Cisco Nexus 7702 Hardware Installation Guide

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Preface

This preface describes the audience, organization and conventions of the *Cisco Nexus 7706 Hardware Installation Guide*. It also provides information on how to obtain related documentation.

- Audience, on page vii
- Document Conventions, on page vii
- Documentation Feedback, on page viii
- Communications, Services, and Additional Information, on page ix

Audience

This publication is for network administrators who configure and maintain Cisco Nexus devices.

Document Conventions

Note As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.

Convention	Description
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Documentation Feedback

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Communications, Services, and Additional Information

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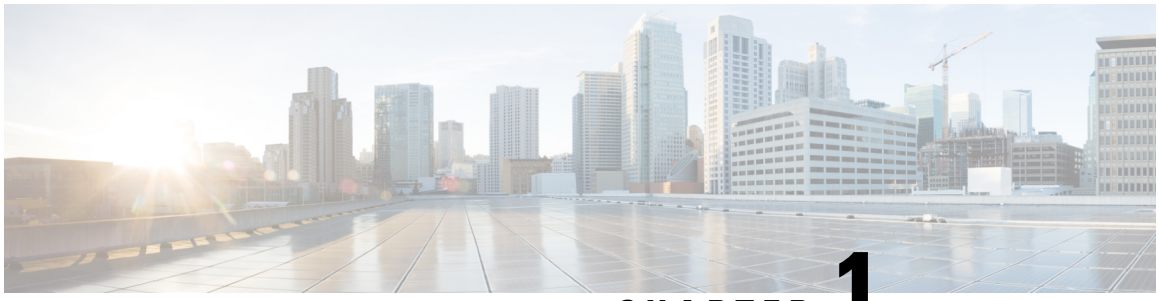
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

Overview

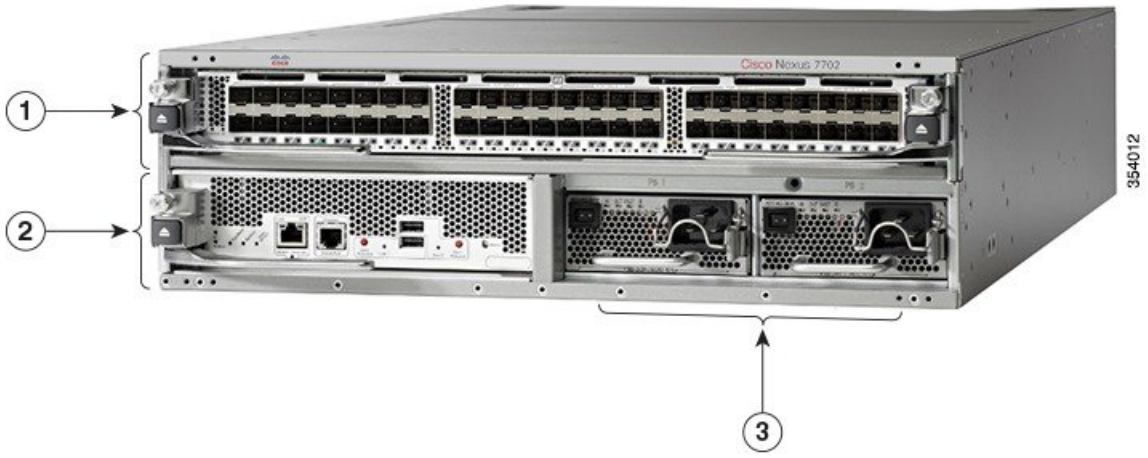
This chapter includes the following sections:

- Overview of the Cisco Nexus 7702 Switch Installation Features, on page 1

Overview of the Cisco Nexus 7702 Switch Installation Features

The Cisco Nexus 7702 chassis has two slots, one for the supervisor module and one for the I/O module. The chassis has two power supply slots which support either AC or DC 3-kW and HVAC/HVDC 3.5-kW power supplies. The chassis also has one fan tray at the rear. The following figure shows the standard hardware features seen from the front of the chassis.

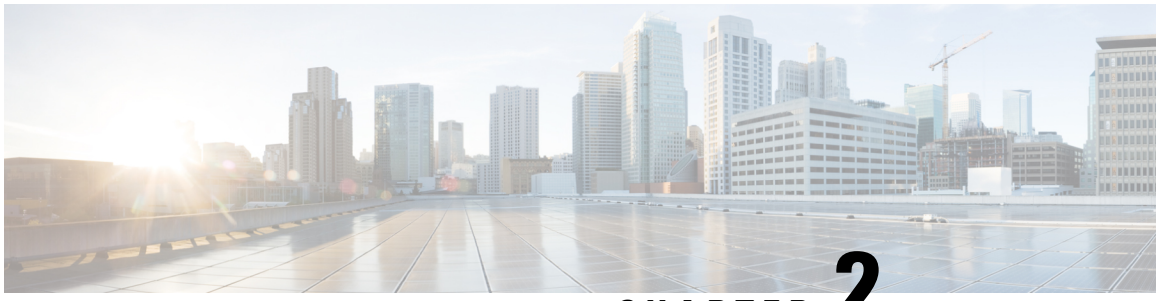
Figure 1: Standard Hardware Features on the Front of the Cisco Nexus 7702 Chassis



1	I/O modules (one) • 12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26) • 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25) • 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23) • 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36) • 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L) • 24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L) • 48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L)
2	Supervisor modules (one) (N77-SUP2E and N77-SUP3E)
3	Power supplies (up to 2) • 3-kW AC power supply (N77-AC-3KW) • 3-kW DC power supply (N77-DC-3KW) • 3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)

Figure 2: Standard Hardware Features on the Rear of the Cisco Nexus 7702 Chassis

1	One fan tray (N77-C7702-FAN)



CHAPTER 2

Preparing the Site

This chapter includes the following sections:

- Humidity Requirements, on page 3
- Altitude Requirements, on page 3
- Dust and Particulate Requirements, on page 4
- Minimizing Electromagnetic and Radio Frequency Interference, on page 4
- Shock and Vibration Requirements, on page 5
- Grounding Requirements, on page 5
- Planning for Power Requirements, on page 5
- Rack and Cabinet Requirements, on page 8
- Clearance Requirements, on page 9

Humidity Requirements

High humidity can cause moisture to seep into the switch. Moisture can cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. The switch is rated to operate at 8 to 80 percent relative humidity, with a humidity gradation of 10 percent per hour.

The switch can withstand from 5 to 90 percent relative humidity. Buildings in which the climate is controlled by air-conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for the switch equipment. However, if the switch is located in an unusually humid location, you should use a dehumidifier to maintain the humidity within an acceptable range.

Altitude Requirements

If you operate a switch at a high altitude (low pressure), the efficiency of forced and convection cooling is reduced and can result in electrical problems that are related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or to perform at a reduced efficiency. This switch is rated to operate at altitudes from –500 to 13,123 feet (–152 to 4,000 meters). You can store the switch at altitudes of –1,000 to 30,000 feet (–305 to 9,144 meters).

Dust and Particulate Requirements

Exhaust fans cool power supplies and system fan trays cool switches by drawing in air and exhausting air out through various openings in the chassis. However, fans also ingest dust and other particles, causing contaminant buildup in the switch and increased internal chassis temperature. A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and interfere with the mechanical components in the switch.

Note If you are using this switch in a nonclean environment, you can order and install an optional air filter. This air filter requires that you also order the optional front door for the chassis.

In addition to regular cleaning, follow these precautions to avoid contamination of your switch:

- Do not permit smoking near the switch.
- Do not permit food or drink near the switch.

Minimizing Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from the switch can adversely affect other devices such as radio and television (TV) receivers operating near the switch. Radio frequencies that emanate from the switch can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the switch monitor.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the switch to other devices through the power cable and power source or through the air like transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI that can be emitted by computing equipment. Each switch meets these FCC regulations.

To reduce the possibility of EMI and RFI, follow these guidelines:

- Cover all open expansion slots with a metal filler.
- Always use shielded cables with metal connector shells for attaching peripherals to the switch.

When wires are run for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the wires and cause the following implications:

- Bad wiring can result in radio interference emanating from the plant wiring.
- Strong EMI, especially when it is caused by lightning or radio transmitters, can destroy the signal drivers and receivers in the chassis and even create an electrical hazard by conducting power surges through lines into equipment.

Note To predict and prevent strong EMI, you might need to consult experts in radio frequency interference (RFI).

The wiring is unlikely to emit radio interference if you use twisted-pair cable with a good distribution of grounding conductors. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.

If the wires exceed the recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic switches. You may want to consult experts in electrical surge suppression and shielding if you had similar problems in the past.

Shock and Vibration Requirements

The switch has been shock- and vibration-tested for operating ranges, handling, and earthquake standards to Network Equipment Building Standards (NEBS) Zone 4 per GR-63-Core.

Grounding Requirements

The switch is sensitive to variations in voltage supplied by the power sources. Overvoltage, undervoltage, and transients (or spikes) can erase data from the memory or cause components to fail. To protect against these types of problems, ensure that there is an earth-ground connection for the switch. You can connect the grounding pad on the switch either directly to the earth-ground connection or to a fully bonded and grounded rack.

You must provide the grounding cable to make this connection but you can connect the grounding wire to the switch using a grounding lug that ships with the switch. Size the grounding wire to meet local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations (for those installations, we recommend that you use commercially available 6 AWG wire). The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

Note You automatically ground the AC power supplies when you connect them to a power source, but you cannot ground a 3-kW DC power supply. You must connect the chassis to the facility earth ground.

Planning for Power Requirements

To plan for the power requirements of a switch, you must determine each of the following:

- Power requirements of the switch
- Minimum number of power supplies required to power the switch and its components
- Power mode to use and the number of additional power supplies required for that mode

You must also ensure that the circuit used for the switch is dedicated to the switch to minimize the possibility of circuit failure.

When you know the amount of power that is required for operations (available power) and redundancy (reserve power), you can plan for the required number of input power receptacles with reach of the switch location.

Step 1 Determine the power requirement for the switch by summing the maximum wattage for each installed module (see the following table).

Component		Quantity	Maximum Power	Typical Power
Supervisor Modules		1	—	—
	Supervisor 2 Enhanced (N77-SUP2E)		265 W	137 W
	Supervisor 3 Enhanced (N77-SUP3E)		150 W	110 W
F3 I/O Modules		1	—	—
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)		480 W	450 W
	24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)		740 W	650 W
	12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)		730 W	640 W
F4 I/O Module			—	—
	30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)		1000 W	730 W
M3 I/O Modules			—	—
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L)		560 W	500 W
	24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)		750 W	700 W
	12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)		1095 W	800 W
Fan Tray		1	—	—
	Fan Tray (N77-C7702-FAN)		300 W	50 W

Note Maximum power values are used for calculating the power requirements.

Step 2 Determine the number of power supplies needed for the available power requirement by dividing the power requirement amount (see Step 1) by the output wattage of the power supplies installed in the switch.

Step 3 Select one of the following power modes to determine the number of additional power supplies required for reserve power:

- Combined power—Do not add any power supplies to the number of power supplies calculated for the available power in Step 2. This power mode does not provide power redundancy, so no extra power supplies are needed.
- Power supply redundancy (*n*+1 redundancy)—Add one power supply (reserve power supply). This form of power redundancy provides a reserve power supply that can replace any active power supply that goes offline.
- Input source redundancy (grid redundancy)—Add enough power supplies (reserve power supplies) to at least equal the total output of the active power supplies (number of power supplies calculated in Step 2). Typically, you would double the number of power supplies. You must plan for a second power source for the reserve power supplies.

- Full redundancy (*n*+1 and grid redundancy)—Add enough power supplies (reserve power supplies) to at least equal the output of the active power supplies (number of power supplies calculated in Step 2). For power supply (*n*+1) redundancy, ensure that . For input-source (grid) redundancy, you will probably double the number of power supplies. You must plan for a second power source with at least the same amount of input power for the reserve power supplies. Either one of the reserve power supplies can replace any of the active power supplies.

Step 4 Be sure that the power source circuits are dedicated to the switch and not to other electrical equipment.

For combined power mode (no power redundancy) or power supply (*n*+1) redundancy, you need only one dedicated circuit. The requirements for each circuit are listed in the following table.

Table 1: Circuit Requirements for 3-kW Power Supplies

Power Supply			Number of Circuits	Requirement for Each Circuit
AC Power Supplies				
	3-kW power supply	(N77-AC-3.0KW)	1	20 A at 110 VAC or 220 VAC
DC Power Supplies				
	3-kW power supply	(N77-DC-3.0KW)	1	20A

Table 2: Circuit Requirements for 3.5-kW HVAC/HVDC Power Supplies

Power Supply			Number of Circuits	Requirement for Each Circuit
	3.5-kW HVAC/HVDC power supply	(N77-HV-3.5KW)	1	20 A at 110 VAC, 210 VAC, 220/230 VAC and 277 VAC or 20 A at 210 VDC, 220/240 VDC and 380 VDC

Step 5 Plan the placement of the input power receptacles within reach of the power cables used for each power supply (see the following table for the maximum distances).

Typically, power receptacles are placed on the rack with the switch. If the DC power source is further than allowed by the DC power cables, you can install a power interface unit (PIU) in the rack with the switch and connect that to the power source with other cabling.

Power Supply	Maximum Distance Between Receptacle and Power Supply
All AC power supplies	12 feet (3.6 m)
HVAC/HVDC 3.5-kW power supplies	14 feet (4.26 m)
DC 3-kW power supplies	Determined by the length of the power cord that you supply.

Rack and Cabinet Requirements

You can install the following types of racks or cabinets for your switch:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)

Note Installation clearance requirements for solid-wall cabinets are not in the scope of this guide. Such installations have to be custom-engineered by a cooling professional. The customised configuration should satisfy the requirements mentioned in the Preparing the Site and the Switch Specifications sections.

- Standard open four-post Telco racks
- Standard open two-post Telco racks

To correctly install the switch in a cabinet that is located in a hot-aisle/cold-aisle environment, you should fit the cabinet with baffles to prevent exhaust air from recirculating into the chassis air intake.

Work with your cabinet vendors to determine which of their cabinets meet the following requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- Use a standard 19-inch, four-post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.
- The height of the rack or cabinet must accommodate the 3-RU (5.25 inches or 13.3 cm) height of the switch.
- The depth of a four-post rack must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting brackets.
- Required clearances between the chassis and the edges of its rack or the interior of its cabinet are as follows:
  - 7.5 inches (19.1 cm) between the front of the chassis and the front of the rack or interior of the cabinet (required for cabling).
  - 3.0 inches (7.6 cm) between the rear of the chassis and the perforated rear door of the cabinet (required for airflow in the cabinet if used).

Note This requirement does not apply to enclosures which have a solid rear door or wall with other exhaust configurations.

  - No clearance is required between the chassis and the sides of the rack or cabinet (no side airflow).

Additionally, you must consider the following site requirements for the rack:

- Power receptacles must be located within reach of the power cords used with the switch.
  - AC power supplies

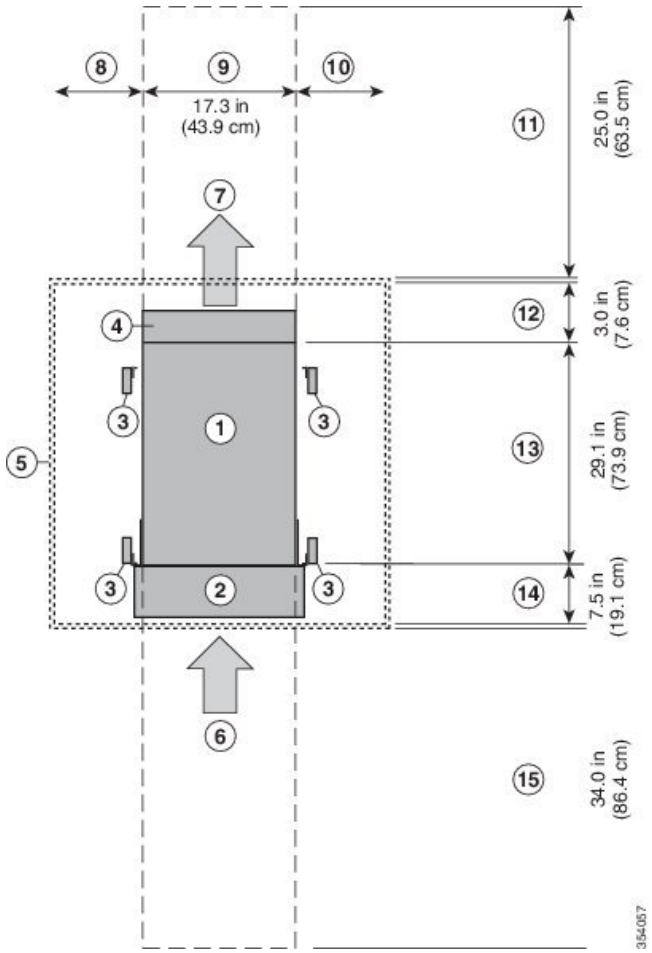
    - Power cords for 3-kW AC power supplies are 8 to 12 feet (2.5 to 3.6 m) long.
  - DC power supplies
    - Power cords for 3.0-kW DC power supplies are supplied and dimensioned by the customer.
  - HVAC/HVDC power supplies
    - Power cords for 3.5-kW HVAC/HVDC power supplies are 14 feet (4.26 m) long.

- Clearance required for cables that connect to as many as 200 ports (in addition to the cabling required for other devices in the same rack). These cables must not block access to any removable chassis modules or block airflow into or out of the chassis. Route the cables through the cable management frames on the left and right sides of the chassis.
- Where necessary, have a seismic rating of Network Equipment Building Standards (NEBS) Zone 3 or Zone 4, per GR-63-CORE if required.
- Minimum gross load rating of 2000 lb (907.2 kg) (static load rating) if supporting two switches.

Clearance Requirements

You must provide the chassis with adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the chassis, route cables, provide airflow, and maintain the switch. For the clearances required for an installation of this chassis, see the following figure.

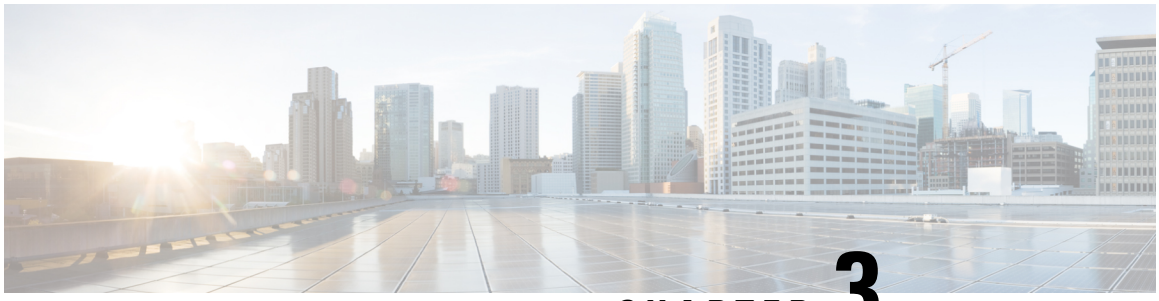
Figure 3: Clearances Required Around the Chassis



1	Chassis	9	Chassis width
2	Cable management frames	10	No right side clearance required (no airflow on right side)
3	Vertical rack-mount posts and rails	11	Rear service clearance required to replace fan trays and fabric modules
4	Area used for fan tray handles at the rear of the chassis (allow 2 inches [5 cm])	12	Airflow clearance area required at the rear of the chassis within the cabinet (if a cabinet is used)
5	Nearest object or inside of cabinet (no side clearance required)	13	Chassis depth
6	Air intake from the cold aisle for all modules and power supplies	14	Clearance required between the front of the chassis and the inside of the cabinet (if used) or the edge of the cold aisle (if no cabinet) for the cable management frames and the optional front doors

7	Air exhaust to the hot aisle for all modules and power supplies	15	Front service clearance required for installing the chassis and replacing the modules on the front of the chassis
8	No left side clearance required (no airflow on left side)		

Note Figure 3: Clearances Required Around the Chassis, on page 10 shows the clearance requirements for conventional cold-aisle to hot-aisle systems which include rack enclosures with perforated front and rear doors. The information given above does not apply to enclosures which have a solid rear or front door or wall with other inlet or exhaust configurations. We recommend consulting a cooling professional if a solid rear or front door is used.



CHAPTER 3

Installing the Switch Chassis

This chapter includes the following topics:

- Installing a Rack or Cabinet, on page 13
- Unpacking and Inspecting a New Switch, on page 14
- Installing the Chassis in a Two-Post Rack, on page 15
- Installing the Chassis on a Four-Post Rack or Cabinet, on page 19
- Grounding a Switch Chassis, on page 22
- Installing Cable Management Frames onto the Chassis , on page 23
- Attaching the Front Door to the Chassis, on page 25

Installing a Rack or Cabinet

Before you install the switch, you must install a standard four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) Rack and Cabinet Requirements.

Step 1 Bolt the rack to the concrete subfloor before moving the chassis onto it.

Note 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.

Step 2 If the rack has bonded construction, connect it to the earth ground. This action enables you to easily ground the switch and its components and to ground your electrostatic discharge (ESD) wrist strap to prevent damaging discharges when you handle ungrounded components before installing them.

Step 3 If you need access to the source power at the rack, include either AC power receptacles or a DC power interface unit (PIU) with the amperage required by the switch that you are installing. .

If you are using DC power, be sure that the DC power supply is grounded and that there is direct access to the facility DC power or indirect access though a power interface unit (PIU). You must connect the DC power supply to the earth ground before you connect it to the facility DC power.

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

Note If you are using the combined power mode or power-supply redundancy, you need only one power source. If you are using input-source redundancy or full redundancy, you need two power sources.

Unpacking and Inspecting a New Switch

Before you install a new chassis, you need to unpack and inspect it to be sure that you have all the items that you ordered and verify that the switch was not damaged during shipment. If anything is damaged or missing, contact your customer representative immediately.

Caution When you handle the chassis or its components, you must follow ESD protocol at all times to prevent ESD damage. This protocol includes but is not limited to wearing an ESD wrist strap that you connect to the earth ground.

Tip Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them with the pallet used for the system. If you need to move or ship the system in the future, you will need these containers.

Step 1 Compare the shipment to the equipment list that is provided by your customer service representative and verify that you have received all of the ordered items.

The shipment should include boxes for the following:

- System chassis, which includes the following installed components:
  - 1 supervisor module
  - 1 I/0 module
  - 1 fan tray
  - 1 to 2 power supply units
- Switch accessory kit

  To see a list of what is included in this kit, see .
- Cable management frames
  - Left and right side frames
  - Top and bottom hood frames
  - M4x14 mm flat-head Phillips screws (4)
- Front door kit — Optional
  - Front door (1) (69-100222-01)

- Air filter kit — Optional
  - Air filter (1) for the front door
  - Cable-management frame brush filters (2)
  - M3 x 12 mm flat-head Phillips screws (4)
- Center-mount kit — For Two-Post rack installation

Step 2 Check the contents of each box for damage.

Step 3 If you notice any discrepancies or damage, send the following information to your customer service representative by email:

- Invoice number of the shipper (see the packing slip)
- Model and serial number of the missing or damaged unit
- Description of the problem and how it affects the installation

Installing the Chassis in a Two-Post Rack

Before you begin

- Verify that the chassis shipment is complete and undamaged.
- Verify that a two-post rack is installed and secured to the subfloor.

Warning The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before installation or servicing. Failure to stabilize the rack can cause bodily injury.

- If there are other devices in the rack, verify that the devices that are heavier than this chassis are installed below where you are going to install the chassis and lighter devices are installed above where you are going to install the chassis.
- Verify that the data center ground is accessible where you are installing the chassis.

Note Fully loaded, the chassis can weigh up to 81.7 lb (37.05 kg). You can lighten the chassis for easier moving by removing a power supply. To determine the full weight of the chassis and the appropriate weight rating for the mechanical lift, see Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies, on page 83.

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.

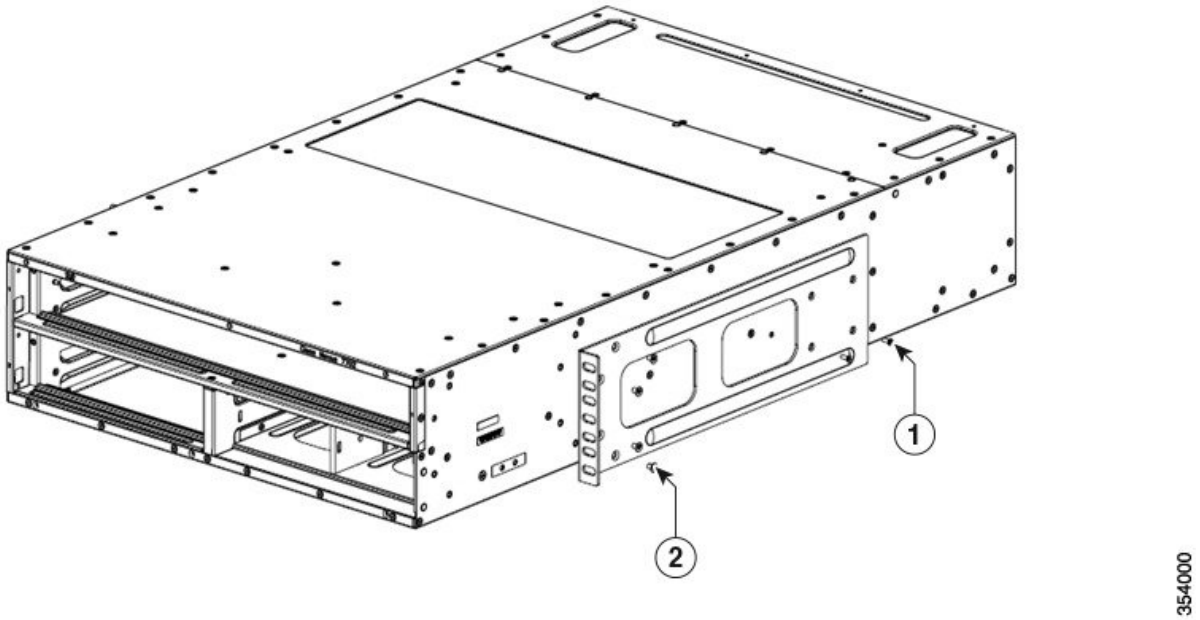
Step 1 If you need to make the chassis as light as possible for moving, you can optionally remove the fan tray and power supplies.

- To remove a power supply, follow these steps:
  a. Push and hold the release handle on the power supply to the left.
  b. Pull the power supply about two inches (about 5 cm) out of the chassis.
  c. Place one hand under the power supply to support its weight and pull the power supply out of the chassis.
  d. Place the power supply on an antistatic surface.
- To remove a fan tray, follow these steps:
  a. Unscrew the two captive screws on the front of the fan tray.
  b. Hold both handles on the fan tray with both of your hands and pull the fan tray out of the chassis.
  c. Place the fan tray on an antistatic surface.

Step 2 Align the rear of the chassis to the front of the rack or cabinet.

Step 3 Push the chassis halfway onto the rack or cabinet.

