Complete Hardware Guide for EX 3200 and EX 4200 Switches

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About This Topic Collection

How To Use This Guide

Complete documentation for the EX-series product family is provided on Web pages at http://www.juniper.net/techpubs/en_US/release-independent/information-products/pathway-pages/ex-series/product/index.html. We have selected content from these Web pages and created a number of EX-series guides that collect related topics into a book-like format so that the information is easy to print and easy to download to your local computer.

This guide, *Complete Hardware Guide for EX 3200 and EX 4200 Switches*, collects together information about the EX 3200 fixed-configuration and EX 4200 virtual-chassis switches. The release notes are at http://www.juniper.net/techpubs/en_US/junos9.1/information-products/pathway-pages/ex-series/software/index.html.

List of EX-series Guides for JUNOS 9.2

Title	Description
Complete Hardware Guide for EX 3200 and EX 4200 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance
Complete Software Guide for JUNOS Software for EX-series Switches, Release 9.2	Software feature descriptions, configuration examples and tasks, and reference pages for configuration statements and operational commands
J-Web User Interface Guide for JUNOS Software for EX-series Switches	How to use the J-Web graphical user interface (GUI) with JUNOS Software for EX-series Switches
JUNOS Software for EX-series Switches Release Notes, Release 9.2	Summary of hardware and software features and known problems with the software and hardware

Downloading Software

You can download the JUNOS software for EX-series switches from the Download Software area at http://www.juniper.net/customers/support/. To download the software, you must have a Juniper Networks user account. For information about obtaining an account, see http://www.juniper.net/entitlement/setupAccountInfo.do.

Documentation Symbols Key

Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host> show chassis alarms` `No alarms currently active`
Italic text like this	■ Introduces important new terms. ■ Identifies book names. ■ Identifies RFC and Internet draft titles.	■ A policy *term* is a named structure that defines match conditions and actions. ■ *JUNOS System Basics Configuration Guide* ■ RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	■ To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. ■ The console port is labeled **CONSOLE**.
< > (angle brackets)	Enclose optional keywords or variables.	**stub <default-metric** *metric*>;
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** (*string1* | *string2* | *string3*)

# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[ ] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [*community-ids*]

Indention and braces ({ })	Identify a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	■ In the Logical Interfaces box, select **All Interfaces**. ■ To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select **Protocols > Ospf**.

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NOTE: For international or direct-dial options in countries without toll free numbers, go to http://www.juniper.net/support/requesting-support.html.

Part 1
Switch Overview

Chapter 1
Switch Overview

Switch Description

EX-series Switch Hardware Overview

EX-series switches provide scalable connectivity for the enterprise market, including branch offices, campus locations, and data centers. The switches run under the JUNOS software, which provides Layer 2 and Layer 3 switching, routing, and security services. The same JUNOS code base that runs on EX-series switches also runs on all Juniper Networks J-series, M-series, MX-series, and T-series routing platforms.

EX-series Switch Types

EX-series switches are available in two product lines:

- **EX 3200 switches**—Typically, you deploy these switches in branch environments or wiring closets.
- **EX 4200 switches**—You can interconnect EX 4200 switches to form a virtual chassis that operates as a single network entity. You can deploy these switches wherever you need a high density of Gigabit Ethernet ports (24 to 480 ports), redundancy, or the ability to span a single switch across several wiring closets. Typically, EX 4200 switches are used in large branch offices, campus wiring closets, and top-of-rack locations in a data center.

Both lines have these features:

- Run under JUNOS software for EX-series switches
- Have options of 24-port and 48-port models
- Have options of full (all ports) or partial (8 ports) Power over Ethernet (PoE) capability
- Have optional uplink modules that provide connection to distribution switches

EX 3200 Switches

EX 3200 switches provide connectivity for low-density environments. Typically, you deploy these switches in branch environments or wiring closets where only one switch is required.

EX 3200 switches are available in models with either 24 or 48 ports and with either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All ports have 10/100/1000Base-T Gigabit Ethernet connectors.

EX 3200 switches include:

- A field-replaceable power supply and an optional additional connection to an external power source.
- A field-replaceable fan tray with single fan.
- JUNOS software with its modular design that enables failed system processes to gracefully restart.

EX 4200 Switches

EX 4200 switches provide connectivity for medium- and high-density environments and scalability for growing networks. These switches can be deployed wherever you need a high density of Gigabit Ethernet ports (24 to 480 ports) or redundancy. Typically, EX 4200 switches are used in large branch offices, campus wiring closets, and data centers where they can be positioned as the top device in a rack to provide connectivity for all the devices in the rack.

You can connect individual EX 4200 switches together to form one unit and manage the unit as a single chassis, called a *virtual chassis*. You can add more member switches to the virtual chassis as needed, up to a total of 10 members.

EX 4200 switches are available in models with 24 or 48 ports and with either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All models provide ports that have 10/100/1000Base-T Gigabit Ethernet connectors and optional small form-factor pluggable (SFP) transceivers or 10-gigabit small form-factor pluggable (XFP) transceivers for use with fiber connections.

Additionally, a 24-port model provides 100Base-FX/1000Base-X SFP transceivers. This model is typically used as a small distribution switch.

All EX 4200 switches have dedicated 64-Gbps virtual chassis ports that allow you to connect the switches to each other. You can also use optional 10-Gbps uplink ports to connect members of a virtual chassis across multiple wiring closets.

To provide carrier-class reliability, EX 4200 switches include:

- Dual redundant power supplies that are field-replaceable and hot-swappable. An optional additional connection to an external power source is also available.
- A field-replaceable fan tray with three fans. The switch remains operational if a single fan fails.
- Redundant Routing Engines in a virtual chassis configuration. This redundancy enables GRES (Graceful Routing Engine Switchover) and nonstop active routing.
- JUNOS software with its modular design that enables failed system processes to gracefully restart.

Uplink Modules

Optional uplink modules are available for all EX 3200 and EX 4200 models. Uplink modules provide either two 10-gigabit small form-factor pluggable (XFP) transceivers or four 1-gigabit small form-factor pluggable (SFP) transceivers. You can use SFP or XFP ports to connect an access switch to a distribution switch or to interconnect member switches of a virtual chassis across multiple wiring closets.

NOTE: If you insert a transceiver in an SFP uplink module installed in an EX 3200 switch, a corresponding network port from the last four ports is disabled. For example, if you insert an SFP transceiver in ge-0/1/3, ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

Power over Ethernet (PoE) Ports

PoE ports provide electrical current to devices through the network cables so that separate power cords for devices such as IP phones, wireless access points, and security cameras are unnecessary. Both the EX 3200 and EX 4200 switch lines have options of full (all 24 or 48 ports) or partial (8 ports) PoE capability.

Full PoE models are primarily used in IP telephony environments. Partial PoE models are used in environments where, for example, only a few ports for wireless access points or security cameras are required.

Related Topics

- EX 3200 Switch Models on page 6
- EX 4200 Switch Models on page 6
- Field-Replaceable Units in EX-series Switches on page 99
- Site Preparation Checklist for EX-series Switches on page 49

EX 3200 Switch Models

The EX 3200 switch is available with 24 or 48 ports with partial or full Power over Ethernet (PoE) capability. Table 1 on page 6 lists the EX 3200 switch models.

Table 1: EX 3200 Switch Models

Model	Typical Deployment	Access Ports	Number of PoE-enabled Ports	Power Supply (Minimum)
EX 3200-24T	Access or Distribution switch	24 Gigabit Ethernet	First 8 ports	320 W
EX 3200-24P	Access switch	24 Gigabit Ethernet	All 24 ports	600 W
EX 3200-48T	Access or Distribution switch	48 Gigabit Ethernet	First 8 ports	320 W
EX 3200-48P	Access switch	48 Gigabit Ethernet	All 48 ports	930 W

Related Topics

- EX 4200 Switch Models on page 6
- EX 3200 Switch—Front-Panel Description on page 9
- EX 3200 Switch—Rear-Panel Description on page 10
- EX-series Switch Hardware Overview on page 3

EX 4200 Switch Models

The EX 4200 switch is available with 24 or 48 ports and with partial or full Power over Ethernet (PoE) capability. Table 2 on page 6 lists the EX 4200 switch models.

Table 2: EX 4200 Switch Models

Model	Ports	Number of PoE-enabled Ports	Power Supply (Minimum)
EX 4200-24T	24 Gigabit Ethernet	First 8 ports	320 W
EX 4200-24P	24 Gigabit Ethernet	All 24 ports	600 W
EX 4200-48T	48 Gigabit Ethernet	First 8 ports	320 W
EX 4200-48P	48 Gigabit Ethernet	All 48 ports	930 W
EX 4200-24F	24 small form-factor pluggable (SFP) transceivers	Not applicable	320 W

Related Topics

- EX 3200 Switch Models on page 6
- EX 4200 Switch—Front-Panel Description on page 11
- EX 4200 Switch—Rear-Panel Description on page 12
- EX-series Switch Hardware Overview on page 3

Hardware Components and Specifications

EX-series Switch Chassis Physical Specifications

The EX-series switch chassis is a rigid sheet-metal structure that houses the other hardware components. Table 3 on page 7 summarizes the physical specifications of the EX-series switch chassis.

Table 3: Physical Specifications of the EX-series Switch Chassis

Description	Value
Chassis height	1.75 inches (4.445 cm)
Chassis width	■ 17.25 inches (43.82 cm) ■ 19 inches (48.2 cm) with mounting brackets attached

Table 3: Physical Specifications of the EX-series Switch Chassis *(continued)*

Description	Value
Chassis depth	17 inches (43.18 cm), extended by 2.25 inches by power supply in models that have 600 W and 930 W power supply
Weight	■ EX 3200 switch with 1 power supply: 15–17 lbs (6.8–7.7 kg) ■ EX 4200 switch with 1 power supply: 16–18 lbs (7.2–8.2 kg) ■ 320 W power supply: 2.5 lbs (1.1 kg) ■ 600 W and 960 W power supplies: 3.1 lbs (1.4 kg)

You can mount an EX-series switch on a 19-in. or 23-in. equipment rack or cabinet by using mounting brackets. You can mount an EX-series switch on a desk or other level surface by using rubber feet. The switch is shipped with mounting brackets and screws to be used to secure the chassis to rack or cabinet rails. It is also shipped with 4 rubber feet to be used to stabilize the chassis on a desk or other level surface.

Related Topics

- EX 3200 Switch—Front-Panel Description on page 9
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Front-Panel Description on page 11
- EX 4200 Switch—Rear-Panel Description on page 12
- Mounting an EX-series Switch on page 65
- Rack Requirements and Specifications for an EX-series Switch on page 50
- Cabinet Requirements and Specifications for an EX-series Switch on page 52
- Installing and Connecting an EX-series Switch on page 61
- Installing and Removing EX-series Switch Hardware Components on page 100

Field-Replaceable Units in EX-series Switches

Field-replaceable units (FRUs) are components that you can replace at your site. The field-replaceable units (FRUs) in EX-series switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- XFP transceiver

NOTE: Uplink modules are not part of the standard package and must be ordered separately.

Related Topics

- Installing a Power Supply in an EX-series Switch on page 107
- Removing a Power Supply from an EX-series Switch on page 108
- Installing a Fan Tray in an EX-series Switch on page 110
- Removing a Fan Tray from an EX-series Switch on page 112
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- Installing an SFP or XFP Transceiver in an EX-series Switch on page 104
- Removing an SFP or XFP Transceiver from an EX-series Switch on page 106

EX 3200 Switch—Front-Panel Description

The front panel of the EX 3200 switch consists of the following components:

- 10/100/1000 Gigabit Ethernet ports, some or all of which are enabled for Power over Ethernet (PoE)
- Uplink module ports—SFP or XFP ports
- LCD panel and the LCD navigation buttons
- Front-panel LEDs

Figure 1 on page 9 shows the front panel of an EX 3200 switch with 48 Gigabit Ethernet ports. Figure 2 on page 9 shows the front panel of an EX 3200 with 24 Gigabit Ethernet ports. Models are available that have either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All ports have 10/100/1000 Base-T Gigabit Ethernet connectors.

Figure 1: EX 3200 Switch with 48 Gigabit Ethernet Ports

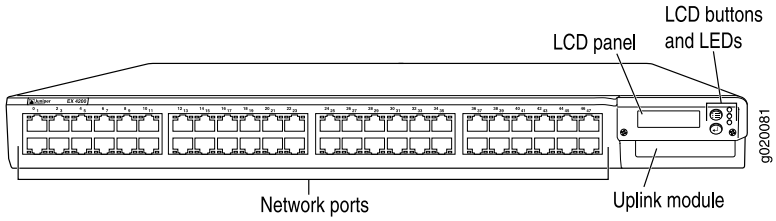
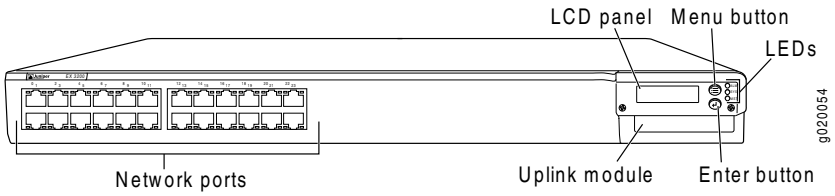


Figure 2: EX 3200 Switch with 24 Gigabit Ethernet Ports



Related Topics

- EX 3200 Switch—Front-Panel LEDs on page 13
- EX-series Switch—LCD on page 24
- EX-series Switch—Network Port LEDs on page 15
- Installing and Removing EX-series Switch Hardware Components on page 100
- Installing an Uplink Module in an EX-series Switch on page 101
- Removing an Uplink Module from an EX-series Switch on page 102

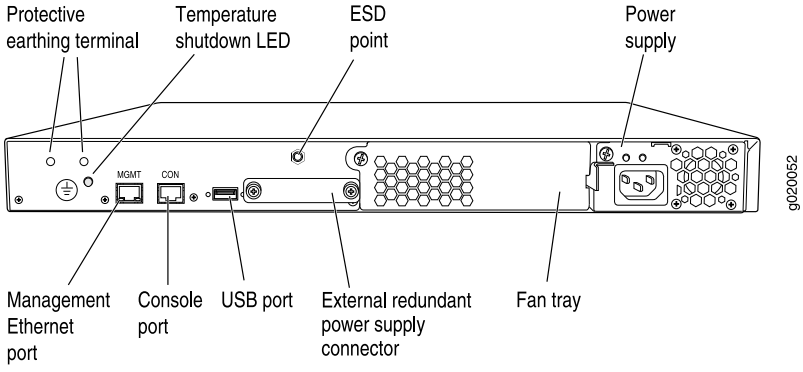
EX 3200 Switch—Rear-Panel Description

The rear panel of the EX 3200 switch consists of the following components:

- Protective earthing terminal
- Temperature shutdown LED
- Management Ethernet port
- Console port
- USB port
- ESD point
- Fan tray
- External redundant power supply connector
- Power supply

Figure 3 on page 10 shows the rear panel of an EX 3200 switch with a 320 W power supply. All switches in the EX 3200 series have the same rear panel. The 320 W power supply is flush with the chassis. The 600 W power supply and 930 W power supply extend out of the chassis by 2.25 inches. The power cord retainer clips extend out of the power supply by 3 inches.

Figure 3: EX 3200 Switch Rear Panel



Related Topics

- Field-Replaceable Units in EX-series Switches on page 99
- USB Port Specifications for an EX-series Switch on page 26

- Cooling System in an EX 3200 Switch on page 30
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Preventing Electrostatic Discharge Damage on page 138
- Connecting Earth Ground to an EX-series Switch on page 78
- Installing and Removing EX-series Switch Hardware Components on page 100

EX 4200 Switch—Front-Panel Description

The front panel of the EX 4200 switch consists of the following components:

- Network ports—depending on the switch model, either of:
  - 10/100/1000 Base-T Gigabit Ethernet ports, some or all of which are enabled for Power over Ethernet (PoE)
  - 100Base-FX/1000Base-X SFP transceivers for use with fiber-optic connections
- Optional uplink module provides SFP or XFP ports
- LCD panel and the LCD navigation buttons
- Front-panel LEDs

Figure 4 on page 11 shows the front panel of an EX 4200 switch with 48 Gigabit Ethernet ports. Figure 5 on page 11 shows the front panel of an EX 4200 switch with 24 Gigabit Ethernet ports. Figure 6 on page 12 shows the front panel of an EX 4200-24F switch with 24 SFP ports for use with fiber-optic connectors.

Figure 4: EX 4200 Switch with 48 Gigabit Ethernet Ports

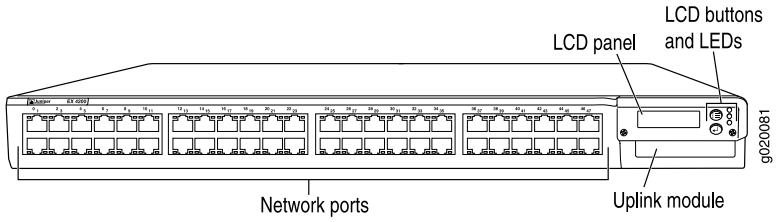


Figure 5: EX 4200 Switch with 24 Gigabit Ethernet Ports

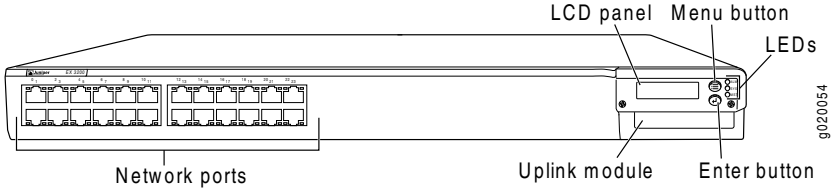
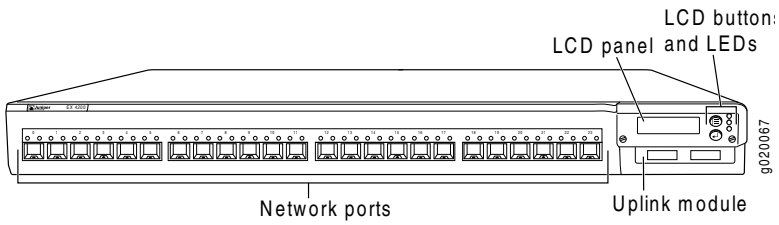


Figure 6: EX 4200-24F Switch with 24 SFP Ports



Related Topics

- EX 4200 Switch—Front-Panel LEDs on page 14
- EX-series Switch—LCD on page 24
- EX-series Switch—Network Port LEDs on page 15
- Installing and Removing EX-series Switch Hardware Components on page 100
- Installing an Uplink Module in an EX-series Switch on page 101
- Removing an Uplink Module from an EX-series Switch on page 102

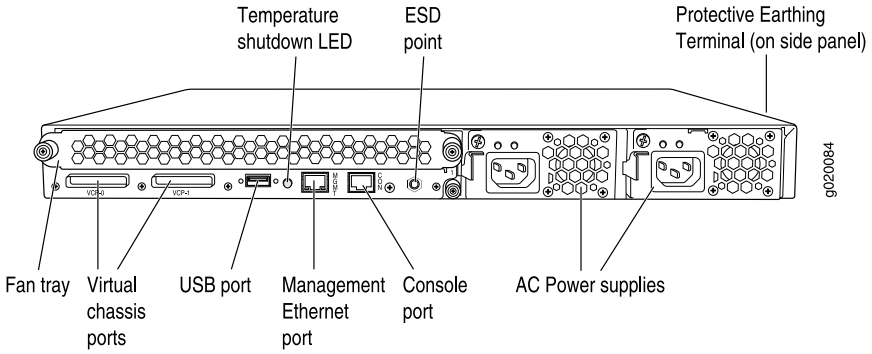
EX 4200 Switch—Rear-Panel Description

The rear panel of the EX 4200 switch consists of the following components:

- Fan tray
- Virtual chassis ports (VCPs)
- USB port
- Temperature shutdown LED
- Management Ethernet port
- Console port
- ESD point
- Power supply

Figure 7 on page 13 shows the rear panel of an EX 4200 switch. All switches in the EX 4200 series have the same rear panel. The 320 W power supply is flush with the chassis. The 600 W power supply and 930 W power supply extend out of the chassis by 2.25 inches. Power cord retainer clips extend out of the power supply by 3 inches.

