</b>	This procedure installs and closes the rear cover.
<b>Tools/Equipment</b>	#2 Phillips Dynamometric screwdriver Medium slot-head screwdriver Small slot-head screwdriver
<b>Prerequisite Procedures</b>	<a href="#">NTP-D219 Open and Remove the FMEC Cover, page 1-7</a>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

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- Step 1** Insert the cover carefully onto the left pin of the hinge ([Figure 1-4](#)).
- Step 2** Move the cover to the right side towards the right pin of the hinge.
- Step 3** Pull the right side of the hinge-locking spring ([Figure 1-4](#)). Push the cover onto the right pin until the spring snaps into place.

**Figure 1-4** ONS 15454 SDH FMEC Cover



- Step 4** Attach the ground wire to the shelf.
- Step 5** Attach the washer and nut.
- Step 6** Attach the cover to the shelf using the screws on the top of the cover.
- Stop. You have completed this procedure.**

## NTP-D13 Perform the Shelf Installation Acceptance Test

<b>Purpose</b>	Use this procedure to perform a shelf installation acceptance test.
<b>Tools/Equipment</b>	Voltmeter Oval and/or block ferrites
<b>Prerequisite Procedures</b>	Applicable procedures in <a href="#">Chapter 1, “Install the Shelf and FMECs”</a>
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

- Step 1** Complete [Table 1-2](#) by verifying that each applicable procedure was completed.

**Table 1-2**      **ONS 15454 SDH Shelf Installation Task Summary**

Description	Completed
NTP-D1 Unpack and Inspect the ONS 15454 SDH Shelf Assembly, page 1-4	
NTP-D2 Install the Shelf Assembly, page 1-5	
NTP-D3 Open and Remove the Front Door, page 1-6	
NTP-D219 Open and Remove the FMEC Cover, page 1-7	
NTP-D220 Install the Power and Signal FMECs, page 1-7	
NTP-D6 Install the Power and Ground, page 1-10	
NTP-D7 Install the Fan-Tray Assembly, page 1-11	
NTP-D222 Install the E1-75/120 Conversion Panel, page 1-13	
NTP-D223 Attach Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-15	
NTP-D224 Install the Electrical Card Cables on the FMECs, page 1-16	
NTP-D10 Route Electrical Cables, page 1-16	
NTP-D226 Install and Close the FMEC Cover, page 1-17	

**Step 2** Complete the “DLP-D32 Inspect the Shelf Installation and Connections” task on page 17-26.

**Step 3** Complete the “DLP-D33 Measure Voltage” task on page 17-26.

**Step 4** Continue with Chapter 2, “Install Cards and Fiber-Optic Cable.”

**Stop. You have completed this procedure.**

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