Figure 4: Moving a Chassis onto a Rack or Cabinet

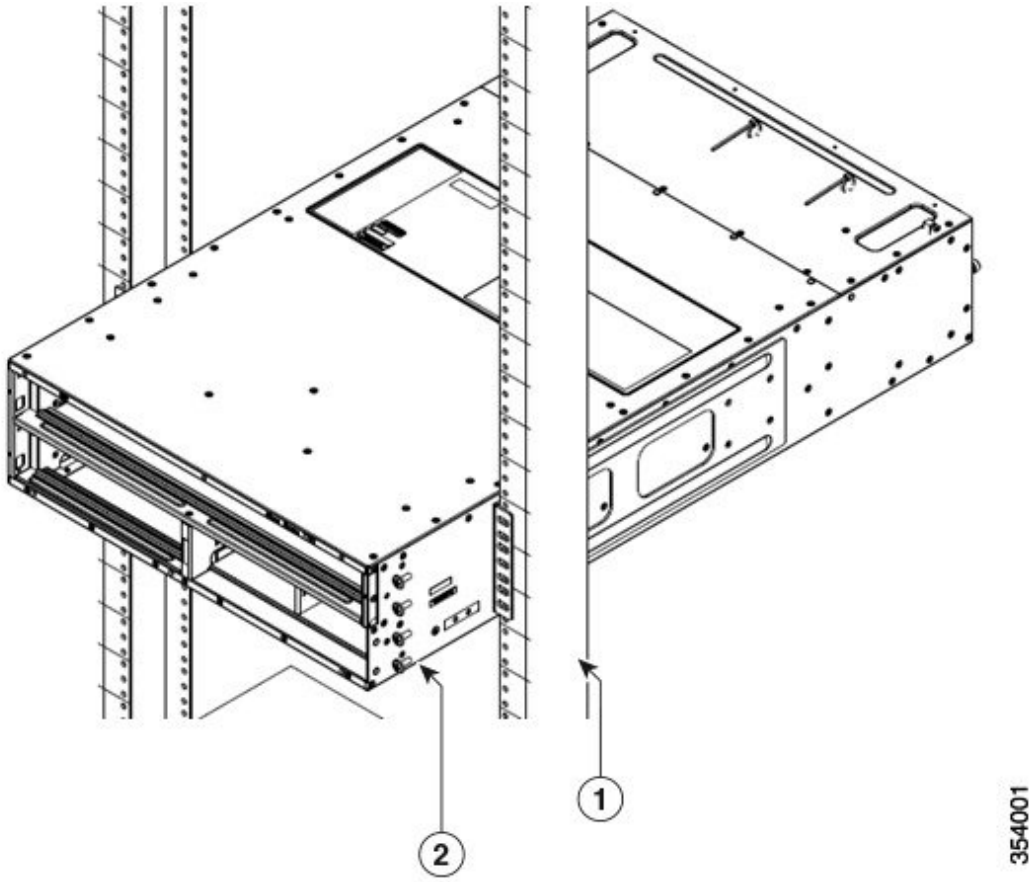


1	Total of four M3 screws (for brackets on both sides).	2	Total of eight M4 screws (for brackets on both sides).

Step 4 Push the chassis all the way onto the rack so that the vertical mounting brackets on the chassis come in contact with the vertical mounting rails on the rack.

Step 5 Use 2 center mount-brackets with eight M4 screws and two M3 screws to attach each of the two vertical mounting brackets on the chassis to the two vertical mounting rails on the rack. It is recommended to use a minimum of 8 screws (user preference from the accessory kit) on the front of the chassis to secure the chassis to the 2-post rack.

Figure 5: Attaching the Chassis to the Rack



1	Vertical mounting rails on the rack
2	Install a total of eight screws (user preference from the accessory kit) at the front to secure the chassis.

Step 6 If you removed the fan tray before moving the chassis, reinstall each one in the chassis as follows:

a) Holding each of the two handles on the fan tray with your two hands, align the fan tray to an open fan tray slot.

b) Slide the fan tray into the slot until the front of the fan tray comes in contact with the rear of the chassis.

Note The two alignment pins on the fan tray (on the left and the right) should go into holes in the chassis and the two captive screws on the fan tray should align to screw holes in the chassis.

c) Screw in the two captive screws to the chassis and tighten each screw to 8 in-lb (0.9 N·m).

Step 7 If you removed any power supplies before moving the chassis, reinstall each one as follows:

a) Determine which power supply slots to fill and ensure that each of those slots is open.

If you are using the combined or power supply redundancy mode, you can use any slot for the power supply that you are installing. If you are using the input-source or full redundancy mode, you must group the power supplies that are to be connected to the same grid on either the left or right power supply slots in the chassis.

b) Place one hand on the front of the power supply and place your other hand under it to support its weight.

c) Align the power supply to an open power supply slot.

Note The alignment bracket on top of the power supply should align to a track at the top of the slot and a bar at the bottom of the power supply should be guided by a track at the bottom of the slot.

d) Slide the power supply all the way into the slot until its release handle clicks and the module stops.

Installing the Chassis on a Four-Post Rack or Cabinet

Before you begin

- Verify that the chassis shipment is complete and undamaged.
- Verify that a rack or cabinet is installed and secured to the subfloor.

Warning The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before installation or servicing. Failure to stabilize the rack can cause bodily injury.

- Verify that there is 3 RU (5.25 inches [13.3 cm]) of space above the rails to install the chassis.
- If there are other devices in the rack, verify that the devices that are heavier than this chassis are installed below where you are going to install the chassis and lighter devices are installed above where you are going to install the chassis.
- Verify that the data center ground is accessible where you are installing the chassis.

Note Fully loaded, the chassis can weigh up to 81.7 lb (37.05 kg). You can lighten the chassis for easier moving by removing a power supply. To determine the full weight of the chassis and the appropriate weight rating for the mechanical lift, see Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies, on page 83.

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.

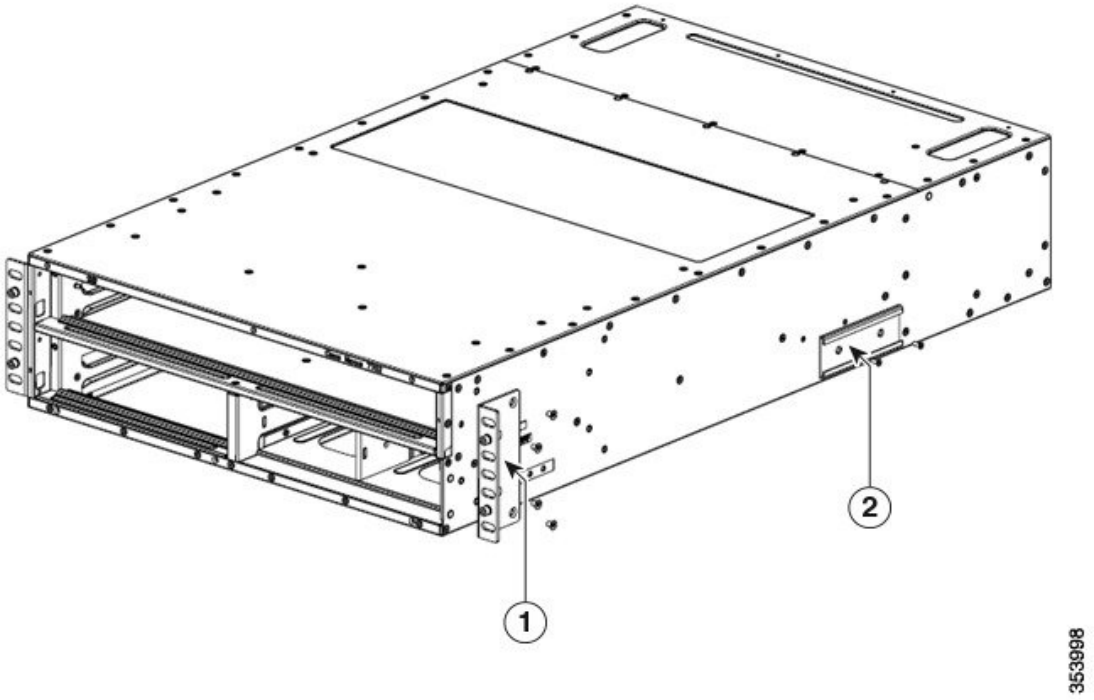
Step 1 If you need to make the chassis as light as possible for moving, you can optionally remove the fan tray and power supplies.

- To remove a power supply, follow these steps:
  a. Slide the handle in the middle of the ejector lever towards the end of the lever and rotate the lever away from the power supply.
  b. Pull the power supply a couple of inches (about 5 cm) out of the chassis.
  c. Place one hand under the power supply to support its weight and pull the power supply out of the chassis.
  d. Place the power supply on an antistatic surface.
- To remove a fan tray, follow these steps:
  a. Unscrew the two captive screws on the front of the fan tray.
  b. Hold both handles on the fan tray with both of your hands and pull the fan tray out of the chassis.
  c. Place the fan tray on an antistatic surface.

Step 2 Prepare chassis by installing the front and side brackets.

Step 3 Align the rear of the chassis to the front of the rack or cabinet.

Figure 6: Moving a Chassis onto a Rack or Cabinet

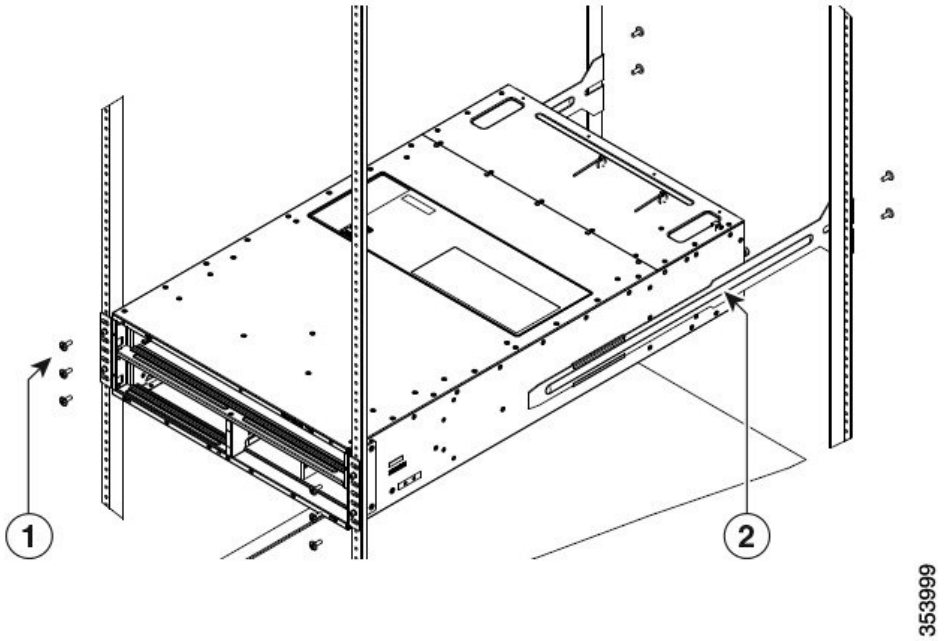


1	2 front mount brackets with eight M4 screws..
2	2 side C-shape brackets with four M3 screws.

Step 4 Push the chassis all the way onto the rack so that the vertical mounting brackets on the chassis come in contact with the vertical mounting rails on the rack.

Step 5 Use six screws (user preference from the accessory kit) at the front and four M3 screws at the back of the slide to secure the system chassis to the four-post rack

Figure 7: Attaching the Chassis to the Rack



1	Install six screws (user preference from the accessory kit) at the front.	2	Install 2 sliders to the C-shape bracket on each side of the chassis. Use four screws at the back of the slider to secure the chassis to the four-post rack.

Step 6 If you removed the fan tray before moving the chassis, reinstall each one in the chassis as follows:

a) Holding each of the two handles on the fan tray with your two hands, align the fan tray to an open fan tray slot.

Note The two alignment brackets on top of the fan tray should align to two tracks at the top of the slot.

b) Slide the fan tray into the slot until the front of the fan tray comes in contact with the rear of the chassis.

Note The two alignment pins on the fan tray (on the left and the right) should go into holes in the chassis and the two captive screws on the fan tray should align to screw holes in the chassis.

c) Screw in the two captive screws to the chassis and tighten each screw to 8 in-lb (0.9 N·m).

Step 7 If you removed any power supplies before moving the chassis, reinstall each one as follows:

a) Determine which power supply slots to fill and ensure that each of those slots is open.

If you are using the combined or power supply redundancy mode, you can use any slot for the power supply that you are installing. If you are using input-source or full redundancy mode, you must group the power supplies that are to be connected to the same grid on either the left or right power supply slots in the chassis.

b) Place one hand on the front of the power supply and place your other hand under it to support its weight.

c) Align the power supply to an open power supply slot.

Note The alignment bracket on top of the power supply should align to a track at the top of the slot and a bar at the bottom of the power supply should be guided by a track at the bottom of the slot.

d) Slide the power supply all the way into the slot until it stops.
e) Slide the handle in the middle of the ejector lever toward the end of the lever and rotate the lever to the front of the power supply. Release the middle handle.

Note The lever should grab the inside of the slot and push the power supply onto its mid plane connectors.

f) Screw in the two captive screws on the front of the power supply to the chassis. Tighten each screw to 8 in-lb (0.9 N·m).

Grounding a Switch Chassis

The switch is fully grounded as soon as you connect the chassis and the power supplies to the earth ground in the following ways:

- You connect the chassis to either a fully-bonded, grounded rack or to the data center ground.

Note The system ground, also referred to as the network equipment building system (NEBS) ground, provides additional grounding for EMI shielding requirements and for the low-voltage supplies (DC-DC converters) on the modules. This grounding system is active even when the AC and HVAC/HVDC power cables are not connected to the system.

- You connect the AC and HVAC/HVDC power supplies to the earth ground automatically when you connect an AC or HVAC/HVDC power supply to an AC or HVAC/HVDC power source.

Before you begin

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the switch chassis into a bonded rack (see the rack manufacturer's instructions for more information) that now has a connection to the data center earth ground, you can ground the chassis by connecting its grounding pad to the rack. Otherwise, you must connect the chassis grounding pad directly to the data center ground.

To connect the switch chassis to the data center ground, you need the following tools and materials:

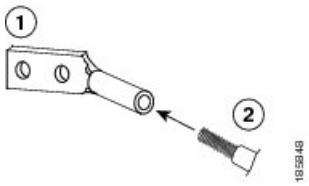
- Grounding lug—A two-holed standard barrel lug that supports up to 6 AWG wire. This lug is supplied with the accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the accessory kit.
- Grounding wire—Not supplied with the accessory kit. This wire should be sized to meet local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. We recommend that you use commercially available 6 AWG wire. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- Number 1 manual Phillips-head torque screwdriver.

- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in the following figure.

Figure 8: Inserting a Grounding Wire in a Grounding Lug



1	NRTL listed 45-degree grounding lug	2	Grounding cable with 0.75 in. (19 mm) of insulation stripped from one end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug.

Step 4 Secure the grounding wire lug to the grounding pad with two M4 screws, and tighten the screws to 11.5 to 15 in-lb (1.3 to 1.7 N·m) of torque.

Step 5 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is fully bonded and grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Installing Cable Management Frames onto the Chassis

Before you begin

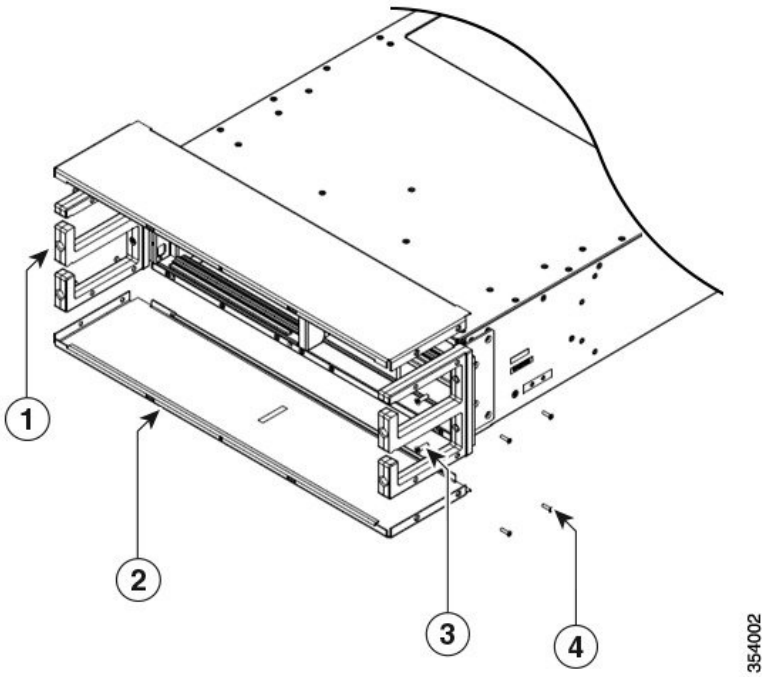
- The chassis must be installed and secured to the rack.
- You must have the following tools and equipment:
  - Manual Phillips screwdriver with torque capability (customer supplied).
  - The following frames and screws (shipped with the switch):
    - Two cable management side frames
    - One cable management top hood frame
    - One cable management bottom hood frame
    - Two M4 and four M3 screws.

Step 1 Attach the two cable management frames to the chassis as follows:

a) Position one of the cable management side frame assemblies on the vertical mounting bracket attached to one side of the front of the chassis.

b) Secure the cable management frame with two M4 screws. (see the following figure).

- ***Figure 9: Attaching a Cable Management Assembly to the Chassis***



1	Cable management side frame	3	Two M4 screws to secure the cable management frame to front mounting bracket on chassis.
2	Cable management bottom hood frame	4	Four M3 screws to secure top and bottom hood frames to the chassis.

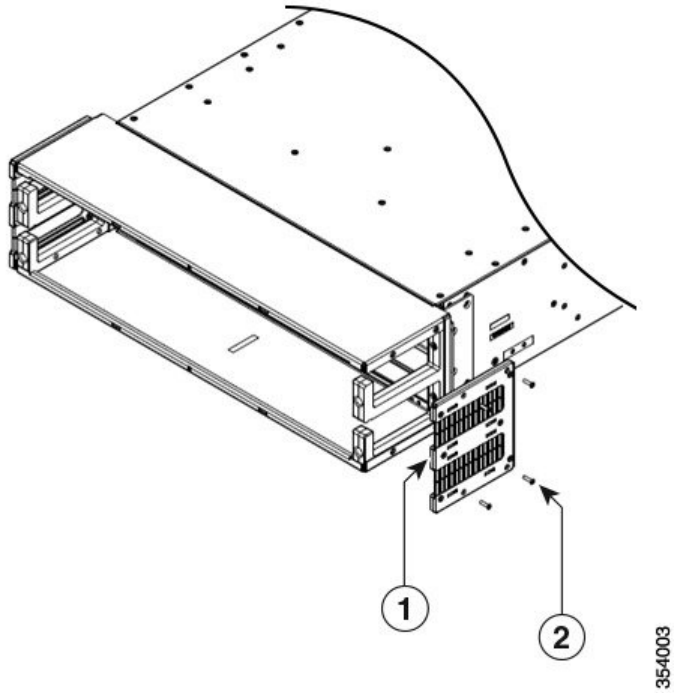
c) Repeat Steps 1a through 1b to attach the other cable management frame.

d) Place the top and bottom hood frame as shown in the figure. Secure the hood frames with four M3 screws.

Step 2 Attach the side filter to the cable management assembly as follows:

a) Remove 4 M3 screws as shown in the figure.

Figure 10: Attaching the Top Hood to the Chassis and Cable Management Assemblies



1	Side filter assembly
2	Four M3 screws to secure the side filter to the cable management assembly.

b) Attach the side filter assembly to the cable management assembly.
c) Use the 4 M3 screws to secure the side filter to the cable management assembly.
d) Repeat Steps 2a through 2c to attach the side filter assembly on the other side of the cable management assembly.

What to do next

You are ready to attach the optional door to the cable management frames.

Attaching the Front Door to the Chassis

Before installing the front door to the chassis, you must install an air filter to the front door.

Before you begin

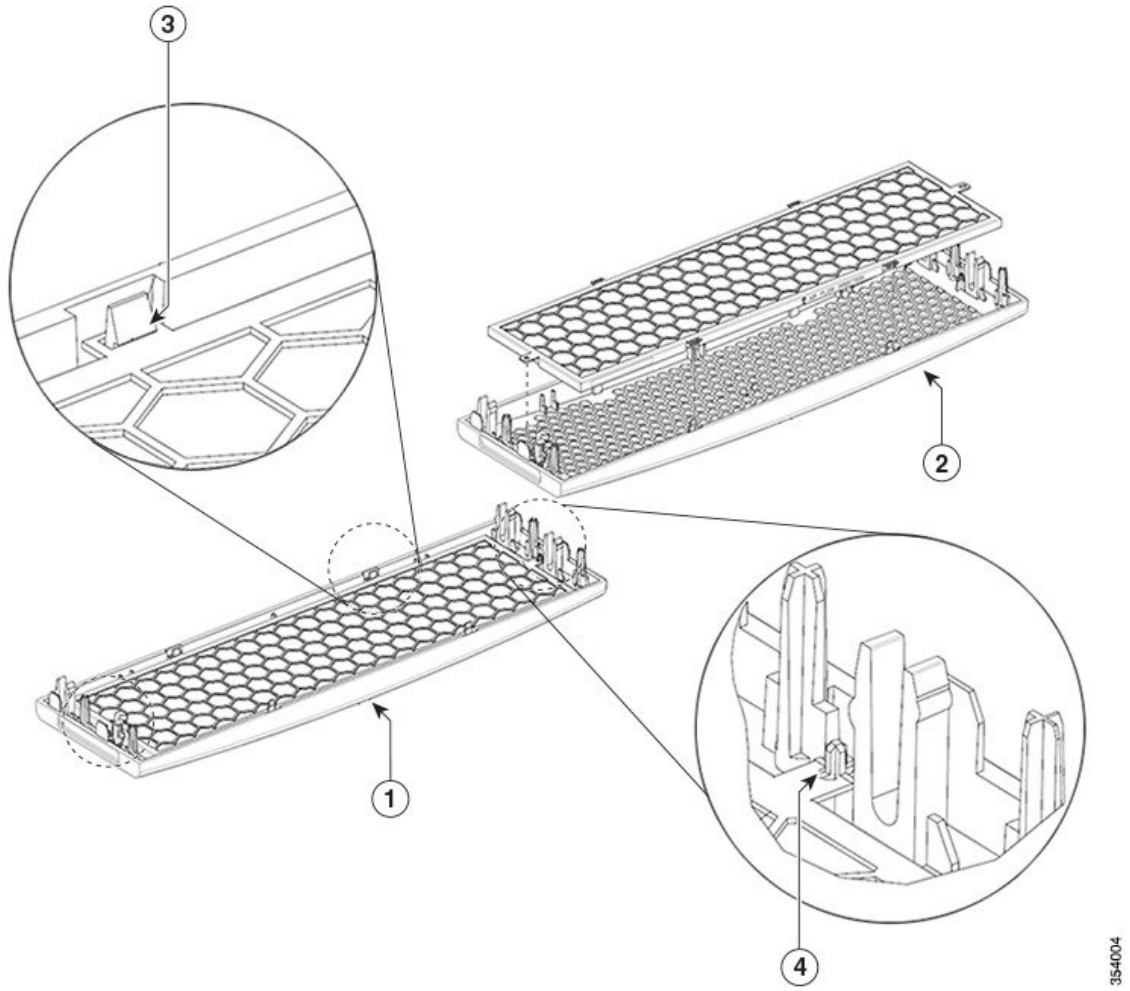
- Verify that the cable management frames are attached to the chassis.
- Verify that you have the following tools and equipment:
  - Optional front door kit

- Number 1 manual Phillips torque screwdriver

Step 1 Install the air filter to the front door as follows:

a) Attach the air filter to the front door by aligning the plastic guides on the air filter with the slot holes on the front door.

Figure 11: Attaching the Air Filter to the Front Door



1	Front door.	3	Snap fit hook on the front door for air filter.
2	Air filter.	4	Slot hole on the front door for air filter.

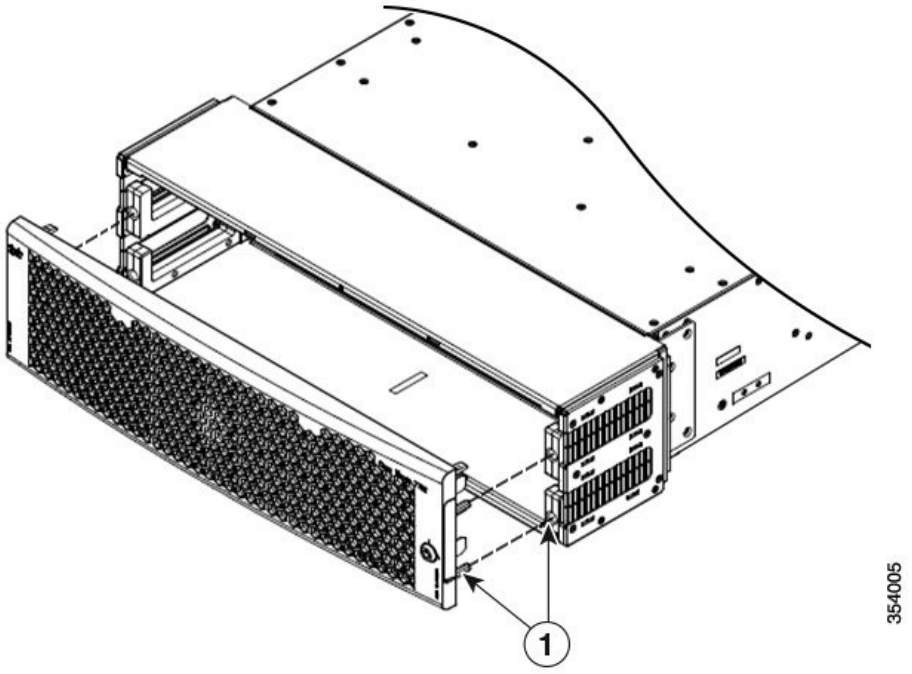
b) Secure the air filter to the front door by pushing the air filter beyond the plastic snap fit hook on the front door.

Note We recommend that you change the air filter every 3 months. However, examine the air filter once a month (or more often in dusty environments) and replace it if it appears to be excessively dirty or damaged. To comply with Telecordia GR-63-Core standard air filter requirements for NEBS deployments, the air filter must be replaced, not cleaned.

Step 2 Attach the front door as follows:

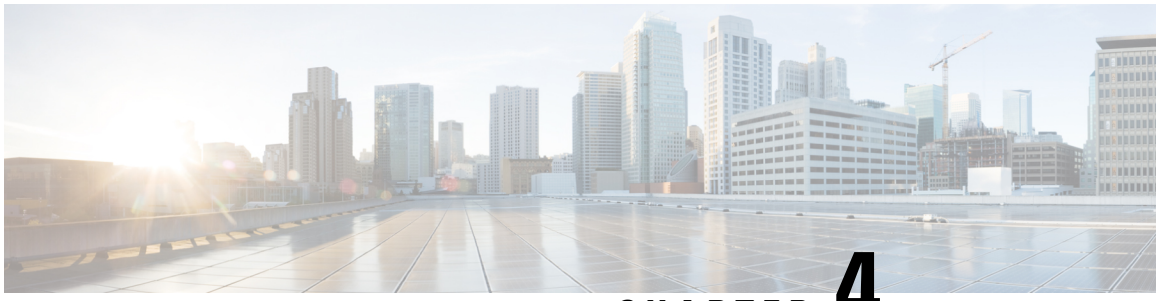
a) Place the front door on the chassis by aligning the guidepins on the front door with the slot holes on the cable management assembly.

Figure 12: Placing the Door on the Cable Management Frames



1	Align the guidepins on the front door with the slot holes on the cable management assembly.

b) Push to snap fit the front door to the cable management assembly.