Figure 7: EX 4200 Switch Rear Panel



Related Topics

- Field-Replaceable Units in EX-series Switches on page 99
- USB Port Specifications for an EX-series Switch on page 26
- Cooling System in an EX 4200 Switch on page 32
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Preventing Electrostatic Discharge Damage on page 138
- Connecting Earth Ground to an EX-series Switch on page 78
- Installing and Removing EX-series Switch Hardware Components on page 100
- Understanding Virtual Chassis Hardware Configuration on page 58

EX 3200 Switch—Front-Panel LEDs

The front panel of an EX 3200 switch has three LEDs on the far right side of the panel, next to the LCD (seeFigure 8 on page 13).

Figure 8: Front Panel LEDs in an EX 3200 Switch

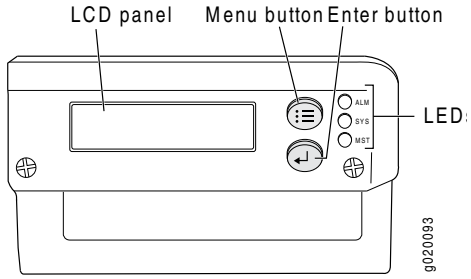


Table 4 on page 14 describes the LEDs in an EX 3200 switch, their colors and state, and the status they indicate.

Table 4: Front Panel LEDs in an EX 3200 Switch

LED Label	Color	State and Description
ALM (Alarm)	Unlit	There is no alarm.
	Red	There is an alarm.
SYS (System)	Green	■ On steadily—JUNOS software for EX-series switches has been loaded on the switch. ■ Blinking—The switch is booting.
MST (Master)	Green	This LED is always on and is meaningful only on EX 4200 models.

Related Topics
- EX 3200 Switch—Front-Panel Description on page 9
- Power Supply in EX 3200 and EX 4200 Switches on page 27

EX 4200 Switch—Front-Panel LEDs

The front panel of an EX 4200 switch has three LEDs on the far right side of the panel, next to the LCD (seeFigure 9 on page 14).

Figure 9: Front Panel LEDs in an EX 4200 Switch

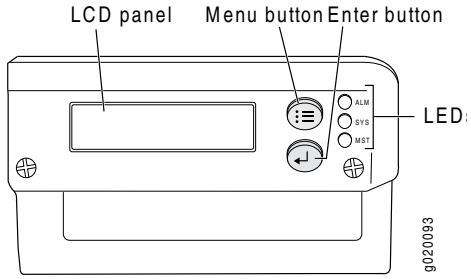


Table 5 on page 14 describes the LEDs in an EX 4200 switch, their colors and state, and the status they indicate.

Table 5: Front Panel LEDs in an EX 4200 Switch

LED Label	Color	State and Description
ALM (Alarm)	Unlit	There is no alarm.
	Red	There is an alarm.
SYS (System)	Green	■ On steadily—JUNOS software for EX-series switches has been loaded on the switch. ■ Blinking—The switch is booting.

Table 5: Front Panel LEDs in an EX 4200 Switch *(continued)*

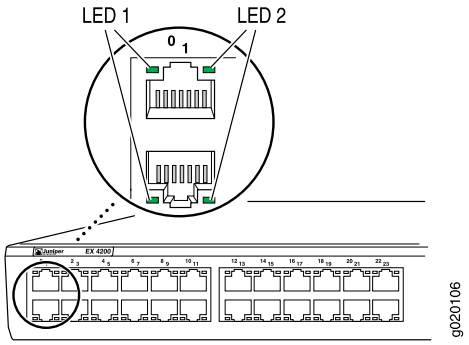
LED Label	Color	State and Description
MST (Master)	Green	■ On steadily—The switch is the master in the virtual chassis configuration. ■ Blinking—The switch is the backup in the virtual chassis configuration. ■ Off—The switch is a member (linecard member) in the virtual chassis configuration.

Related Topics
- EX 4200 Switch—Front-Panel Description on page 11
- Power Supply in EX 3200 and EX 4200 Switches on page 27

EX-series Switch—Network Port LEDs

Each network port on the front panel of an EX-series switch has two LEDs. Figure 10 on page 25 shows the network ports and the locations of the LEDs on the port.

Figure 10: EX-series Switch—Network Port LEDs



The LEDs to the left of the port opening (labeled LED 1 in Figure 10 on page 25) indicate link activity. The LEDs to the right of the port opening (labeled LED 2 in Figure 10 on page 25) indicate the status of one of the four port parameters. The port parameters are: administrative status; duplex mode; PoE status; and speed.

Table 6 on page 15 describes LED 1.

Table 6: EX-series Switch—Network Port LEDs–LED 1

LED	Color	State and Description
LED 1	Unlit	No link or no link activity.
	Green	■ On steadily—The port is up and the link is active, but there is no link activity. ■ Blinking—The port is up, with active links.

Table 7 on page 16 describes LED 2, which indicates the administrative status (enabled or disabled), duplex mode, PoE status, or speed, of the network ports. From the Idle menu of the LCD, use the Enter button on the LCD panel to toggle between the ADM, DPX, POE, and SPD indicators.

Table 7: EX-series Switch—Network Port LEDs–LED 2

LED	LCD Indicator	State and Description
LED 2	LED: ADM	Indicates the administrative status (enabled or disabled). The status indicators are: ■ Green—Port is enabled ■ Unlit—Port is disabled
	LED: DPX	Indicates the duplex mode. The status indicators are: ■ Green—Port is set to full-duplex mode ■ Unlit—Port is set to half-duplex mode
	LED: POE	Indicates the PoE status. The status indicators are: ■ Green—PoE is enabled on the port ■ Yellow—PoE failure; the power limit for the PoE port is exceeded or the device connected to the port is not PoE compliant ■ Unlit—PoE is not enabled on the port
	LED: SPD	Indicates the speed. The status indicators are: ■ One blink per second—10 Mbps ■ Two blinks per second—100 Mbps ■ Three blinks per second—1000 Mbps

Related Topics

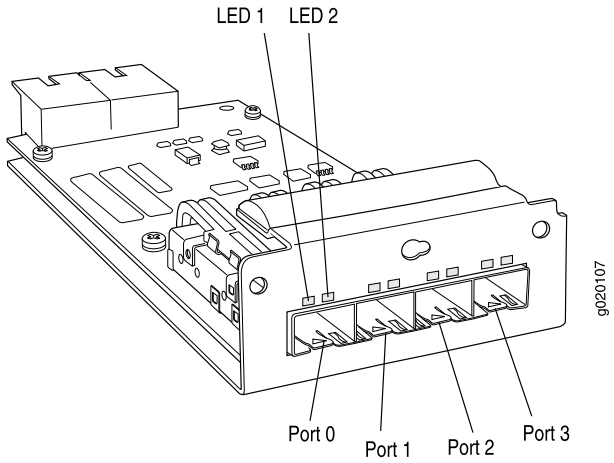
- EX-series Switch—SFP Uplink Module Port LEDs on page 18
- EX-series Switch—XFP Uplink Module Port LEDs on page 19
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

Uplink Modules in an EX 3200 or EX 4200 Switch

Optional uplink modules are available for all EX 3200 and EX 4200 models. Uplink modules provide either two 10-gigabit small form-factor pluggable (XFP) transceivers or four 1-gigabit small form-factor pluggable (SFP) transceivers. You can use these ports to connect an access switch to a distribution switch or to interconnect member switches of a virtual chassis across multiple wiring closets.

Figure 11 on page 17 shows the SFP uplink module:

Figure 11: SFP Uplink Module

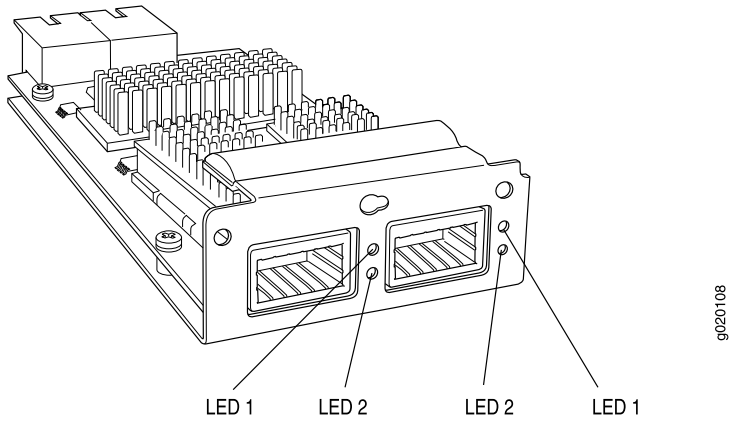


SFP uplink modules are shipped with dust covers preinstalled in the ports.

NOTE: If you insert a transcriber in an SFP uplink module installed in an EX 3200 switch, a corresponding network port from the last four ports is disabled. For example, if you insert an SFP transceiver in ge-0/1/3, ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

Figure 12 on page 17 shows the XFP uplink module which provides two 10-gigabit small form-factor pluggable (XFP) transceivers.

Figure 12: XFP Uplink Module



XFP uplink modules are shipped with a dust cover preinstalled in one port.

Related Topics

- EX-series Switch—XFP Uplink Module Port LEDs on page 19
- EX-series Switch—SFP Uplink Module Port LEDs on page 18
- Uplink Modules Connector Pinout Information on page 35
- Installing an Uplink Module in an EX-series Switch on page 101

- Installing an SFP or XFP Transceiver in an EX-series Switch on page 104
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21
- Example: Configuring Aggregated Ethernet High-Speed Uplinks Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch
- Example: Configuring Aggregated Ethernet High-Speed Uplinks with LACP Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch

EX-series Switch—SFP Uplink Module Port LEDs

The ports on the small-form factor pluggable transceiver (SFP) uplink module have two LEDs. Figure 13 on page 18 shows the SFP uplink module port and the location of the LEDs on the port.

The LEDs labeled LED 1 in Figure 13 on page 18 indicate link status, and the LEDs labeled LED 2 in Figure 13 on page 18 indicate the status of one of the four port parameters. The port parameters are: administrative status; duplex mode; PoE status; and speed.

Figure 13: EX-series Switch—SFP Uplink Module Port LEDs

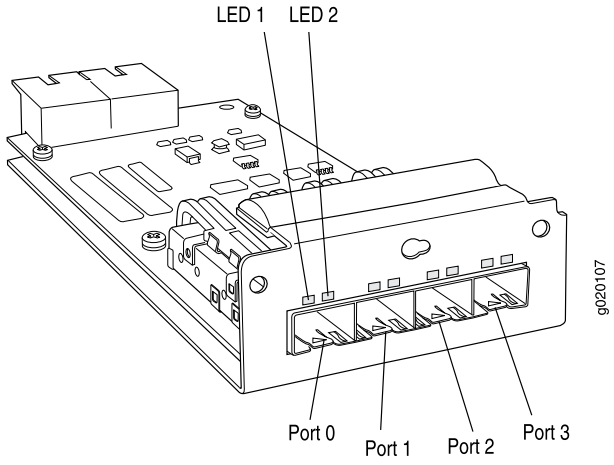


Table 8 on page 18 describes LED 1.

Table 8: EX-series Switch—SFP Uplink Module Port LEDs–LED 1

LED	Color	State and Description
LED 1	Unlit	No link activity.
	Green	■ On steadily—The port is up and the link is active, but there is no link activity. ■ Blinking—The port is up, with active links.

Table 9 on page 19 describes LED 2, which indicates the administrative status (enabled or disabled), duplex mode, PoE status, or speed, of the SFP uplink module ports. From the Idle menu of the LCD, use the Enter button on the LCD panel to toggle between the ADM, DPX, POE, and SPD indicators.

Table 9: EX-series Switch—SFP Uplink Module Port LEDs–LED 2

LED	LCD Indicator	State and Description
LED 2	LED: ADM	Indicates the administrative status (enabled or disabled). The status indicators are: ■ Green—Administrative status enabled ■ Unlit—Administrative status disabled
	LED: DPX	Indicates the duplex mode. The SFP uplink module ports ares always set to full-duplex; therefore, the LED is always green.
	LED: POE	Indicates the PoE status. PoE is not available on the SFP uplink module ports; therefore, the LED is always unlit.
	LED: SPD	Indicates the speed. The status indicators are: ■ Green—1000 Mbps ■ Unlit—10/100 Mbps

Related Topics

- Uplink Modules in an EX 3200 or EX 4200 Switch on page 16
- EX-series Switch—Network Port LEDs on page 15
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

EX-series Switch—XFP Uplink Module Port LEDs

The ports on the 10-gigabit small-form factor pluggable transceiver (XFP) uplink module have two LEDs. Figure 14 on page 20 shows the XFP uplink module port and the location of the LEDs on the port.

The LEDs labeled LED 1 in Figure 14 on page 20 indicate link status, and the LEDs labeled LED 2 in Figure 14 on page 20 indicate the status of one of the four port parameters. The port parameters are: administrative status; duplex mode; PoE status; and speed.

Figure 14: EX-series Switch—XFP Uplink Module Port LEDs

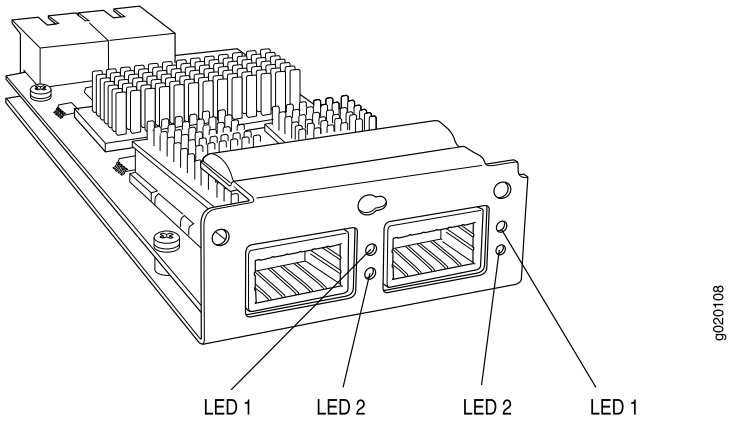


Table 10 on page 20 describes LED 1.

Table 10: EX-series Switch—XFP Uplink Module Port LEDs–LED 1

LED	Color	State and Description
LED 1	Unlit	No link activity.
	Green	■ On steadily—The port is up and the link is active, but there is no link activity. ■ Blinking—The port is up, with active links.

Table 11 on page 20 describes LED 2, which indicates the administrative status (enabled or disabled), duplex mode, PoE status, or speed, of the XFP uplink module ports. From the Idle menu of the LCD, use the Enter button on the LCD panel to toggle between the ADM, DPX, POE, and SPD indicators.

Table 11: EX-series Switch—XFP Uplink Module Port LEDs–LED 2

LED	LCD Indicator	State and Description
LED 2	LED: ADM	Indicates the administrative status (enabled or disabled). The status indicators are: ■ Green—Administrative status enabled ■ Unlit—Administrative status disabled
	LED: DPX	Indicates the duplex mode. The XFP uplink module ports are always set to full-duplex; therefore, the LED is always green.
	LED: POE	Indicates the PoE status. PoE is not available on XFP uplink module ports; therefore, the LED is always unlit.
	LED: SPD	Indicates the speed. The speed of the XFP uplink module ports is always 10 Gbps; therefore, the LED is always green.

Related Topics

- Uplink Modules in an EX 3200 or EX 4200 Switch on page 16
- EX-series Switch—Network Port LEDs on page 15
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

Optical Interface Support—EX 3200 and EX 4200 Switches

Optional uplink modules for EX 3200 and EX 4200 switches support either SFP or XFP transceivers. This topic describes the optical interfaces supported for those transceivers. It also lists the copper interface supported for the SFP transceivers.

Table 12 on page 21 describes the optical interface support over single-mode fiber-optic (SMF) and multimode fiber-optic (MMF) cables for SFP transceivers in EX 3200 and EX 4200 switches.

Table 12: Optical Interface Support for SFP Transceivers in EX 3200 and EX 4200 Switches

Transceiver	Specifications	
1000Base-SX Gigabit Ethernet optics	Model number	EX-SFP-1GE-SX
	Maximum distance	■ 550 m (1804.46 ft) on 50 microns MMF cable (minimum modal bandwidth: 500 MHz-Km) ■ 500 m (1640.42 ft) on 50 microns MMF cable (minimum modal bandwidth: 400 MHz-Km) ■ 275 m (902.23 ft) on 62.5 microns MMF cable (minimum modal bandwidth: 200 MHz-Km) ■ 220 m (721.78 ft) on 62.5 microns MMF cable (minimum modal bandwidth: 160 MHz-Km)
	Transmitter wavelength	850 nm
	Average launch power	–9.5 dBm through –3 dBm
	Receiver sensitivity	–21 dBm through –20 dBm
	Connector type	LC

Table 12: Optical Interface Support for SFP Transceivers in EX 3200 and EX 4200 Switches *(continued)*

Transceiver	Specifications	
1000Base-LX Gigabit Ethernet optics	Model number	EX-SFP-1GE-LX
	Maximum distance	10 km (6.2 miles) on 9 microns SMF cable
	Transmitter wavelength	1310 nm
	Average launch power	–9.5 dBm through –3 dBm
	Receiver sensitivity	–25 dBm through –22 dBm
	Connector type	LC
1000Base-LH (also called 1000Base-ZX) Gigabit Ethernet optics	Model number	EX-SFP-1GE-LH
	Maximum distance	70 km (43.5 miles) on 10 microns SMF cable
	Transmitter wavelength	1550 nm
	Average launch power	–2 dBm through 5 dBm
	Receiver sensitivity	–25 dBm through –24 dBm
	Connector type	LC
100Base-FX Fast Ethernet optics	Model number	EX-SFP-1FE-FX
	Maximum distance	2 km (1.24 miles) on 62.5 microns MMF cable
	Transmitter wavelength	1310 nm
	Average launch power	–20 dBm through –14 dBm
	Receiver sensitivity	–32.5 dBm through –31.5 dBm
	Connector type	LC

Table 13 on page 23 describes the optical interface support over single-mode fiber-optic (SMF) and multimode fiber-optic (MMF) cables for XFP transceivers in EX 3200 and EX 4200 switches.

Table 13: Optical Interface Support for XFP Transceivers in EX 3200 and EX 4200 Switches

Transceiver	Specifications	
10GBase-SR 10-Gigabit Ethernet optics	Model number	EX-XFP-10GE-SR
	Maximum distance	■ 300 m (984.25 ft) on 50 microns MMF cable (minimum modal bandwidth: 2000 MHz-Km) ■ 82 m (269.02 ft) on 50 microns MMF cable (minimum modal bandwidth: 500 MHz-Km) ■ 66 m (216.5 ft) on 50 microns MMF cable (minimum modal bandwidth: 400 MHz-Km) ■ 33 m (108.27 ft) on 62.5 microns MMF cable (minimum modal bandwidth: 200 MHz-Km) ■ 26 m (85.3 ft) on 62.5 microns MMF cable (minimum modal bandwidth: 160 MHz-Km)
	Transmitter wavelength	850 nm
	Average launch power	–7.3 dBm through –1.3 dBm
	Receiver sensitivity	–11.1 dBm through –7.5 dBm
	Connector type	LC
10GBase-LR 10-Gigabit Ethernet optics	Model number	EX-XFP-10GE-LR
	Maximum distance	10 km (6.2 miles) on 9 microns SMF cable
	Transmitter wavelength	1310 nm
	Average launch power	–8.2 dBm through 1 dBm
	Receiver sensitivity	–18 dBm through –12.6 dBm
	Connector type	LC
10GBase-ER 10-Gigabit Ethernet optics	Model number	EX-XFP-10GE-ER
	Maximum distance	40 km (24.85 miles) on 9 microns SMF cable
	Transmitter wavelength	1550 nm
	Average launch power	–5 dBm through 2 dBm
	Receiver sensitivity	–22 dBm through –16 dBm
	Connector type	LC

Table 13: Optical Interface Support for XFP Transceivers in EX 3200 and EX 4200 Switches *(continued)*

Transceiver	Specifications	
10GBase-ZR 10-Gigabit Ethernet optics	Model number	EX-XFP-10GE-ZR
	Maximum distance	80 km (49.7 miles) on 9 microns SMF cable
	Transmitter wavelength	1550 nm
	Average launch power	0 dBm through 4 dBm
	Receiver sensitivity	–30 dBm through –23 dBm
	Connector type	LC

Table 14 on page 24 describes the copper interface support for SFP transceivers in EX 3200 and EX 4200 switches.