CHAPTER 4

Connecting to the Network

This chapter contains the following sections:

- Guidelines for Connecting Ports, on page 29
- Connecting a Console to the Switch, on page 30
- Connecting the Management Interface, on page 31
- Creating the Initial Switch Configuration, on page 32
- Connecting Interface Ports to the Network, on page 33

Guidelines for Connecting Ports

You can use and Small Form-Factor Pluggable (SFP) transceivers to connect the ports on the I/O modules to other network devices, which can include other switches or Fabric Extenders (FEXs). The SFP+ transceivers include Fabric Extender Transceivers (FETs) for connecting I/O modules with FEXs.

The transceivers used with copper cables come already assembled with their cables. The transceivers used with fiber-optic cables come separated from their cables. To prevent damage to the fiber-optic cables and their transceivers, we recommend that you keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the I/O module. Before removing a transceiver for a fiber-optic cable, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables, do the following:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The switch is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be kept below 0.35 dB.
  - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
  - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.

- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

Connecting a Console to the Switch

Before you create a network management connection for the switch or connect the switch to the network, you must create a local management connection through a console terminal and configure an IP address for the switch. You can also use the console to perform the following functions, each of which can be performed through the management interface after you make that connection later on:

- Configure the switch using the command-line interface (CLI).
- Monitor network statistics and errors.
- Configure Simple Network Management Protocol (SNMP) agent parameters.
- Download software updates.

You make this local management connection between the asynchronous serial port on a supervisor module and a console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device. On the supervisor modules, you use one of the following asynchronous serial ports:

- CONSOLE SERIAL PORT

  This port is used for direct connections to the console.

Note Before you can connect the console port to a computer terminal, make sure that the computer terminal supports VT100 terminal emulation. The terminal emulation software makes communication between the switch and computer possible during setup and configuration.

Before you begin

- The switch must be fully installed in its rack, connected to a power source, and grounded.
- The necessary cabling for the console, management, and network connections must be available.
  - An RJ-45 rollover cable and DB9F/RJ-45 adapter are provided in the switch accessory kit.
  - Network cabling should already be routed to the location of the installed switch.

Step 1 Configure the console device to match the following default port characteristics:

- 9600 baud
- 8 data bits
- 1 stop bit

- No parity

Step 2 Route the RJ-45 rollover cable through the center slot in the cable management system and then to the console or modem.

Step 3 Connect the other end of the RJ-45 rollover cable to the console or to a modem.

If the console or modem cannot use an RJ-45 connection, use the DB-9F/RJ-45F PC terminal adapter found in the accessory kit for the switch. Alternatively, you can use an RJ-45/DSUB F/F or RJ-45/DSUB R/P adapter, but you must provide those adapters.

What to do next

You are ready to create the initial switch configuration (see Creating the Initial Switch Configuration, on page 32).

Connecting the Management Interface

The supervisor management port (MGMT ETH) provides out-of-band management, which enables you to use the command-line interface (CLI) or the Cisco Data Center Network Manager (DCNM) interface to manage the switch by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.

Note In a dual supervisor switch, you can ensure that the active supervisor module is always connected to the network by connecting the management interface on both supervisor modules to the network (that is, you can perform this task for each supervisor module). That way, no matter which supervisor module is active, the switch automatically has a management interface that is running and accessible from the network.

Caution To prevent an IP address conflict, do not connect the MGMT 10/100/1000 Ethernet port until the initial configuration is complete. For more information, see Creating the Initial Switch Configuration, on page 32.

Before you begin

You must have completed the initial switch configuration (see Creating the Initial Switch Configuration, on page 32).

Step 1 Connect a modular, RJ-45, UTP cable to the MGMT ETH port on the supervisor module.

Step 2 Route the cable through the central slot in the cable management system.

Step 3 Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.

What to do next

You are ready to connect the interface ports on each of the I/O modules to the network.

Creating the Initial Switch Configuration

You must assign an IP address to the switch management interface so that you can then connect the switch to the network.

When you initially power up the switch, it boots up and asks you a series of questions to configure the switch. To enable you to connect the switch to the network, you can use the default choices for each configuration except the IP address, which you must provide. You can perform the other configurations at a later time as described in the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*.

Note You should also know the unique name needed to identify the switch among the devices in the network.

Before you begin

- A console device must be connected with the switch.
- The switch must be connected to a power source.
- Determine the IP address and netmask needed for the following interfaces:
  - Management (Mgmt0) interface

Step 1 Power up the switch by turning the power switch from standby () to on () with each power supply installed in the switch chassis.

The Input and Output LEDs on each power supply light up (green) when the power supply units are sending power to the switch, and the software asks you to specify a password to use with the switch.

Step 2 Enter a new password to use for this switch.

The software checks the security strength of your password and rejects your password if it is not considered to be a strong password. To increase the security strength of your password, make sure that it adheres to the following guidelines:

- At least eight characters
- Minimizes or avoids the use of consecutive characters (such as "abcd")
- Minimizes or avoids repeating characters (such as "aaabbb")
- Does not contain recognizable words from the dictionary
- Does not contain proper names
- Contains both uppercase and lowercase characters
- Contains numbers as well as letters

Examples of strong passwords include the following:

- If2CoM18
- 2004AsdfLkj30

- Cb1955S21

Note Clear text passwords cannot include the dollar sign ($) special character.

Tip If a password is trivial (such as a short, easy-to-decipher password), the software will reject your password configuration. Be sure to configure a strong password as explained in this step. Passwords are case sensitive.

If you enter a strong password, the software asks you to confirm the password.

Step 3 Enter the same password again.

If you enter the same password, the software accepts the password and begins asking a series of configuration questions.

Step 4 Until you are asked for an IP address, you can enter the default configuration for each question.

Repeat this step for each question until you are asked for the Mgmt0 IPv4 address.

Step 5 Enter the IP address for the management interface.

The software asks for the Mgmt0 IPv4 netmask.

Step 6 Enter a network mask for the management interface.

The software asks if you need to edit the configuration.

Step 7 Enter **no** to not edit the configuration.

The software asks if you need to save the configuration.

Step 8 Enter **yes** to save the configuration.

What to do next

You can now set up the management interface for each supervisor module on the switch.

Connecting Interface Ports to the Network

You can connect optical interface ports on I/O modules with other devices for network connectivity.

Connecting a Fiber-Optic Cable to a Transceiver

To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend them to a radius less than 1 inch (2.54 cm) if there is no tension in the cable or 2 inches (5.08 cm) if there is tension in the cable.

To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

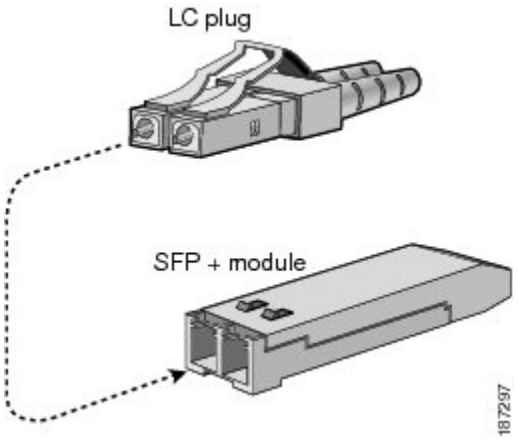
Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 Remove the dust cover from the port connector on the cable.

Step 3 Remove the dust cover from the cable end of the transceiver.

Step 4 Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place (see the following figure for SFP or SFP+ transceivers).

Figure 13: Connecting an LC Optical Cable Plug to a Transceiver



If the cable does not install easily, ensure that it is correctly oriented before continuing.

Disconnecting Optical Ports from the Network

When removing fiber-optic transceivers, you must remove the fiber-optic cables from a transceiver before removing the transceiver from the port.

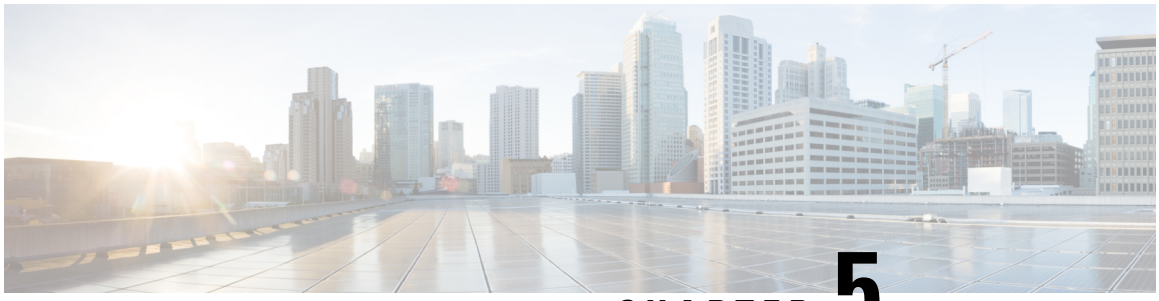
Maintaining Transceivers and Optical Cables

Transceivers and fiber-optic cables must be kept clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.



CHAPTER 5

Managing the Switch

- Displaying Information About Installed Hardware Modules, on page 37
- Displaying the Hardware Inventory for a Switch, on page 39
- Displaying the Backplane and Serial Number Information, on page 40
- Displaying Environmental Information for a Switch, on page 43
- Displaying Temperatures for Modules, on page 44
- Connecting to a Module, on page 46
- Saving the Module Configuration, on page 47
- Displaying Power Usage Information, on page 47
- Reloading a Module, on page 48
- Rebooting the Switch, on page 48
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- Overview of I/O Module Support, on page 49
- Power Modes Overview, on page 52
- Overview of Fan Trays, on page 56

Displaying Information About Installed Hardware Modules

To display information about the switch hardware and the hardware modules installed in the switch chassis, use the **show hardware** command.

Enter the **show hardware** command.

Example:

```
switch# show hardware
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_series_home.html
Copyright (c) 2002-2015, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
```

```
Software
  BIOS:      version 1.7.0
  kickstart: version 8.3(0)SK(1) [build 8.3(0)SK(0.47)] [gdb]
  system:    version 8.3(0)SK(1) [build 8.3(0)SK(0.47)] [gdb]
  BIOS compile time:       10/10/2017
  kickstart image file is: bootflash:///n7700-s3-kickstart.8.3.0.SK.0.47.gbin
  kickstart compile time:  5/31/2018 23:00:00 [03/02/2018 06:26:13]
  system image file is:    bootflash:///n7700-s3-dk9.8.3.0.SK.0.47.gbin
  system compile time:     5/31/2018 23:00:00 [03/02/2018 08:23:10]


Hardware
  cisco Nexus7700 C7702 (2 Slot) Chassis ("Supervisor Module-3")
  Intel(R) Xeon(R) CPU         with 32744992 kB of memory.
  Processor Board ID JAE183300QX

  Device name: APEX2
  bootflash:    4014080 kB
  slot0:        7989768 kB (expansion flash)

Kernel uptime is 6 day(s), 23 hour(s), 38 minute(s), 57 second(s)

Last reset at 448455 usecs after  Wed Jun  3 19:10:58 2015

  Reason: Reset Requested by CLI command reload
  System version: 8.3(0)SK(0.47)
  Service:

plugin
  Core Plugin, Ethernet Plugin
--------------------------------
Switch hardware ID information
--------------------------------

Switch is booted up
  Switch type is : Nexus7700 C7702 (2 Slot) Chassis
  Model number is N77-C7702
  H/W version is 0.202
  Part Number is 73-100796-02
  Part Revision is 02
  Manufacture Date is Year 19 Week 13
  Serial number is JPG1913002X
  CLEI code is CMM1700DRA

--------------------------------
Chassis has 2 Module slots
--------------------------------

Module1  ok
  Module type is : 100 Gbps Ethernet Module
  0 submodules are present
  Model number is N77-F430CQ-36
  H/W version is 0.203
  Part Number is 73-101350-02
  Part Revision is 05
  Manufacture Date is Year 19 Week 41
  Serial number is JAE214303LY
  CLEI code is

Module2  ok
  Module type is : Supervisor Module-3
  0 submodules are present
  Model number is N77-SUP3E
```

```
  H/W version is 0.909
  Part Number is 73-16310-09
  Part Revision is 09
  Manufacture Date is Year 18 Week 33
  Serial number is JAE2150086E
  CLEI code is

--------------------------------------
Chassis has 2 PowerSupply Slots
--------------------------------------

PS1 ok
  Power supply type is: 3000.00W 220v AC
  Model number is N7K-AC-3KW
  H/W version is 1.0
  Part Number is 341-0428-01
  Part Revision is A0
  Manufacture Date is Year 16 Week 52
  Serial number is DTM165200TK
  CLEI code is CMUPABRCAA

PS2 ok
  Power supply type is: 3000.00W 220v AC
  Model number is N77-AC-3KW
  H/W version is 1.0
  Part Number is 341-0600-01
  Part Revision is A0
  Manufacture Date is Year 17 Week 32
  Serial number is DTM173200S1
  CLEI code is CMUPAB4CAA

---------------------------------
Chassis has 1 Fan slots
---------------------------------

Fan1(sys_fan1) ok
  Model number is N77-C7702-FAN
  H/W version is 0.0
  Part Number is 73-100660-02
  Part Revision is 04
  Manufacture Date is Year 19 Week 6
  Serial number is DCH1906A020
  CLEI code is
```

Displaying the Hardware Inventory for a Switch

To display information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs, use the **show inventory** command.

Enter the **show inventory** command.

Example:

```
switch# show inventory
NAME: "Chassis",  DESCR: "Nexus7700 C7702 (2 Slot) Chassis "
PID: N77-C7702          ,  VID: V00 ,  SN: JPG1913002X
```

```
NAME: "Slot 1",  DESCR: "100 Gbps Ethernet Module"
PID: N77-F430CQ-36       ,  VID: V00 ,  SN: JAE214303LW

NAME: "Slot 2",  DESCR: "Supervisor Module-3"
PID: N77-SUP3E           ,  VID: V00 ,  SN: JAE2150086E

NAME: "Slot 33",  DESCR: "Nexus7700 C7702 (2 Slot) Chassis Power Supply"
PID: N7K-AC-3KW          ,  VID: V01 ,  SN: DTM165200TK

NAME: "Slot 34",  DESCR: "Nexus7700 C7702 (2 Slot) Chassis Power Supply"
PID: N77-AC-3KW          ,  VID: V01 ,  SN: DTM173200S1

NAME: "Slot 35",  DESCR: "Nexus7700 C7702 (2 Slot) Chassis Fan Module"
PID: N77-C7702-FAN       ,  VID: V00 ,  SN: DCH1906A020
```

Displaying the Backplane and Serial Number Information

You can display the backplane information, including the serial number for the switch, by using the **show sprom backplane** command.

Enter the **show sprom backplane** command.

Example:

```
switch# show sprom backplane 1
DISPLAY backplane sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x170c
 EEPROM Size     : 65535
 Block Count     : 5
 FRU Major Type  : 0x6001
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N77-C7702
 Serial Number   : JPG1913002X
 Part Number     : 73-100796-02
 Part Revision   : 02
 Mfg Deviation   : 0
 H/W Version     : 0.202
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.12.3.1.3.1648.0.0
 Power Consump   : 0
 RMA Code        : 0-0-0-0
 CLEI Code       : CMM1700DRA
 VID             : V00
Chassis specific block:
 Block Signature : 0x6001
 Block Version   : 3
 Block Length    : 39
 Block Checksum  : 0x360
 Feature Bits    : 0x0
```

```
 HW Changes Bits : 0x1
 Stackmib OID    : 0
 MAC Addresses   : 8c-60-4f-30-db-00
 Number of MACs  : 128
 OEM Enterprise  : 9
 OEM MIB Offset  : 5
 MAX Connector Power: 0
WWN software-module specific block:
 Block Signature : 0x6005
 Block Version   : 1
 Block Length    : 0
 Block Checksum  : 0x268
wwn usage bits:
 00 00 00 00 00 00 00 00
 01 00 03 ff ff 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
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License software-module specific block:
 Block Signature : 0x6006
 Block Version   : 1
 Block Length    : 16
 Block Checksum  : 0x17d
lic usage bits:
 c0 46 00 00 00 00 00 00
Second Serial number specific block:
 Block Signature : 0x6007
 Block Version   : 1
 Block Length    : 28
 Block Checksum  : 0x31e
 Serial Number   : JAE191106QG
```

```
switch# show sprom backplane 2
DISPLAY backplane sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
```

```
 Block Length    : 160
 Block Checksum  : 0x170c
 EEPROM Size     : 65535
 Block Count     : 5
 FRU Major Type  : 0x6001
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N77-C7702
 Serial Number   : JPG1913002X
 Part Number     : 73-100796-02
 Part Revision   : 02
 Mfg Deviation   : 0
 H/W Version     : 0.202
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.12.3.1.3.1648.0.0
 Power Consump   : 0
 RMA Code        : 0-0-0-0
 CLEI Code       : CMM1700DRA
 VID             : V00
Chassis specific block:
 Block Signature : 0x6001
 Block Version   : 3
 Block Length    : 39
 Block Checksum  : 0x360
 Feature Bits    : 0x0
 HW Changes Bits : 0x1
 Stackmib OID    : 0
 MAC Addresses   : 8c-60-4f-30-db-00
 Number of MACs  : 128
 OEM Enterprise  : 9
 OEM MIB Offset  : 5
 MAX Connector Power: 0
WWN software-module specific block:
 Block Signature : 0x6005
 Block Version   : 1
 Block Length    : 0
 Block Checksum  : 0x268
wwn usage bits:
 00 00 00 00 00 00 00 00
 01 00 03 ff ff 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
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```

```
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 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00
License software-module specific block:
 Block Signature : 0x6006
 Block Version   : 1
 Block Length    : 16
 Block Checksum  : 0x17d
lic usage bits:
 c0 46 00 00 00 00 00 00
Second Serial number specific block:
 Block Signature : 0x6007
 Block Version   : 1
 Block Length    : 28
 Block Checksum  : 0x31e
 Serial Number   : JAE191106QG
```

Displaying Environmental Information for a Switch

You can display all of the environment-related switch information by using the **show environment** command.

Enter the **show environment** command.

Example:

```
switch# show environment
Power Supply:
Voltage: 50 Volts
Power                                 Actual        Total
Supply    Model                       Output     Capacity    Status
                                     (Watts )     (Watts )
-------  ------------------  -----------  -----------  --------------
1        N7K-AC-3KW                251 W       3000 W     Ok
2        N77-AC-3KW                245 W       3000 W     Ok


                                    Actual        Power
Module    Model                       Draw    Allocated    Status
                                     (Watts )     (Watts )
-------  ------------------  -----------  -----------  --------------
1        N77-F430CQ-36             604 W       1000 W    Powered-Up
2        N77-SUP3E                 100 W        190 W    Powered-Up
fan1     N77-C7702-FAN              39 W        300 W    Powered-Up

N/A - Per module power not available


Power Usage Summary:
--------------------
Power Supply redundancy mode (configured)               PS-Redundant
Power Supply redundancy mode (operational)              PS-Redundant

Total Power Capacity (based on configured mode)              3000 W
Total Power of all Inputs (cumulative)                       6000 W
```

```
Total Power Output (actual draw)                                 496 W
Total Power Allocated (budget)                                  1045 W
Total Power Available for additional modules                    1955 W

Clock:
----------------------------------------------------------
Clock           Model                Hw         Status
----------------------------------------------------------
A               Clock Module         --         NotSupported/None
B               Clock Module         --         NotSupported/None


Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Fan1(sys_fan1)  N77-C7702-FAN        0.0        Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         Ok
Fan Zone Speed: Zone 1: 0x79


Temperature:
---------------------------------------------------------------------
Module   Sensor        MajorThresh   MinorThres   CurTemp     Status
                       (Celsius)     (Celsius)    (Celsius)
---------------------------------------------------------------------
1        Crossbar1(s1)   125             115          51         Ok
1        Crossbar2(s2)   125             115          51         Ok
1        Arb-mux (s3)    125             115          35         Ok
1        L2L3Dev1(s5)    125             115          31         Ok
1        L2L3Dev2(s6)    125             115          29         Ok
1        L2L3Dev3(s7)    125             115          34         Ok
1        L2L3Dev4(s8)    125             115          32         Ok
1        L2L3Dev5(s9)    125             115          31         Ok
1        L2L3Dev6(s10)   125             115          32         Ok
2        Inlet  (s1)     60              42           17         Ok
2        Crossbar(s2)    125             115          58         Ok
2        L2L3Dev1(s3)    125             110          39         Ok
2        Arbiter (s4)    125             105          47         Ok
2        CPU1CORE1(s5)   85              75           27         Ok
2        CPU1CORE2(s6)   85              75           26         Ok
2        CPU1CORE3(s7)   85              75           26         Ok
2        CPU1CORE4(s8)   85              75           24         Ok
2        CPU2CORE1(s9)   85              75           23         Ok
2        CPU2CORE2(s10)  85              75           21         Ok
2        CPU2CORE3(s11)  85              75           24         Ok
2        CPU2CORE4(s12)  85              75           19         Ok
2        DDR3DIMM1(s13)  95              85           25         Ok
2        DDR3DIMM2(s14)  95              85           24         Ok
2        DDR3DIMM4(s16)  95              85           22         Ok
2        DDR3DIMM5(s17)  95              85           21         Ok
```

Displaying Temperatures for Modules

Each module has temperature sensors with two thresholds:

- Minor temperature threshold—When a minor threshold is exceeded, a minor alarm occurs and the following actions occur for all four sensors:

- Displays system messages
- Sends Call Home alerts (if configured)
- Sends SNMP notifications (if configured)

- Major temperature threshold—When a major threshold is exceeded, a major alarm occurs and the following actions occur:
  - For sensors 1, 3, and 4 (outlet and onboard sensors), the following actions occur:
    - Displays system messages.
    - Sends Call Home alerts (if configured). For more information, refer Associating an Alert Group with a Destination Profile .
    - Sends SNMP notifications (if configured). For more information, refer Enabling SNMP Notifications.
  - For sensor 2 (intake sensor), the following actions occur:
    - If the threshold is exceeded in a switching module, only that module is shut down.
    - If the threshold is exceeded in an active supervisor module with HA-standby or standby present, only that supervisor module is shut down and the standby supervisor module takes over.
    - If you do not have a standby supervisor module in your switch, you have up to 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages as configured.

Tip We recommend that you install dual supervisor modules. If you are using a switch without dual supervisor modules, we recommend that you immediately replace the fan module if just one fan is not working.

Note A threshold value of -127 indicates that no thresholds are configured or applicable.

You can display temperature readings for module temperature sensors by using the **show environment temperature** command.

Enter the **show environment temperature** command.

Example:

```
switch# show environment temperature
Temperature:
------------------------------------------------------------------
Module   Sensor        MajorThresh   MinorThres   CurTemp     Status
                       (Celsius)     (Celsius)    (Celsius)
------------------------------------------------------------------
1        Crossbar1(s1)   125            115         51         Ok
1        Crossbar2(s2)   125            115         51         Ok
```

```
1        Arb-mux (s3)    125             115         35          Ok
1        L2L3Dev1(s5)    125             115         31          Ok
1        L2L3Dev2(s6)    125             115         29          Ok
1        L2L3Dev3(s7)    125             115         34          Ok
1        L2L3Dev4(s8)    125             115         32          Ok
1        L2L3Dev5(s9)    125             115         31          Ok
1        L2L3Dev6(s10)   125             115         32          Ok
2        Inlet  (s1)     60              42          17          Ok
2        Crossbar(s2)    125             115         58          Ok
2        L2L3Dev1(s3)    125             110         39          Ok
2        Arbiter (s4)    125             105         47          Ok
2        CPU1CORE1(s5)   85              75          27          Ok
2        CPU1CORE2(s6)   85              75          26          Ok
2        CPU1CORE3(s7)   85              75          26          Ok
2        CPU1CORE4(s8)   85              75          24          Ok
2        CPU2CORE1(s9)   85              75          23          Ok
2        CPU2CORE2(s10)  85              75          21          Ok
2        CPU2CORE3(s11)  85              75          24          Ok
2        CPU2CORE4(s12)  85              75          19          Ok
2        DDR3DIMM1(s13)  95              85          25          Ok
2        DDR3DIMM2(s14)  95              85          24          Ok
2        DDR3DIMM4(s16)  95              85          22          Ok
2        DDR3DIMM5(s17)  95              85          21          Ok
```

Connecting to a Module

At any time, you can connect to any module by using the **attach module** command. Once you are at the module prompt, you can obtain further details about the module by using module-specific commands in EXEC mode.

Step 1 Enter the **attach module** *slot_number* command.

Example:

```
switch# attach module 1
switch#
```

Provides direct access to the I/O module in slot 1 (in this example, the supervisor module is in slot 2).

Step 2 **dir bootflash**

Example:

```
switch# dir bootflash
Example:
switch# dir bootflash:
   80667580     Feb 21 22:04:59 2008  n7700-s2-kickstart.7.3.0.DX.1.bin
   22168064     Feb 21 22:04:19 2008  n7700-s2-dk9.7.3.0.DX.1.bin
      16384     Jan 03 19:56:00 2005  lost+found/
Usage for bootflash://sup-local
  234045440 bytes used
 1684602880 bytes free
 1918648320 bytes total
switch#
```

Note To exit the module-specific prompt, use the **exit** command.

Tip If you are not accessing the switch from a console terminal, this step is the only way to access the standby supervisor module.

Saving the Module Configuration

To save the new configuration along with the non-default VDC configuration to nonvolatile storage, use the **copy running-config startup-config vdc-all** command from EXEC mode. Once you enter these commands, the running and the startup copies of the configuration are identical.

The following table lists various scenarios when module configurations are preserved or lost.

Scenario	Consequence
A particular switching module is removed and you used the **copy running-config startup-config vdc-all** command again.	The configured module information is lost.
A particular switching module is removed and the same switching module is replaced before you enter the **copy running-config startup-config vdc-all** command again.	The configured module information is preserved.
A particular switching module is removed and replaced with the same type switching module, and you entered the **reload module** *slot_number* command.	The configured module information is preserved.
A particular switching module is reloaded when you enter the **reload module** *slot_number* command.	The configured module information is preserved.

Displaying Power Usage Information

To display the power usage information for the entire switch, use the **show environment power** command. This command shows the power usage for many of the modules installed in the switch. For the older modules that do not have the capability to output this information, the output is shown as N/A.

Note Power usage is reserved for both supervisor modules regardless of whether one or both supervisor modules are present.

Enter the **show environment power** command.

Reloading a Module

You can reset a module by using the **reload module** command and specifying the module by its slot number in the chassis.

Caution Reloading a module disrupts traffic through the module.

Step 1 Enter the **configure terminal** command to enter the configuration terminal mode.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Specify the slot number for the module that you are resetting by entering the **reload module** *slot_number*command.

Example:

```
switch(config)# reload module 1
```

Rebooting the Switch

To reboot or reload the switch, use the **reload** command without any options. When you use this command, you reboot the switch.

Note If you need to use the **reload** command, be sure to save the running configuration by using the **copy running-config startup-config vdc-all** command beforehand.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Save the running configuration by entering the **copy running-config startup-config vdc-all** command.

Example:

```
switch(config)# copy running-config startup-config vdc-all
```

Step 3 Reload the switch by entering the **reload** command.

Example:

```
switch(config)# reload
```

Overview of Supervisor Modules

The Cisco Nexus 7702 switch has one supervisor module slot. You can install any one of the following types of supervisor modules:

- Supervisor 2 Enhanced (N77-SUP2E)
- Supervisor 3 Enhanced (N77-SUP3E)

Note For the Supervisor 2 Enhanced (N77-SUP2E) supervisor module in the Cisco Nexus 7702 chassis, the minimum EPLD version supported is 1.4. For more information about EPLD upgrades, please refer Cisco Nexus 7000 Series FPGA/EPLD Upgrade Release Notes, Release 7.2

Note You can use only one type of supervisor module in a switch.

The supervisor module is automatically powered up and started with the switch.

Overview of I/O Module Support

The following F3-Series modules are supported by the Cisco Nexus 7700 Series switches:

- F3-Series Enhanced 48-port 1-/10-G Ethernet with XL (N77-F348XP-23)
- F3-Series Enhanced 24-port 40-G Ethernet with XL (N77-F324FQ-25)
- F3-Series Enhanced 12-port 100-G Ethernet with XL (N77-F312CK-26)

The following F4-Series module is supported by the Cisco Nexus 7700 Series switches:

- F4-Series 30-port 100-G Ethernet (N77-F430CQ-36)

The following M3 Series modules are supported by the Cisco Nexus 7700 Series switches:

- M3-Series 48-port 1-/10-G Ethernet (N77-M348XP-23L)
- M3-Series 24-port 40-G Ethernet (N77-M324FQ-25L)
- M3-Series 12-port 100-G Ethernet (N77-M312CQ-26L)

Accessing an I/O Module through a Console

You can troubleshoot bootup problems for an I/O module by accessing the module through its console port. This action establishes a console mode that you must exit in order to use other Cisco NX-OS commands.

To attach to the console port for an I/O module, use the **attach console module** command to specify the module you need to work with.

Note To exit the console mode, enter the ~, command.

Attach to the console port for the I/O module by entering the **attach console module** *slot_number* command.

Example:

```
switch# attach console module 1
connected
Escape character is `~,' (tilde comma]
```

Displaying Information for the Installed Modules

You can display information about the modules installed in the switch chassis by using the **show module** command. This information includes module type, bootup status, MAC addresses, serial numbers, software versions, and hardware versions. You can use this command in the following ways to display information about all of the installed module or specific modules:

- For information on all modules, use the **show module** command.
- For information on a specific supervisor or I/O module, use the **show module** *slot_number* command to specify a slot number.

For a description of the module status indicated by one of the above **show module** commands, see the following table.

I/O Module State	Description
powered up	The hardware has electrical power. When the hardware is powered up, the software begins booting.
testing	The module has established connection with the supervisor and the module is performing bootup diagnostics.
initializing	The diagnostics have completed successfully and the configuration is being downloaded.
failure	The switch detects a module failure upon initialization and automatically attempts to power-cycle the module three times. After the third attempt, the module powers down.
ok	The switch is ready to be configured.
power-denied	The switch detects insufficient power for an I/O module to power up.

I/O Module State	Description
active	This module is the active supervisor module and the switch is ready to be configured.

Use the **show module** [*slot_number*]command in one of the following ways:

Option	Description
show module	Displays information for all of the installed modules.
show module *slot_number*	Displays information for a supervisor or I/O module that you specify by its slot number.

Display information for all or specific modules.

Displaying Information for All Installed Modules

Displaying Information for a Specific Supervisor or I/O Module

```
switch# show module
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    30     100 Gbps Ethernet Module           N77-F430CQ-36       ok
2    0      Supervisor Module-3                N77-SUP3E          active *

Mod  Sw              Hw
---  --------------  ------
1    8.3(0)SK(0.47)  0.203
2    8.3(0)SK(0.47)  0.909


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    00-27-90-a1-ab-50 to 00-27-90-a1-ab-b3  JAE214303LW
2    00-3c-10-17-55-ec to 00-3c-10-17-55-ff  JAE2150086E

Mod  Online Diag Status
---  ------------------
1    Pass
2    Pass

* this terminal session
switch# show module 1
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ------
1    30     100 Gbps Ethernet Module           N77-F430CQ-36       ok

Mod  Sw              Hw
---  --------------  ------
1    8.3(0)SK(0.47)  0.203


Mod  MAC-Address(es)                         Serial-Num
```

```
---  -------------------------------------  ----------
1    00-27-90-a1-ab-50 to 00-27-90-a1-ab-b3  JAE214303LW

Mod  Online Diag Status
---  ------------------
1    Pass

Chassis Ejector Support: Enabled
Ejector Status:
Left ejector CLOSE, Right ejector CLOSE, Module HW does support
ejector based shutdown, Ejector policy enabled.
switch#
```

Purging the Module Configuration

You can clear the running configuration for an I/O slot that is not functioning by using the **purge module** command in EXEC mode.

Note This command does not work on supervisor slots nor on any I/O slot that currently has a powered-up module.

Before you begin

Verify that either the I/O slot is empty or the I/O module installed in the slot is powered down.

Clear the running configuration by using the **purge module** *slot_number* **running-config** command.

Example:

switch# **purge module 1 running-config**

Power Modes Overview

You can configure one of the following power modes to either use the combined power provided by the installed power supply units (no power redundancy) or to provide power redundancy when there is a power loss:

Combined mode

This mode allocates the combined power of all power supplies to active power for switch operations. This mode does not allocate reserve power for power redundancy in case of power outages or power supply failures.

Power-supply (*n*+1) redundancy mode

This mode allocates one power supply as a reserve power supply in case an available power supply fails. The remaining power supplies are allocated for available power. The reserve power supply must be at least as powerful as each power supply used for the available power.

Input-source (grid) redundancy mode

This mode allocates half of the power to available power and the other half to reserve power. You must use a different power source for the active and reserve power sources so that if the power source used for active power fails, the other power source used for the reserve power can provide power for the switch.

Full redundancy mode

This mode provides both power-supply (*n*+1) and input-source (grid) redundancies. As happens with the input-source redundancy mode, this mode allocates half of the power supplies to provide available power and the other half of the power supplies to provide the reserve power. One of the reserve power supplies can alternatively be used to provide power if a power supply supplying the available power fails.

Guidelines for Configuring Power Redundancy Modes

The amounts of available and reserve power depend on the power redundancy mode that you specify and the number of power supplies installed in the switch. For each redundancy mode, consider the following:

Combined mode

The available power equals the combined output of all installed power supplies. There is no reserve power. You activate this mode by using the **power redundancy-mode combined** command.

Power supply (*n*+1) redundancy mode

The power supply that outputs the most power provides the reserve power so that it can take over for any other power supply that fails, and all of the other installed power supplies provide the available power. You activate this power mode by using the **power redundancy-mode ps-redundant** command.

Input-source (grid) redundancy mode

The available power is provided by one power source and the reserve power is provided by the other power source. If the power source providing the available power fails, the switch uses the reserve power source to provide its required power. You activate this power mode by using the **power redundancy-mode insrc_redundant** command.

Full redundancy mode

Full redundancy provides both power-supply redundancy and input-source redundancy. For power-supply redundancy, the power supply with the most output provides reserve power and the other power supplies provide the available power. For input-source redundancy, the available power is provided by one power source and the reserve power is provided by another power source You activate this power mode by using the **power redundancy-mode redundant** command.

Configuring the Power Mode

You can configure the power supply mode by using the **power redundancy-mode** command.

Note To display the current power supply configuration, use the **show environment power** command.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Specify one of the following power modes by entering the **power redundancy-mode** *mode* command:

- For combined mode, include the **combined** keyword.
- For power supply redundancy mode, include the **ps-redundant** keyword.
- For input source redundancy mode, include the **insrc_redundant** keyword.
- For full redundancy mode, include the **redundant** keyword.

Example:

```
switch(config)# power redundancy-mode redundant
switch(config)#
```

Maximum Power Available for 3-kW AC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW AC power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (220 V)	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W
1 input (110 V)	1	1450 W	—	—	—
	2	2900 W	1450 W	1450 W	1450 W

Maximum Power Available for 3-kW DC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW DC power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W

Maximum Power Available for 3.5-kW Inputs (AC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on AC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (277 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
1 input (220/230 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
1 input (210 V)	1	3100 W	—	—	—
	2	6200 W	3100 W	3100 W	3100 W
1 input (110 V)	1	1500 W	—	—	—
	2	3000 W	1500 W	1500 W	1500 W

Note A combination of 3-kW AC and 3.5-kW HVAC/HVDC power supplies can be used.

Maximum Power Available for 3.5-kW Inputs (DC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on DC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode	
1 input (380 V)	1	3,500 W	—	—	—	
	2	7,000 W	3,500 W	3,500 W	3,500 W	
	1 input (220/240 V)	1	3,500 W	—	—	—
		2	7,000 W	3,500 W	3,500 W	3,500 W
1 input (210 V)		1	3,100 W	—	—	—
		2	6,200 W	3,100 W	3,100 W	3,100 W

Note A combination of 3-kW DC and 3.5-kW HVAC/HVDC power supplies can be used.

Overview of Fan Trays

Note During normal switch operations, all 3 fan trays in a switch should be of the same type.

The Cisco Nexus 7702 switch has one fan tray with three variable speed fans. The fan tray can be removed and replaced while the switch is operating without presenting an electrical hazard or damage to the switch. The switch can operate without the fan tray for up to two minutes. If a fan tray is not installed within that time, the switch will automatically shutdown.

Note When one of the three fans in the fan tray fails, the remaining two fans run at a higher speed to compensate for the failed fan and keep the switch operating.

Caution If one or more fans fail within a fan tray, the Fan Status LED turns red. A fan failure could lead to temperature alarms if not corrected immediately.

The fan status is continuously monitored by the software. In case of a fan failure, the following actions occur:

- System messages are displayed.
- Call Home alerts are sent (if configured). For more information, refer Associating an Alert Group with a Destination Profile .
- SNMP notifications are sent (if configured). For more information, refer Enabling SNMP Notifications.

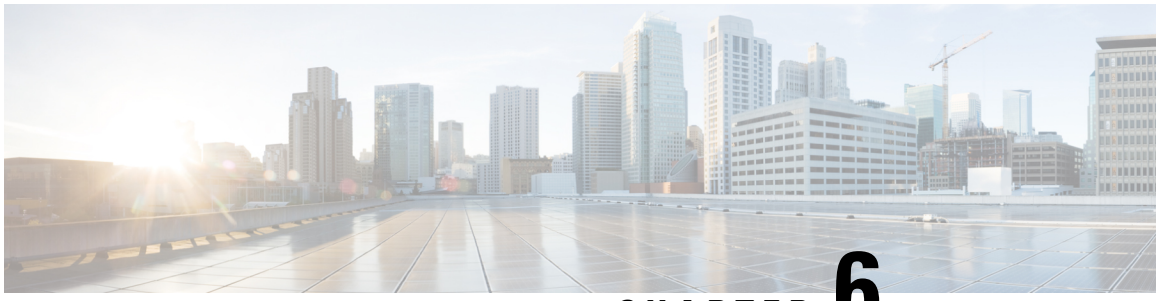
.

Displaying the Status for the Fan Trays

To display the status for the , use the **show environment fan** command as shown in the following example.

Enter the **show environment fan** command.

Example:



CHAPTER 6

Installing or Replacing Modules, Fan Trays, and Power Supplies

This chapter includes the following topics:

- Using an ESD Wrist Strap to Prevent ESD Damage, on page 59
- Installing or Replacing a Supervisor Module, on page 60
- Migrating from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E), on page 63
- Installing or Replacing an I/O Module, on page 66
- Replacing a Fan Tray, on page 68
- Installing or Replacing a Power Supply in a Switch Chassis, on page 71

Using an ESD Wrist Strap to Prevent ESD Damage

Before you touch any switch modules, you must ground yourself to protect the modules from electrostatic discharge (ESD). You can ground yourself by wearing an ESD wrist strap connected to a grounded chassis or a grounded rack.

Caution Always handle modules by their carrier edges (typically the covered bottom, sides, and front of the module) and never touch the circuitry on the module.

Before you begin

You must have a grounding connection close to where you are installing components in the chassis.

Step 1 Attach or wrap an ESD wrist strap to your arm.

Step 2 Attach the other end of the strap to the grounded chassis in one of the following ways:

- If the wrist strap has a banana plug on the other end, insert the plug into the ESD port on the chassis (see the following figure for the location of the port on the front of the chassis).

1	ESD port on the front of the chassis

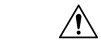
- If the wrist strap has an alligator clip on the other end, clip that onto one of the two screws holding the grounding lug to the chassis.

What to do next

After you ground yourself, you can replace the modules on the chassis.

Installing or Replacing a Supervisor Module

Before you begin



Caution The system will shut down when you remove the single supervisor module in the Cisco Nexus 7702 chassis.

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver

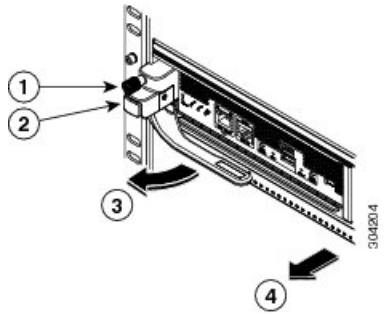
    Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
  - Replacement supervisor module

Step 1 If you need to remove a supervisor module to open the slot for a new module, follow these steps (if you already have an open slot, go to the next step):

Note If the slot that you need to open has a blank filler plate, remove the plate by unscrewing its captive screw and pulling on the handle attached to the plate to remove the plate, and go to Step 3).

a) Disconnect all of the networking cables attached to the front of the module.
b) Unscrew the captive screw on the left side of the module until the screw is no longer connected to the chassis (see Callout 1 in the following figure).

Figure 14: Removing a Half-Width Supervisor Module



1	Unscrew the captive screw until it is free of the chassis.	3	The handle springs open.
2	Press the ejector button.	4	Pull the handle to remove the module part way from the slot. Place your other hand under the module and fully remove it from the slot.

c) Press the eject button on the left side of the module (see Step 2 in the previous figure).

The ejector springs out part way from the front of the module.

d) Fully rotate the handle from the front of the module and pull the handle to move the module part way out of its slot.
e) Place your other hand under the module to support its weight and pull the module fully out of its slot.
f) Place the module on or in antistatic material.

Step 2 Install the new or replacement supervisor module as follows:

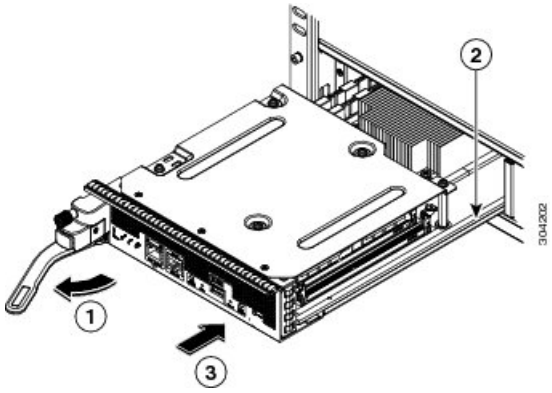
a) Unpack the new supervisor module and inspect it for damage.

If anything is damaged or missing, contact your customer representative immediately.

Caution Do not touch the electrical components or connectors on the module. Always hold the module by only its covered front and bottom sides.

b) Press the ejector button next to the handle to release the handle from the front of the module (see Callout 1 in the following figure).

Figure 15: Positioning a Half-Width Supervisor Module to its Slot



1	Rotate the handle fully away from the front of the module.	3	Push the module all the way into the slot (until it stops and the front is about 1/4 inch in front of the chassis).
2	Align the bottom of the module to the module guides in the slot.		

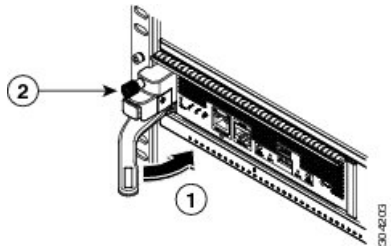
c) Rotate the end of the handle away from the front of the module until it stops (see Callout 1 in the previous figure).
d) With one hand under the supervisor module and the other hand holding the module by its front, align the rear of the module to the open supervisor slot.
e) Slide the module onto the guides inside the slot and push the module fully into the slot until you cannot push the module further.

   The front of the module should be about 1/4 inch (0.6 cm) in front of the chassis.

f) Rotate the handle to the front of the module (see Callout 1 in the following figure) until it clicks when it reaches the front of the module.

   The module should be fully inserted in the slot and the front of the module should be even with the fronts of all of the other installed modules. The captive screw by the ejector button on the module should be aligned to a screw hole on the chassis.

Figure 16: Securing a Supervisor Module to its Slot



1	Rotate the handle all the way to the front of the module.	2	Tighten the captive screw to 8 in-lb (0.9 N·m) of torque.

g) Screw in the captive screw to secure the module to the chassis (see Callout 2 in the previous figure). Tighten the screw to 8 in-lb (0.9 N·m) of torque.
h) Verify that the supervisor module LEDs turn on and appear as follows:
   - STATUS LED is green.
   - SYSTEM LED is green.
   - ACTIVE LED is amber or green.

   For more information about the LED states for this module, see Supervisor Module LEDs, on page 125.

i) Attach the management cable to the MGMT ETH port.

   The MGMT ETH LED should be green. If not, see Supervisor Module LEDs, on page 125 for information about the LED states.

Migrating from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)

To migrate from Supervisor 2E modules to Supervisor 3E modules, follow these steps:

Before you begin

- Before migrating from Supervisor 2E modules to Supervisor 3E modules, note the following guidelines:
  - This migration process is disruptive because the power must be turned off for the switch.
  - You cannot mix Supervisor 2E and Supervisor 3E modules in a production environment.

Step 1 Insert a USB drive in the usb1 or the slot0 USB port on the active supervisor 2E module. We will use the usb1 port for the steps given below.

Step 2 Format the drive by using the **format** command.

switch(config)# **format usb1**

Step 3 Copy all of the VDC configurations for the switch to the USB drive by using the **copy running-config** command.

switch(config)# **copy running-config usb1:***configuration_file_name* **vdc-all**

Step 4 Backup the installed licenses for the switch to the USB drive by using the **copy licenses** command.

switch(config)# **copy licenses usb1:***licenses_archive_file_name***.tar**

Note You must use the **tar** extension for the archive file. This file will contain all of the license files that were installed on the Supervisor 2E module.

Step 5 Copy the Supervisor 3E version of the kickstart, system, and EPLD (optional) images to the USB drive by using the **copy** command.

switch(config)# **copy scp:***//path/n7700-s3-kickstart.8.3.1.bin* **usb1:**

switch(config)# **copy scp:***//path/n7700-s3-dk9.8.3.1.bin* **usb1:**

switch(config)# **copy scp:***//path/n7700-s3-epld.8.3.1.img* **usb1:**

Note This example specifies Cisco NX-OS Release 8.3(1) images. This is the minimum software release for the Cisco Nexus 7700 Series Supervisor 3E modules.

Caution Use -s3- images with Supervisor 3E modules. If you use an -s2- image with a Supervisor 3E module, the supervisor will not boot up. Some examples of an -s2- image are given below:

- n7700-s2-kickstart.8.0.1.bin
- n7700-s2-kickstart.8.1.1.bin
- n7700-s2-kickstart.8.2.1.bin

Step 6 Turn off the power to the switch using the power switch on each power supply. The Output LED turns off on each power supply and the Status LEDs turn off on all of the supervisor and I/O modules.

Caution If any of the supervisor or I/O module Status LEDs is turned on (showing any color), stop at this step until you are able to turn off those modules.

Step 7 For each Supervisor 2E module installed in the switch, remove the module and replace it with a Supervisor 3E module as explained in Installing or Replacing a Supervisor Module, on page 60.

Caution If the switch has two supervisor modules, ensure that both supervisors are of the same type. Do not mix Supervisor 2E modules with Supervisor 3E modules.

Step 8 Power up the switch by using the power switch on each of its power supplies. The Output LED on each power supply turns on and eventually turns green when the power supply is sending power to the switch. The Status LED on each installed supervisor module also turns on when the module begins to turn on. The supervisor that becomes active has a green ACTIVE LED (the standby supervisor module has an amber ACTIVE LED).

Step 9 Remove the USB drive from the Supervisor 2E module (this drive has the copies of the Supervisor 2E configuration, license, and software images) and insert it in the USB port on the active Supervisor 3E module (ACTIVE LED is green).

Step 10 Connect a console to the active supervisor module as explained in Connecting a Console to the Switch, on page 30.

Step 11 If you are setting up the initial configuration for the supervisor module, the initial setup script will ask you if you want to enforce the secure password standard. Make your selection, enter your password, and then confirm the password by entering it again.

```
        ---- System Admin Account Setup ----
Do you want to enforce secure password standard (yes/no) [y]:
  Enter the password for "admin":
  Enter the password for "admin":
```

Step 12 When you are asked to enable admin VDCs, enter **no**.

```
Do you want to enable admin vdc (yes/no) [no]: no
```

Step 13 When you are asked to enter the basic configuration, enter **no**.

```
          ---- Basic System Configuration Dialog VDC: 1 ----
This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.

Please register Cisco Nexus7000 Family devices promptly with your
supplier. Failure to register may affect response times for initial
service calls. Nexus7000 devices must be registered to receive
entitled support services.

Press Enter at anytime to skip a dialog. Use ctrl-c at anytime
to skip the remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): no
```

Step 14 When asked to log in, enter the login and password that you specified in step 11.

```
User Access Verification
switch login:
Password:
```

Step 15 Verify that the switch is running the required version of the NX-OS software by using the show version command.

switch(config)# **show version**

Note If the version of NX-OS is not the same as you intended to use, copy the previously saved images from the USB drive in usb1 to bootflash: and perform an upgrade to the appropriate version. For more information, see the Cisco Nexus 7000 Series NX-OS Software Upgrade and Downgrade Guide.

Step 16 Copy the TAR archive containing the license files from the usb1 drive to bootflash:, extract the archive, and install the licenses by using the **copy**, **tar extract**, and **install license** commands. Repeat the **install license** command for each extracted license file.

switch(config)# **copy usb1:***licenses_archive_file_name***.tar bootflash:**

switch(config)# **tar extract bootflash:***licenses_archive_file_name***.tar to bootflash:**

switch(config)# **install license bootflash:***licenses_archive_file_name***.lic**

Note The **tar extract** command requires that the TAR file be located in bootflash: or volatile:.

Step 17 Make sure that all I/O modules are online and that the standby supervisor is in ha-standby mode by using the **show module** command.

switch(config)# **show module**

```
switch(config)# show module
Mod Ports Module-Type                          Model              Status
--- ----- ------------------------------------ ------------------ ---------------
9   0     Supervisor module-3                  N77-SUP3E          active *
10  0     Supervisor module-3                  N77-SUP3E         ha-standby
12  30    100 Gbps Ethernet Module             N77-F430CQ-36        ok
...
```

Step 18 Restore the previously saved configurations by using the **copy** command to copy the configuration file in the USB drive to the running configuration.

switch(config)# **copy usb1:***configuration_file_name* **running-config**

Note If the imported configuration file includes configurations for Fabric Extenders (FEXs) and those modules are not up yet, you will see error messages for that. If that happens, we recommend that you run the FEX configuration again after the FEX modules come online. You can verify the status of the FEX modules and for the associated server-facing interfaces by using the **show fex** and **show interface brief** commands.

Note If you have not inserted the standby supervisor module until now, do not insert it during this step. Instead, wait until you complete this procedure before installing the standby supervisor module.

Step 19 Save the configuration in the startup configuration by using the **copy running-config startup-config vdc-all** command.

switch(config)# **copy running-config startup-config vdc-all**

Installing or Replacing an I/O Module

Before you begin

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - Number 1 Phillips torque screwdriver

Note Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.

  - Replacement or new I/O module

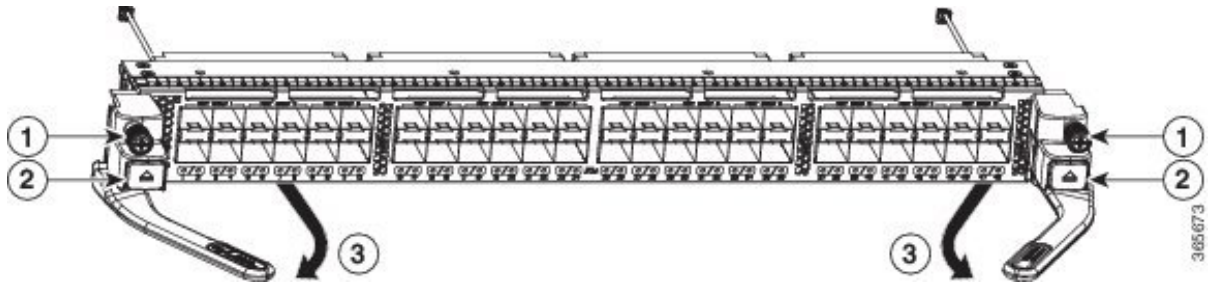
Note You can replace an I/O module with another I/O module while the switch is operational. To do this action, you must first remove an I/O module from the chassis, and then install a new or replacement I/O module in the newly vacated slot within a couple of minutes to maintain the designed airflow.

Step 1 Open a slot in the chassis for the new I/O module as follows:

Note If you need to remove a blank filler plate from the slot, unscrew the captive screws on either side of the module and pull the handle on the plate to remove it from the slot. Continue with Step 2.

a) Disconnect all of the networking cables attached to the front of the I/O module to be removed.
b) Unscrew the captive screw on each side of the module until the screws are loose and no longer connected to the chassis (see Callout 1 in the following figure).

Figure 17: Removing an I/O Module



1	Loosen the two captive screws	3	Two handles spring out part way from the front of the module
2	Press the two ejector buttons		

c) Press the two ejector buttons on the each side of the module (see Callout 2 in the above figure).

The two handles spring out part way from the front of the module.

d) Fully rotate the two handles away from the front of the module and pull on them to move the module part way out of its slot.

e) Place one hand under the module to support its weight, grasp the front of the module with the other hand, pull the module fully out of its slot, and set the module on an antistatic surface.

Caution Do not touch any electrical circuitry on the removed I/O module. Handle the module only by its covered surfaces (front and bottom of the module) and always set the module on an antistatic surface when it is not inside the chassis.

Step 2 Install the new I/O module in the open slot as follows:

a) Unpack the new I/O module, set it right side up on an antistatic surface (so that you can see the electrical components from above the module), and inspect the module for damage.

If anything is damaged, contact your customer representative immediately.

b) Press the two eject buttons (one on each side of the module front) and rotate the handles away from the front of the module.

c) Without touching any electronic circuitry, grasp the front of the I/O module with one hand, place your other hand under the module to support its weight, and lift the module to the slot.

d) Align the back of the module to the guides inside the slot, and slide the module fully into the slot by pushing on the front of the module.

If you push the module fully into the slot, you seat it onto its connectors inside the slot and the handles move part way toward the front of the module. The front of the module should be 1/4 inch (0.6 cm) out of the slot.

e) Simultaneously rotate each of the two handles to the front of the module until they click.

As you rotate the handles to the front of the module, the module should move fully into the slot.

f) Verify that the front of the module is even with the fronts of the other installed I/O modules. If not, press both ejector buttons, pull on the handles to partly remove the module, and repeat Steps 2d and 2e to reseat the module in the slot.

g) Screw in the two captive screws (one on each side of the module) to secure the module to the chassis. Tighten the screws to 8 in-lb (0.9 N·m) of torque.

The Status module LED should be green. If not, see I/O Module LEDs, on page 127 for information about the LED states.

h) Attach networking cables to the I/O ports.

The LED for each port should be green. If not, see I/O Module LEDs, on page 127 for information about the LED states.

Replacing a Fan Tray

Starting from Cisco NX-OS Release 7.2(0)D1(1), use the **hardware fan-tray maintenance-mode** [**long** | **medium** | **short**] command to prepare a switch for fan tray removal. By default, the fans run at 100 percent speed for approximately 4 minutes to prepare for fan tray removal when the **hardware fan-tray maintenance-mode** command is used. Starting from Cisco NX-OS Release 8.1(1), by default, the fans run at 85 percent speed for approximately 4 minutes to prepare for fan tray removal when the **hardware fan-tray maintenance-mode** command is used.

Use the **long** keyword to run the fans at 65 percent speed for approximately 9 minutes to prepare for fan tray removal. Use the **medium** keyword to run the fans at 75 percent speed for approximately 6 minutes to prepare for fan tray removal. Use the **short** keyword to run the fans at 85 percent speed for approximately 4 minutes to prepare for fan tray removal. For more information about the **hardware fan-tray maintenance-mode**, see Cisco Nexus 7000 Series NX-OS System Management Command Reference.

The fan tray maintenance mode will be cancelled in the following cases:

- If a temperature alarm is present.
- Hot-inlet temperature (Sup inlet temperature >= 30 degrees Celsius)
- Fan-tray is absent.
- Post-cool period (time elapsed after fan tray removal) has crossed 4 minutes.

Note Fan tray maintenance mode is cancelled and fan speed is set to normal if fan tray migration or replacement is completed within 2 minutes of using the **hardware fan-tray maintenance-mode** command. If fan tray migration or replacement is not completed within 2 minutes, the remaining fan trays run at 85 percent speed for the next 2 minutes, and at 100 percent speed from then on.

- Pre-cool period (time elapsed before fan tray removal) has crossed 1 hour and 9 minutes—The fan tray has not been removed since the past 1 hour and 9 minutes during which the switch was ready for fan tray removal.

The following example shows the syslogs that are generated when the fan speed increases due to a minor temperature alarm:

```
2017 Apr 3 16:46:07 SWITCH %CARDCLIENT-2-SSE: XBAR:5 FABRIC ONLINE
2017 Apr 3 16:46:07 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_ONLINE/OK
2017 Apr 3 16:46:07 SWITCH %MODULE-5-XBAR_OK: Xbar 5 is online (Serial number: JAE1921079X)
```

```
2017 Apr 3 16:47:00 SWITCH %PLATFORM-2-MOD_TEMPMINALRM: Xbar-5 reported minor temperature
alarm. Sensor=1 Temperature=48 MinT
hreshold=20
2017 Apr 3 16:47:00 SWITCH %VSHD-5-VSHD_SYSLOG_CONFIG_I: Configured from vty by admin on
vsh.12644
2017 Apr 3 16:47:35 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
45.88(0x75) to 54.12(0x8a)
2017 Apr 3 16:54:50 SWITCH %PLATFORM-2-PFM_MODULE_POWER_OFF: Manual power-off of Xbar 5
from Command Line Interface
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-XBAR_PWRDN: Xbar 5 powered down (Serial number
JAE1921079X)
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_POWERED_DOWN
2017 Apr 3 16:58:40 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
54.12(0x8a) to 45.88(0x75)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-2-PFM_MODULE_POWER_ON: Manual power-on of Xbar 5 from
 Command Line Interface
2017 Apr 3 17:00:41 SWITCH %PLATFORM-2-XBAR_DETECT: Xbar 5 detected (Serial number
JAE1921079X)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-5-XBAR_PWRUP: Xbar 5 powered up (Serial number
JAE1921079X)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_POWERED_UP
2017 Apr 3 17:00:59 SWITCH %CARDCLIENT-2-SSE: XBAR:5 FABRIC ONLINE
```

The following example shows the syslogs displaying the fan tray maintenance mode being cancelled after the post-cool period of 4 minutes is completed:

```
2017 Apr 3 16:20:08 SWITCH %PLATFORM-2-PFM_CRITICAL: FAN_MAINTENANCE_MODE: system is ready
 for fan-removal.
2017 Apr 3 16:21:07 SWITCH %PLATFORM-2-FAN_REMOVED: Fan module 1(Serial number NCV2108V017)
 Fan1(sys_fan1) removed
2017 Apr 3 16:21:08 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
85.10(0xd9) to 74.90(0xbf)
2017 Apr 3 16:21:11 SWITCH %PLATFORM-1-PFM_ALERT: System shutdown in 3 days 0 hours 0 mins
 0 seconds due to fan policy __pfm_
fanabsent_any_singlefan for fan1
2017 Apr 3 16:23:09 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
74.90(0xbf) to 85.10(0xd9)
2017 Apr 3 16:25:09 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
85.10(0xd9) to 100.00(0xff)
2017 Apr 3 16:25:33 SWITCH %PLATFORM-5-FAN_DETECT: Fan module 1(Serial number NCV2108V017)
 Fan1(sys_fan1) detected
2017 Apr 3 16:25:33 SWITCH %PLATFORM-5-FAN_STATUS: Fan module 1(Serial number NCV2108V017)
 Fan1(sys_fan1) current-status is F
AN_OK
2017 Apr 3 16:25:33 SWITCH %PLATFORM-2-FANMOD_FAN_OK: Fan module 1(Fan1(sys_fan1) fan) ok
2017 Apr 3 16:25:33 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
100.00(0xff) to 45.88(0x75)
2017 Apr 3 16:25:33 SWITCH %PLATFORM-2-PFM_CRITICAL: FAN_MAINTENANCE_MODE_CANCELLED:
Reason(s): Temperature alarm: No, Superv
isor hot-inlet: No, Absent fans count: 0, Precool period completed: N/A, Postcool period
completed: Yes, Total maint. duratio
n: 564 seconds
```

Note The switch can operate for two minutes without the fan tray that you are replacing.

Before you begin

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver

    Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
  - Replacement fan tray
    - N77-C7702-FAN=
- Put the switch in fan tray maintenance mode.

Step 1 Remove the fan tray as follows:

a) Use a Phillips torque screwdriver to loosen the four captive screws on the fan tray until they are no longer connected to the chassis.
b) Grab both fan tray handles with both of your hands.
c) Set the fan tray on an antistatic surface or inside an antistatic bag.

Caution Do not touch the electrical connectors on the back side and do not set the back side connectors on anything—always set a fan tray down on a covered side to protect its connectors.

Step 2 Install the new fan tray in the open slot as follows:

a) Unpack the new fan tray and inspect it for damage.

   If anything is damaged or missing, contact your customer representative immediately.

b) Hold both fan tray handles with both of your hands and align the back side of the fan tray to the open fan tray slot.

   Alignment pin on the left and the alignment pin on the right should align to holes on the left and right side of the fan tray slot.

Figure 18: Installing a Fan Tray

1	Hold both handles with both of your hands. Position the alignment pins on the left and right side of the fan tray to alignment holes in the chassis and press the fan tray into the slot.

c) Screw in the two captive screws to secure the fan tray to the chassis and tighten them to 8 in-lb (0.9 N·m) of torque.

Installing or Replacing a Power Supply in a Switch Chassis

You can install up to two power supplies of the following types:

- 3-kW AC power supply (N77-AC-3KW)
- 3-kW DC power supply (N77-DC-3KW)
- 3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)

If you leave any power supply slots empty, you must install a blank filler plate (N77-3KPS-BLANK-H=) in that slot to maintain the designed airflow.

You follow the same steps to install AC, DC and HVAC/HVDC power supplies into the switch, but you ground them differently. For an AC and HVAC/HVDC power supply, you automatically ground it when you connect its power cable to the power supply and the power source. For a 3-kW DC power supply, you do not directly connect the power supply to the earth ground.

Before you begin

- The switch chassis must be installed in a cabinet or rack that is secured to the data center.

You need the following additional tools and equipment:

- Nut driver attachment for Number 1 Phillips-head screwdriver or ratchet wrench with torque capability (used only for DC power supplies)

- Crimping tool
- Grounding wire—Size this wire to meet local and national installation requirements. For U.S. installations, you must use a 6 AWG copper conductor. For installations outside the U.S., consult your local and national electrical codes. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

Step 1 If you need to open a power supply slot for another power supply, follow these steps:

Note If you neet to remove a blank filler plate, unscrew its captive screws and pull it off the chassis. Go to Step 2.

a) Turn off the power for the power supply that you are removing, as follows:

1. Ensure that the power switch on the front of the power supply is set to standby (labelled as 0). The Output LED turns off.
2. Verify that the Output LED turns off. If the LED is still on, return to Step 1.
3. If you are removing a DC power supply, ensure that the power is turned off at the power source by turning off the power for that circuit, and verify that the Input LEDs turn off.

b) If you are removing a power supply, detach the power and ground cables as follows:

- For a 3-kW AC power supply, unplug the power cables that are attached to the power supply and the power source.
- For a 3-kW DC power supply, open the terminal box, and use a Phillips screwdriver to remove the power cables from their terminals. Replace the terminal box cover. Remove the power cables from the power source.
- For a 3.5-kW HVAC/HVDC power supply, release the built-in latch and unplug the power cable from the power source.

c) Remove the power supply or blank filler plate from the power supply slot as follows:

Note To remove a blank filler plate, unscrew its captive screws and pull on its handle to remove the plate from the slot.

- For a 3-kW power supply, press its ejector latch to the left, pull the power supply part way out of the slot by its handle, place your other hand under the module to support its weight, and pull it fully from the slot.
- For a 3.5-kW HVAC/HVDC power supply, disconnect the power cable from the power supply by pressing the release button on the power cable, pull the power supply part way out of the slot by its handle, place your other hand under the module to support its weight, and pull it fully from the slot.

Step 2 Install the new power supply in the open slot as follows:

a) Verify that the power switch on the front of the new power supply is set to standby (labelled as 0) and that the power supply is not connected to any power sources.
b) Hold the handle on the power supply with one hand, place your other hand under the power supply to support its weight, and position the power supply with its back end at the open power supply bay.
c) Slide the unit all the way into the power supply bay until one of the following situations occurs:

- For a 3-kW power supply, the release latch on the front of the power supply clicks and prevents you from moving the power supply in or out of the chassis. This action completes the mounting of the power supply on this chassis.

- For a 3.5-kW power supply, the built-in latch secures the power cable to the power supply.

What to do next

- For an AC and HVAC/HVDC (when used with an input AC source) power supply, you must connect it to an AC power source (see the Connecting a 3-kW AC Power Supply to AC Power Sources and Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources topic). The power supply will be automatically grounded through its power cable.
- For a 3-kW DC power supply, you must connect the power supply to the DC power source (see the "Connecting a DC Power Supply to DC Power Sources" topic).

Connecting a 3-kW AC Power Supply to AC Power Sources

You use one power cord to connect a 3-kW power supply to its AC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one AC power source or you connect half of the power supplies to one AC power source and the other half to another AC power source:

- For combined power mode (no power redundancy), you need enough power supplies to power all switch operations and connect all of the power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For power supply redundancy mode (*n*+1 redundancy mode), you need enough power supplies to power all switch operations and one extra power supply that can replace a failing power supply. You connect all power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For input source redundancy (grid redundancy) mode or full redundancy mode, you need twice the number of power supplies needed to power the switch operations. You connect half of the power supplies to one power source for active power and the other half to another power source for redundant power. You must ensure that the power supplies on the left side of the chassis are connected to one grid and that the power supplies on the right side of the chassis are connected to the other grid.

Before you begin

Before you connect power supplies to one or two power sources, ensure all of the following:

- You have receptacles for one or two AC power sources within reach of the power supply cables. The number of power sources depends on the power mode to be used for the switch.
  - Combined power (no power redundancy)—One AC power source
  - Power supply redundancy (*n*+1 redundancy)—One AC power source
  - Input source redundancy (power-grid redundancy)—Two AC power sources
  - Full redundancy—Two AC power sources
- The AC power sources are rated as follows:
  - For North American installations—20A with 110V or 220V circuits.

- For international installations—size the circuits by local and national standards.

- The power supply is already installed in the chassis.
- The chassis is connected to an earth ground.

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).

Step 2 Plug one AC power cable into the power supply, and pull down the retention clip over the plug on the power cable.

Step 3 Plug the other end of the power cable into a AC power source supplied by the data center.

Note If you are using the combined power mode or power supply redundancy, you connect the power cables to the same 20-A circuit. If you are using the input source redundancy mode or full redundancy mode, you connect half of the power cables to one AC power source and the other half to another AC power source.

Warning To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.

Warning This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

250V, 20 A

Step 4 Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

Step 5 Verify that the power supply is receiving AC power and outputting DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see Power Supply LEDs

Note When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the AC power connections on the power supply and the AC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources

You use one power cord to connect a 3.5-kW HVAC/HVDC power supply to its AC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one AC power source or you connect half of the power supplies to one AC power source and the other half to another AC power source:

- For combined power mode (no power redundancy), you need enough power supplies to power all switch operations and connect all of the power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For power supply redundancy mode (*n*+1 redundancy mode), you need enough power supplies to power all switch operations and one extra power supply that can replace a failing power supply. You connect all power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.

- For input source redundancy (grid redundancy) mode or full redundancy mode, you need twice the number of power supplies needed to power the switch operations. You connect half of the power supplies to one power source for active power and the other half to another power source for redundant power. You must ensure that the power supplies on the left side of the chassis are connected to one grid and that the power supplies on the right side of the chassis are connected to the other grid.

Before you begin

Before you connect power supplies to one or two power sources, ensure all of the following:

- You have receptacles for one or two AC power sources within reach of the power supply cables. The number of power sources depends on the power mode to be used for the switch.
  - Combined power (no power redundancy)—One AC power source
  - Power supply redundancy (*n*+1 redundancy)—One AC power source
  - Input source redundancy (power-grid redundancy)—Two AC power sources
  - Full redundancy—Two AC power sources
- The AC power sources are rated as follows:
  - For North American installations—20A with 110V or 220V circuits.
  - For international installations—size the circuits by local and national standards.
- The power supply is already installed in the chassis.
- The chassis is connected to an earth ground.

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).

Step 2 Plug the AC power cable into the power supply. The built-in latch secures the power cable to the power supply. You can disconnect the power cable from the power supply by pressing the release button on the power cable.

Step 3 Plug or connect the other end of the power cable into a AC power source supplied by the data center.

Note If you are using the combined power mode or power supply redundancy, you connect the power cables to the same 20-A circuit. If you are using the input source redundancy mode or full redundancy mode, you connect half of the power cables to one AC power source and the other half to another AC power source.

Warning To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.

Warning This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

250V, 20 A

Step 4 Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

Step 5 Verify that the power supply is receiving AC power and outputting DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see Power Supply LEDs

Note When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the power connections on the power supply and the AC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

Connecting DC Power Supplies with Power Sources

Connect each installed DC power supply with a DC power circuit as follows:

Note If you are using combined power mode (no power redundancy) or power supply (*n*+1) power mode, connect all of the power supplies to the same power circuit (grid).

Before you begin

- The power supplies are installed in the chassis.
- A DC power source is within reach of power cables that will be attached to the power supplies.
- Power cables are available to connect each DC power supply to the DC power source.

Step 1 Turn the power switch to standby (labeled 0 on the power switch).

Step 2 Turn off the power at the circuit breakers for the portions of the DC grid power that you are connecting to and verify that all of the LEDs on the power supplies are off.

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

Step 3 Size the power cables to the distance between the power supply and the DC power grid. If you need to cut the cable, cut it at the end that connects to the DC power grid, remove 0.75 inch (19 mm) of insulation from the cut ends, and attach them to the DC power system. Be sure to connect the negative cables to negative lines and positive cables to positive lines.

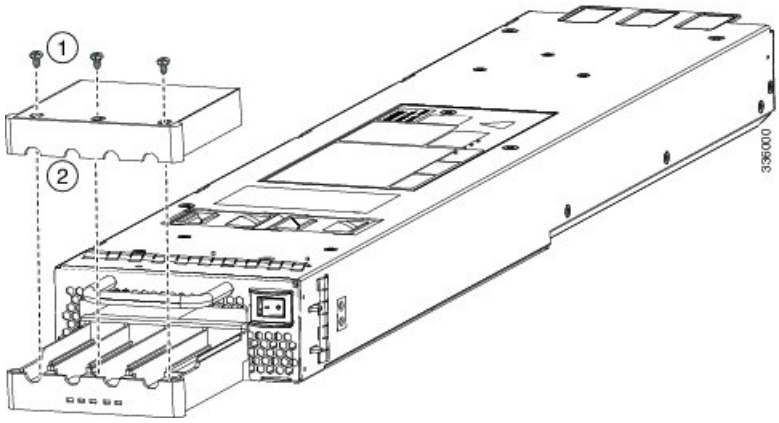
Note For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

Warning Hazardous voltage or energy may be present on DC power terminals. Always replace the cover when the terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.

Step 4 Remove the three screws that hold down the safety cover for the terminal box on the front of the DC power supply and remove the cover (see the following figure).

Note The terminal box has four slots for four power terminals (ordered as negative [-], positive [+], positive [+], and negative [-]). Each terminal has two nuts that you use to fasten a power cable to the terminal.

Figure 19: Removing the Safety Cover for the Terminal Box on a 3-kW DC Power Supply



1	Remove three screws from the safety cover.	2	Remove the cover.

Step 5 Install four cables (two positive and two negative cables) in the four terminal slots as follows:

a) Unscrew the two nuts in each of the four terminal slots.
b) Attach and crimp each lug to the end of each power cable.
c) Attach each cable lug to the two terminal posts in each slot, fasten with two nuts, and tighten to 40 in-lb (4.5 N·m).

Note For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

d) Replace the safety cover on the terminal box and fasten with three screws.

Step 6 Install the four cables from the DC power supply to a DC power source as follows:

a) If the unconnected end of each power cable is not stripped of its insulation for the last 0.75 inches (19 mm), use wire strippers to remove that amount of insulation.
b) Attach the negative cables to the negative terminals of a DC power source, and attach the positive cables to the positive terminals of the same power source.

Note If you are using combined power mode or power supply redundancy mode, connect all the power supplies in the chassis to the same power source. If you are using input source redundancy mode or full redundancy mode, connect half the power supplies to one DC power source and the other half of the power supplies to another DC power source.

Step 7 For the powered down circuits connected to the power supplies, turn on the power at the circuit breaker. The Input 1 (IN1) and Input 2 (IN2) LEDs turn on each connected power supply.

Step 8 Turn on the power supply by setting the power switch to 1. The LEDs should flash and then the Output LED should turn on in addition to the Input LEDs.

If the FAULT LED is lit or flashing, call Cisco TAC for assistance.

What to do next

You are ready to connect the switch to the network.

Connecting a 3.5-kW HVAC/HVDC Power Supply to DC Power Sources

You use one power cord to connect a 3.5-kW HVAC/HVDC power supply to its DC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one DC power source or you connect half of the power supplies to one DC power source and the other half to another DC power source.

Before you begin

Before you connect power supplies to one or two power sources, ensure all of the following:

- The power supply is already installed in the chassis.
- A DC power source is within reach of power cables that will be attached to the power supplies.
- Power cables are available to connect each HVAC/HVDC power supply to the DC power source.

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).

Step 2 Plug the DC power cable into the power supply. The built-in latch secures the power cable to the power supply. You can disconnect the power cable from the power supply by pressing the release button on the power cable.

Step 3 Plug or connect the other end of the power cable into a DC power source supplied by the data center.

Note Connect the power supply to the appropriate polarity and ground as indicated on the power cable plug or as marked on the ring lug cable.

Warning To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.

Warning This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

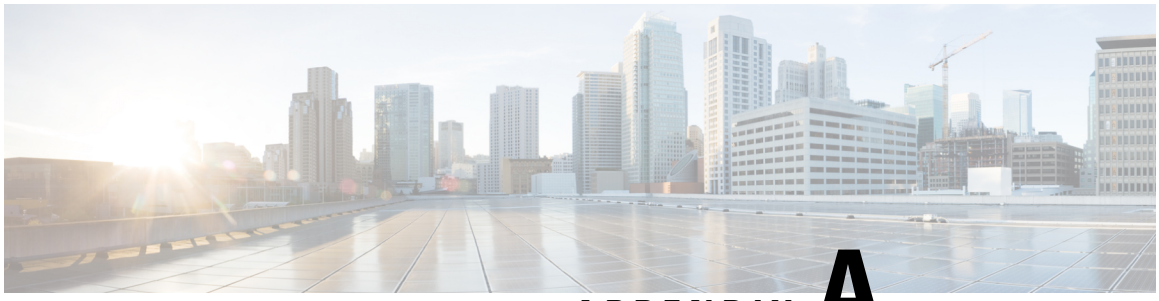
250V, 20 A

Step 4 Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

Step 5 Verify that the power supply is receiving DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see Power Supply LEDs

Note When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the HVAC/HVDC power connections on the power supply and the DC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.



APPENDIX A

Switch Specifications

This appendix includes the following topics:

- Environmental Specifications, on page 79
- Switch Dimensions, on page 80
- Power Requirements, on page 80
- Maximum Power Available for 3-kW AC Power Supplies, on page 80
- Maximum Power Available for 3-kW DC Power Supplies, on page 81
- Maximum Power Available for 3.5-kW Inputs (AC), on page 81
- Maximum Power Available for 3.5-kW Inputs (DC), on page 82
- Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies, on page 83
- Transceivers, Connectors, and Cables Used with Each I/O Module, on page 84
- Power Supply Cable Specifications , on page 110

Environmental Specifications

Environment		Specification
Temperature	Ambient operating	32 to 104°F (0 to 40°C)
	Ambient nonoperating	–40 to 158°F (–40 to 70°C)
Relative humidity	Ambient (noncondensing) operating	8 to 80%
	Ambient (noncondensing) nonoperating	5 to 90%
Altitude	Operating	–500 to 13,123 feet (–152 to 4,000 meters), agency certified 0 to 6500 feet (0 to 1980 meters)
	Storage	–1,000 to 30,000 feet (–305 to 9,144 meters)

Switch Dimensions

Switch Component	Width	Depth	Height
Cisco Nexus 7702 chassis	17.3 inches (43.9 cm)	32.0 inches (81.3 cm)	5.25 inches (13.3 cm) (3 RU)
Cable management system and front door	18.3 inches (46.5 cm)	6.5 inches (16.5 cm)	—[1]

[1] The total height of the cable management system is within the height of the chassis. The cable management system is added to the front of the chassis but does not add any height to the chassis.

Power Requirements

Component		Quantity	Maximum Power	Typical Power
Supervisor Modules		1	—	—
	Supervisor 2 Enhanced (N77-SUP2E)		265 W	137 W
	Supervisor 3 Enhanced (N77-SUP3E)		150 W	110 W
F3 I/O Modules		1	—	—
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)		480 W	450 W
	24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)		740 W	650 W
	12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)		730 W	640 W
F4 I/O Module			—	—
	30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)		1000 W	730 W
M3 I/O Modules			—	—
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L)		560 W	500 W
	24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)		750 W	700 W
Fan Tray (N77-C7702-FAN)		1	300 W	50 W

Maximum Power Available for 3-kW AC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following

table lists the amount of power available for 3-kW AC power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (220 V)	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W
1 input (110 V)	1	1450 W	—	—	—
	2	2900 W	1450 W	1450 W	1450 W

Maximum Power Available for 3-kW DC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW DC power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W

Maximum Power Available for 3.5-kW Inputs (AC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on AC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (277 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
1 input (220/230 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (210 V)	1	3100 W	—	—	—
	2	6200 W	3100 W	3100 W	3100 W
1 input (110 V)	1	1500 W	—	—	—
	2	3000 W	1500 W	1500 W	1500 W

Note A combination of 3-kW AC and 3.5-kW HVAC/HVDC power supplies can be used.

Maximum Power Available for 3.5-kW Inputs (DC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on DC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode	
1 input (380 V)	1	3,500 W	—	—	—	
	2	7,000 W	3,500 W	3,500 W	3,500 W	
	1 input (220/240 V)	1	3,500 W	—	—	—
		2	7,000 W	3,500 W	3,500 W	3,500 W
1 input (210 V)		1	3,100 W	—	—	—
		2	6,200 W	3,100 W	3,100 W	3,100 W

Note A combination of 3-kW DC and 3.5-kW HVAC/HVDC power supplies can be used.

Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies

Component		Weight per Unit	Quantity
Cisco Nexus 7702 Chassis (N77-C7702)		37.5 lb (17 kg)	1
Supervisor module (N77-SUP2E)		8.5 lb (3.9 kg)	1
Supervisor module (N77-SUP3E)		7.7 lb (3.5 kg)	1
F3 Series I/O Modules		—	1
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)	17.0 lb (7.7 kg)	
	24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)	17.0 lb (7.7 kg)	
	12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)	21.0 lb (9.5 kg)	
F4 Series I/O Module		—	
	30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)	23.14 lb (10.5 kg)	
M3 Series I/O Modules		—	
	48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L)	18.95 lb (8.60 kg)	
	24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)	18.0 lb (8.16 kg)	
	12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)	22.44 lb (10.18kg)	
Fan Tray (N77-C7702-FAN)		13.5 lb (6.1 kg)	1
Power Supplies		—	1 or 2
	3-kW AC power supply (N77-AC-3KW)	5.0 lb (2.3 kg)	
	3-kW DC power supply (N77-DC-3KW)	11.0 lb (5.0 kg)	
	3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)	11.0 lb (5.0 kg)	
Optional Components		—	—
	Front doors (N77-C7702-FDK)		0 or 1

Transceivers, Connectors, and Cables Used with Each I/O Module

Table 3: F3 Series 48-port, 1- and 10-Gigabit Ethernet (N77-F348XP-23) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
FET	FET-10G	10-Gigabit Fabric Extender Transceiver (FET) for FEX connections [2]
SFP+	SFP-10G-SR	Multi-mode fiber (MMF)
	DWDM-SFP10G-*xx.xx* SFP-10G-ER SFP-10G-LR SFP-10G-LRM SFP-10G-ZR	Single-mode fiber (SMF)