Table 14: Copper Interface Support for SFP Transceivers in EX 3200 and EX 4200 Switches

Transceiver	Specifications	
10/100/1000 Copper	Model number	EX-SFP-1GE-T
	Maximum distance	100 m

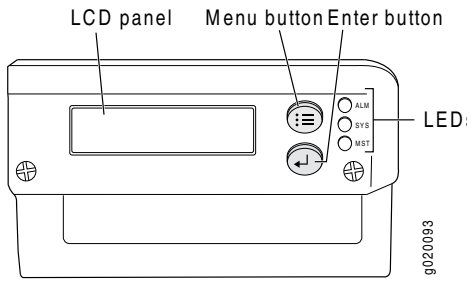
Related Topics

- Uplink Modules in an EX 3200 or EX 4200 Switch on page 16
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

EX-series Switch—LCD

The LCD on the front panel of an EX-series switch is a character display that can show two lines of text, each 16 characters in length. The LCD displays a variety of information about the switch and also provides a menu to perform basic operations such as initial setup and reboot (see Figure 15 on page 24).

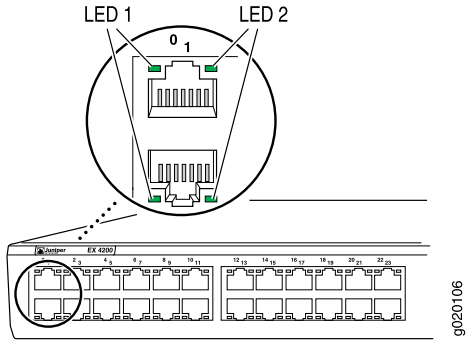
Figure 15: LCD on an EX-series Switch



In an EX 3200 switch, the first line displays the host name. In an EX 4200 switch that is a member of a virtual chassis, the first line displays the virtual chassis ID, the role of the switch in a virtual chassis and the host name. The roles are indicated as RE for master, BK for backup, and LC for linecard.

The second line displays the mode of the network ports LED 2 (Figure 10 on page 25) and the number of chassis alarms. The modes are: ADM (administrative status); DPX (duplex mode); POE (PoE status); and SPD (speed). You can change the mode using the Enter button.

Figure 16: EX-series Switch—Network Port LEDs



You can toggle between the LCD menus by pressing the Menu button and navigate through the menu options by pressing the Enter button. Table 15 on page 25 describes the LCD menu options.

Table 15: EX-series Switch—LCD Menu Options

Menu	Description

STATUS MENU	Status menu has the following options:
	■ Show VCP Status—Displays the virtual chassis port status: Up, Down, Disabled. This menu option is available only for an EX 4200 switch that is a member of a virtual chassis configuration.
	■ Show PSU Status—Displays the status of the power supply: OK, Failed, Absent.
	■ Show Environment Status—Displays the status of the fan and temperature.
	  ■ Fan status: OK, Failed, Absent.
	  ■ Temp status: OK, High, Shutdown.
	■ Show JUNOS Version Status—Displays the version of JUNOS software for EX-series switches loaded on the switch.
	■ EXIT STAT MENU?—Select this option to exit the Status menu.

Table 15: EX-series Switch—LCD Menu Options *(continued)*

Menu	Description
MAINT MENU (Maintenance Menu)	Maintenance menu has the following options: ■ SYSTEM HALT?—Select this option using the Enter button to halt the switch. Press the Enter button again to confirm halt. Press the Menu button to go to the next option in the Maintenance menu. ■ SYSTEM REBOOT?—Select this option using the Enter button to reboot the switch. Press the Enter button again to confirm reboot. Press the Menu button to go to the next option in the Maintenance menu. ■ FACTORY DEFAULT?—Select this option using the Enter button to restore the switch to factory default configuration. Press the Enter button again to confirm. Press the Menu button to go to the next option in the Maintenance menu. ■ ENTER EZSETUP?—Select this option using the Enter button to launch EZSetup. Press the Enter button again to confirm. Press the Menu button to go to the next option in the Maintenance menu. **NOTE:** You can use this option only if the switch is in factory default configuration. For information about EZSetup, see "Connecting and Configuring the EX-series Switch (J-Web Procedure)" on page 92. ■ EXIT MAINT MENU?—Select this option to exit the Maintenance menu.

NOTE: The Chassis view in the J-Web interface also displays the LCD. From the J-Web interface, you can view real-time status information in the LCD.

If you want to disable the Maintenance menu in the LCD panel, execute the CLI command **set chassis lcd fpc 0 maintenance-menu disable**, where 0 is the port number (also slot number). After disabling the Maintenance menu, press the Enter button to return the LCD to the Idle mode. If you disable the Maintenance menu while navigating through the menu options, exit the menu to return the LCD to the Idle mode. You can enable the Maintenance menu in the LCD panel by executing the CLI command **set chassis lcd fpc 0 maintenance-menu enable**, where 0 is the port number (also slot number).

Related Topics
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

USB Port Specifications for an EX-series Switch

The USB port on the rear panel of an EX-series switch accepts a USB storage device or a USB storage device adapter with a compact flash disk installed, as defined in the *CompactFlash Specification* published by the CompactFlash Association.

Related Topics
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Power Supply in EX 3200 and EX 4200 Switches

The power supply in EX-series switches (see Figure 17 on page 28, Figure 18 on page 28 and Figure 19 on page 28) is a hot-removable and hot-insertable field-replaceable unit (FRU) that can be installed on the rear panel. EX 4200 switches have an internal redundant power supply, making the power supply in EX 4200 switches fully redundant. The power supply in EX 3200 switches is not redundant. However, you can connect an external power supply to an EX 3200 switch to provide redundancy.

EX-series switches use power that provides two DC output voltages: 12 V for system and logic power and 48–51 V (or higher, to compensate for voltage drops along the path from the power supplies to the RJ-45 connector) for PoE ports.

The AC power supply in EX-series switches is available in 320 W, 600 W, and 930 W models. The exterior of the 600 W model is identical to that of the 930 W model. The 320 W power supply is flush with the chassis. The 600 W power supply and 930 W power supply extend out of the chassis by 2.25 inches. The power cord retainer clips extend out of the power supply by 3 inches. The number of ports on which PoE is enabled determines the minimum power requirements.

The DC power supply in EX 3200 and EX 4200 switches is available in a 190 W model, with dual input feeds for power resiliency.You can install redundant DC power supplies in an EX 4200 switch to achieve both power supply and power feed resiliency. The DC power supply in EX 3200 and EX 4200 switches does not support Power over Ethernet (PoE); you can use either an external power injector or an AC power supply to supply power to PoE devices that you connect to the switch.

NOTE: The DC power supply in EX 3200 and EX 4200 switches has four terminals labeled A+, A–, B+, and B– (see Figure 44 on page 82) for connecting DC power source cables labeled positive (+) and negative (–). The DC power supplies for EX 3200 and EX 4200 switches are shipped with jumpers from A+ input to B+ input tied together and jumpers from A– input to B– input tied together.

NOTE: The A+ and B+ terminals are referred to as +RTN and A– and B– terminals are referred to as –48 V in “DC Power Wiring Sequence Warning for EX 3200 and EX 4200 Switches” on page 159 and “DC Power Electrical Safety Guidelines for EX 3200 and EX 4200 Switches” on page 157.

Figure 17: 320 W AC Power Supply in EX 3200 and EX 4200 Switches

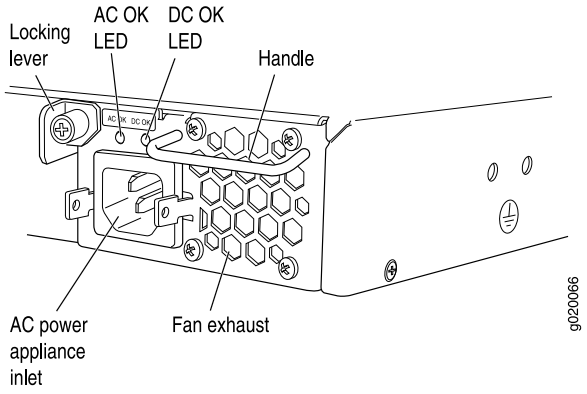


Figure 18: 600 W and 930 W AC Power Supplies in EX 3200 and EX 4200 Switches

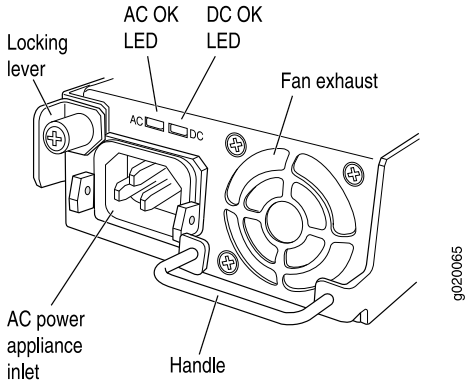


Figure 19: DC Power Supply in EX 3200 and EX 4200 Switches

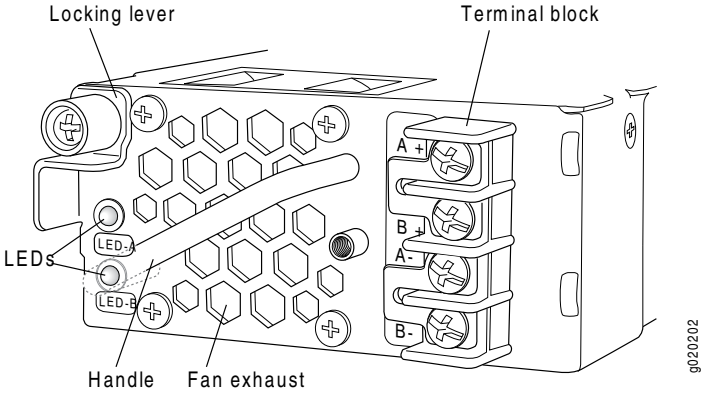


Table 16 on page 29 provides the minimum power requirements for each model of EX 3200 switch. The maximum power available to each PoE port is 15.4 W.

Table 16: Minimum Power Requirements for an EX 3200 Switch

Model Number	Number of PoE-enabled Ports	Minimum Power Requirement
EX 3200-24T	8	320 W
EX 3200-48T	8	320 W
EX 3200-24P	24	600 W
EX 3200-48P	48	930 W

Table 17 on page 29 provides the minimum power requirements for each model of EX 4200 switch. The maximum power available to each PoE port is 15.4 W.

Table 17: Minimum Power Requirements for an EX 4200 Switch

Model Number	Number of PoE-enabled Ports	Minimum Power Requirement
EX 4200-24T	8	320 W
EX 4200-48T	8	320 W
EX 4200-24P	24	600 W
EX 4200-48P	48	930 W
EX 4200-24F	–	320 W

To avoid electrical injury, follow instructions in "Installing a Power Supply in an EX-series Switch" on page 107 and "Removing a Power Supply from an EX-series Switch" on page 108 carefully.

NOTE: After powering on an EX-series switch, wait for at least 60 seconds before powering it off. After powering off an EX-series switch, wait for at least 60 seconds before powering it back on.

After an EX-series switch has been powered on, it can take up to 60 seconds for status indicators—such as LEDs on the power supply, show chassis command output, and messages on the LCD—to indicate that the power supply is functioning normally. Ignore error indicators that appear during the first 60 seconds.

Related Topics

- AC Power, Connection, and Power Cord Specifications on page 56
- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting DC Power to an EX 3200 or EX 4200 Switch on page 81
- Connecting Earth Ground to an EX-series Switch on page 78
- Preventing Electrostatic Discharge Damage on page 138

- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12
- Field-Replaceable Units in EX-series Switches on page 99

AC Power Supply LEDs in EX 3200 and EX 4200 Switches

The AC power supply in an EX 3200 or EX 4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel. Table 18 on page 30 describes the LEDs on the AC power supplies in EX 3200 and EX 4200 switches.

Table 18: AC Power Supply LEDs in EX 3200 and EX 4200 Switches

LED	State and Description
AC OK	■ Off—Disconnected from power or power is not coming into the power supply. ■ On—Power is coming into the power supply.
DC OK	■ Off—Power supply is not sending out power correctly. ■ On—Power supply is sending out power correctly.

NOTE: If AC OK LED and DC OK LED are unlit, it indicates that either the AC power cord is not installed properly or the power supply fuse has failed. If AC OK LED is lit and DC OK LED is unlit, it indicates that the AC power supply is not installed properly or the power supply has an internal failure.

Related Topics

- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting DC Power to an EX 3200 or EX 4200 Switch on page 81

Cooling System in an EX 3200 Switch

The cooling system in an EX 3200 switch consists of a field-replaceable unit (FRU) fan tray with one fan (see Figure 20 on page 31). The fan tray is located at the rear of the chassis and provides side-to-rear chassis cooling (see Figure 21 on page 31).

Figure 20: Fan Tray Used in an EX 3200 Switch

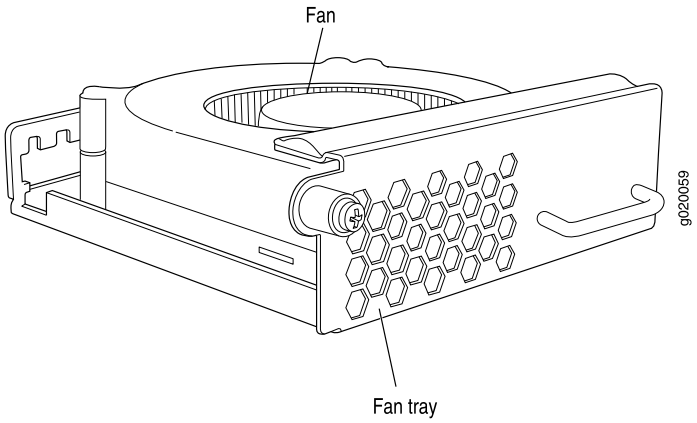
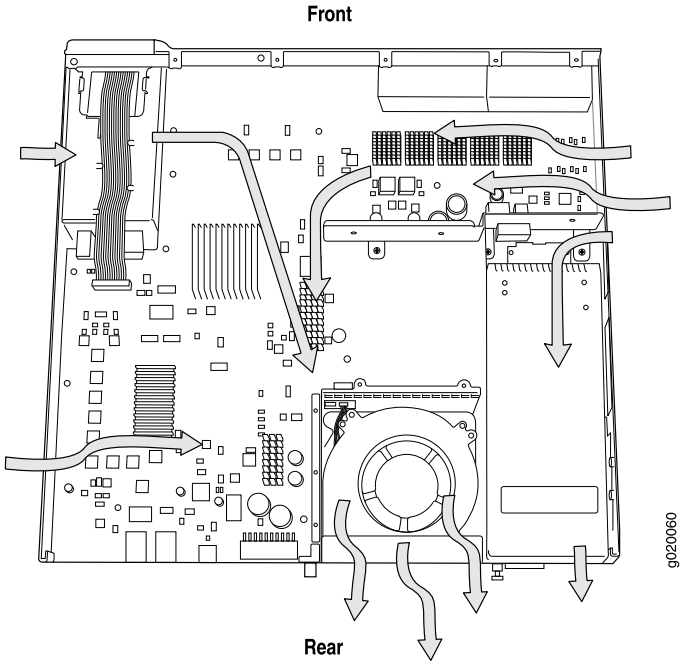


Figure 21: Airflow Through the EX 3200 Switch Chassis



Temperature sensors in the chassis monitor the temperature within the chassis. The system raises an alarm if the fan fails or if the temperature inside the chassis rises above permitted levels. If the temperature inside the chassis rises above the threshold, the system shuts down automatically and the temperature shutdown LED on the rear panel is lit. You can see the status of fans and the temperature from the Environment Status menu on the LCD panel.

Related Topics

- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Rear-Panel Description on page 10
- Installing a Fan Tray in an EX-series Switch on page 110

- Removing a Fan Tray from an EX-series Switch on page 112
- Preventing Electrostatic Discharge Damage on page 138

DC Power Supply LEDs in EX 3200 and EX 4200 Switches

The DC power supply in an EX 3200 or EX 4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel. Table 19 on page 32 describes the LEDs on the DC power supplies in EX 3200 and EX 4200 switches.

Table 19: DC Power Supply LEDs in EX 3200 and EX 4200 Switches

LED Label	Color	Description
LED A	Red	Inputs A and B are normal, but there is no output.
LED B	Red	
LED A	Green	Inputs A and B are normal; output is normal.
LED B	Green	
LED A	Flash Red	Input A has failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Green	
LED A	Green	Input B has failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Flash Red	
LED A	Flash Red	Both inputs have failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Flash Red	
LED A	Off	There is no input; there is no output.
LED B	Off	

Related Topics

- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting DC Power to an EX 3200 or EX 4200 Switch on page 81

Cooling System in an EX 4200 Switch

The cooling system in an EX 4200 switch consists of a field-replaceable unit (FRU) fan tray with three fans (see Figure 22 on page 33). The fan tray is located at the rear of the chassis and provides side-to-rear chassis cooling (see Figure 23 on page 33).

Figure 22: Fan Tray Used in an EX 4200 Switch

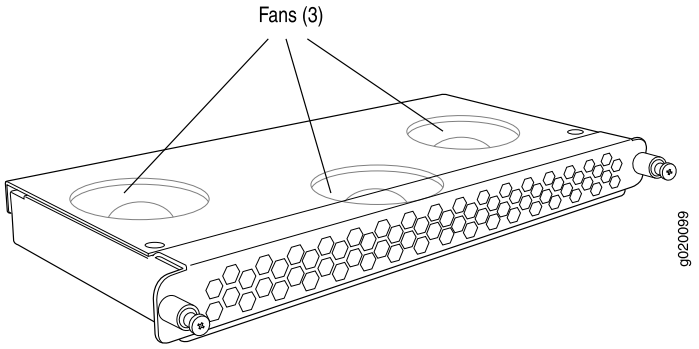
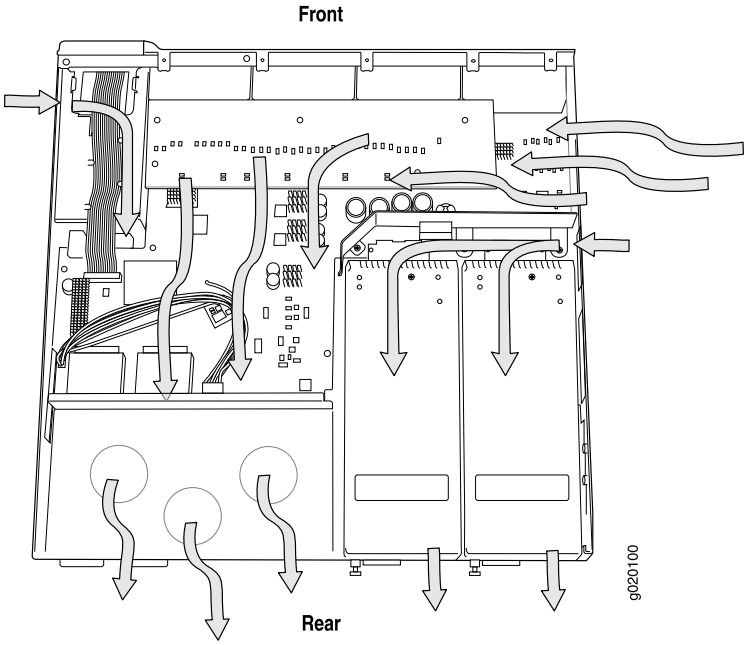


Figure 23: Airflow Through the EX 4200 Switch Chassis



The fan tray used in an EX 4200 switch comes with load-sharing redundancy that can tolerate a single fan failure at room temperature (below 45° C/113° F) to still provide sufficient cooling.

Temperature sensors in the chassis monitor the temperature within the chassis. The system raises an alarm if the fan fails or if the temperature inside the chassis rises above permitted levels. If the temperature inside the chassis rises above the threshold, the system shuts down automatically and the temperature shutdown LED on the rear panel is lit. You can see the status of fans and the temperature from the Environment Status menu on the LCD panel.

Related Topics

- Field-Replaceable Units in EX-series Switches on page 99
- EX 4200 Switch—Rear-Panel Description on page 12
- Installing a Fan Tray in an EX-series Switch on page 110

- Removing a Fan Tray from an EX-series Switch on page 112
- Preventing Electrostatic Discharge Damage on page 138

EX-series Switch—Console Port Connector Pinout Information

The console port on the rear panel of an EX-series switch chassis has an RJ-45 connector. Table 20 on page 34 provides the pinout information for the RJ-45 chassis console connector. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the switch.

NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to an EX-series switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter.

Table 20: Console Port Connector Pinout Information

Pin	Signal	Description
1	RTS Output	Request to send
2	DTR Output	Data terminal ready
3	TxD Output	Transmit data
4	Signal Ground	Signal ground
5	Signal Ground	Signal ground
6	RxD Input	Receive data
7	CD Input	Data carrier detect
8	CTS Input	Clear to send

Related Topics

- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12
- Connecting an EX-series Switch to a Network for Out-of-Band Management on page 85
- Connecting an EX-series Switch to a Management Console on page 86
- Virtual Chassis Ports Connector Pinout Information on page 42
- Uplink Modules Connector Pinout Information on page 35
- EX-series Switch—Management Port Connector Pinout Information on page 35

EX-series Switch—Management Port Connector Pinout Information

The management port on the rear panel of an EX-series switch chassis has an RJ-45 connector. Table 21 on page 35 provides the pinout information of the RJ-45 connector. An RJ-45 cable is supplied with the switch.