	SFP-H10GB-CU1M SFP-H10GB-CU1-5M SFP-H10GB-CU2M SFP-H10GB-CU2-5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable assembly, passive
	SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable assembly, active
	SFP-10G-AOC1M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active optical cable assembly

[2] FETs are used only when connecting this I/O module to a Fabric Extender (FEX).

Table 4: F3 Series 24-port, 40-Gigabit Ethernet (N77-F324FQ-25) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
FET	FET-40G	40-Gigabit Fabric Extender Transceiver (FET) for FEX connections [3]

Port Type	Transceiver or Connector	Cable Type
QSFP+	QSFP-40G-CSR4 QSFP-40G-SR4 QSFP-40G-SR-BD	Multi-mode fiber (MMF)
	QSFP-40G-LR4	Single-mode fiber (SMF)
	QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct attach copper, active
	QSFP-4X10G-AC7M QSFP-4X10G-AC10M	40GBASE-CR4 QSFP+ to four SFP+ Twinax direct attach copper breakout cable active
	QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M	40GBASE-AOC (Active Optical Cable) QSFP+ cable
	QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC3M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	40GBASE-AOC QSFP+ to four SFP+ breakout cable

[3] FETs are used only when connecting this I/O module to a Fabric Extender (FEX).

Table 5: F3 Series 12-port, 100-Gigabit Ethernet (N77-F312CK-26) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
CPAK	CPAK-100G-SR10	Multi-mode fiber (MMF)
	CPAK-100G-LR4	Single-mode fiber (SMF)

Table 6: F4 Series 30-port, 100-Gigabit Ethernet (N77-F430CQ-36) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
FET	FET-40G	40-Gigabit Fabric Extender Transceiver (FET) for FEX connections

Port Type	Transceiver or Connector	Cable Type
QSFP+ (QSFP28)	QSFP-100G-SR4-S QSFP-40G-CSR4 QSFP-40G-SR4 QSFP-40G-SR4-S	Multi-mode fiber (MMF), supports breakout
	QSFP-40G-SR-BD QSFP-40/100-SRBD	Multi-mode fiber (MMF), no breakout support
	QSFP-100G-CWDM4-S QSFP-100G-PSM4-S QSFP-100G-LR4-S QSFP-40G-ER4 QSFP-40G-LR4 QSFP-4x10G-LR-S	Single-mode fiber (MMF), supports breakout
	QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC3M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	QSFP to four SFP+ active optical breakout cables, supports breakout
		Active optical cable assembly, supports breakout

Port Type	Transceiver or Connector	Cable Type
	QSFP-100G-AOC1M QSFP-100G-AOC2M QSFP-100G-AOC3M QSFP-100G-AOC5M QSFP-100G-AOC7M QSFP-100G-AOC10M QSFP-100G-AOC15M QSFP-100G-AOC20M QSFP-100G-AOC25M QSFP-100G-AOC30M QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M QSFP-H40G-AOC15M	

Table 7: M3 Series 48-port, 1- and 10-Gigabit Ethernet (N77-M348XP-23L) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
SFP	GLC-TE	Category 5
	GLC-LH-SMD GLC-SX-MMD	Multi-mode fiber (MMF)
	CWDM-SFP-*xxxx* **Note** CWDM-SFP-*xxxx* is supported only with 1-Gigabit Ethernet I/O modules. DWDM-SFP-xxxx GLC-BX-U GLC-BX-D GLC-EX-SMD GLC-LH-SMD GLC-ZX-SMD	Single-mode fiber (SMF)

Port Type	Transceiver or Connector	Cable Type
SFP+	SFP-10G-SR	Multi-mode fiber (MMF)
	DWDM-SFP10G-*xx.xx* **Note** DWDM-SFP10G-C is not supported. SFP-10G-BXD-I SFP-10G-BXU-I SFP-10G-ER SFP-10G-LR SFP-10G-LRM SFP-10G-ZR	Single-mode fiber (SMF)
	SFP-H10GB-CU1M SFP-H10GB-CU1-5M SFP-H10GB-CU2M SFP-H10GB-CU2-5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable assembly, passive
	SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable assembly, active
	SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active optical cable assembly

Table 8: M3 Series 24-port, 40-Gigabit Ethernet (N77-M324FQ-25L) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
QSFP+	QSFP-40G-CSR4 QSFP-40G-SR4 QSFP-40G-SR4-S QSFP-40G-SR-BD	Multi-mode fiber (MMF)
	QSFP-40G-ER4 QSFP-40G-LR4 QSFP-40G-LR4-S QSFP-4x10G-LR-S WSP-Q40G-LR4L	Single-mode fiber (SMF)
	QSFP-4X10G-AC7M QSFP-4X10G-AC10M	Direct-attach copper cable assembly
	QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC3M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	Active optical cable assembly
	QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct attach copper, active
	QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M QSFP-H40G-AOC15M	Active optical cable assembly

Table 9: M3 Series 12-port, 100-Gigabit Ethernet (N77-M312CQ-26L) Transceivers and Cables

Port Type	Transceiver or Connector	Cable Type
QSFP+ (QSFP28)	QSFP-100G-SR4-S QSFP-40G-CSR4 QSFP-40G-SR4 QSFP-40G-SR4-S QSFP-40/100-SRBD QSFP-40G-SR-BD	Multi-mode fiber (MMF)
	QSFP-100G-CWDM4-S QSFP-100G-PSM4-S QSFP-100G-LR4-S QSFP-40G-ER4 QSFP-40G-LR4 QSFP-4x10G-LR-S	Single-mode fiber (SMF)
	QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct attach copper, active
	QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC3M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	QSFP to four SFP+ active optical breakout cables
	QSFP-4X10G-AC7M QSFP-4X10G-AC10M	QSFP to 4 SFP+ copper break-out cables
		Active optical cable assembly

Port Type	Transceiver or Connector	Cable Type
	QSFP-100G-AOC1M QSFP-100G-AOC2M QSFP-100G-AOC3M QSFP-100G-AOC5M QSFP-100G-AOC7M QSFP-100G-AOC10M QSFP-100G-AOC15M QSFP-100G-AOC20M QSFP-100G-AOC25M QSFP-100G-AOC30M QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M QSFP-H40G-AOC15M	

100-Gb CPAK Transceiver Specifications

The 100-Gigabit CPAK transceivers are used with the F3-Series 100-Gigabit I/O module (N77-F312CK-26).

For the cable specifications that apply to these transceivers, see the following table.

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
CPAK-100G-LR4	SMF	LC Duplex	1310	G.652	—	6.21 miles (10 km)
CPAK-100G-SR10	MMF	24-fiber MPO/MTP	850	50.0 50.0	2000 (OM3) 4700 (OM4)	328 feet (100 m) 492 feet (150 m)

For the environmental specifications, see the following table.

Parameter	Specification
Storage temperature	–40 to 158°F (–40 to 70°C)
Operating temperature	32 to 104°F (0 to 40°C)
Storage relative humidity	5 to 95 percent, noncondensing
Operating relative humidity	5 to 90 percent, noncondensing

100-Gb QSFP+ Transceiver Specifications

Note The 100-Gigabit QSFP+ transceivers are used with the M3-Series 100-Gigabit I/O module (N77-M312CQ-26L) and the F4-Series 100-Gigabit Ethernet I/O module (N77-F430CQ-36). These I/O modules support Forward Error Correction (FEC) with the 100-Gigabit QSFP+ transceivers. For more information, refer FEC Support on Optic Modules.

For the cable specifications that apply to these transceivers, see the following table.

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
QSFP-100G-SR4-S	MMF	12-fiber MPO	850	50.0 50.0	2000 (OM3) 4700 (OM4)	230 feet (70 m) over OM3 Multimode Fiber 328 feet (100 m) over OM4 Multimode Fiber
QSFP-100G-LR4-S	SMF	LC Duplex	1295, 1300, 1304, 1309	G.652	—	6.21 miles (10 km)
QSFP-100G-CWDM4-S	SMF	LC Duplex	1271, 1291, 1311, 1331	G.652	—	1.24 miles (2 km)
QSFP-100G-PSM4-S	SMF	12-fiber MPO	1310	G.652	—	1640 feet (500 m)
QSFP-100G-AOC*x*M	Active optical cable	QSFP+ to QSFP+	—	—	—	3.3 feet (1 m) 6.6 feet (2 m) 9.8 feet (3 m) 16.4 feet (5 m) 23 feet (7 m) 33 feet (10 m) 49.4 feet (15 m) 65.6 feet (20 m) 82 feet (25 m) 98.4 feet (30 m)
QSFP-40/100-SRBD	MMF	LC	855, 908	50.0 50.0	2000 (OM3) 4700 (OM4)	230 feet (70 m) 328 feet (100m)

For the optical specifications, see the following table.

Table 10:

Transceiver	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
QSFP-100G-SR4-S	QSFP+	2.4 (maximum per lane) -8.4 (minimum per lane)	2.4 (maximum per lane) -5.2 (minimum per lane)	840 to 860 nm
QSFP-100G-LR4-S	QSFP+	4.5 (maximum per lane) -4.3 (minimum per lane)	4.5 (maximum per lane) -8.6 (minimum per lane)	Four lanes: 1295, 1300, 1304, 1309
QSFP-100G-CWDM4-S	QSFP+	2.5 (maximum per lane) -6.5 (minimum per lane)	2.5 (maximum per lane) -10 (minimum per lane)	Four lanes: 1271, 1291, 1311, 1331
QSFP-100G-PSM4-S	QSFP+	2.9 (maximum per lane) -9.4 (minimum per lane)	2 (maximum per lane) -26 (minimum per lane)	1295 to 1325
QSFP-40/100G-SRBD	QSFP+	+4 (100G), +5 (40G) (maximum per lane) -6 (100G), -4 (40G) (minimum per lane)	4 (100G), 5 (40G) (maximum per lane) -7.9 (100G), -6 (40G) (minimum per lane)	855, 908

For the environmental specifications, see the following table.

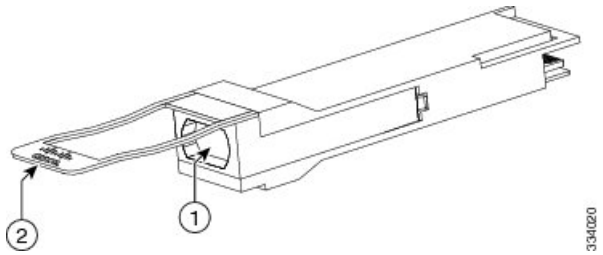
Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 158°F (0 to 70°C)
Case temperature	–40 to 158°F (–40 to 70°C)
Storage relative humidity	5 to 95 percent

40-Gb QSFP+ Transceiver Specifications

Note The 40-Gigabit QSFP+ transceivers are used with the F3-Series 40-Gigabit I/O modules (N77-F324FQ-25) , F4-Series 100-Gigabit I/O modules (N77-F430CQ-36), M3-Series 40-Gigabit I/O modules (N77-M324FQ-25L), and the M3-Series 100-Gigabit I/O modules (N77-M312CQ-26L).

The following figure identifies the major features of these transceivers.

Figure 20:



1	Optical bore	2	Pull tab

For the cable specifications that apply to these transceivers, see the following table.

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
FET-40G **Note** FET-40G is not supported with N77-M324FQ-25L and N77-M312CQ-26L.	MMF	QSFP+ to QSFP+	850	50.0 50.0 50.0	500 2000 4700	98 feet (30 m) 328 feet (100 m) 328 feet (100 m)
QSFP-H40G-ACU*x*M	Direct attach copper, active	QSFP+ to QSFP+	—	—	—	23 feet (7 m) 33 feet (10 m)
QSFP-H40G-AOC*x*M	Active optical cable	QSFP+ to QSFP+	—	—	—	3.3 feet (1 m) 6.6 feet (2 m) 9.8 feet (3 m) 16.4 feet (5 m) 23 feet (7 m) 33 feet (10 m) 49.4 feet (15 m)

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
QSFP-40G-CSR4	MMF	12-fiber MTP/MPO	850	62.5 50.0 50.0 50.0	200 500 2000 4700	108 feet (33 m) 269 feet (82 m) 984 feet (300 m) 1312 feet (400 m)
QSFP-40G-ER4	SMF	LC	1310	G.652	—	40 km[4]
QSFP-40G-LR4	SMF	LC Duplex	1310	G.652	—	6.21 miles (10 km)
QSFP-40G-SR4	MMF	PC or UPC	850	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98 feet (30 m) 328 feet (100 m) 492 feet (150 m)
QSFP-4X10G-AOC*x*M	Active optical cable assembly	QSFP to four SFP+	-	-	-	3 feet (1 m) 6.5 feet (2 m) 9.8 feet (3 m) 16.4 feet (5 m) 23 feet (7 m) 33 feet (10 m)
QSFP-4X10G-AC*x*M	Direct-attach copper cable assembly	QSFP to four SFP+	-	-	-	23 feet (7 m) 33 feet (10 m)
QSFP-4X10G-LR-S	SMF	MPO-12	1310	G.652	-	10 km
QSFP-40G-SR-BD	MMF	LC Duplex	850/900	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98 feet (30 m) 328 feet (100 m) 328 feet (100 m)
WSP-Q40G-LR4L	SMF	LC	1310	G.652	—	1.24 miles (2 km)

For the optical specifications, see the following table.

Transceiver	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
QSFP-40G-CSR4	40GBASE-CSR4	0 (maximum per lane) -7.3 (minimum per lane)	0 (maximum per lane) -9.9 (minimum per lane)	840 to 860

Transceiver	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
QSFP-40G-ER4	40GBASE-ER4	4.5 (maximum per lane) -2.7 (minimum per lane)	-4.5 (maximum per lane) -21.2 (minimum per lane)	Four lanes: 1271, 1291, 1311, 1331
QSFP-40G-LR4	40GBASE-LR4	2.3 (maximum per lane) -7 (minimum per lane)	2.3 (maximum per lane) -13.7 (minimum per lane)	Four lanes: 1271, 1291, 1311, 1331
QSFP-40G-SR4	40GBASE-SR4	-1.0 (maximum per lane*6) -7.6 (minimum per lane)	2.4 (maximum per lane) -9.5 (minimum per lane)	840 to 860 nm
QSFP-4X10G-LR-S	4x10GBASE-LR	0.5 (maximum per lane) -8.2 (minimum per lane)	0.5 (maximum per lane) -14.4 (minimum per lane)	1260 to 1355
QSFP-40G-SR-BD	40GBASE-SR-BiDi	5 (maximum per lane) -4 (minimum per lane)	5 (maximum per lane) -6 (minimum per lane)	832 to 918
WSP-Q40G-LR4L	40GBASE-LR4-Lite	2.3 (maximum per lane) -10 (minimum per lane)	2.3 (maximum per lane) -13.7 (minimum per lane)	Four lanes: 1271, 1291, 1311, 1331

For the environmental specifications, see the following table.

Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 104°F (0 to 40°C)
Case temperature	–40 to 158°F (–40 to 70°C)
Storage relative humidity	5 to 95 percent

10-Gb SFP+ Optical Transceivers and Fabric Extender Transceivers

The following table indicates which 10-Gigabit SFP+ transceivers are used with the 10-Gigabit Ethernet (GE) I/O modules:

Transceiver	F3 Series 48-port 1-/10-GE (N77-F348XP-23)	M3 Series 48-port 1-/10-GE (N77-M348XP-23L)
CWDM-SFP10G-*xxxx*	—	—
DWDM-SFP10G-*xx.xx*	X	X **Note** DWDM-SFP10G-C is not supported.
FET-10G	X	—
SFP-H10GB-CU*x*M	X	X
SFP-H10GB-ACU*x*M	X	X
SFP-10G-AOC*x*M	X	X
SFP-10G-BXD-I	X	X
SFP-10G-BXU-I	X	X
SFP-10G-ER	X	X
SFP-10G-LR	X	X
SFP-10G-LRM	X	X
SFP-10G-SR	X	X
SFP-10G-ZR	X	X

You can use the SFP-10G-SR, SFP-10G-LR, and the 10-Gigabit Fabric Extender Transceiver (FET) to connect the following I/O modules to Fabric Extenders (FEXs):

- F3 Series 48-port, 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)

On the other end of the connections using the SFP-10G-SR, SFP-10G-LR, and FET transceivers, you can connect to the following FEXs:

- Cisco Nexus 2248TP FEX
- Cisco Nexus 2248TP-E FEX
- Cisco Nexus 2248PQ-E FEX
- Cisco Nexus 2232TM-E FEX
- Cisco Nexus 2232TM FEX
- Cisco Nexus 2232PP FEX

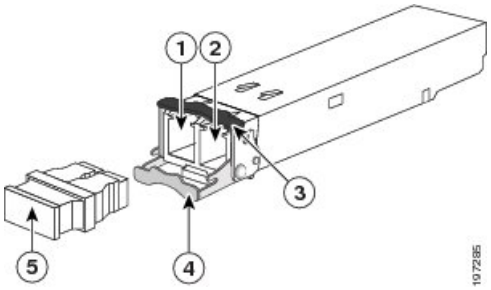
Using the QSFP-40G-SR4, QSFP-40G-LR4, and FET transceivers, you can connect the F3 Series 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25) to the following FEXs:

- Cisco Nexus 2348TQ-10GE
- Cisco Nexus 2348UPQ

- Cisco Nexus B22IBM

The following figure identifies the major features of these transceivers.

Figure 21:



1	Receive optical bore	4	Clasp shown in open position
2	Transmit optical bore	5	Dust plug
3	Clasp shown in closed position		

For the cable specifications that apply to the supported transceivers, see the following table. For information about the DWDM transceivers, see 10BASE-DWDM SFP+ Transceiver Specifications, on page 100

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
FET-10G	MMF	Dual LC/PC	850	50.0 50.0	500 2000	82 feet (25 m) 328 feet (100 m)
SFP-H10GB-CUxM	Twinax cable, passive, 30-AWG cable assembly	—	—	—	—	3.3 feet (1 m) 4.9 feet (1.5 m) 6.6 feet (2 m) 8.2 feet (2.5 m) 9.8 feet (3 m) 16.4 feet (5 m)
SFP-H10GB-ACUxM	Twinax cable, active, 30-AWG cable assembly	—	—	—	—	22.8 feet (7 m) 32.5 feet (10 m)

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
SFP-10G-AOC*x*M	Active optical cable assembly	—	—	—	—	3.3 feet (1 m) 6.6 feet (2 m) 9.8 feet (3 m) 16.4 feet (5 m) 22.8 feet (7 m) 32.5 feet (10 m)
SFP-10G-BXD-I	SMF	—	1330	G.652	—	6.2 miles (10 km)
SFP-10G-BXU-I	SMF	—	1270	G.652	—	6.2 miles (10 km)
SFP-10G-ER	SMF	Dual LC/PC	1550	G.652 fiber	—	24.9 miles (40 km)
SFP-10G-LR	SMF	Dual LC/PC	1310	G.652 fiber	—	6.2 miles (10 km)
SFP-10G-LRM	SMF	Dual LC/PC	1310	G.652	—	984 feet (300 m)
SFP-10G-SR	MMF	Dual LC/PC	850	62.5 62.5 50 50 50	160 200 400 500 2000	85 feet (26 m) 108 feet (33 m) 216 feet (66 m) 269 feet (82 m) 984 feet (300 m)
SFP-10G-ZR	SMF		1550	G.652	—	49.7 miles (80 km)

For the optical specifications, see the following table.

Transceiver	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
SFP-10G-ER	10GBASE-ER, 1550-nm SMF	4.0 (maximum per lane) -4.7 (minimum per lane)	–1.0 (maximum per lane) –15.8 (minimum per lane)	1530 to 1565 nm
SFP-10G-LR	10GBASE-LR, 1310-nm SMF	0.5 (maximum per lane) -8.2 (minimum per lane)	0.5 (maximum per lane) -14.4 (minimum per lane)	1260 to 1355 nm

Transceiver	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
SFP-10G-LRM	10GBASE-LRM, 1310-nm SMF	0.5 (maximum per lane) -6.5 (minimum per lane)	0.5 (maximum per lane) -8.4 (minimum per lane) (in average) -6.4 (minimum per lane) (in OMA)[4]	1260 to 1355 nm
SFP-10G-SR	10GBASE-SR, 850-nm MMF	–1.2 (maximum per lane)[5] –7.3 (minimum per lane)	0.5 (maximum per lane) -8.2 (minimum per lane)	840 to 860 nm

[4] Both the average and the OMA specifications must be met simultaneously.
[5] The launch power shall be the lesser of the class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1:2001.

For the environmental specifications, see the following table.

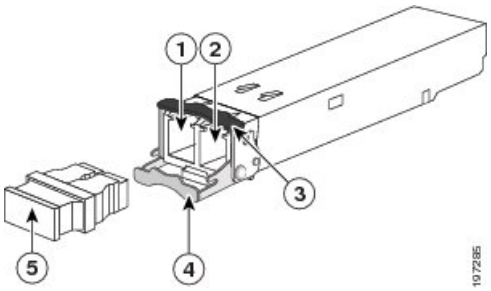
Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 158°F (0 to 70°C)
Case temperature	–40 to 158°F (–40 to 70°C)
Module supply voltage	3.1 to 3.5 V

10BASE-DWDM SFP+ Transceiver Specifications

The Dense Wavelength Division Multiplexing (DWDM) SFP+ transceivers are part of a DWDM optical network to provide high-capacity bandwidth across a fiber-optic network. There are 32 fixed-wavelength DWDM SFP+ transceivers that support the International Telecommunications Union (ITU) 100-GHz wavelength grid. These transceivers have duplex SC connectors. DWDM SFP+ transceivers can transmit and receive optical signals up to 50 miles (80 km) depending on the quality of the fiber-optic cable used.

DWDM SFP+ transceivers look like the typical 10GBASE-X SFP+ transceivers as shown in the following figure.

Figure 22:



1	Receive optical bore	4	Clasp shown in open position
2	Transmit optical bore	5	Dust plug
3	Clasp shown in closed position		

For the Cisco DWDM SFP+ transceiver cable specifications, see the following table.

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	ITU Channel
	SMF[6]	Dual LC/PC connector	1530.33, 1531.12, 1531.90, 1532.68, 1533.46, 1534.25, 1535.04, 1535.82, 1536.61, 1537.39, 1538.19, 1538.98, 1539.77, 1540.56, 1542.14, 1542.94, 1543.73, 1544.53, 1546.12, 1546.92, 1547.72, 1548.51, 1549.31, 1550.12, 1550.92, 1551.72, 1552.52, 1554.13, 1554.94, 1555.75, 1556.55, 1558.17, 1558.98, 1559.79, 1560.61, 1561.41	

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	ITU Channel
DWDM-SFP10G-30.33				59
DWDM-SFP10G-31.12				58
DWDM-SFP10G-31.90				57
DWDM-SFP10G-32.68				56
DWDM-SFP10G-33.47				55
DWDM-SFP10G-34.25				54
DWDM-SFP10G-35.04				53
DWDM-SFP10G-35.82				52
DWDM-SFP10G-36.61				51
DWDM-SFP10G-37.40				50
DWDM-SFP10G-38.19				49
DWDM-SFP10G-38.98				48
DWDM-SFP10G-39.77				47
DWDM-SFP10G-40.56				46
DWDM-SFP10G-41.35				45
DWDM-SFP10G-42.14				44
DWDM-SFP10G-42.94				43
DWDM-SFP10G-43.73				42
DWDM-SFP10G-44.53				41
DWDM-SFP10G-45.32				40
DWDM-SFP10G-46.12				39
DWDM-SFP10G-46.92				38
DWDM-SFP10G-47.72				37
DWDM-SFP10G-48.51				36
DWDM-SFP10G-49.32				35
DWDM-SFP10G-50.12				34
DWDM-SFP10G-50.92				33
DWDM-SFP10G-51.72				32
DWDM-SFP10G-52.52				31
DWDM-SFP10G-53.33				30
DWDM-SFP10G-54.13				29
DWDM-SFP10G-54.94				28
DWDM-SFP10G-55.75				27

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	ITU Channel
DWDM-SFP10G-56.55				26
DWDM-SFP10G-57.36				25
DWDM-SFP10G-58.17				24
DWDM-SFP10G-58.98				23
DWDM-SFP10G-59.79				22
DWDM-SFP10G-60.61				21
DWDM-SFP10G-61.41				20

[6] Single-mode fiber optic (SMF)

For the specifications that differentiate the 10GBASE-DWDM SFP+ transceivers, see the 10-Gigabit Ethernet Transceiver Modules Compatibility Matrix.

1-Gb SFP Transceivers

The following table indicates which 1-Gigabit SFP transceivers can be used with the 1-Gigabit Ethernet (GE) I/O modules:

Transceiver	F3 Series 48-port 1-/10-GE (N77-F348XP-23)	M3 Series 48-port 1-/10-GE (N77-M348XP-23L)
CWDM-SFP-*xxxx*	X	X
CWDM-SFP-1*xxx*	X	X
DWDM-SFP-*xxxx*	X	X
GLC-BX-D	X	X
GLC-BX-U	X	X
GLC-EX-SMD	X	X
GLC-LH-SMD	X	X
GLC-SX-MMD	X	X
GLC-T	X	X
GLC-ZX-SMD	X	X
SFP-GE-T	X	X

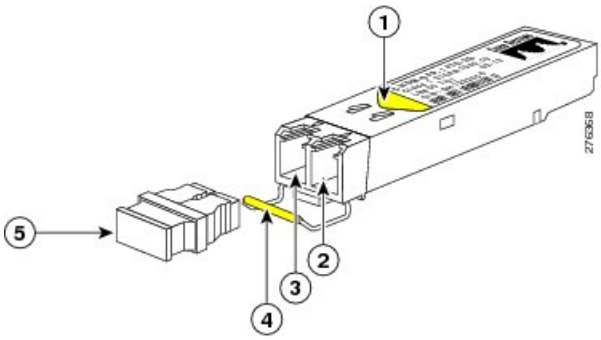
1000BASE-CWDM SFP Transceiver Cables

The Coarse Wavelength Division Multiplexing (CWDM) SFP transceivers are hot-swappable transceivers that you plug into SFP-compatible I/O modules. The CWDM SFP transceiver uses an LC optical connector to connect to a single-mode fiber-optic (SMF) cable. You can connect the CWDM SFPs to CWDM passive optical system optical add/drop multiplexer (OADM) modules or multiplexer/demultiplexer plug-in modules

using SMF cables. CWDM SFP transceivers can transmit and receive optical signals up to 61 miles (100 km) depending on the quality of the fiber-optic cable used.

CWDM SFP transceivers are color coded to indicate their designated optical wavelength. The following figure shows the CWDM transceiver, which looks like a standard 1000BASE-X SFP transceiver with a colored arrow and bail clasp to indicate the designated wavelength.

Figure 23: CWDM SFP Transceiver (Yellow Color Code)



1	Colored arrow on label specifies the wavelength	4	Bail clasp
2	Receive optical bore	5	Dust plug
3	Transmit optical bore		

Whenever the transceiver receive optical bores are not filled with optical cables, you should minimize the chance of contamination by plugging the transceiver with its dust plug.

For the Cisco CWDM SFP transceiver cable specifications, see the following table.

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
CWDM-SFP-1470 CWDM-SFP-1490 CWDM-SFP-1510 CWDM-SFP-1530 CWDM-SFP-1550 CWDM-SFP-1570 CWDM-SFP-1590 CWDM-SFP-1610	SMF[7]	Dual LC/PC connector	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	G.652[8]	—	62 miles (100 km)

[7] Single-mode fiber optic (SMF)
[8] ITU-T G652 SMF as specified by the IEEE 802.32 standard.

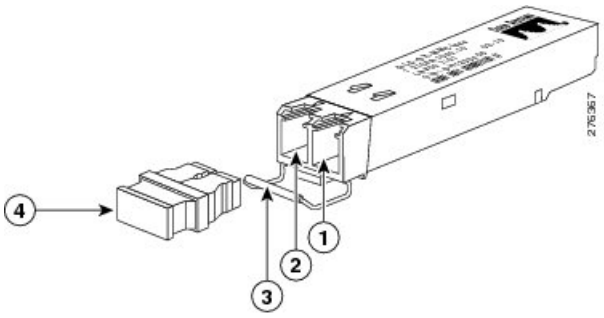
For the specifications that differentiate the 1000BASE-CWDM SFP transceivers, see the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix. For specifications and installation information that apply to all CWDM SFP transceivers, see the Cisco SFP and SFP+ Transceiver Module Installation Notes.

1000BASE-DWDM SFP Transceiver Specifications

The Dense Wavelength Division Multiplexing (DWDM) SFP transceivers are part of a DWDM optical network to provide high-capacity bandwidth across a fiber-optic network. There are 40 fixed-wavelength DWDM SFP transceivers that support the International Telecommunications Union (ITU) 100-GHz wavelength grid. These transceivers have duplex SC connectors. DWDM SFP transceivers can transmit and receive optical signals up to 50 miles (80 km) depending on the quality of the fiber-optic cable used.

DWDM SFP transceivers look like the typical 1000BASE-X transceivers as shown in the following figure.

Figure 24: 1000BASE-DWDM SFP Transceiver



1	Receive optical bore	3	Bail clasp
2	Transmit optical bore	4	Dust plug

For the Cisco DWDM SFP transceiver cable specifications, see the following table.

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	ITU Channel
DWDM-SFP-3033	SMF[9]	Dual LC/PC connector	1530.33, 1531.12, 1531.90, 1532.68, 1534.25, 1535.04, 1535.82, 1536.61, 1537.39, 1538.19, 1539.98, 1539.77, 1540.56, 1542.14, 1542.94, 1543.73, 1544.53, 1546.12, 1546.92, 1547.72, 1548.51, 1550.12, 1550.92, 1551.72, 1552.52, 1554.13, 1554.94, 1555.75, 1556.55, 1558.17, 1558.98, 1559.79, 1560.61	59
DWDM-SFP-3112				58
DWDM-SFP-3190				57
DWDM-SFP-3268				56
DWDM-SFP-3425				54
DWDM-SFP-3504				53
DWDM-SFP-3582				52
DWDM-SFP-3661				51
DWDM-SFP-3819				49
DWDM-SFP-3998				48
DWDM-SFP-3977				47
DWDM-SFP-4056				46
DWDM-SFP-4214				44
DWDM-SFP-4294				43
DWDM-SFP-4373				42
DWDM-SFP-4453				41
DWDM-SFP-4612				39
DWDM-SFP-4692				38
DWDM-SFP-4772				37
DWDM-SFP-4851				36
DWDM-SFP-5012				34
DWDM-SFP-5092				33
DWDM-SFP-5172				32
DWDM-SFP-5252				31
DWDM-SFP-5413				29
DWDM-SFP-5494				28
DWDM-SFP-5575				27
DWDM-SFP-5655				26
DWDM-SFP-5817				24
DWDM-SFP-5898				23
DWDM-SFP-5979				22
DWDM-SFP-6061				21

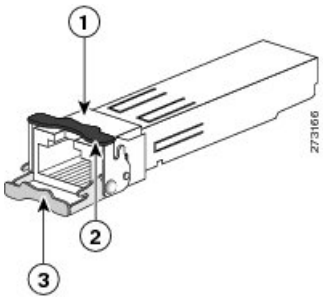
[9] Single-mode fiber optic (SMF)

For the specifications that differentiate the 1000BASE-DWDM SFP transceivers, see the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix. For specifications and installation information that apply to all CWDM SFP transceivers, see the Cisco SFP and SFP+ Transceiver Module Installation Notes.

1000BASE-T and 1000BASE-X SFP Transceiver Specifications

The 1000BASE-T and 1000BASE-X SFPs are hot-swappable transceivers that you plug into SFP-compatible I/O modules. The 1000BASE-T transceiver, shown in the following figure, provides an RJ-45 connection for copper cables.

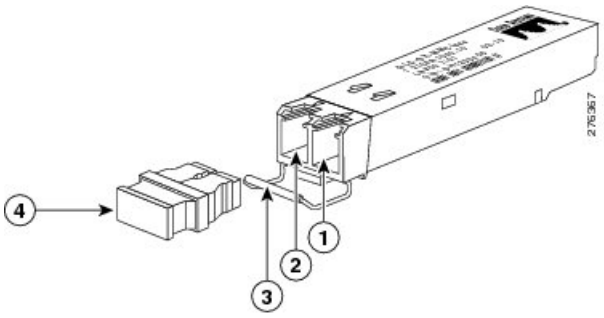
Figure 25: 1000BASE-T SFP Transceiver



1	RJ-45 connector	3	Bail clasp shown in the open (unlocked) position
2	Bail clasp shown in the closed (locked) position		

The 1000BASE-X transceiver, shown in the following figure, provides an optical connection for fiber-optic cables.

Figure 26: 1000BASE-X SFP Transceiver



1	Receive optical bore	3	Bail clasp
2	Transmit optical bore	4	Dust plug

For the 1000BASE-T and 1000BASE-X transceiver cable specifications, see the following table.

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
1000BASE-BX10 (GLC-BX-U)	SMF[10]	Single LC/PC	1310	G.652[11]	—	6.2 miles (10 km)

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
1000BASE-BX10 (GLC-BX-D)	SMF[1]	Single LC/PC	1490	G.652[2]	—	6.2 miles (10 km)
1000BASE-SX (GLC-SX-MMD)	MMF[12]	LC duplex	850	62.5 62.5 50.0 50.0	160 200 400 500	722 feet (220 m) 902 feet (275 m) 1640 feet (500 m) 1804 feet (550 m)
1000BASE-LX (GLC-LH-SMD)	MMF[3]	LC duplex	1310	62.5 50.0 50.0	500 400 500	1804 feet (550 m)[13] 1804 feet (550 m)[4] 1804 feet (550 m)[4]
	SMF[1]	LC duplex	1310	G.652[2]	—	6.2 miles (10 km)
1000BASE-ZX (GLC-ZX-SMD)	SMF[1]	LC duplex	1550	G.652[2]	—	Approximately 43.4 to 60 miles (70 to 100 km) depending on link loss
1000BASE-T (GLC-T and SFP-GE-T)	Category 5, 5E, or 6 UTP/FTP	RJ-45	—	—	—	328 feet (100 meters)

10 Single-mode fiber optic (SMF)
11 ITU-T G652 SMF as specified by the IEEE 802.32 standard.
12 Multimode fiber optic (MMF)