Table 21: Management Port Connector Pinout Information

Pin	Signal	Description
1	TX +	Transmit data
2	TX-	Transmit data
3	RX +	Receive data
4	Termination network	
5	Termination network	
6	RX-	Receive data
7	Termination network	
8	Termination network	

Related Topics

- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12
- Virtual Chassis Ports Connector Pinout Information on page 42
- Uplink Modules Connector Pinout Information on page 35
- EX-series Switch—Console Port Connector Pinout Information on page 34

Uplink Modules Connector Pinout Information

EX-series switches have a field-replaceable unit (FRU) uplink module on the front panel. Table 22 on page 35 provides the uplink modules connector pinout information.

NOTE: You can use the ports in the uplink modules as virtual chassis ports.

Table 22: Uplink Modules Connector Pinout Information

Pin Number	Pin Name
A1	GND
A2	GND
A3	GND

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
A4	GND
A5	GND
A6	GND
A7	GND
A8	GND
A9	GND
A10	GND
A11	GND
A12	GND
A13	GND
A14	GND
A15	Uplink_I2C_SCK
A16	GND
A17	Uplink_PD
A18	GND
A19	POWER (12V)
A20	GND
B1	GND
B2	XAUI0_RX0N
B3	GND
B4	XAUI0_RX2N
B5	Uplink_P25_LED2
B6	XAUI1_RX0N
B7	Uplink_P27_LED2
B8	XAUI1_RX2N
B9	GND
B10	SRX28N

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
B11	Uplink_XAUI_XMDIO
B12	SRX26N
B13	GND
B14	SGMIIRXN
B15	Uplink_I2C_Rst
B16	Uplink_Intr
B17	Uplink_Pwr_En
B18	Uplink_P26_LED0
B19	POWER (12V)
B20	POWER (12V)
C1	GND
C2	XAUI0_RX0P
C3	GND
C4	XAUI0_RX2P
C5	GND
C6	XAUI1_RX0P
C7	GND
C8	XAUI1_RX2P
C9	GND
C10	SRX28P
C11	GND
C12	SRX26P
C13	GND
C14	SGMIIRXP
C15	CPU_UPLINK_MDC
C16	Uplink_I2C_SDA
C17	CPU_UPLINK_MDIO

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
C18	Uplink_P26_LED1
C19	UPLNK_PWR_OK
C20	POWER (12V)
D1	GND
D2	GND
D3	XAUI0_TX1N
D4	GND
D5	XAUI0_TX3N
D6	GND
D7	XAUI1_TX1N
D8	GND
D9	XAUI1_TX3N
D10	GND
D11	STX27N
D12	GND
D13	STX25N
D14	GND
D15	Uplink_Rst
D16	GND
D17	Uplink_Status_LED0
D18	GND
D19	POWER (12V)
D20	GND
E1	GND
E2	XAUI0_TX0N
E3	XAUI0_TX1P
E4	XAUI0_TX2N

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
E5	XAUI0_TX3P
E6	XAUI1_TX0N
E7	XAUI1_TX1P
E8	XAUI1_TX2N
E9	XAUI1_TX3P
E10	STX28N
E11	STX27P
E12	STX26N
E13	STX25P
E14	SGMIITXN
E15	Uplink_Hotswap_LED
E16	Uplink_Spare_Intr
E17	Uplink_Status_LED1
E18	Uplink_P27_LED0
E19	POWER (12V)
E20	POWER (12V)
F1	GND
F2	XAUI0_TX0P
F3	GND
F4	XAUI0_TX2P
F5	GND
F6	XAUI1_TX0P
F7	GND
F8	XAUI_TX2P
F9	GND
F10	STX28P
F11	GND

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
F12	STX26P
F13	GND
F14	SGMIITXP
F15	GND
F16	Uplink_Expander_Intr
F17	GND
F18	Uplink_P27_LED1
F19	GND
F20	POWER (12V)
G1	GND
G2	GND
G3	XAUI0_RX1N
G4	GND
G5	XAUI0_RX3N
G6	GND
G7	XAUI1_RX1N
G8	GND
G9	XAUI1_RX3N
G10	GND
G11	SRX27N
G12	GND
G13	SRX25N
G14	GND
G15	GND
G16	GND
G17	Uplink_P25_LED0
G18	GND

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
G19	POWER (12V)
G20	GND
H1	Uplink_PD_Loopback
H2	GND
H3	XAUI0_RX1P
H4	GND
H5	XAUI0_RX3P
H6	Uplink_P26_ LED2
H7	XAUI1_RX1P
H8	Uplink_P28_ LED2
H9	XAUI1_RX3P
H10	GND
H11	SRX27P
H12	Uplink_XAUI_MDC
H13	SRX25P
H14	GND
H15	Serial_RX
H16	GND
H17	Uplink_P25_LED1
H18	Uplink_P28_LED0
H19	POWER (12V)
H20	POWER (12V)
I1	GND
I2	GND
I3	GND
I4	GND
I5	GND

Table 22: Uplink Modules Connector Pinout Information *(continued)*

Pin Number	Pin Name
I6	GND
I7	GND
I8	GND
I9	GND
I10	GND
I11	GND
I12	GND
I13	GND
I14	GND
I15	GND
I16	Serial_TX
I17	GND
I18	Uplink_P28_LED1
I19	GND
I20	POWER (12V)

Related Topics

- Uplink Modules in an EX 3200 or EX 4200 Switch on page 16
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11
- Installing an Uplink Module in an EX-series Switch on page 101
- Removing an Uplink Module from an EX-series Switch on page 102

Virtual Chassis Ports Connector Pinout Information

EX 4200 switches use a 68–pin connector cable to interconnect switches to form a virtual chassis. The cable is provided with the switch. Table 23 on page 42 provides the virtual chassis ports (VCPs) connector pinout information.

Table 23: Virtual Chassis Ports Connector Pinout Information

Pin Number	Pin Name
A1	GND

Table 23: Virtual Chassis Ports Connector Pinout Information *(continued)*

Pin Number	Pin Name
A2	P1TXP0
A3	P1TXN0
A4	GND
A5	P1TXP1
A6	P1TXN1
A7	GND
A8	P1TXP2
A9	P1TXN2
A10	GND
A11	P1TXP3
A12	P1TXN3
A13	GND
A14	NC
A15	NC
A16	GND
A17	NC
A18	NC
A19	NC
A20	NC
A21	NC
A22	GND
A23	P2TXP0
A24	P2TXN0
A25	GND
A26	P2TXP1
A27	P2TXN1
A28	GND

Table 23: Virtual Chassis Ports Connector Pinout Information *(continued)*

Pin Number	Pin Name
A29	P2TXP2
A30	P2TXN2
A31	GND
A32	P2TXP3
A33	P2TXN3
A34	GND
B1	GND
B2	P1RXP0
B3	P1RXN0
B4	GND
B5	P1RXP1
B6	P1RXN1
B7	GND
B8	P1RXP2
B9	P1RXN2
B10	GND
B11	P1RXP3
B12	P1RXN3
B13	GND
B14	NC
B15	NC
B16	NC
B17	NC
B18	NC
B19	NC
B20	NC
B21	NC

Table 23: Virtual Chassis Ports Connector Pinout Information *(continued)*

Pin Number	Pin Name
B22	GND
B23	P2RXP0
B24	P2RXN0
B25	GND
B26	P2RXP1
B27	P2RXN1
B28	GND
B29	P2RXP2
B30	P2RXN2
B31	GND
B32	P2RXP3
B33	P2RXN3
B34	GND

Related Topics

- Virtual Chassis Cabling Configuration Examples on page 72
- Planning the Virtual Chassis on page 58
- Understanding Virtual Chassis Components
- Understanding Virtual Chassis Hardware Configuration on page 58

Field-Replaceable Units (FRUs)

- Field-Replaceable Units in EX-series Switches on page 99

Field-Replaceable Units in EX-series Switches

Field-replaceable units (FRUs) are components that you can replace at your site. The field-replaceable units (FRUs) in EX-series switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- XFP transceiver

NOTE: Uplink modules are not part of the standard package and must be ordered separately.

Related Topics

- Installing a Power Supply in an EX-series Switch on page 107
- Removing a Power Supply from an EX-series Switch on page 108
- Installing a Fan Tray in an EX-series Switch on page 110
- Removing a Fan Tray from an EX-series Switch on page 112
- Installing an Uplink Module in an EX-series Switch on page 101
- Removing an Uplink Module from an EX-series Switch on page 102
- Installing an SFP or XFP Transceiver in an EX-series Switch on page 104
- Removing an SFP or XFP Transceiver from an EX-series Switch on page 106

Part 2

Setting Up the Switch

Chapter 2

Preparing the Site for Switch Installation

Site Preparation Checklist

Site Preparation Checklist for EX-series Switches

The checklist in Table 24 on page 49 summarizes the tasks you need to perform when preparing a site for switch installation.

Table 24: Site Preparation Checklist

Item or Task	For More Information	Performed By	Date
Environment			
Verify that environmental factors such as temperature and humidity do not exceed switch tolerances.	Environmental Requirements and Specifications for EX-series Switches.		
Power			
Measure distance between external power sources and switch installation site.			
Locate sites for connection of system grounding.			
Calculate the power consumption and requirements.	"Power Specifications and Requirements for an EX-series Switch" on page 54		
Hardware Configuration			

Table 24: Site Preparation Checklist *(continued)*

Item or Task	For More Information	Performed By	Date
Choose the number and types of switches you want to install.	"EX-series Switch Hardware Overview" on page 3		
Rack or Cabinet			
Verify that your rack meets the minimum requirements for the installation of the switch.	"Rack Requirements and Specifications for an EX-series Switch" on page 50 "Cabinet Requirements and Specifications for an EX-series Switch" on page 52		
Plan rack location, including required space clearances.	"Clearance Requirements for Airflow and Hardware Maintenance" on page 52		
Secure the rack to the floor and building structure.			
Cables			
Acquire cables and connectors: ■ Determine the number of cables needed based on your planned configuration. ■ Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected.			
Plan the cable routing and management.			

Related Topics
- General Safety Guidelines and Warnings on page 130
- Installing and Connecting an EX-series Switch on page 61
- Mounting an EX-series Switch on page 65

Rack or Cabinet Requirements

- Rack Requirements and Specifications for an EX-series Switch on page 50
- Requirements for Mounting an EX-series Switch on the Desktop or Wall on page 52
- Cabinet Requirements and Specifications for an EX-series Switch on page 52

Rack Requirements and Specifications for an EX-series Switch

You can mount an EX-series switch in a rack. If you are installing multiple EX-series switches to function as a virtual chassis, you must install the switches in a rack. Table 25 on page 51 provides the rack requirements and specifications for an EX-series switch.

Table 25: Rack Requirements and Specifications for an EX-series Switch

Rack Requirement	Guidelines
Rack type	Use a front-mount rack, four-post (telco) rack, or a center-mount rack.
Rack size and strength	■ Ensure that the rack complies with one of these standards: ■ A 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org). ■ A 600-mm rack as defined in the four-part *Equipment Engineering (EE); European telecommunications standard for equipment practice* (document numbers ETS 300 119-1 through 119-4) published by the European Telecommunications Standards Institute (http://www.etsi.org). The horizontal spacing between the rails in a rack that complies with this standard is usually wider than the switch's mounting brackets, which measure 19 in. (48.2 cm) from outer edge to outer edge. Use approved wing devices to narrow the opening between the rails as required. ■ Ensure that the rack rails are spaced widely enough to accommodate the switch chassis' external dimensions. See Table 26 on page 51. ■ Ensure that the spacing of rails and adjacent racks allows for the proper clearance around the switch and rack.
Rack connection to building structure	■ Secure the rack to the building structure. ■ If earthquakes are a possibility in your geographical area, secure the rack to the floor. ■ Secure the rack to the ceiling brackets as well as wall or floor brackets if maximum stability is required.

One pair of mounting brackets is supplied with the EX-series switch. The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.445 cm), so the switch can be mounted in any rack that provides holes spaced at that distance.

The outer edges of the mounting brackets extend the width of either chassis to 19 in. (48.2 cm), and the front of the chassis extends approximately 0.5 in. (1.27 cm) beyond the mounting brackets. The spacing of rails and adjacent racks must also allow for the clearances around the switch and rack.

Table 26: EX-series Switches—External Dimensions

Switch Model	Dimensions
EX 3200, EX 4200 (without mounting brackets)	1.75 in. (4.445 cm) high, 17.25 in. (43.815 cm), and 17 in. (43.18 cm) deep.
EX 3200, EX 4200 (with mounting brackets)	1.75 in. (4.445 cm) high, 17.25 in. (43.815 cm), and 19 in. (48.2 cm) deep.

Related Topics

- EX-series Switch Chassis Physical Specifications on page 7
- Rack-Mounting Requirements and Warnings on page 147
- Clearance Requirements for Airflow and Hardware Maintenance on page 52

Requirements for Mounting an EX-series Switch on the Desktop or Wall

You can install an EX-series switch on a desktop or wall. When choosing a location, allow at least 6 in. (15.2 cm) of clearance between the front and back of the chassis and adjacent equipment or walls.

If you are mounting an EX-series switch on a wall, use the EX-series switch wall mount kit from Juniper Networks. The wall mount kit is not part of the standard package and needs to be ordered separately.

Related Topics
- Clearance Requirements for Airflow and Hardware Maintenance on page 52
- Mounting an EX-series Switch on a Desk or Other Level Surface on page 66

Cabinet Requirements and Specifications for an EX-series Switch

You can mount an EX-series switch on a 19-in. cabinet as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org).

Related Topics
- Clearance Requirements for Airflow and Hardware Maintenance on page 52
- Rack Requirements and Specifications for an EX-series Switch on page 50
- Mounting an EX-series Switch on a Rack or Cabinet on page 67

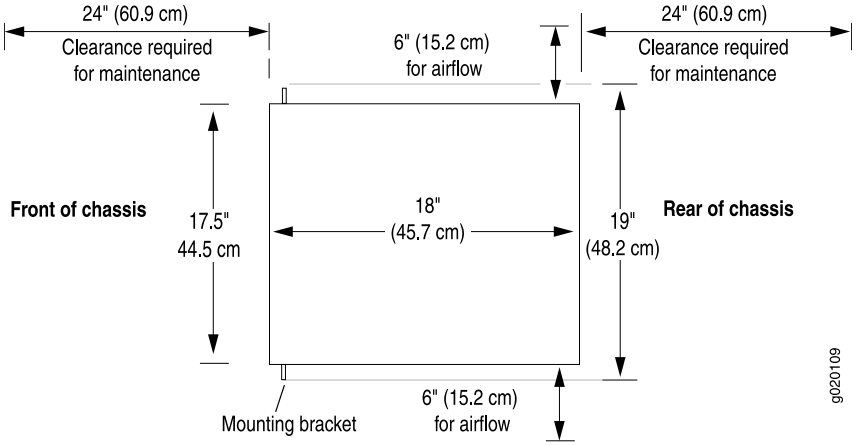
Clearance Requirements

- Clearance Requirements for Airflow and Hardware Maintenance on page 52

Clearance Requirements for Airflow and Hardware Maintenance

When planning the site for installing an EX-series switch, you must allow sufficient clearance around the installed switch (see Figure 24 on page 52).

Figure 24: Clearance Requirements for Airflow and Hardware Maintenance



- Allow at least 6 in. (15.2 cm) of clearance on the side between devices that have fans or blowers installed. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall. For the cooling system to function properly, the airflow around the chassis must be unrestricted. Figure 25 on page 53 shows the airflow through the EX 3200 switch chassis and Figure 26 on page 54 shows the airflow through the EX 4200 switch chassis.
- If you are mounting a switch in a rack or cabinet with other equipment, or if you are placing it on the desktop or floor near other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.
- Leave at least 24 in. (61 cm) both in front of and behind the switch. For service personnel to remove and install hardware components, you must leave adequate space at the front and back of the switch. NEBS GR-63 recommends that you allow at least 30 in. (76.2 cm) in front of the rack or cabinet and 24 in. (61 cm) behind the rack or cabinet.

Figure 25: Airflow Through the EX 3200 Switch Chassis

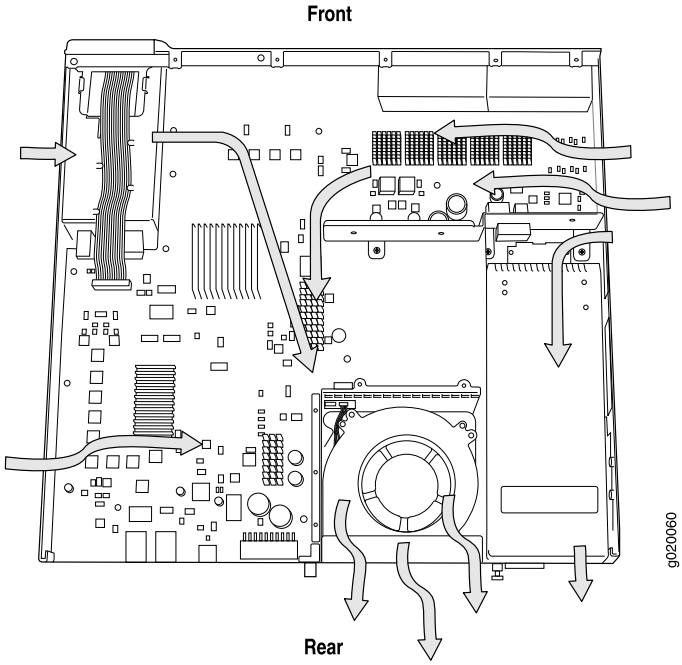
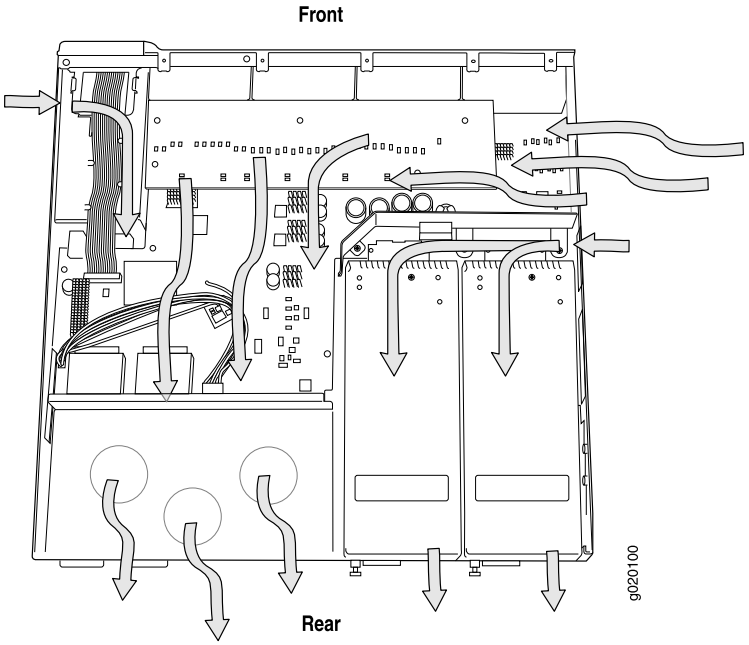


Figure 26: Airflow Through the EX 4200 Switch Chassis



Related Topics

- Rack Requirements and Specifications for an EX-series Switch on page 50
- Rack-Mounting Requirements and Warnings on page 147
- Cabinet Requirements and Specifications for an EX-series Switch on page 52
- Cooling System in an EX 3200 Switch on page 30
- Cooling System in an EX 4200 Switch on page 32

Electrical and Power Requirements

- Power Specifications and Requirements for an EX-series Switch on page 54
- Site Electrical Wiring Guidelines on page 55
- AC Power, Connection, and Power Cord Specifications on page 56

Power Specifications and Requirements for an EX-series Switch

Table 27 on page 54 provides the AC power supply electrical specifications for an EX-series switch.

Table 27: AC Power Supply Electrical Specifications for an EX-series Switch

Item	Specification
AC input voltage	100 to 240 VAC
AC input line frequency	50 to 60 Hz

Table 27: AC Power Supply Electrical Specifications for an EX-series Switch *(continued)*

Item	Specification
AC system current rating	■ 4 A (for EX 3200-24T, EX 4200-24T, EX 3200-48T, EX 4200-48T, and EX 4200-24F ■ 7 A (for EX 3200-24P and EX 4200-24P ■ 12 A (for EX 3200-48P and EX 4200-48P

Related Topics

- AC Power, Connection, and Power Cord Specifications on page 56
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153

Site Electrical Wiring Guidelines

Table 28 on page 55 describes the factors you must consider while planning the electrical wiring at your site.

CAUTION: It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.

To comply with intrabuilding lightning/surge requirements, intrabuilding wiring must be shielded and the shield for the wiring must be grounded at both ends.

Table 28: Site Electrical Wiring Guidelines

Site Wiring Factor	Guidelines
Signaling limitations	If your site has experienced any of the following problems, consult experts in electrical surge suppression and shielding: ■ Improperly installed wires emitted radio interference. ■ Damage from lightning strikes occurred when wires exceeded recommended distances or passed between buildings. ■ Damage to unshielded conductors and electronic devices was caused by the electromagnetic pulse (EMP) caused by lightning.
Radio frequency interference (RFI)	To reduce or eliminate the emission of radio frequency interference (RFI) from your site wiring, do the following: ■ Use twisted-pair cable with a good distribution of grounding conductors. ■ If you must exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.

Table 28: Site Electrical Wiring Guidelines *(continued)*

Site Wiring Factor	Guidelines
Electromagnetic compatibility	If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, you might want to seek expert advice. Some of the problems caused by strong sources of electromagnetic interference (EMI) are: ■ Destruction of the signal drivers and receivers in the switch. ■ Electrical hazards as a result of power surges conducted over the lines into the equipment.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- Preventing Electrostatic Discharge Damage on page 138
- Power Supply in EX 3200 and EX 4200 Switches on page 27

AC Power, Connection, and Power Cord Specifications

Detachable AC power cords are supplied with the switch. The appliance coupler at the female end of the cord inserts into the AC appliance inlet on the faceplate of the AC power supply. The coupler is type C19 as described by International Electrotechnical Commission (IEC) standard 60320. The plug at the male end of the power cord fits into the power source outlet that is standard for your geographical location.

NOTE: In North America, AC power cords must not exceed 4.5 meters (approximately 14.75 feet) in length, to comply with National Electrical Code (NEC) Sections 400-8 (NFPA 75, 5-2.2) and 210-52 and Canadian Electrical Code (CEC) Section 4-010(3). The cords supplied with the switch are in compliance.

Table 29 on page 56 lists AC power cord specifications provided for each country or region.

Table 29: AC Power Cord Specifications

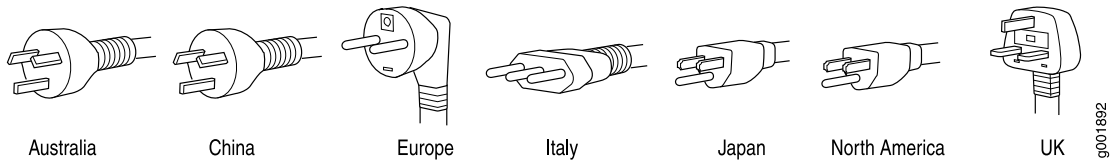
Country/Region	Electrical Specifications	Plug Standards
Australia	250 VAC, 10 A, 50 Hz	AS/NZ 3112–1993
China	250 VAC, 10 A, 50 Hz	GB2099.1 1996 and GB1002 1996 (CH1-10P)
Europe (except Italy and United Kingdom)	250 VAC, 10 A, 50 Hz	CEE (7) VII

Table 29: AC Power Cord Specifications *(continued)*

Country/Region	Electrical Specifications	Plug Standards
Italy	250 VAC, 10 A, 50 Hz	CEI 23–16/VII
Japan	125 VAC, 12 A, 50 Hz or 60 Hz	JIS 8303
North America	125 VAC, 10 A, 60 Hz	NEMA 5-15
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363A

Figure 27 on page 57 illustrates the plug on the power cord for each country or region listed in Table 29 on page 56.

Figure 27: AC Plug Types



CAUTION: The AC power cord for the EX-series switch is intended for use with the switch only and not for any other use.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- Preventing Electrostatic Discharge Damage on page 138
- Power Supply in EX 3200 and EX 4200 Switches on page 27

Network Cable Specifications

- Network Cable Specifications on page 57

Network Cable Specifications

EX-series switches support interfaces that use various types of network cables.

For instructions on connecting an EX-series switch to a network for out-of-band management using an Ethernet cable with an RJ-45 connector, see “Connecting an EX-series Switch to a Network for Out-of-Band Management” on page 85.

For instructions on connecting an EX-series switch to a management console using an Ethernet cable with an RJ-45 connector, see “Connecting an EX-series Switch to a Management Console” on page 86.

Related Topics

- EX-series Switch—Management Port Connector Pinout Information on page 35
- EX-series Switch—Console Port Connector Pinout Information on page 34
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Virtual Chassis Requirements

Understanding Virtual Chassis Hardware Configuration

Virtual chassis is a feature in EX 4200 switches that allows you to interconnect two or more EX 4200 switches, enabling them to operate as a unified single high bandwidth switch. You can interconnect a maximum of 10 EX 4200 switches through the dedicated 64-Gbps virtual chassis ports (VCPs) or the uplink module ports configured as VCPs to form a virtual chassis. All EX 4200 switch models support virtual chassis, and you can interconnect different models, offering a range of port configurations, within the same virtual chassis.

The virtual chassis configuration includes designation of a master switch and a backup switch, with all other switches in the configuration designated as "linecard" role switches. Virtual chassis operation is managed through the master switch. Each switch in the virtual chassis is assigned a unique identifier that is displayed on the switch LCD.

Related Topics

- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 58
- Virtual Chassis Ports Connector Pinout Information on page 42
- Virtual Chassis Cabling Configuration Examples on page 72

Planning the Virtual Chassis

Before installing EX 4200 switches in a virtual chassis configuration, you must consider the following factors:

- The number of switches in the virtual chassis and location—You can interconnect two to ten EX 4200 switches to form a virtual chassis. You can stack the switches in a single rack or install them on multiple racks. For information on the size and strength of racks, see “Rack Requirements and Specifications for an EX-series Switch” on page 50. See “EX-series Switch Chassis Physical Specifications” on page 7 for the dimensions and weights of the switch models.
- Cabling requirements for virtual chassis—You can interconnect the EX 4200 switches in a virtual chassis configuration through virtual chassis ports (VCPs) using the 0.5 meter long VCP cable supplied in the package. Depending on the virtual chassis configurations you have, you might need cables of different lengths. If you need longer cables, you can purchase them separately. The maximum

length allowed for a virtual chassis cable is 3 meters. To connect switches that are installed farther apart, you must configure the uplink module ports as virtual chassis ports and use them to interconnect the switches.

NOTE: If you order virtual chassis cables separately, you should reuse the locking covers provided with the original cable or order virtual chassis cable locking covers also separately.

- Clearance on the rear of the switch—You must have access to the rear of the switch if you plan to interconnect switches to form a virtual chassis.
- Power supply—You must plan the installation site to meet the power requirements of the EX-series switches in a virtual chassis. The input power requirements vary depending on the number of Power over Ethernet (PoE) ports in a switch. See “Power Supply in EX 3200 and EX 4200 Switches” on page 27 for the power requirements for the various configurations of PoE ports in EX 4200 switches.

Related Topics

- Understanding Virtual Chassis Components
- Virtual Chassis Ports Connector Pinout Information on page 42
- Understanding Virtual Chassis Hardware Configuration on page 58
- Virtual Chassis Cabling Configuration Examples on page 72
- Clearance Requirements for Airflow and Hardware Maintenance on page 52

Chapter 3

Installing the Switch

Installing and Connecting an EX-series Switch

The EX-series switch chassis is a rigid sheet-metal structure that houses the other hardware components. The EX-series switch is shipped in a cardboard carton and is secured with foam packing material.

To unpack an EX-series switch, follow instructions in "Unpacking an EX-series Switch" on page 62.

You can install an EX-series switch on a 19-in. or 23-in. equipment rack or cabinet by using mounting brackets. You can mount an EX-series switch on a desk or other level surface by using rubber feet. To attach mounting brackets to an EX-series switch, follow instructions in "Attaching Mounting Brackets to an EX-series Switch" on page 64. To install an EX-series switch on a rack or cabinet, follow instructions in "Mounting an EX-series Switch on a Rack or Cabinet" on page 67. To install an EX-series switch on a desk or other level surface, follow instructions in "Mounting an EX-series Switch on a Desk or Other Level Surface" on page 66.

To connect an EX-series switch to earth ground, follow instructions in "Connecting Earth Ground to an EX-series Switch" on page 78.

To connect power to the EX-series switch chassis, follow instructions in "Connecting AC Power to an EX 3200 or EX 4200 Switch" on page 79.

To connect and configure the EX-series switch, follow instructions in "Connecting and Configuring the EX-series Switch (CLI Procedure)" on page 91 or "Connecting and Configuring the EX-series Switch (J-Web Procedure)" on page 92.

To connect an EX-series switch to a network for out-of-band management, follow instructions in "Connecting an EX-series Switch to a Network for Out-of-Band Management" on page 85. To connect an EX-series switch to a management console, follow instructions in "Connecting an EX-series Switch to a Management Console" on page 86.

To connect a virtual chassis cable to an EX-series switch, follow instructions in "Connecting a Virtual Chassis Cable to an EX 4200 Switch" on page 88.

Related Topics

- Rack Requirements and Specifications for an EX-series Switch on page 50
- Cabinet Requirements and Specifications for an EX-series Switch on page 52
- Clearance Requirements for Airflow and Hardware Maintenance on page 52
- Chassis Lifting Guidelines on page 147

Unpacking the Switch

- Unpacking an EX-series Switch on page 62

Unpacking an EX-series Switch

The EX-series switch is shipped in a cardboard carton and is secured with foam packing material. The carton also contains an accessory box.

NOTE: The EX-series switch is maximally protected inside the shipping carton. Do not unpack it until you are ready to begin installation.

To unpack the switch (see Figure 28 on page 63):

1. Move the shipping carton to a staging area as close to the installation site as possible, but where you have enough room to remove the system components.
2. Position the carton so that the arrows are pointing up.
3. Open the top flaps on the shipping carton.
4. Remove the accessory box and verify the contents against the parts inventory on the label attached to the carton.
5. Pull out the packing material holding the switch in place.
6. Verify the chassis components received against the packing list included with the switch. An inventory of parts provided with an EX-series switch is provided in Table 30 on page 63.
7. Save the shipping carton and packing materials in case you need to move or ship the switch later.

Figure 28: Unpacking an EX-series Switch

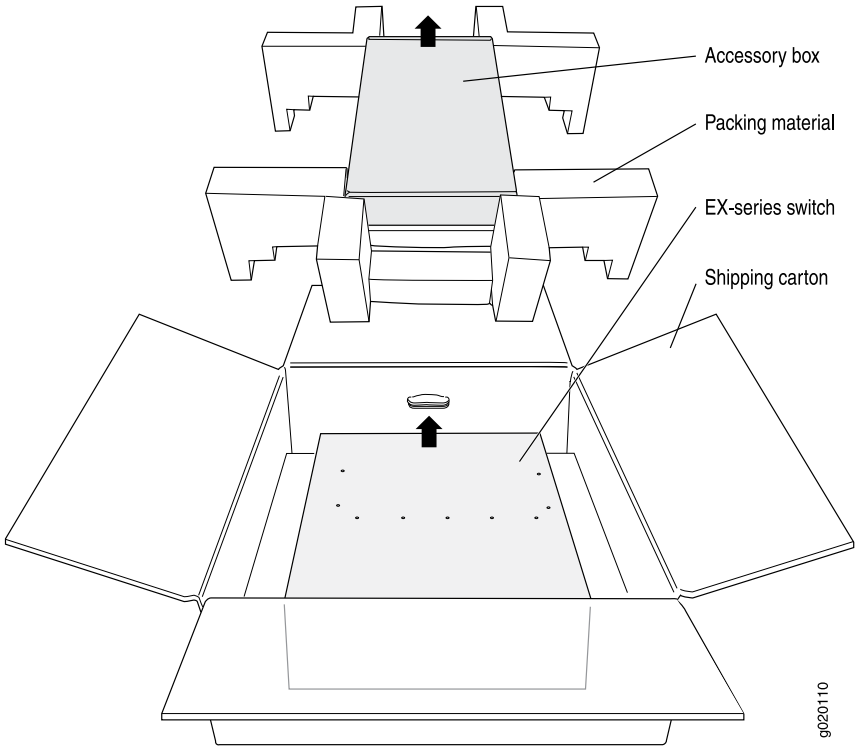


Table 30: Inventory of Components Provided with an EX-series Switch

Component	Quantity
Switch	1
Fan tray (preinstalled)	1
Power supply (preinstalled if the switch uses a 320 W power supply; not preinstalled if the switch uses a 600 W or 930 W power supply)	1
Power cord retainer clip	1
Mounting brackets	2
Mounting screws	8
Rubber feet	4
RJ-45 cable and RJ-45 to DB-9 serial port adapter	1
Virtual chassis cable (for an EX 4200 switch)	1
Virtual chassis cable connector retainers (for an EX 4200 switch)	2
Dust covers for ports (for an EX 4200-24F switch)	24

Related Topics

- Mounting an EX-series Switch on page 65
- Installing and Connecting an EX-series Switch on page 61
- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92

Installing the Switch

- Attaching Mounting Brackets to an EX-series Switch on page 64
- Mounting an EX-series Switch on page 65
- Mounting an EX-series Switch on a Desk or Other Level Surface on page 66
- Mounting an EX-series Switch on a Rack or Cabinet on page 67
- Mounting an EX 3200 or EX 4200 Switch on a Wall on page 69
- Virtual Chassis Cabling Configuration Examples on page 72
- Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure) on page 75
- Connecting Earth Ground to an EX-series Switch on page 78
- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting DC Power to an EX 3200 or EX 4200 Switch on page 81
- Connecting an EX-series Switch to a Network for Out-of-Band Management on page 85
- Connecting an EX-series Switch to a Management Console on page 86
- Connecting a Virtual Chassis Cable to an EX 4200 Switch on page 88

Attaching Mounting Brackets to an EX-series Switch

If you are installing a switch in a rack or cabinet, you must attach mounting brackets to the switch.

An EX-series switch is shipped with one pair of mounting brackets. The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.445 cm), so the switch can be mounted in any rack that provides holes spaced at that distance.

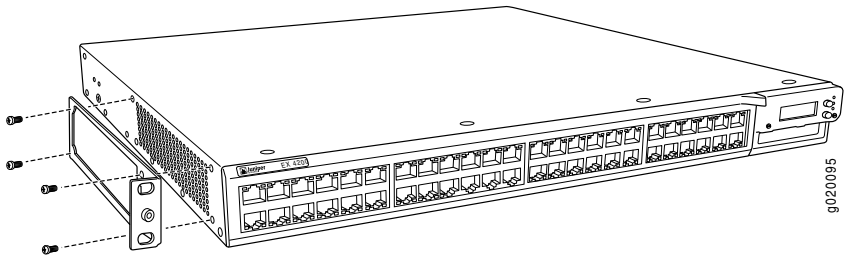
The outer edges of the mounting brackets extend the width of an EX-series switch chassis to 19 in. (48.2 cm), and the front of the chassis extends approximately 0.5 in. (1.27 cm) beyond the mounting brackets. The spacing of rails and adjacent racks must also allow for the clearances around the switch and rack (see “Clearance Requirements for Airflow and Hardware Maintenance” on page 52).

Ensure you have a Phillips (+) screwdriver, number 2 available to install mounting brackets on an EX-series switch chassis.

To attach each mounting bracket to an EX-series switch (see Figure 29 on page 65):

1. Place the EX-series switch on a flat, stable surface.
2. Align the mounting brackets along the front, rear, or center of a side panel of the EX-series switch chassis depending on how you want to mount the switch in a rack or cabinet. For example, if you want to center-mount a switch, align the mounting brackets along the center of the side panel. For instructions on mounting an EX-series switch on a rack or cabinet, see "Mounting an EX-series Switch on a Rack or Cabinet" on page 67.
3. Align the bottom hole in the mounting bracket with a hole on the side panel on the EX-series switch chassis.
4. Insert one mounting screw (provided in the accessory box shipped with the switch) into each of the two aligned holes. Use a Phillips (+) screwdriver, number 2 to tighten the screw to the chassis. Ensure that the other holes in the mounting bracket are aligned with the other holes in the side panel.
5. Insert screws into the other holes in the mounting bracket aligned with the holes in the side panel and tighten the screws to the chassis using a Phillips (+) screwdriver, number 2.

Figure 29: Attaching Mounting Brackets Along the Front of an EX-series Switch



Related Topics

- Mounting an EX-series Switch on a Rack or Cabinet on page 67
- Rack Requirements and Specifications for an EX-series Switch on page 50
- Cabinet Requirements and Specifications for an EX-series Switch on page 52

Mounting an EX-series Switch

You can mount an EX-series switch:

- On a 19-in. or 23-in. equipment rack or cabinet by using mounting brackets. The switch is shipped with mounting brackets and screws to be used to secure the chassis to rack or cabinet rails.
- On a desk or other level surface by using rubber feet. The switch is shipped with 4 rubber feet to be used to stabilize the chassis on a desk or other level surface.
- On a wall. You can order the wall-mount kit separately.

Related Topics

- Mounting an EX-series Switch on a Rack or Cabinet on page 67
- Mounting an EX-series Switch on a Desk or Other Level Surface on page 66
- Mounting an EX 3200 or EX 4200 Switch on a Wall on page 69

Mounting an EX-series Switch on a Desk or Other Level Surface

You can mount an EX-series switch on a desk or other level surface by using the 4 rubber feet that are shipped with the switch. The rubber feet stabilize the chassis.

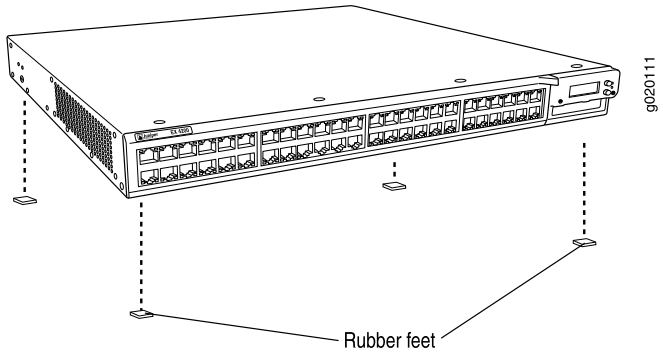
Before mounting an EX-series switch on a desk or other level surface:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX-series Switches" on page 49.
- Place the desk in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 130, with particular attention to "Chassis Lifting Guidelines" on page 147.
- Remove the switch from the shipping carton (see "Unpacking an EX-series Switch" on page 62).
- Ensure you have the following tools and parts available to mount an EX-series switch on a desk or other level surface:
  - Phillips (+) screwdriver, number 2
  - Rubber feet to stabilize the chassis on the a desk or other level surface
  - Dust covers for ports (for EX 4200-24F switches only; optional)

To mount the EX-series switch on a desk or other level surface:

1. Turn the chassis upside down on the desk or the level surface where you intend to mount the switch.
2. Attach the rubber feet to the bottom of the chassis, as shown in Figure 30 on page 66.
3. Turn the chassis right side up on the desk or the level surface.
4. If it is an EX 4200-24F switch, we recommend you insert dust covers in unused SFP ports.

Figure 30: Attaching Rubber Feet to the EX-series Switch Chassis



Related Topics

- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91

- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Clearance Requirements for Airflow and Hardware Maintenance on page 52

Mounting an EX-series Switch on a Rack or Cabinet

You can mount an EX-series switch on a 19-in. or 23-in. equipment rack or cabinet by using mounting brackets. The switch is shipped with mounting brackets and screws to be used to secure the chassis to rack or cabinet rails.

NOTE: If you are mounting multiple switches on a rack or cabinet, mount a switch in the bottom of the rack or cabinet first and proceed to mount the rest of the switches from bottom to top.

CAUTION: One person must be available to lift the switch chassis while another secures the chassis to the rack or cabinet.

Before mounting an EX-series switch on a rack or cabinet, you must attach mounting brackets to the switch. For instructions on attaching mounting brackets to an EX-series switch, see "Attaching Mounting Brackets to an EX-series Switch" on page 64.