13 You must use a mode-conditioning patch cord, as specified by the IEEE standard, regardless of the amount of span.

The transceivers that support Digital Optical Monitoring have a greater range of temperatures for operations, as shown in the following table.

Transceiver Type	Part Number	Digital Optical Monitoring Support	Operating Temperature	Storage Temperature
1000BASE-SX	GLC-SX-MMD	Yes	EXT[14]	–40 to 185°F (–40 to 85°C)
1000BASE-LX	GLC-LH-SMD	Yes	EXT[5]	
1000BASE-ZX	GLC-ZX-SMD	No	COM[6]	
1000BASE-T	GLC-T	—	COM[6]	
	SFP-GE-T	—	EXT[5]	

14 Extended (EXT) temperature range is 23 to 185°F (-5 to 85°C)

RJ-45 Module Connectors

The RJ-45 connector connects Category 3, Category 5, Category 5e, Category 6, or Category 6A foil twisted-pair or unshielded twisted-pair cable from the external network to the following module interface connectors:

- Supervisor modules
  - CONSOLE port
  - MGMT ETH port
- Fabric Extenders (Cisco Nexus 2232PP, 2232TM, 2232TM-E, 2248PQ, 2248TP, and 2248TP-E FEXs)
  - 100/1000 downlink ports

Cisco Nexus C2348UPQ FEX

- 1000/10000 downlink ports

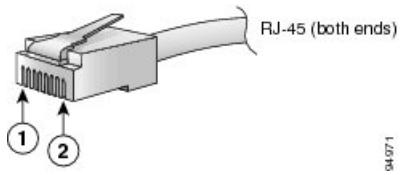
Cisco Nexus C2348TQ-10GE FEX

- 100/1000/10000 downlink ports

Caution To comply with GR-1089 intrabuilding, lightning immunity requirements, you must use a foil twisted-pair (FTP) cable that is properly grounded at both ends.

The following figure shows the RJ-45 connector.

Figure 27: RJ-45 Connector

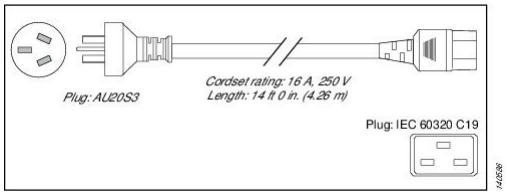
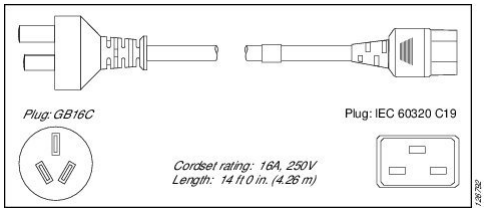
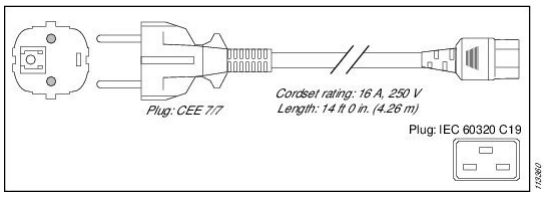
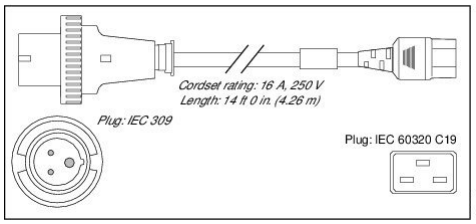
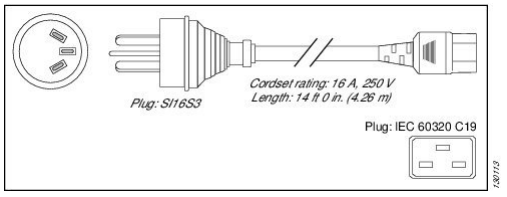
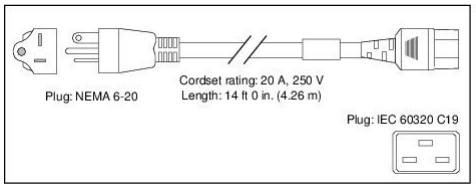


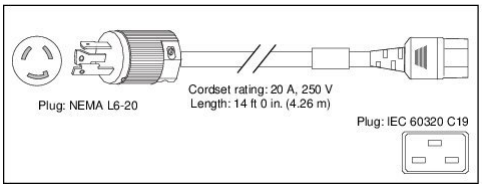
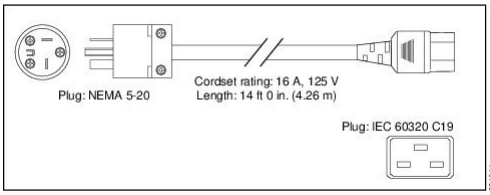
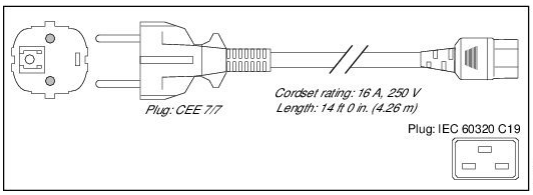
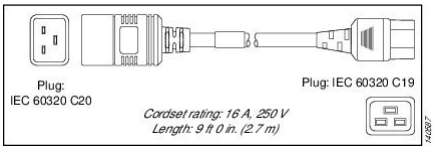
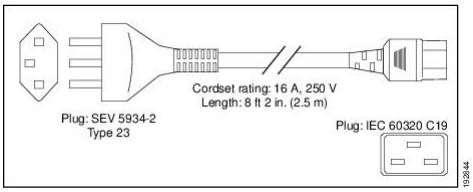
1	Pin 1	2	Pin 2

Power Supply Cable Specifications

Note If you do not order the optional power cord with the system, you are responsible for selecting the appropriate power cord for the product. Using a non-compatible power cord with this product may result in electrical safety hazard. Orders delivered to Argentina, Brazil, and Japan must have the appropriate power cord ordered with the system.

3-kW AC Power Cord Specifications

Locale	Power Cord Part Number	Cord Set Rating	Power Cord Illustration
Australia and New Zealand	CAB-AC-16A-AUS	16A, 250 VAC	
Peoples Republic of China	CAB-AC-16A-CH	16A, 250 VAC	
Continental Europe	CAB-AC-2500W-EU	16A, 250 VAC	
International	CAB-AC-2500W-INT	16A, 250 VAC	
Israel	CAB-AC-2500W-ISRL	16A, 250 VAC	
Japan and North America (non locking) 200-240 VAC operation	CAB-9K16A-US1	16A, 250 VAC	

Locale	Power Cord Part Number	Cord Set Rating	Power Cord Illustration
Japan and North America (locking) 200-240 VAC operation	CAB-AC16K-TWLK	16A, 250 VAC	
Japan and North America 100-120 VAC operation	CAB-7513AC	16A, 250 VAC	
Korea	CAB-9K16A-KOR	16A, 250 VAC	
Power distribution unit (PDU)	CAB-C19-CBN	16A, 250 VAC	
Switzerland	CAB-ACS-16	16A, 250 VAC	

3.5-kW HVAC/HVDC Power Supply AC Power Cord Specifications

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
Argentina, IRSM 2073/Saf-D-Grid	CAB-AC-16A-SG-AR	37-1649-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 28: CAB-AC-16A-SG-AR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 116

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
Australia and New Zealand, AU20LS3/Saf-D-Grid	CAB-AC-16A-SG-AZ	37-1661-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 29: CAB-AC-16A-SG-AZ Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 117
Brazil, EL224/Saf-D-Grid	CAB-AC-16A-SG-BR	37-1650-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 30: CAB-AC-16A-SG-BR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 117
Peoples Republic of China, GB 16C/Saf-D-Grid	CAB-AC-16A-SG-CH	37-1655-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 31: CAB-AC-16A-SG-CH Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 117
Continental Europe, CEE 7-7/Saf-D-Grid	CAB-AC-16A-SG-EU	37-1660-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 32: CAB-AC-16A-SG-EU Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 117
India, SABS 164-1/Saf-D-Grid	CAB-AC-16A-SG-IND	37-1648-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 33: CAB-AC-16A-SG-IND Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 118
International, IEC60309/Saf-D-Grid	CAB-AC-16A-SG-IN	37-1659-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 34: CAB-AC-16A-SG-IN Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 118

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
Israel, SI 16S3/Saf-D-Grid	CAB-AC-16A-SG-IS	37-1658-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 35: CAB-AC-16A-SG-IS Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 118
Italy, CEI 23-50/Saf-D-Grid to IEC-C19	CAB-AC-16A-SG-IT	37-1651-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 36: CAB-AC-16A-SG-IT Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 119
North America (non locking) 110 VAC operation, Straight Blade, NEMA 5-20P/Saf-D-Grid	CAB-AC-20A-SG-US	37-1662-01	14' 0" (4.26 m)	20A, 110 VAC	Figure 37: CAB-AC-20A-SG-US Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 119
North America (locking) 125 VAC operation, Twist Lock, NEMA L5-20/Saf-D-Grid	CAB-AC-20A-SG-US1	37-1652-01	14' 0" (4.26 m)	20A, 125 VAC	Figure 38: CAB-AC-20A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 119
North America (non locking) 200-240 VAC operation, Straight Blade, NEMA 6-20/Saf-D-Grid	CAB-AC-20A-SG-US2	37-1657-01	14' 0" (4.26 m)	20A, 250 VAC	Figure 39: CAB-AC-20A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 119
North America (locking) 200-240 VAC operation, Twist Lock, NEMA L6-20/Saf-D-Grid	CAB-AC-20A-SG-US3	37-1656-01	14' 0" (4.26 m)	20A, 250 VAC	Figure 40: CAB-AC-20A-SG-US3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 120

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
North America 277 VAC operation, NEMA L7-20P/Saf-D-Grid	CAB-AC-20A-SG-US4	37-1645-01	14' 0" (4.26 m)	20A, 277 VAC	Figure 41: CAB-AC-20A-SG-US4 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 120
North America Cabinet Jumper Power Distribution Unit (PDU), Cabinet Jumper PDU, IEC C20/Saf-D-Grid	CAB-AC-20A-SG-C20	37-1653-01	14' 0" (4.26 m)	20A, 250 VAC	Figure 42: CAB-AC-20A-SG-C20 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 120
South Africa, EL/Saf-D-Grid	CAB-AC-16A-SG-SA	37-1647-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 43: CAB-AC-16A-SG-SA Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 120
Korea, Src/Saf-D-Grid	CAB-AC-16A-SG-SK	37-1646-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 44: CAB-AC-16A-SG-SK Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 121
Switzerland, SEV 5934-2/Saf-D-Grid	CAB-AC-16A-SG-SW	37-1654-01	14' 0" (4.26 m)	16A, 250 VAC	Figure 45: CAB-AC-16A-SG-SW Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 121
IEC/EU, Ring Terminal source plug, Ring Terminal/Saf-D-Grid	CAB-HV-25A-SG-IN2	37-1640-01	14' 0" (4.26 m)	20A, 300 VAC/500 VDC	Figure 46: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 121

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
IEC/EU, Saf-D-Grid P10/Saf-D-Grid P4	CAB-HV-25A-SG-IN3	37-100904-01	14' 0" (4.26 m)	20A, 300 VAC	Figure 47: CAB-HV-25A-SG-IN3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 121
North America, Ring Terminal source plug, Ring Terminal/Saf-D-Grid	CAB-HV-25A-SG-US2	37-1641-01	14' 0" (4.26 m)	20A, 300 VAC/500 VDC	Figure 48: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 122
North America, Saf-D-Grid P10/Saf-D-Grid P4	CAB-HV-25A-SG-US5	37-100903-01	14' 0" (4.26 m)	20A, 300 VAC	Figure 49: CAB-HV-25A-SG-US5 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 122

Note All power cords will not be orderable at first customer shipment (FCS).

Figure 28: CAB-AC-16A-SG-AR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

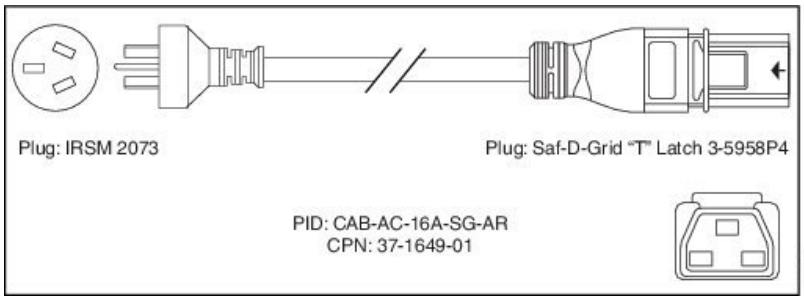


Figure 29: CAB-AC-16A-SG-AZ Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

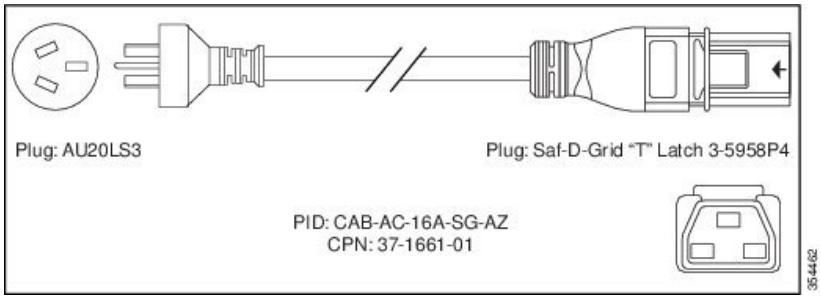


Figure 30: CAB-AC-16A-SG-BR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

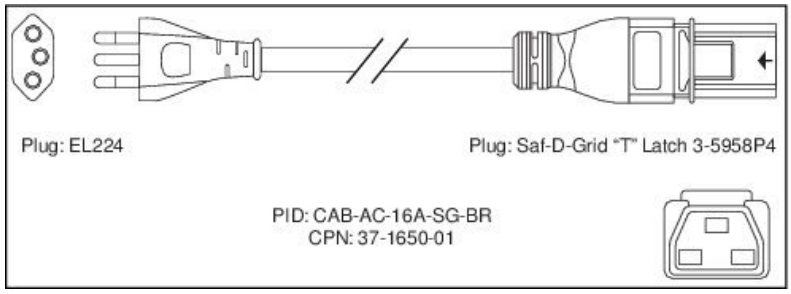


Figure 31: CAB-AC-16A-SG-CH Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

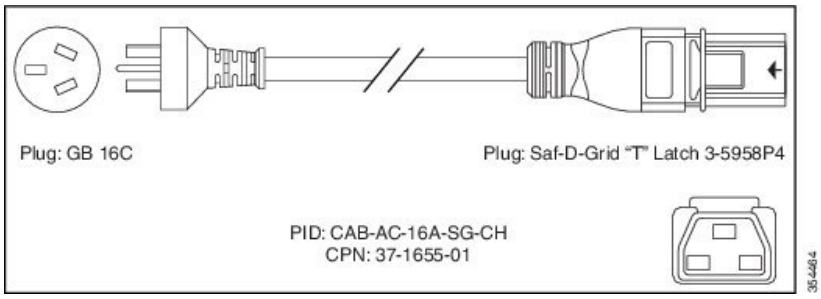


Figure 32: CAB-AC-16A-SG-EU Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

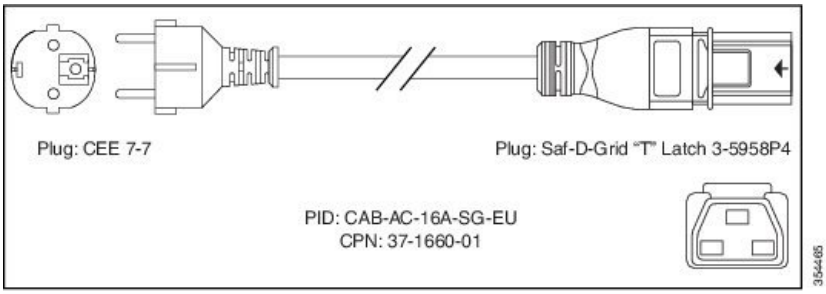


Figure 33: CAB-AC-16A-SG-IND Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

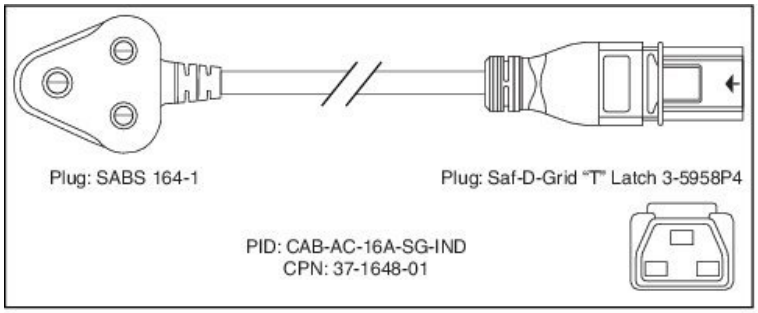


Figure 34: CAB-AC-16A-SG-IN Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

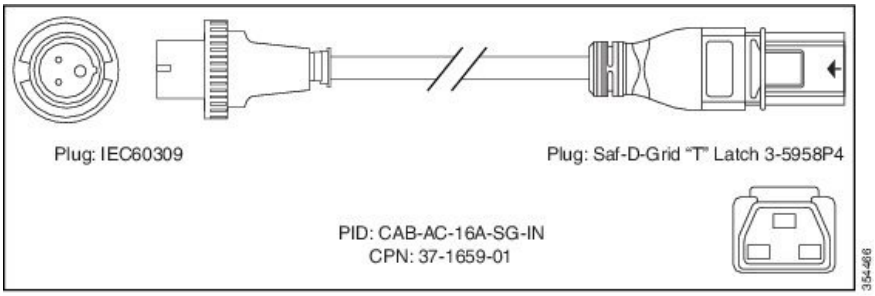


Figure 35: CAB-AC-16A-SG-IS Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

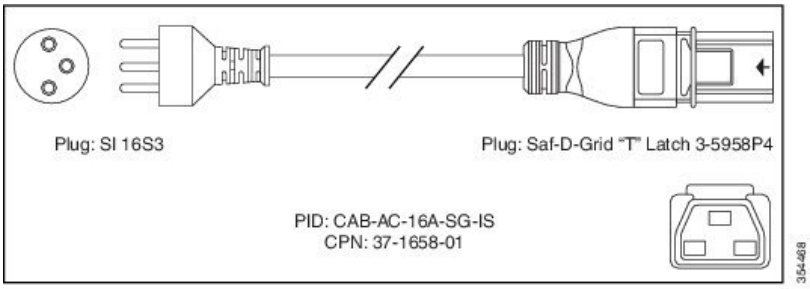


Figure 36: CAB-AC-16A-SG-IT Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

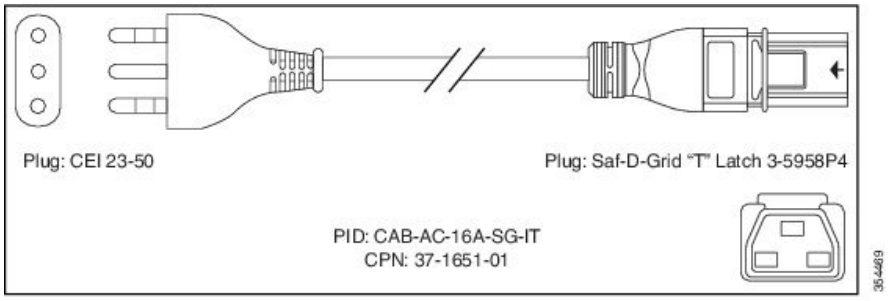


Figure 37: CAB-AC-20A-SG-US Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

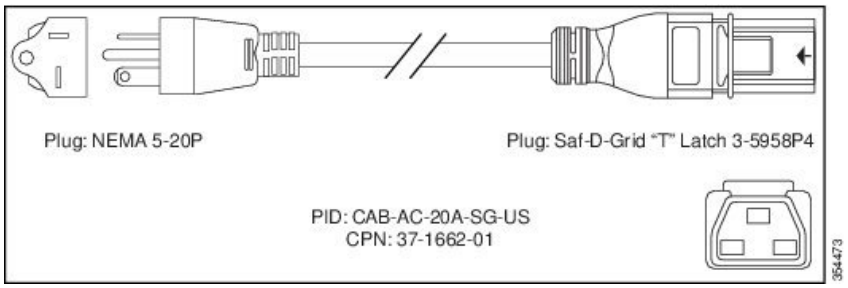


Figure 38: CAB-AC-20A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

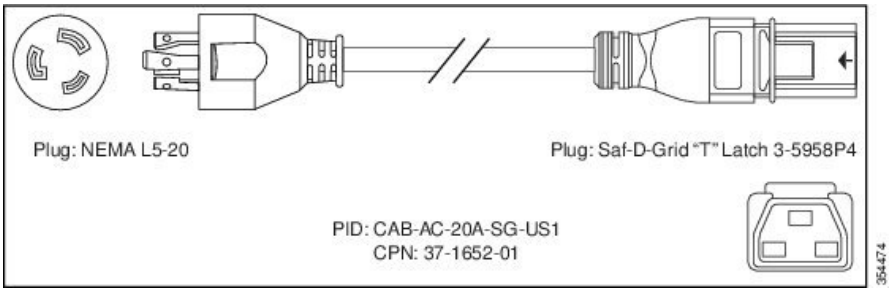
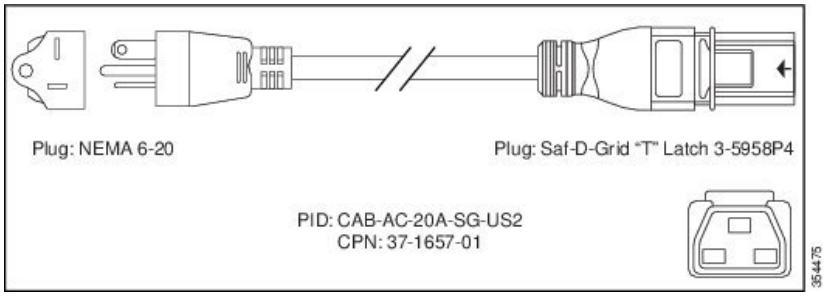


Figure 39: CAB-AC-20A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit



Switch Specifications

Figure 40: CAB-AC-20A-SG-US3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

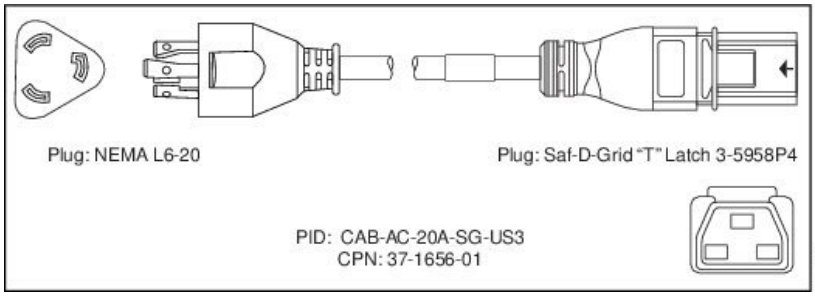


Figure 41: CAB-AC-20A-SG-US4 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

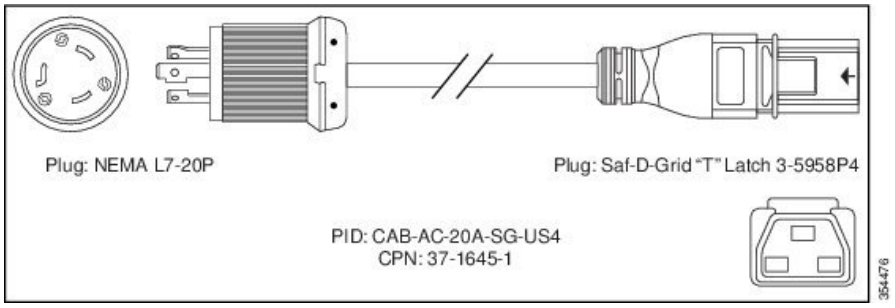


Figure 42: CAB-AC-20A-SG-C20 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

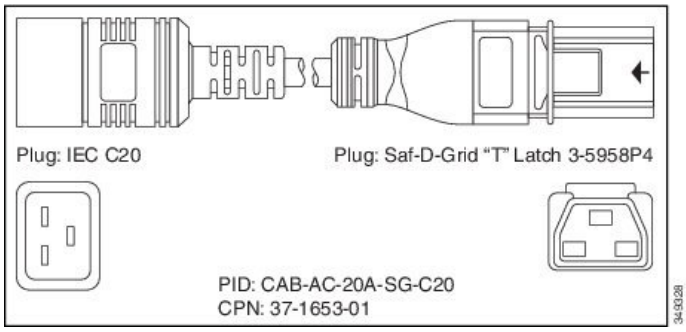


Figure 43: CAB-AC-16A-SG-SA Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

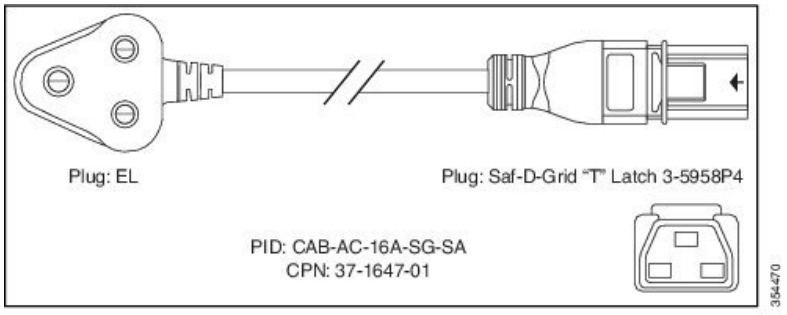


Figure 44: CAB-AC-16A-SG-SK Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

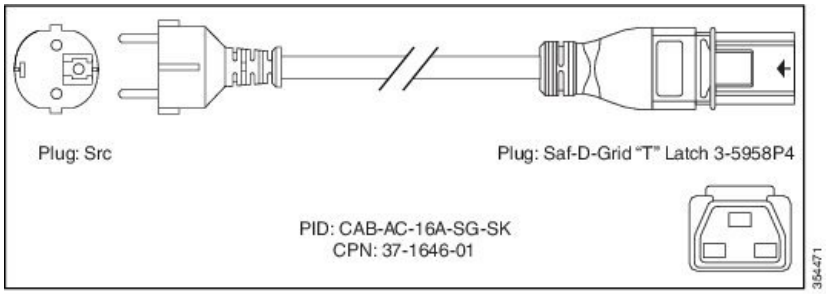


Figure 45: CAB-AC-16A-SG-SW Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

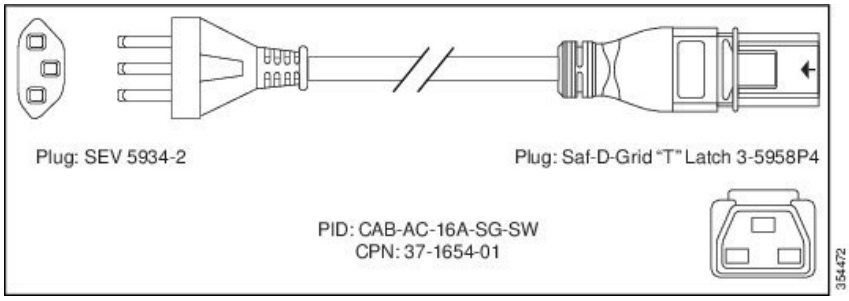


Figure 46: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

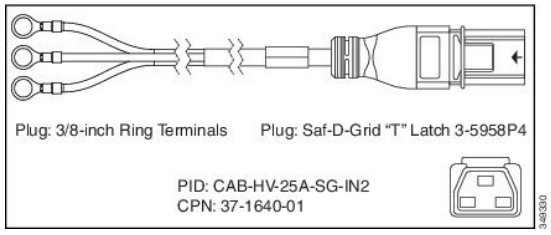


Figure 47: CAB-HV-25A-SG-IN3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

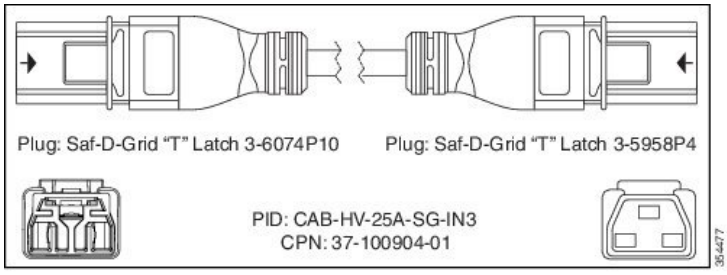


Figure 48: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

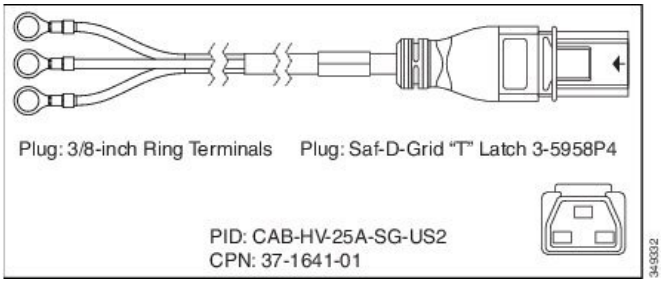
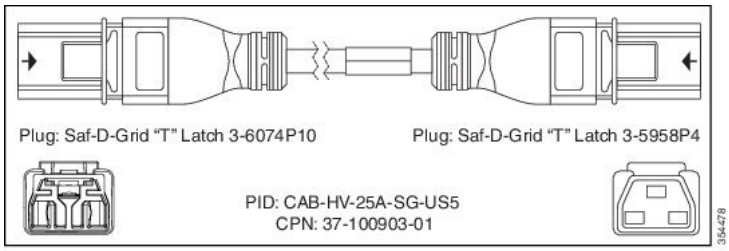


Figure 49: CAB-HV-25A-SG-US5 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit



3-kW DC Power Cord Specifications

Locale	Part Number	Cord Ratings	Power Cord Comments
All	—[15]	45 A	6 AWG

[15] Power cords used for the 3-kW DC power supply are supplied by the customer.

3.5-kW HVAC/HVDC Power Supply DC Power Cord Specifications

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
International, Saf-D-Grid/Saf-D-Grid	CAB-HV-25A-SG-IN1	37-1642-01	14' 0" (4.26 m)	20 A, 400 VDC	Figure 50: CAB-HV-25A-SG-IN1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 123

Locale and Description	PID	Cisco Part Number (CPN)	Length	Cord Set Rating	Power Cord Illustration
International, Ring Terminal source plug, Ring Terminal/Saf-D-Grid	CAB-HV-25A-SG-IN2	37-1640-01	14' 0" (4.26 m)	20 A, 300 VAC/500 VDC	Figure 51: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 124
North America, Saf-D-Grid/Saf-D-Grid	CAB-HV-25A-SG-US1	37-1643-01	14' 0" (4.26 m)	20 A, 400 VDC	Figure 52: CAB-HV-25A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 124
North America, Ring Terminal source plug, Ring Terminal/Saf-D-Grid	CAB-HV-25A-SG-US2	37-1641-01	14' 0" (4.26 m)	20 A, 300 VAC/500 VDC	Figure 53: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 124

Note All power cords will not be orderable at first customer shipment (FCS).

Figure 50: CAB-HV-25A-SG-IN1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

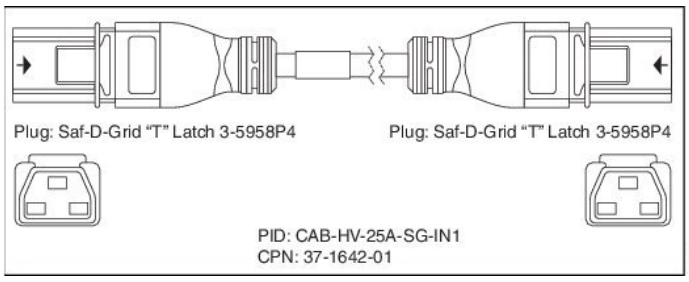


Figure 51: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

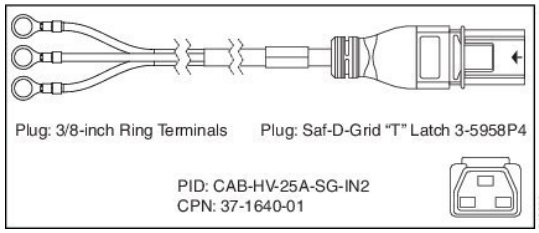


Figure 52: CAB-HV-25A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

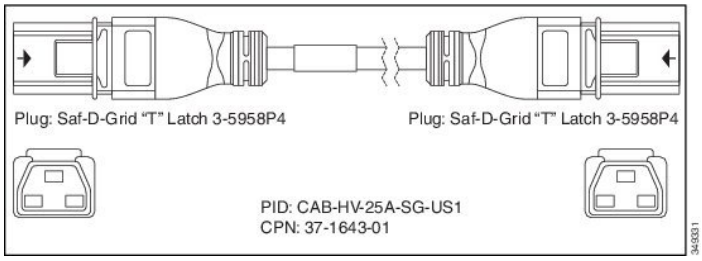
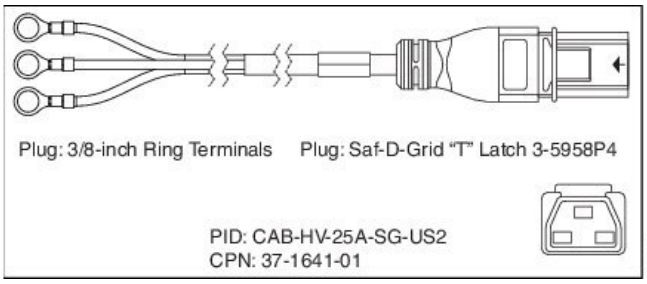
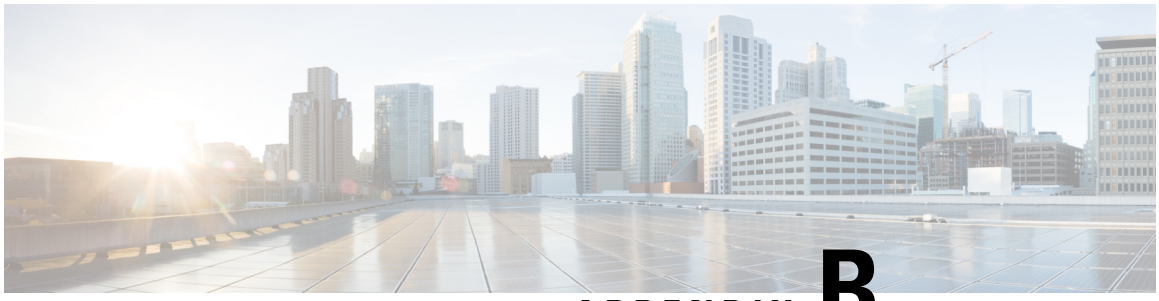


Figure 53: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit





APPENDIX B

LEDs

This appendix includes the following topics:

- Supervisor Module LEDs, on page 125
- I/O Module LEDs, on page 127
- Power Supply LEDs, on page 128

Supervisor Module LEDs

LED	Color	Status
STATUS	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Amber	Indicates one of the following: • The module has detected a slot ID parity error and will not power on or boot up. • The module is booting or running diagnostics (normal initialization sequence). • An over temperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)
	Flashing red	Indicates one of the following: • The diagnostic test has failed. • The module is not operational because a fault occurred during the initialization sequence. • An over temperature condition has occurred. (A major temperature threshold has been exceeded during environmental monitoring.)
	Red	The module has detected a slot ID parity error and will not power on or boot up.
	Off	The module is not receiving power.

LED	Color	Status
ID	Flashing blue	The operator has activated this LED to identify this module in the chassis.
	Off	This module is not being identified.
SYSTEM	Green	All chassis environmental monitors are reporting okay.
	Amber	Indicates one of the following: • At least one power supply has failed or the power supply fan has failed. • Incompatible power supplies are installed. • At least one redundant fan or fan controller has failed in the chassis. Overheating is not imminent.
	Red	Indicates one of the following: • The temperature of the Supervisor engine has exceeded the major threshold level. • At least one non-redundant fan or fan controller, or both redundant, have failed in the chassis. Overheating is imminent.
ACTIVE	Green	The supervisor module is operational and active.
	Amber	The supervisor module is in standby mode.
PWR MGMT	Green	Sufficient power is available for all installed modules.
	Amber	Sufficient power is not available for all installed modules.
LINK	Green	The module has detected a link.
	Off	The module does not detect a link.
ACT	Flashing green	The module is transmitting or receiving.
	Off	The module is not transmitting or receiving.
MGMT ETH **Note** This is available only on Supervisor-2E modules.	Green	The management port is operational.
	Amber	The management port link has been disabled through the software.
	Flashing amber	The management port link is bad and has been disabled due to a hardware failure.
	Off	The module has not detected a signal.

LED	Color	Status
LOG FLASH	Green	The log flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.
	Off	The expansion flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.
Slot 0	Green	The expansion flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.
	Off	The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.
Off	The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.	
USB1	Green	The expansion flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.
	Off	The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.

I/O Module LEDs

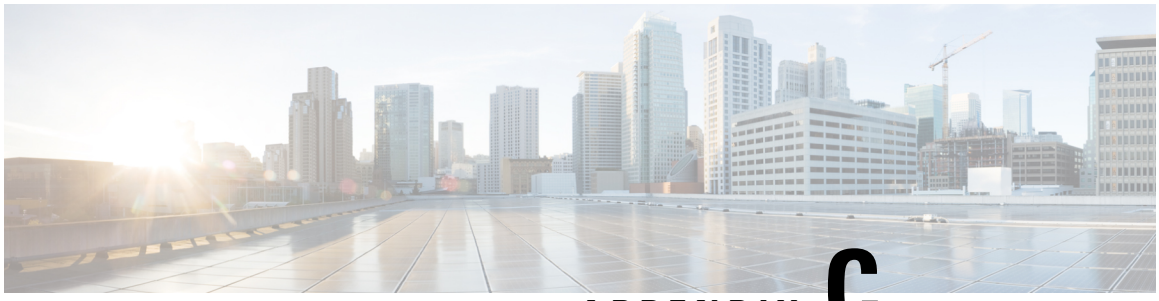
LED	Color	Status
ID	Flashing blue	The operator has activated this LED to identify this module in the chassis.
	Off	This LED is not being used.

LED	Color	Status
Status	Green	All diagnostics passed. This module is operational (normal initialization sequence).
	Amber	Indicates one of the following: • The module is booting or running diagnostics. • An overtemperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)
	Flashing red	Indicates one of the following: • The switch has just been powered on, and the module is resetting. • The module has been inserted during the initialization process. • An overtemperature condition has occurred. A major temperature threshold has been exceeded during environmental monitoring • The module has failed to download code and configuration information successfully during the initial reset. The module is not online.
	Red	Indicates one of the following: • The module has detected a slot ID parity error and will not power on or boot up. • The module is not fully inserted, and it is not making a reliable connection with the supervisor.
	Off	The module is not receiving power.
Link (for each port)	Green	The port is active (the link is connected and active).
	Amber	The module or port is disabled by using a CLI command or the module is initializing.
	Flashing amber	The port is faulty and disabled.
	Off	The port is not active or the link is not connected.

Power Supply LEDs

Depending on the power supply (AC, DC and HVAC/HVDC power supplies), there are 1 or 2 input LEDs. The Output, Fault, and ID LEDs have the same function for the AC, DC and HVAC/HVDC power supply units.

LED	Color	Status
Input 1	Green	The AC, HVAC/HVDC, or DC input voltage is within the valid range.
	Off	The AC, HVAC/HVDC, or DC input voltage is outside the valid range.
Input 2 (available only on DC power supply units)	Green	The DC input voltage is within the valid range.
	Off	The DC input voltage is outside the valid range.
Output	Green	The AC or DC output power is within the valid range.
	Off	The AC or DC output power is outside the valid range.
Fault	Off	The AC or DC output voltage and power supply unit tests are okay.
	Flasing red	Self-diagnostic tests have failed or another power supply failure has occurred.
ID	Flashing blue	The operator has activated this LED to identify this module in the chassis.
	off	This module is not being identified.



APPENDIX C

Accessory Kits

This appendix includes the following sections:

- Cisco Nexus 7702 Switch Accessory Kit, on page 131
- Cisco Nexus 7702 Center-Mount Kit, on page 134

Cisco Nexus 7702 Switch Accessory Kit

The following table lists and illustrates the contents for the accessory kit.

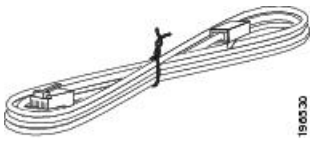
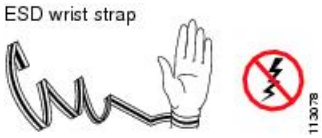
Illustration	Description	Quantity
	Rack Mount Kit • M3 x 8 mm Phillips screws (4) • M4 x 8 mm Phillips screws (8)	1 kit
	RJ-45 rollover cable	1
	DB-9F/RJ-45F PC terminal	1
	Ground lug kit • Two-hole lug (1) • M3 x 9-mm Phillips pan-head screws (2)	1 kit
	Cable tie (2)	1
	ESD wrist strap (disposable)	1

Illustration	Description	Quantity
Not applicable	Hazardous substances list for customers in China	1
Not applicable	Cisco Information Packet	1
Not applicable	1-Year Limited Warranty for Hardware	1

Note If you do not receive a part listed in this document, contact Cisco Technical Support at this URL: http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml.

If you purchased this product through a Cisco reseller, you might receive additional contents in your kit, such as documentation, hardware, and power cables.

The product shipment includes power cords for the following power supplies:

- 3-kW AC power supplies—one power cord per power supply
- 3-kW DC power supplies—no power cords supplied (you must supply a 6 AWG cable for up to 45 A)

The shipped cables depend on your specification when placing an order.

The available power cords for the 3-kW AC power supplies are as follows:

- CAB-AC-16A-AUS—power cord, 250-VAC 16A, C19, Australia
- CAB-AC-16A-CH—power cord, 16A, China
- CAB-AC-2500W-EU—power cord, 250-VAC 16A, Europe
- CAB-AC-2500W-INT—power cord, 250-VAC 16A, International
- CAB-AC-2500W-ISRL—power cord, 250-VAC 16A, Israel
- CAB-9K16A-US1—power cord, 250-VAC 16A, Src Plug NEMA 6-20, US/Japan
- CAB-AC-C6K-TWLK—power cord, 250-VAC 16A, twist lock, NEMA L6-20
- CAB-7513AC—power cord, AC 110V North America
- CAB-C19-CBN—cabinet jumper power cord, 250-VAC, 16A, C20C
- CAB-ACS-16—power cord, 16-A, Switzerland
- CAB-L520P-C19-US—NEMA L5-20 to IEC-C19 6ft US

The available AC power cords for the 3.5-kW HVAC/HVDC power supplies are as follows:

- CAB-AC-16A-SG-AR—power cord, IRSM 2073/Saf-D-Grid 250 VAC 16A, Argentina
- CAB-AC-16A-SG-AZ—power cord, AU20LS3/Saf-D-Grid, 250 VAC 16A, Australia and New Zealand
- CAB-AC-16A-SG-BR—power cord, EL224/Saf-D-Grid 250 VAC 16A, Brazil
- CAB-AC-16A-SG-CH—power cord, GB 16C/Saf-D-Grid, 250 VAC 16A, China
- CAB-AC-16A-SG-EU—power cord, CEE 7-7/Saf-D-Grid, 250 VAC 16A, Europe

- CAB-AC-16A-SG-IND—power cord, SABS 164-1/Saf-D-Grid 250 VAC 16A, India
- CAB-AC-16A-SG-IN—power cord, IEC60309/Saf-D-Grid, 250 VAC 16A, International
- CAB-AC-16A-SG-IS—power cord, SI 16S3/Saf-D-Grid, 250 VAC 16A, Israel
- CAB-AC-16A-SG-IT—power cord, CEI 23-50/Saf-D-Grid to IEC-C19 250 VAC 16A, Italy
- CAB-AC-20A-SG-US—power cord, 110 VAC 20A, Straight Blade, NEMA 5-20P/Saf-D-Grid, North America
- CAB-AC-20A-SG-US1—power cord, 125 VAC 20A, twist lock, NEMA L5-20/Saf-D-Grid, North America
- CAB-AC-20A-SG-US2—power cord, 250 VAC 20A, straight-blade, NEMA 6-20/Saf-D-Grid, North America
- CAB-AC-20A-SG-US3—power cord, 250 VAC 20A, twist lock, NEMA L6-20/Saf-D-Grid, North America
- CAB-AC-20A-SG-US4—power cord, 277 VAC 20A, NEMA L7-20P/Saf-D-Grid, North America
- CAB-AC-20A-SG-C20—cabinet jumper power cord, 250 VAC, 20A, IEC C20/Saf-D-Grid, North America
- CAB-AC-16A-SG-SA—power cord, 250 VAC 16A, EL/Saf-D-Grid, South Africa
- CAB-AC-16A-SG-SK—power cord, 250 VAC 16A, Src/Saf-D-Grid, Korea
- CAB-AC-16A-SG-SW—power cord, 250 VAC 16A, SEV 5934-2/Saf-D-Grid, Switzerland
- CAB-HV-25A-SG-IN2—power cord, 300 VAC/500 VDC 20A, Ring Terminal/Saf-D-Grid, IEC/EU
- CAB-HV-25A-SG-IN3—power cord, 300 VAC 20A, Saf-D-Grid P10/Saf-D-Grid P4, IEC/EU
- CAB-HV-25A-SG-US2—power cord, 300 VAC/500 VDC 20A, Ring Terminal/Saf-D-Grid, North America
- CAB-HV-25A-SG-US5—power cord, 300 VAC 20A, Saf-D-Grid P10/Saf-D-Grid P4, North America

Note All power cords will not be orderable at first customer shipment (FCS).

The available DC power cords for the 3.5-kW HVAC/HVDC power supplies are as follows:

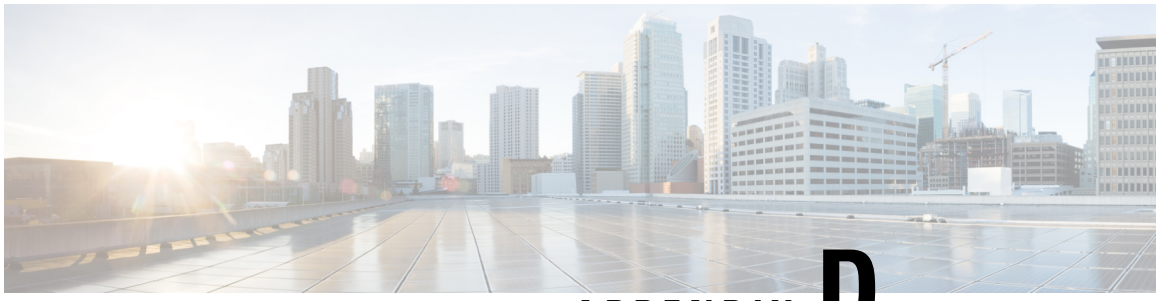
- CAB-HV-25A-SG-US1—power cord, 400-VDC 20A, Saf-D-Grid/Saf-D-Grid, North America
- CAB-HV-25A-SG-US2—power cord, 300-VAC/500-VDC 20A, Ring Terminal/Saf-D-Grid, North America
- CAB-HV-25A-SG-IN1—power cord, 400-VDC 20A, IEC/EU, Saf-D-Grid/Saf-D-Grid, International
- CAB-HV-25A-SG-IN2—power cord, 300-VAC/500-VDC 20A, IEC/EU, Ring Terminal/Saf-D-Grid, International

Note All power cords will not be orderable at first customer shipment (FCS).

Cisco Nexus 7702 Center-Mount Kit

If you are installing the Cisco Nexus 7702 chassis on a two-post rack, you must order this kit (N7K-C7702-CMK) when you order the switch. The following table lists the contents for this kit.

Description	Quantity
Center-mount rack mounting brackets (right and left brackets)	2
M3 x 8-mm Phillips screws	4
M4 x 8-mm Phillips screws	8



APPENDIX D

Site Preparation and Maintenance Records

- Site Preparation Checklist, on page 135
- Contact and Site Information, on page 136
- Chassis and Module Information, on page 137

Site Preparation Checklist

Planning the location and layout of your equipment rack or cabinet is essential for successful switch operation, ventilation, and accessibility.

The following table lists the site planning tasks that we recommend that you complete before you install the switch. Your completion of each task ensures a successful switch installation.

Planning Activity	Verification Time and Date
Space evaluation:	
Space and layout	
Floor covering	
Impact and vibration	
Lighting	
Physical access	
Maintenance access	
Environmental evaluation:	
Ambient temperature	
Humidity	
Altitude	
Atmospheric contamination	
Airflow	

Planning Activity	Verification Time and Date
Power evaluation:	
Input power type	
Power receptacles	
Receptacle proximity to the equipment	
Dedicated (separate) circuits for power redundancy	
UPS for power failures	
Grounding: proper wire gauge and lugs	
Circuit breaker size	
Grounding evaluation:	
Data center ground	
Cable and interface equipment evaluation:	
Cable type	
Connector type	
Cable distance limitations	
Interface equipment (transceivers)	
EMI evaluation:	
Distance limitations for signaling	
Site wiring	
RFI levels	

Contact and Site Information

Use the following worksheet to record contact and site information

Contact person	
Contact phone	

Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	
City	
State	
ZIP code	
Country	

Chassis and Module Information

Use the following worksheets to record information about the chassis and modules.

Table 11: Chassis Information

Contract number	
Chassis serial number	
Product number	

Switch IP address	
Switch IP netmask	
Hostname	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	

Site Preparation and Maintenance Records

Table 12: Module Information for a Cisco Nexus 7702 Switch

Slot	Module Type	Module Serial Number	Notes
1	Supervisor		
2			

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