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX-series Switches" on page 49.
- Place the rack or cabinet in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 130, with particular attention to "Chassis Lifting Guidelines" on page 147.
- Remove the switch from the shipping carton (see "Unpacking an EX-series Switch" on page 62).
- Ensure you have the following tools and parts available to mount an EX-series switch on a rack or cabinet:
  - Phillips (+) screwdriver, number 2
  - Mounting brackets to mount the chassis on a rack or cabinet
  - Dust covers for ports (for EX 4200-24F switches only; optional)

To mount the EX-series switch on a rack or cabinet (see Figure 32 on page 69):

1. Secure the mounting brackets to the chassis by inserting screws along both the front and rear of the mounting brackets (see Figure 31 on page 68). If you are center-mounting the switch, move the mounting brackets to the center of the chassis. For instructions on attaching mounting brackets to an EX-series switch, see "Attaching Mounting Brackets to an EX-series Switch" on page 64.
2. Have one person grasp both sides of the switch, lift the switch, and position it in the rack, aligning the mounting bracket holes with the threaded holes in the

rack. Align the bottom hole in both the mounting brackets with a hole in each rack or cabinet rail, making sure the chassis is level.

3. Insert one mounting screw (provided in the accessory box shipped with the switch) into each of the two aligned holes. Use a Phillips (+) screwdriver, number 2 to tighten the screws to the rack or cabinet rail.
4. Insert another screw into the other hole in each mounting bracket. Use a Phillips (+) screwdriver, number 2 to tighten the screws to the rack or cabinet rail.
5. Verify that all the mounting screws on one side of the rack or cabinet are aligned with the mounting screws on the other side and that the switch chassis is level.
6. If it is an EX 4200-24F switch, we recommend you insert dust covers in unused SFP ports.

Figure 31: Attaching Mounting Brackets Along the Front of an EX-series Switch

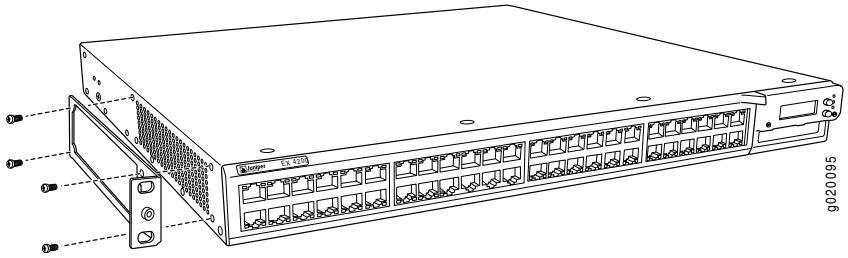
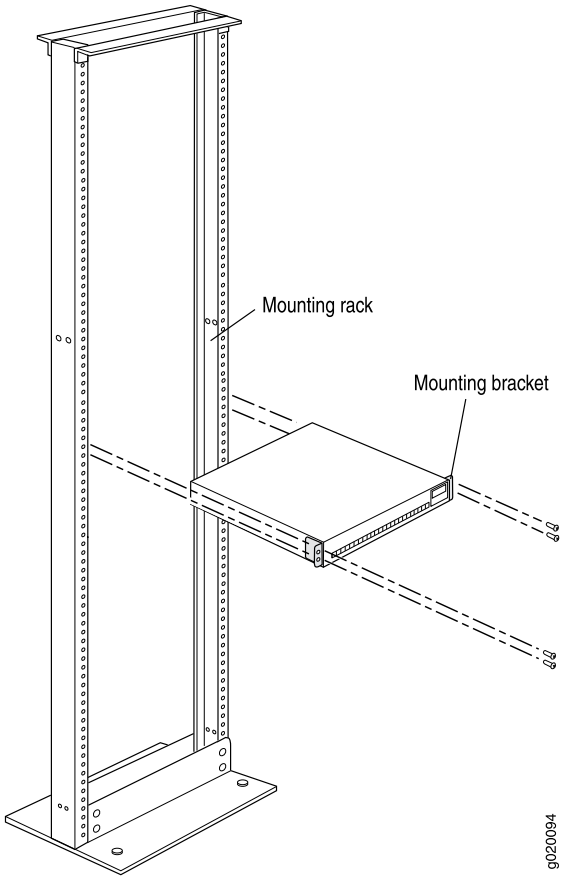


Figure 32: Mounting an EX-series Switch Chassis on a Rack



Related Topics

- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Rack Requirements and Specifications for an EX-series Switch on page 50
- Cabinet Requirements and Specifications for an EX-series Switch on page 52
- Clearance Requirements for Airflow and Hardware Maintenance on page 52

Mounting an EX 3200 or EX 4200 Switch on a Wall

You can mount an EX 3200 or EX 4200 switch on a wall by using separately orderable wall mount brackets.

Before mounting an EX 3200 or EX 4200 switch on a wall:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX-series Switches" on page 49.
- Read "General Safety Guidelines and Warnings" on page 130, with particular attention to "Chassis Lifting Guidelines" on page 147.

- Remove the switch from the shipping carton (see "Unpacking an EX-series Switch" on page 62).
- Ensure you have the following tools and parts available:
  - Phillips (+) screwdriver, number 2
  - 2 wall-mount brackets
  - 12 wall-mount bracket screws
  - 4 mounting screws (8-32 x 1.25 inch or M4 x 30 mm) (not included)
  - Dust covers for ports (for EX 4200-24F switches only; optional)
  - Hollow wall anchors capable of supporting the combined weight of two fully-loaded switches, up to 44 lb (20 kg) (not included)—if you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs
- Verify that there is appropriate clearance in your selected location (see "Clearance Requirements for Airflow and Hardware Maintenance" on page 52).

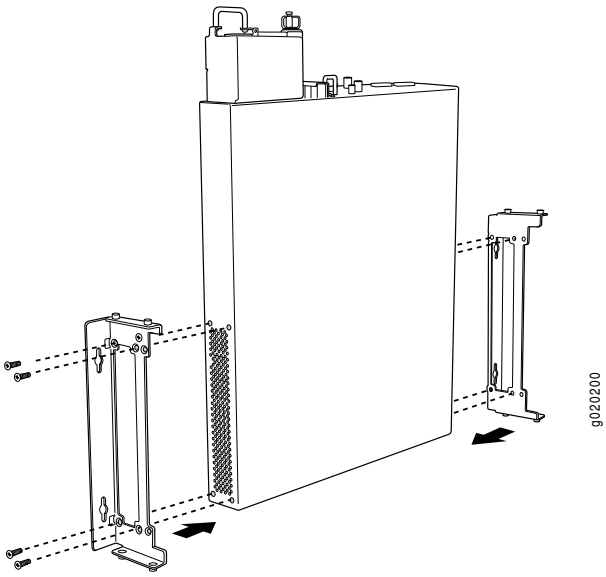
WARNING: When mounted in a vertical position, an EX 3200 or EX 4200 chassis must be oriented with the front panel of the chassis pointing down in order to ensure proper air flow and meet safety requirements in the event of a fire.

NOTE: For easier lifting, install any additional power supplies only after you mount the switch on the wall.

To mount the EX-series switch on a wall:

1. Attach the wall-mount brackets to the sides of the chassis using four of the wall-mount bracket screws on each side, as shown in Figure 33 on page 71.

Figure 33: Attaching Wall-Mount Brackets to the EX-series Switch Chassis

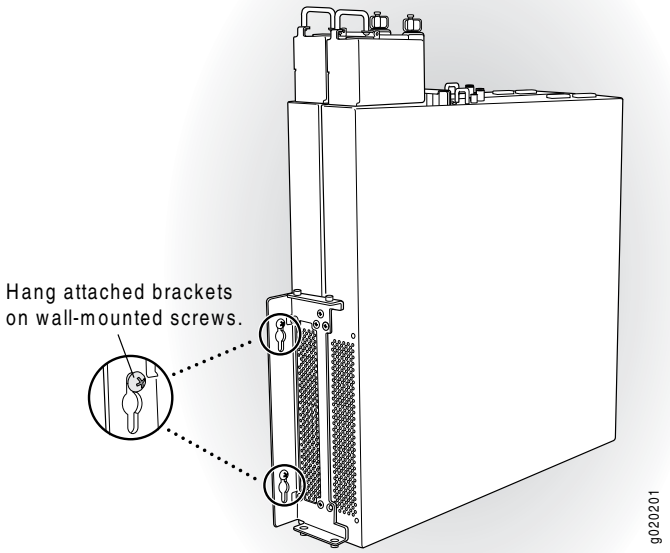


2. If you are mounting two switches together, line the second switch on top of the first and attach it to the mounting brackets using two wall-mount bracket screws on each side (see Figure 34 on page 72).
3. Insert the mounting screws in the wall. Insert the top pair of mounting screws 474.35 mm apart, and insert the second pair of mounting screws 151.81 mm directly below the first set.

   If the mounting screws are inserted in wall board with no stud behind it, you must use dry wall anchors rated to support 75 lb (34 kg). Insert the screws into wall studs wherever possible to provide added support for the chassis.

   Screw only part way in, leaving about 1/4 inch (6 mm) distance between the head of the screw and the wall.
4. Grasp each side of the switch or switches, lift the switch or switches, and hang the brackets from the mounting screws as shown in Figure 34 on page 72.

Figure 34: Mounting the EX-series Switch on the Wall



5. Tighten the mounting screws.
6. If it is an EX 4200-24F switch, we recommend you insert dust covers in unused SFP ports.

Related Topics

- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Wall-Mounting Requirements and Warnings on page 151

Virtual Chassis Cabling Configuration Examples

You can install EX 4200 switches in a single rack or multiple racks, or in different wiring closets, and interconnect them to form a virtual chassis. There are two dedicated virtual chassis ports (VCPs) on the rear panel of the EX 4200 switch that are used exclusively to interconnect EX 4200 switches as a virtual chassis. The physical location of the switches in a virtual chassis is restricted only by the maximum length supported for cables to connect the VCPs. The maximum cable length for interconnecting the dedicated VCPs is 3 meters. If you want to interconnect EX 4200 switches that are located beyond the reach of the dedicated VCP cables, you can install the EX-UM-2XFP uplink module and set the uplink ports as VCP interfaces. See Setting an Uplink Port as a Virtual Chassis Port (CLI Procedure).

NOTE: The interfaces for the two dedicated VCPs are operational by default. However, if you are using the uplink module ports as VCPs, you must explicitly set the uplink ports to function as VCPs.

The following illustrations describe various cabling configuration examples. The available bandwidth varies depending on the type of topology.

NOTE: A ring topology in a virtual chassis configuration provides up to 128 Gbps of bandwidth between member switches. In a chain topology virtual chassis configuration, the bandwidth is limited to 64 Gbps between two member switches.

Figure 35 on page 73 and Figure 36 on page 74 show five EX 4200 switches stacked vertically in a rack and interconnected in a ring topology using four short virtual chassis cables and one long virtual chassis cable.

Figure 35: EX 4200 Switches Virtual Chassis—Mounted on a Single Rack and Connected in a Ring Topology—Short and Long Cables, Option 1

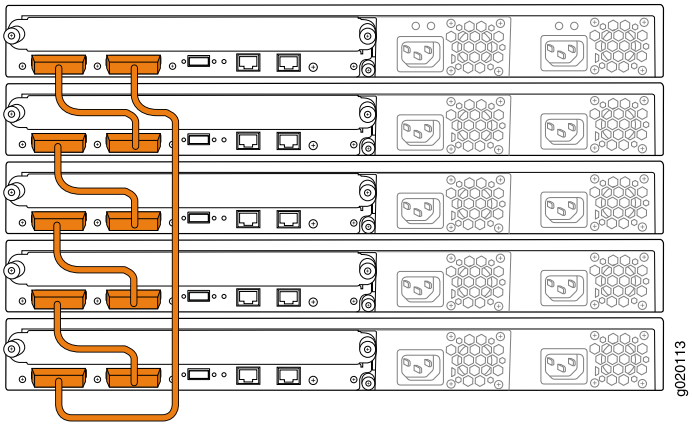


Figure 36: EX 4200 Switches Virtual Chassis—Mounted on a Single Rack and Connected in a Ring Topology—Short and Long Cables, Option 2

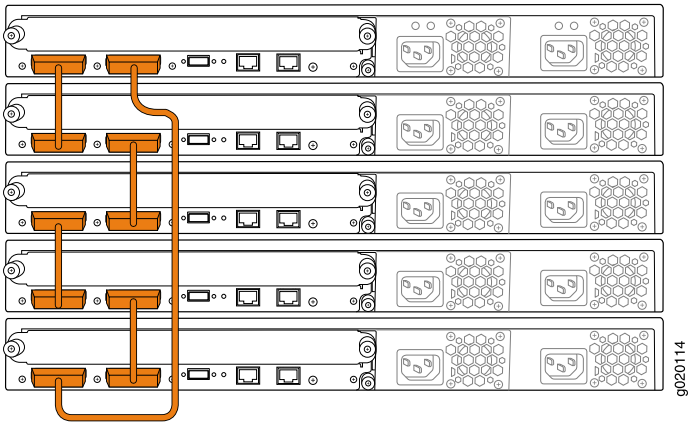


Figure 37 on page 74 shows five EX 4200 switches stacked vertically in a rack and interconnected in a ring topology using short-length and medium-length virtual chassis cables.

Figure 37: EX 4200 Switches Virtual Chassis—Mounted on a Single Rack and Connected in a Ring Topology—Short and Medium Cables

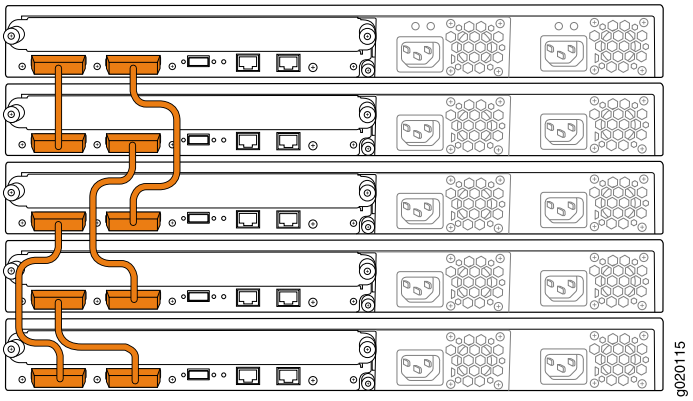


Figure 38 on page 74 and Figure 39 on page 75 show five EX 4200 switches mounted on the top rows of adjacent racks and interconnected in a ring topology using medium-length and long-length virtual chassis cables.

Figure 38: EX 4200 Switches Virtual Chassis—Mounted on Adjacent Racks and Connected in a Ring Topology—Medium and Long Cables, Option 1

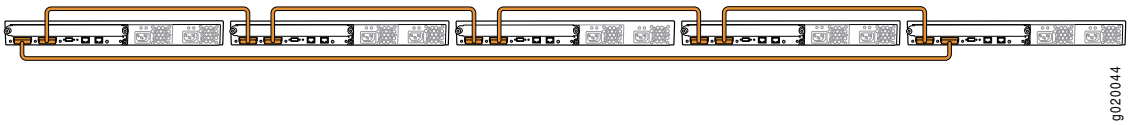


Figure 39: EX 4200 Switches Virtual Chassis—Mounted on Adjacent Racks and Connected in a Ring Topology—Medium and Long Cables, Option 2

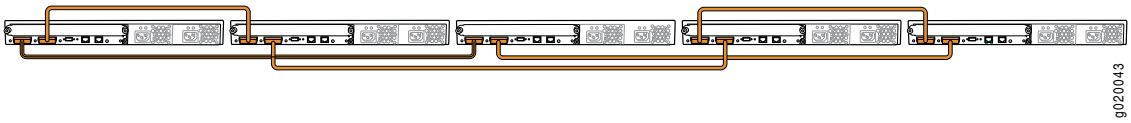
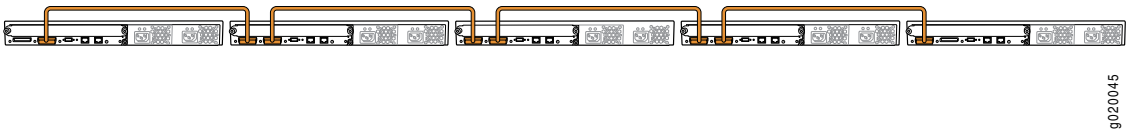


Figure 40 on page 75 shows five EX 4200 switches mounted on the top rows of adjacent racks and interconnected in a chain topology using medium-length virtual chassis cables.

Figure 40: EX 4200 Switches Virtual Chassis—Mounted on Adjacent Racks and Connected in a Chain Topology—Medium Cables



Related Topics

- Understanding Virtual Chassis Hardware Configuration on page 58
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 58
- Virtual Chassis Ports Connector Pinout Information on page 42
- Example: Configuring a Virtual Chassis Interconnected Across Multiple Wiring Closets

Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure)

You can add one or more EX 4200 switches to an existing Virtual Chassis configuration. Up to ten EX 4200 switches can be included within a Virtual Chassis configuration.

To add a switch to an existing Virtual Chassis configuration, use the procedure that matches what you need to accomplish:

- Adding a New Switch to an Existing Virtual Chassis Configuration Within the Same Wiring Closet on page 75
- Adding a New Switch from a Different Wiring Closet to an Existing Virtual Chassis Configuration on page 76

Adding a New Switch to an Existing Virtual Chassis Configuration Within the Same Wiring Closet

Before you begin, be sure you have:

- Installed the hardware components.
- Mounted the new switch in a rack.
- Confirmed that the new switch is powered off.

- If you are expanding a preprovisioned configuration, made a note of the serial number (on the back of the switch). You will need to edit the Virtual Chassis configuration to include the serial number of the new member switch.
- If you are expanding a preprovisioned configuration, edited the existing Virtual Chassis configuration to include the serial number of the new member switch.

To add a new member switch to an existing Virtual Chassis configuration within the same wiring closet:

1. If the new member switch has been previously configured, reverted that switch's configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX-series Switch.
2. Interconnect the unpowered new switch to at least one member of the existing Virtual Chassis configuration, using the dedicated Virtual Chassis ports (VCPs).
3. Power on the new switch.
4. Confirm that the new member switch is now included within the Virtual Chassis configuration by checking the front-panel display for the member ID. It should display a member ID that is higher than 0 (1 through 9), because there is already at least one member of the Virtual Chassis configuration.

NOTE: If you are using a preprovisioned configuration, the member ID is assigned to the member's serial number in the configuration file.

Adding a New Switch from a Different Wiring Closet to an Existing Virtual Chassis Configuration

To add a new switch from a different wiring closet to an existing Virtual Chassis configuration, you must use a longer cable to connect the new member switch across wiring closets. An EX-UM-2XFP or EX-UM-4SFP uplink port and fiber optic cable can be used for this purpose. The uplink ports on both sides of the link must be configured as Virtual Chassis port (VCPs). The new member switch in the other wiring closet must first be powered on as a standalone switch in order to configure its uplinks as VCPs. Otherwise, it cannot be recognized as a member switch by the master.

Before you begin, be sure you have:

- Installed the hardware components.
- Mounted the new switch in a rack.
- If the new member switch has been previously configured, reverted to factory defaults. See Reverting to the Default Factory Configuration for the EX-series Switch.
- If you are expanding a preprovisioned configuration, made a note of the serial number (on the back of the switch). You will need to edit the Virtual Chassis configuration to include the serial number of the new member switch.
- If you are expanding a preprovisioned configuration, edited the existing Virtual Chassis configuration to include the serial number of the new member switch.

You can specify the role of the new member switch when you add its serial number in the Virtual Chassis configuration file. The parameters specified in the master Virtual Chassis configuration file are applied after the new member switch has been interconnected with its uplink VCP.

- Confirmed that the new, currently standalone switch is powered off.
- Prepared an existing member for interconnecting with the new switch through an uplink port by configuring an uplink port as a VCP on the existing member.

To add a new member switch that is going to be interconnected with the existing Virtual Chassis configuration across wiring closets:

1. Power on the new switch.
2. Connect a laptop or terminal to the console port of the switch, or use EZ Setup on the standalone switch to specify temporary identification parameters. (When you interconnect the new member switch with the existing Virtual Chassis configuration, the master will overwrite and disable any specified parameters that conflict with the Virtual Chassis parameters or assigned member configuration.)
3. Use the CLI or the J-Web interface to set the uplink ports as VCP interfaces.

NOTE: If you are using a nonprovisioned configuration, you may wish to configure the new member switch with a mastership priority value that is less than that of the existing member switches. Doing so ensures that the new member switch will function in a linecard role when it is included within the Virtual Chassis configuration.

4. Power off the new switch.
5. Interconnect the new member switch to at least one member of the existing Virtual Chassis configuration, using the uplink ports that have been configured as VCPs.
6. Power on the new member switch.
7. Confirm that the new member switch is now included within the Virtual Chassis configuration by checking the front-panel display for the member ID. It should display a member ID that is higher than 0 (1 through 9), because there is already at least one member of the Virtual Chassis configuration.

NOTE: If you are using a preprovisioned configuration, the member-id is assigned to the member's serial number in the configuration file.

Related Topics

- Example: Expanding a Virtual Chassis Configuration in a Single Wiring Closet
- Example: Setting Up a Multimember Virtual Chassis Access Switch with a Default Configuration
- Example: Configuring a Virtual Chassis Interconnected Across Multiple Wiring Closets
- Monitoring Virtual Chassis Configuration Status and Statistics

- Replacing a Member Switch of a Virtual Chassis Configuration (CLI Procedure) on page 114
- Reverting to the Default Factory Configuration for the EX-series Switch

Connecting Earth Ground to an EX-series Switch

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, EX-series switches must be adequately grounded before they are connected to power.

For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the EX-series switch chassis to connect to the earth ground. The protective earthing terminal is located on the left side of the chassis in an EX 4200 switch when you look at it from the front. The protective earthing terminal is located on the rear of the chassis in an EX 3200 switch.

An AC-powered EX-series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location (see "AC Power, Connection, and Power Cord Specifications" on page 56).

Ensure you have the following tools and parts available to connect an EX-series switch to earth ground:

- Electrostatic discharge (ESD) grounding strap
- Grounding cable
- Washers and 10-32x.25 in. screws to secure the grounding lug to the protective earthing terminal
- Phillips (+) screwdriver, number 2

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

Ensure that a licensed electrician has attached an appropriate grounding lug to the grounding cable.

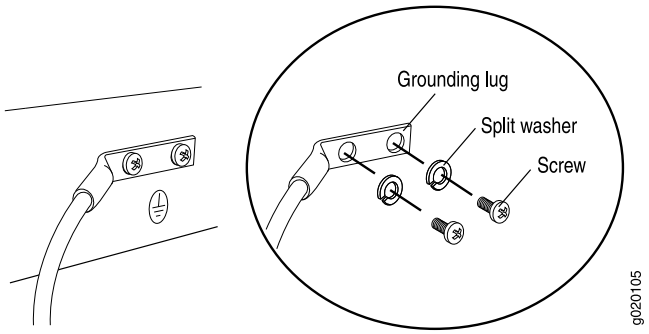
CAUTION: Using a grounding cable with an incorrectly attached lug can damage the switch.

To connect an EX-series switch chassis to earth ground (see Figure 41 on page 79):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is installed.
3. With a Phillips (+) screwdriver, number 2, remove the screws and washers from the protective earthing terminal on the chassis.

4. Place the grounding lug attached to the grounding cable over the protective earthing terminal, as shown in Figure 41 on page 79.
5. Secure the grounding lug to the protective earthing terminal, first with the washers, then with 10-32x.25 in. screws.

Figure 41: Connecting a Grounding Cable to an EX-series Switch



Related Topics

- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- General Safety Guidelines and Warnings on page 130
- Grounded Equipment Warning on page 163

Connecting AC Power to an EX 3200 or EX 4200 Switch

The power supply in an EX 3200 or EX 4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel.

CAUTION: To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect EX 3200 and EX 4200 switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX-series Switch" on page 78. An EX-series switch gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using the AC power cord appropriate for your geographical location (see "AC Power, Connection, and Power Cord Specifications" on page 56).

Ensure that you have the following parts and tools available to connect AC power to an EX 3200 or EX 4200 switch:

- Electrostatic discharge (ESD) grounding strap
- Power cord appropriate for your geographical location

Before you begin connecting AC power to an EX 3200 or EX 4200 switch:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).
- Ensure that you have connected the switch chassis to earth ground.

CAUTION: Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the switch (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect EX 3200 and EX 4200 switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX-series Switch" on page 78.

- Install the power supply in the chassis. For instructions on installing a power supply in an EX 3200 or EX 4200 switch, see "Installing a Power Supply in an EX-series Switch" on page 107.

To connect AC power to an EX 3200 or EX 4200 switch:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Ensure that the power supplies are fully inserted in the chassis and the screws on their faceplates are tightened.
3. Squeeze the two sides of the power cord retainer clip, and insert the L-shaped ends of the wire clip into the holes in the bracket on each side of the AC appliance inlet on the AC power supply faceplate (see Figure 42 on page 81).
4. Locate the power cord or cords shipped with the switch; the cords have plugs appropriate for your geographical location. See "AC Power, Connection, and Power Cord Specifications" on page 56.
5. Insert the coupler end of the power cord into the AC appliance inlet on the AC power supply faceplate.
6. Push the cord into the slot in the adjustment nut of the power cord retainer. Turn the nut until it is tight against the base of the coupler and the slot in the nut is turned 90° from the top of the switch (see Figure 43 on page 81).
7. If the AC power source outlet has a power switch, set it to the OFF (0) position.
8. Insert the power cord plug into an AC power source outlet.
9. If the AC power source outlet has a power switch, set it to the ON (|) position.
10. Verify that the AC OK LED on the power supply is lit and is on steadily.

Figure 42: Connecting the AC Power Cord Retainer Clip to an AC Power Supply in an EX 3200 or EX 4200 Switch

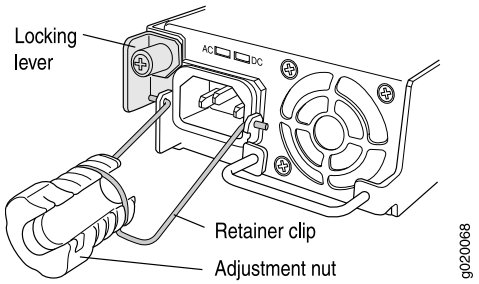
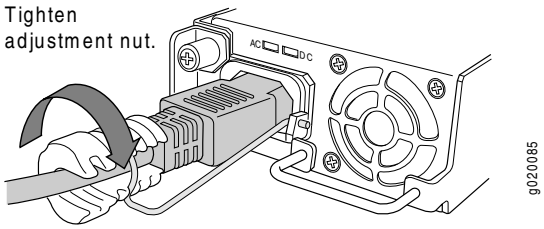


Figure 43: Connecting an AC Power Cord to an AC Power Supply in an EX 3200 or EX 4200 Switch



NOTE: Each power supply must be connected to a dedicated power source outlet.

WARNING: Ensure that the power cord does not block access to switch components or drape where people can trip on it.

"AC Power Supply LEDs in EX 3200 and EX 4200 Switches" on page 30 describes the LEDs on the AC power supplies in EX 3200 and EX 4200 switches.

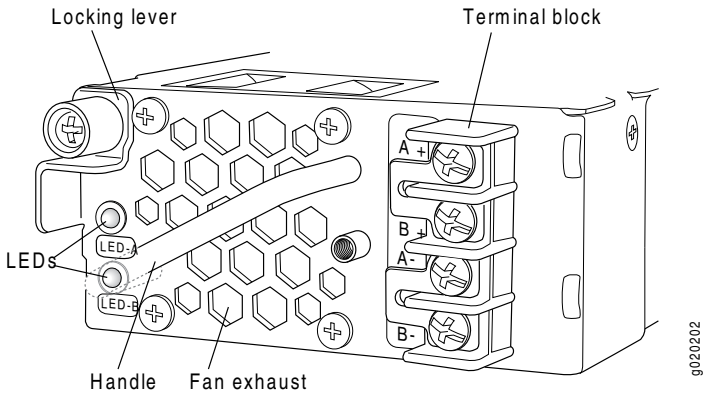
Related Topics

- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Connecting DC Power to an EX 3200 or EX 4200 Switch on page 81

Connecting DC Power to an EX 3200 or EX 4200 Switch

The power supply in an EX 3200 or EX 4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel.

Figure 44: DC Power Supply in EX 3200 and EX 4200 Switches



WARNING: DC-powered EX 3200 and EX 4200 switches are intended for installation only in a restricted access location.

Ensure that you have the following parts and tools available to connect DC power to an EX 3200 or EX 4200 switch:

- Electrostatic discharge (ESD) grounding strap
- DC power source cables (12–14 AWG) with ring lug (Molex 190700067 or equivalent) (not provided)
- Phillips (+) screwdriver, number 2

Before you begin connecting DC power to an EX 3200 or EX 4200 switch:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).
- Ensure that you have connected the switch chassis to earth ground.

CAUTION: Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the switch (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect EX 3200 and EX 4200 switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX-series Switch" on page 78.

- Install the power supply in the chassis. For instructions on installing a power supply in an EX 3200 or EX 4200 switch, see "Installing a Power Supply in an EX-series Switch" on page 107.

To connect DC power to an EX 3200 or EX 4200 switch:

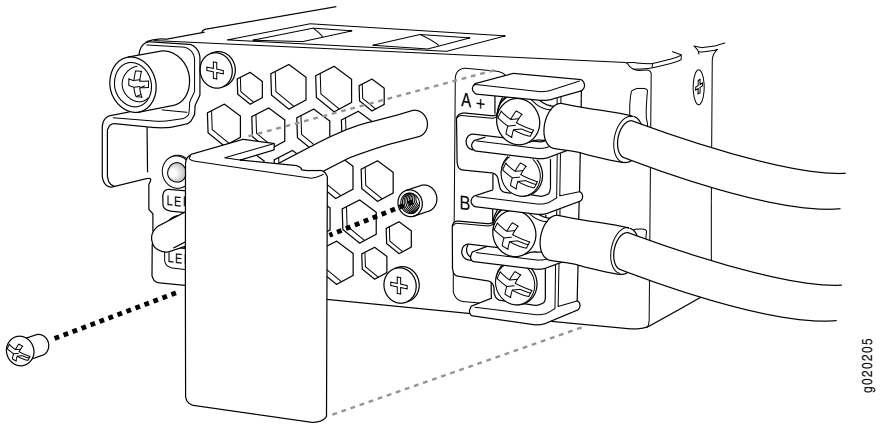
1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Ensure that the power supplies are fully inserted in the chassis and the screws on their faceplates are tightened.
3. Ensure that the input circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads will not become active while you are connecting DC power.

NOTE: The DC power supply in EX 3200 and EX 4200 switches has four terminals labeled A+, A–, B+, and B– (see Figure 44 on page 82) for connecting DC power source cables labeled positive (+) and negative (–). The DC power supplies for EX 3200 and EX 4200 switches are shipped with jumpers from A+ input to B+ input tied together and jumpers from A– input to B– input tied together.

NOTE: The A+ and B+ terminals are referred to as +RTN and A– and B– terminals are referred to as –48 V in "DC Power Wiring Sequence Warning for EX 3200 and EX 4200 Switches" on page 159 and "DC Power Electrical Safety Guidelines for EX 3200 and EX 4200 Switches" on page 157.

4. Remove the screw securing the terminal block cover using the Phillips (+) screwdriver, number 2 and remove the terminal block cover (see Figure 45 on page 83). Save the screw.

Figure 45: Removing the Terminal Block Cover in a DC Power Supply in EX 3200 and EX 4200 Switches



5. Remove the screws on the terminals using the Phillips (+) screwdriver, number 2. Save the screws.

WARNING: Ensure that the power cables do not block access to switch components or drape where people can trip on them.

6. Connect the power supplies to the power sources. Secure power source cables to the power supplies by screwing the ring lug attached to the cable to the appropriate terminal by using the screw from the terminal (see Figure 46 on page 85).

   - To connect a power supply to a power source:

     a. Leave the jumpers on the power supply terminals in place.

     b. Secure the ring lug of the positive (+) DC power source cable to the A+ or B+ terminal on the DC power supply.

     c. Secure the ring lug of the negative (–) DC power source cable to the A– or B– terminal on the DC power supply.

     d. Tighten the screws on the power supply terminals until snug using the Phillips (+) screwdriver, number 2. Do not overtighten—apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to the screws.

     If you have a second installed power supply, connect it in the same way you did the first.

   - To connect one power supply to two power sources:

     a. Remove the jumpers on the power supply terminal block.

     b. Secure the ring lug of the positive (+) DC power source cable from the first DC power source to the A+ terminal on the first DC power supply.

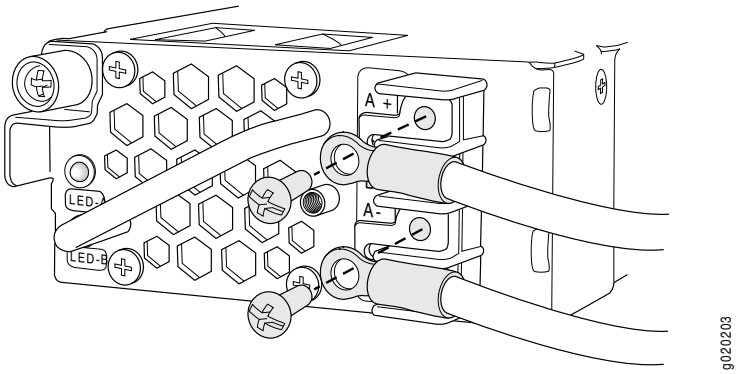
     c. Secure the ring lug of the negative (–) DC power source cable from the first DC power source to the A– terminal on the first DC power supply.

     d. Secure the ring lug of the positive (+) DC power source cable from the second DC power source to the A+ terminal on the second DC power supply.

     e. Secure the ring lug of the negative (–) DC power source cable from the second DC power source to the A– terminal on the second DC power supply.

     f. Tighten the screws on the power supply terminals on both the power supplies until snug using the Phillips (+) screwdriver, number 2. Do not overtighten—apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to the screws.

Figure 46: Securing Ring Lugs to the Terminals on the DC Power Supply in EX 3200 and EX 4200 Switches



7. Replace the terminal block cover and secure it using the screw. Use the Phillips (+) screwdriver, number 2 to tighten the screw.
8. Close the input circuit breaker.
9. Verify that the LEDs on the power supply are lit green and are on steadily.

"DC Power Supply LEDs in EX 3200 and EX 4200 Switches" on page 32 describes the LEDs on the DC power supplies in EX 3200 and EX 4200 switches.

Related Topics

- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Connecting AC Power to an EX 3200 or EX 4200 Switch on page 79

Connecting an EX-series Switch to a Network for Out-of-Band Management

EX-series switches have an out-of-band management port with an RJ-45 connector on the rear panel. If you need to monitor and manage an EX-series switch using a dedicated management channel, you can use the out-of-band management port to connect the EX-series switch to the management device.

Ensure you have an Ethernet cable with an RJ-45 connector available. One such cable is provided with the switch. Figure 49 on page 88 shows the RJ-45 connector of the Ethernet cable supplied with the switch.

To connect an EX-series switch to a network for out-of-band management (see Figure 47 on page 86 and Figure 48 on page 86):

1. Connect one end of the Ethernet cable to the management port (labelled MGMT) on the rear panel of the EX-series switch.
2. Connect the other end of the Ethernet cable to the network device.

Figure 47: Connecting an EX 3200 Switch to a Network for Out-of-Band Management

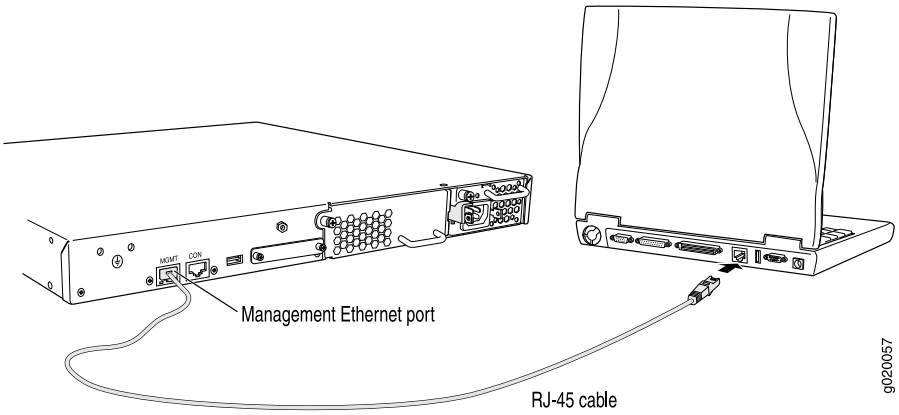


Figure 48: Connecting an EX 4200 Switch to a Network for Out-of-Band Management

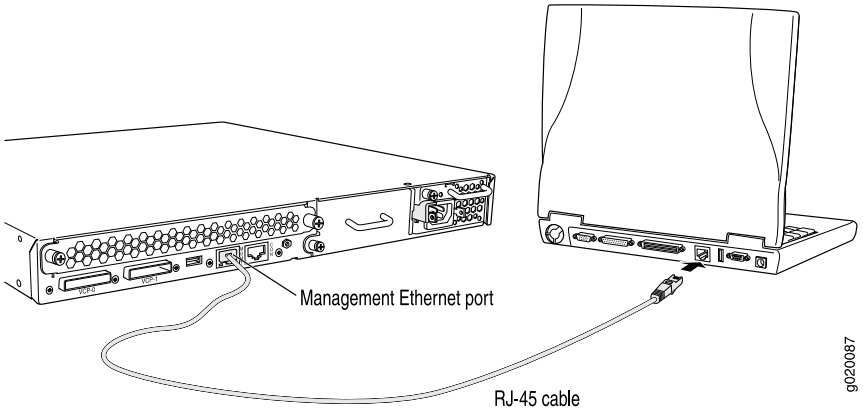
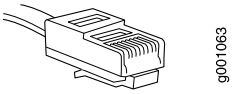


Figure 49: Ethernet Cable Connector



Related Topics

- Connecting an EX-series Switch to a Management Console on page 86
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12
- EX-series Switch—Management Port Connector Pinout Information on page 35

Connecting an EX-series Switch to a Management Console

EX-series switches have a console port with an RJ-45 connector on the rear panel. If you need to monitor and manage an EX-series switch using a dedicated console, you can use the console port to connect the EX-series switch to the console. You can also use the console port to connect the EX-series switch to a console server.

Ensure you have an Ethernet cable with an RJ-45 connector available. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the switch.
Figure 49 on page 88 shows the RJ-45 connector of the Ethernet cable supplied with the switch.

NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to an EX-series switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter.

To connect an EX-series switch to a management console (see Figure 50 on page 87 and Figure 51 on page 87):

1. Connect one end of the Ethernet cable into the console port (labelled CON) on the rear panel of the EX-series switch.
2. Connect the other end of the Ethernet cable into the management console.

Figure 50: Connecting an EX 3200 Switch to a Management Console

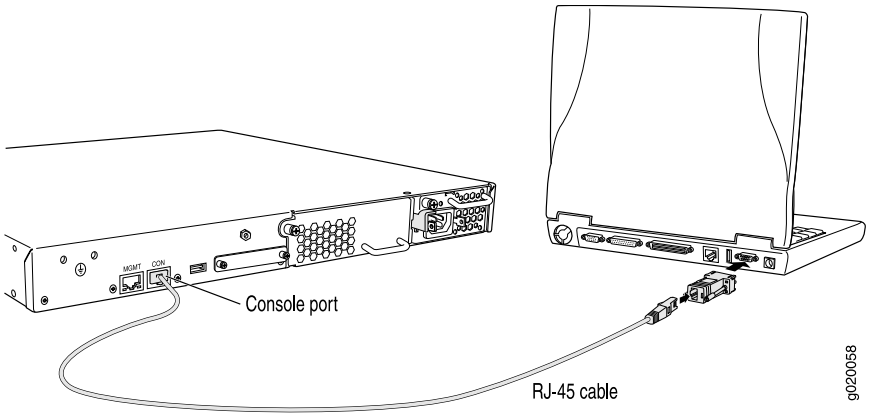


Figure 51: Connecting an EX 4200 Switch to a Management Console

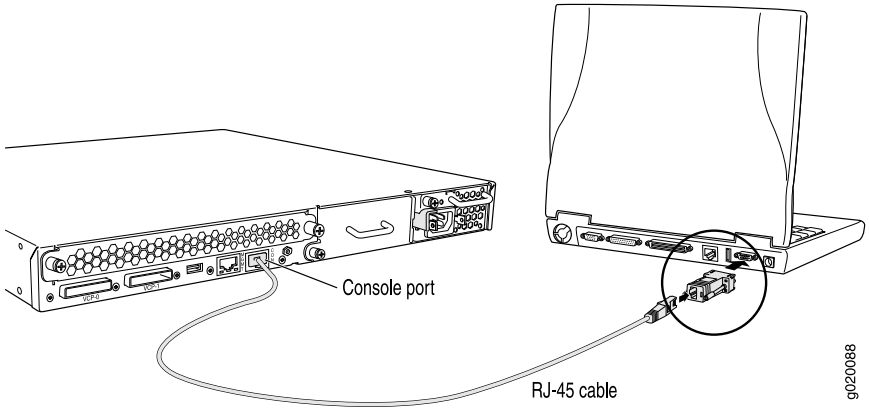
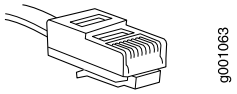


Figure 52: Ethernet Cable Connector



Related Topics

- Connecting an EX-series Switch to a Network for Out-of-Band Management on page 85
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12
- EX-series Switch—Console Port Connector Pinout Information on page 34

Connecting a Virtual Chassis Cable to an EX 4200 Switch

EX 4200 switches have two virtual chassis ports on the rear panel. You can use the virtual chassis ports to interconnect up to 10 EX 4200 switches, enabling them to operate as a unified single high bandwidth switch. To see illustrations of a few virtual chassis cabling configuration examples, see "Virtual Chassis Cabling Configuration Examples" on page 72.

Ensure you have the following tools and parts available to connect a virtual chassis cable to an EX 4200 switch:

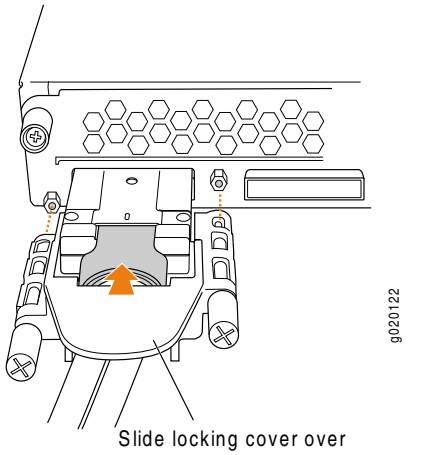
- Electrostatic discharge (ESD) grounding strap
- Cross-head screwdriver

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

To connect a virtual chassis cable to an EX-series switch (see Figure 53 on page 89):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Remove the virtual chassis cable from its bag. Take care not to touch module components, pins, leads, or solder connections.
3. Using both hands, place the virtual chassis cable connector in the empty virtual chassis port and slide it in gently until it is fully seated.
4. Slide the locking cover over the virtual chassis cable connector.
5. Tighten the screws on the locking cover by using the cross-head screwdriver.

Figure 53: Connecting a Virtual Chassis Cable to an EX 4200 Switch



NOTE: If you order virtual chassis cables separately, you should reuse the locking covers provided with the original cable or order virtual chassis cable locking covers also separately.

Related Topics

- Disconnecting a Virtual Chassis Cable from an EX-series Switch on page 113
- Understanding Virtual Chassis Hardware Configuration on page 58
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 58
- Virtual Chassis Ports Connector Pinout Information on page 42

Chapter 4

Connecting the Switch and Performing Initial Configuration

Connecting and Configuring an EX-series Switch

Connecting and Configuring the EX-series Switch (CLI Procedure)

There are two ways to connect and configure the EX-series switch: one method is through the console using the CLI and the other is using the J-Web interface. This section describes the CLI procedure.

To configure the switch from the console:

1. Connect the console port to a laptop or PC using the RJ-45 to DB-9 serial port adapter. The RJ-45 cable and RJ-45 to DB-9 serial port adapter are supplied with the switch.
2. At the shell prompt type ezsetup.
3. Enter the hostname. This is optional.
4. Enter the root password. You are prompted to re-enter the root password.
5. Enter **yes** to enable services like Telnet and SSH. By default, Telnet is not enabled and SSH is enabled.
6. Next, select one of the switch management options:
   - Configure in-band management. In this scenario you have the following two options:
     - Use the default VLAN.
     - Create a new VLAN—If you select this option, you are prompted to specify the VLAN name, VLAN ID, management IP address, default gateway. Select the ports that must be part of this VLAN.
   - Configure out-of-band management. Specify the IP address and gateway of the management interface. Use this IP address to connect to the switch.

7. Specify the SNMP Read Community, Location, and Contact to configure SNMP parameters. These parameters are optional.
8. Specify the system date and time. Select the time zone from the list. These options are optional.

   The configured parameters are displayed. Enter **yes** to commit the configuration.

   The configuration is committed as the active configuration for the switch. You can now log in with the CLI or the J-Web interface to continue configuring the switch. If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

Related Topics

- Connecting and Configuring the EX-series Switch (J-Web Procedure) on page 92
- Installing and Connecting an EX-series Switch on page 61
- EX-series Switch—LCD on page 24
- EX-series Switch Hardware Overview on page 3
- EX-series Switch Software Features Overview

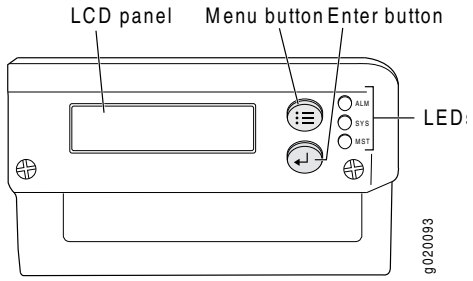
Connecting and Configuring the EX-series Switch (J-Web Procedure)

There are two ways to connect and configure the EX-series switch: one method is through the console using the CLI and the other is using the J-Web interface. This section describes the J-Web procedure.

NOTE: To obtain an IP address dynamically, you must enable a DHCP client on the management PC you connect to the switch. If you have configured a static IP on your PC, you will not be able to connect to the switch.

1. To transition the switch into initial setup mode, use the Menu and Enter buttons to the right of the LCD panel on the front panel of the switch (see Figure 54 on page 93):

Figure 54: LCD Panel



- Press Menu until you see MAINTENANCE MENU. Then press Enter.
- Press Menu until you see ENTER EZSetup. Then press Enter.

NOTE: If EZSetup does not appear as an option in the Maintenance menu, select Factory Default to return the switch to the factory default configuration. EZSetup is displayed in the menu only when the switch is set to the factory default configuration.

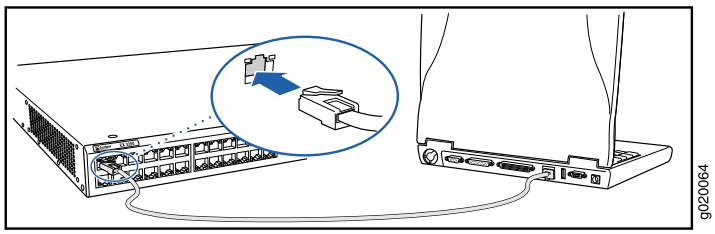
- Press Enter to confirm setup and continue with EZSetup.

The ge-0/0/0 interface on the front panel of the switch is configured as the DHCP server with the default IP address, 192.168.1.1. The switch can assign an IP address to the management PC in the IP address range 192.168.1.2 through 192.168.1.253.

NOTE: You must complete the initial configuration using the J-Web interface within 10 minutes. The LCD displays a count-down timer once you connect the switch to the management PC. The switch exits the EZSetup mode after 10 minutes and reverts to factory configuration, and the PC loses connectivity to the switch.

2. Insert one end of the Ethernet cable into the Ethernet port on the PC and connect the other end to port 0 (ge-0/0/0) on the front panel of the switch (see Figure 55 on page 94).

Figure 55: Connecting PC to Port 0



3. From the PC, open a Web browser, type **http://192.168.1.1** in the address field, and press Enter.
4. On the Login page, type **root** as the username, leave the password field blank, and click **Login**.
5. On the Introduction page, click **Next**.
6. On the Basic Settings page, modify the hostname, the root password, and date and time settings.
   - Enter the hostname. This is optional.
   - Enter a password and reenter the password.
   - Specify the time zone.
   - Synchronize the date and time settings of the switch with the management PC or set them manually by selecting the appropriate option button. This is optional.

   Click **Next**.
7. Use the Management Options page to select the management scenario:
   - **In-band Management-Use VLAN 'default' for management**.

     Select this option to configure all data interfaces as members of the default VLAN. Click **Next**. Specify the management IP address and the default gateway for the default VLAN.
   - **In-band Management-Create new VLAN for management**.

     Select this option to create a management VLAN. Click **Next**. Specify the VLAN name, VLAN ID, member interfaces, and management IP address and default gateway for the new VLAN.
   - **Out-of-band Management-Configure management port**.

     Select this option to configure only the management interface. Click **Next**. Specify the IP address and default gateway for the management interface.
8. Click **Next**.
9. On the Manage Access page, you may select options to enable Telnet, SSH, and SNMP services. For SNMP, you can configure the read community, location, and contact.

10. Click **Next**.
11. The Summary screen displays the configured settings. Click **Finish**.

The configuration is committed as the active configuration for the switch. You can now log in with the CLI or the J-Web interface to continue configuring the switch. If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

NOTE: After the configuration takes effect, you might lose connectivity between the PC and the switch. To renew the connection, release and renew the IP address by executing the appropriate commands on the management PC or by removing and re-inserting the Ethernet cable.

Related Topics

- Connecting and Configuring the EX-series Switch (CLI Procedure) on page 91
- Installing and Connecting an EX-series Switch on page 61
- EX-series Switch Hardware Overview on page 3
- EX-series Switch Software Features Overview
- EX-series Switch—LCD on page 24

Part 3

Hardware Maintenance, Replacement, and Troubleshooting

Chapter 5

Replacing Hardware Components

Field-Replaceable Units in EX-series Switches

Field-replaceable units (FRUs) are components that you can replace at your site. The field-replaceable units (FRUs) in EX-series switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- XFP transceiver

NOTE: Uplink modules are not part of the standard package and must be ordered separately.

Related Topics

- Installing a Power Supply in an EX-series Switch on page 107
- Removing a Power Supply from an EX-series Switch on page 108
- Installing a Fan Tray in an EX-series Switch on page 110

- Removing a Fan Tray from an EX-series Switch on page 112
- Installing an Uplink Module in an EX-series Switch on page 101
- Removing an Uplink Module from an EX-series Switch on page 102
- Installing an SFP or XFP Transceiver in an EX-series Switch on page 104
- Removing an SFP or XFP Transceiver from an EX-series Switch on page 106

Installing and Removing EX-series Switch Hardware Components

The EX-series switch chassis is a rigid sheet-metal structure that houses the other hardware components. The field-replaceable units (FRUs) in EX-series switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- XFP transceiver

The power supply, fan tray, SFP transceiver, and XFP transceiver in EX-series switches are hot-removable and hot-insertable FRUs: you can remove and replace them while the switch is functioning without turning off power to the switch or disrupting switch functions. The uplink module is not hot-removable and hot-insertable: you must turn off power to the switch before removing or installing it.

To install a power supply in an EX-series switch, follow instructions in "Installing a Power Supply in an EX-series Switch" on page 107. To remove a power supply from an EX-series switch, follow instructions in "Removing a Power Supply from an EX-series Switch" on page 108.

To install a fan tray in an EX-series switch, follow instructions in "Installing a Fan Tray in an EX-series Switch" on page 110. To remove a fan tray from an EX-series switch, follow instructions in "Removing a Fan Tray from an EX-series Switch" on page 112.

To install an uplink module in an EX-series switch, follow instructions in "Installing an Uplink Module in an EX-series Switch" on page 101. To remove an uplink module from an EX-series switch, follow instructions in "Removing an Uplink Module from an EX-series Switch" on page 102.

To install an SFP or XFP transceiver in an EX-series switch, follow instructions in "Installing an SFP or XFP Transceiver in an EX-series Switch" on page 104. To remove an SFP or XFP transceiver from an EX-series switch, follow instructions in "Removing an SFP or XFP Transceiver from an EX-series Switch" on page 106.

Related Topics

- Cooling System in an EX 3200 Switch on page 30
- Cooling System in an EX 4200 Switch on page 32
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- EX 3200 Switch—Front-Panel Description on page 9

- EX 4200 Switch—Front-Panel Description on page 11
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21

Installing an Uplink Module in an EX-series Switch

EX-series switches have a field-replaceable unit (FRU) uplink module on the front panel. The uplink module in an EX-series switch is not hot-removable and hot-insertable.

NOTE: If you insert a transceiver in an SFP uplink module installed in an EX 3200 switch, a corresponding network port from the last four ports is disabled. For example, if you insert an SFP transceiver in ge-0/1/3, ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

Ensure you have the following tools and parts available to install an uplink module in an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Cross-head screwdriver (provided in the uplink module kit)

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

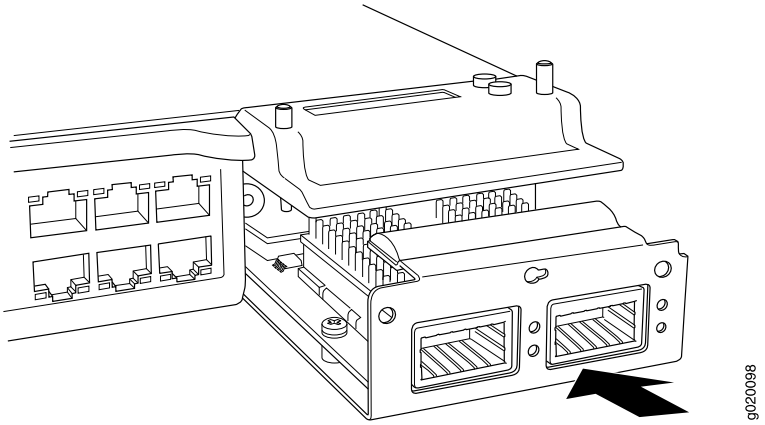
To install an uplink module in an EX-series switch (see Figure 56 on page 102):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. If the switch is on, power it off. Ensure that the AC OK LED on the power supply is unlit.
3. Loosen the screws that secure the flip-up door covering the empty uplink module slot on the front panel of the chassis by using the cross-head screwdriver, flip the door upward, and remove the blanking panel covering the empty uplink module slot.
4. Remove the uplink module from its bag. Take care not to touch module components, pins, leads, or solder connections.

CAUTION: Ensure the uplink module is aligned correctly when you slide it into the slot; misalignment might bend the pins and make the uplink module unusable.

5. Using both hands, place the module in the empty slot and slide it in gently until it is fully seated.
6. Flip the door down and tighten the screws by using the cross-head screwdriver.
7. Power on the switch. Ensure that the AC OK LED on the power supply is lit and is on steadily.

Figure 56: Installing an Uplink Module in an EX-series Switch



Related Topics

- Removing an Uplink Module from an EX-series Switch on page 102
- Installing and Removing EX-series Switch Hardware Components on page 100
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21

Removing an Uplink Module from an EX-series Switch

If your EX-series switch includes an optional field-replaceable unit (FRU) uplink module, it is installed in the switch's front panel. The uplink module in an EX-series switch is not hot-removable and hot-insertable.

Ensure you have the following tools and parts available to remove an uplink module from an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Cross-head screwdriver (provided in the uplink module kit)
- An electrostatic bag or antistatic mat

Ensure you understand how to prevent ESD damage (see “Preventing Electrostatic Discharge Damage” on page 138).

To remove an uplink module from an EX-series switch:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. If the switch is on, power it off. Ensure that the AC OK LED on the power supply is unlit.

3. Loosen the screws that secure the flip-up door covering the uplink module slot on the front panel of the chassis by using the cross-head screwdriver provided with the uplink module kit and flip the door upward.
4. Insert the ball end of the screwdriver in the keyhole on the front panel of the uplink module and slide the screwdriver to the narrow part of the keyhole (see Figure 57 on page 103).

CAUTION: Ensure the screwdriver does not slip out of the keyhole when you pull the uplink module out of the switch chassis.

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5. Using both hands, gently pull the screwdriver to slide the uplink module halfway out of the chassis (see Figure 58 on page 104).
6. Place one hand under the uplink module to support it and slide it completely out of the chassis.
7. Slide the screwdriver out of the keyhole.
8. Place the uplink module in the electrostatic bag or on the antistatic mat.

Figure 57: Sliding the Screwdriver to the Narrow Part of the Keyhole

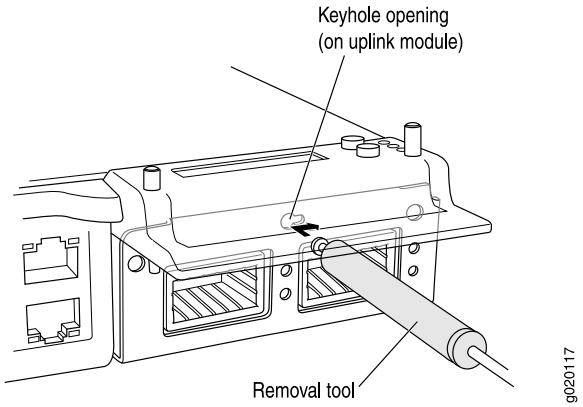
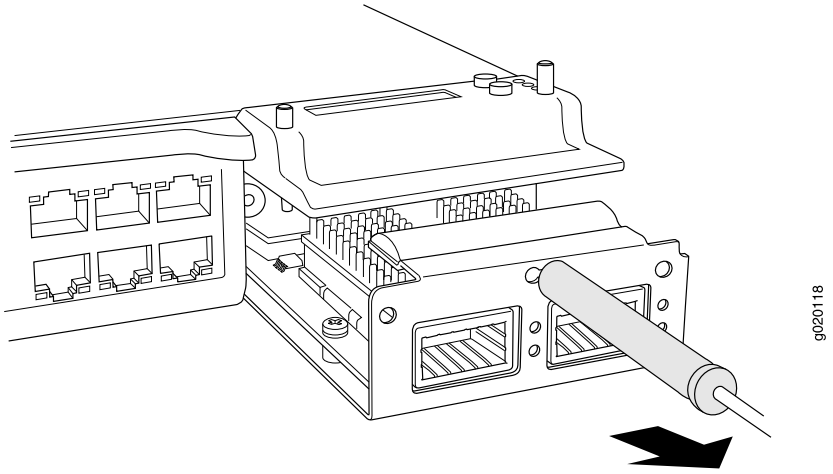


Figure 58: Removing an Uplink Module from an EX-series Switch



Related Topics

- Installing an Uplink Module in an EX-series Switch on page 101
- Installing and Removing EX-series Switch Hardware Components on page 100
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

Installing an SFP or XFP Transceiver in an EX-series Switch

EX-series switches have a field-replaceable unit (FRU) uplink module on the front panel. You can install four SFP transceivers in the SFP uplink module and two XFP transceivers in the XFP uplink module. The SFP and XFP transceivers in EX-series switches are hot-removable and hot-insertable.

NOTE: If you insert a transceiver in an SFP uplink module installed in an EX 3200 switch, a corresponding network port from the last four ports is disabled. For example, if you insert an SFP transceiver in ge-0/1/3, ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

Ensure that you understand safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings" on page 143) and have the following tools and parts available to install an SFP or XFP transceiver in an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- A rubber safety cap for the transceiver

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

To install an SFP or XFP transceiver in an uplink module installed in an EX-series switch (see Figure 59 on page 105):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Remove the SFP or XFP transceiver from its bag.
3. Ensure that the transceiver is covered by a rubber safety cap. If it is not, cover the transceiver with a safety cap.
4. Remove the dust cover covering the port in the uplink module. Save the dust cover in case you need to cover the port later.
5. Using both hands, carefully place the transceiver in the empty port in the uplink module. The connectors should face the uplink module.

CAUTION: Ensure the transceiver is aligned correctly when you slide it into the port; misalignment might bend the pins and make the transceiver unusable.

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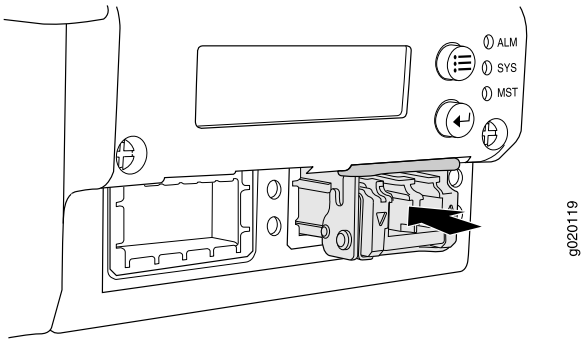
6. Slide the transceiver in gently until it is fully seated.
7. Remove the rubber safety cap when you are ready to connect the cable to the transceiver.

Figure 59: Installing an SFP or XFP Transceiver in an EX-series Switch



Related Topics

- Removing an SFP or XFP Transceiver from an EX-series Switch on page 106
- Removing an Uplink Module from an EX-series Switch on page 102
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21
- Installing and Removing EX-series Switch Hardware Components on page 100
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

Removing an SFP or XFP Transceiver from an EX-series Switch

EX-series switches have a field-replaceable unit (FRU) uplink module on the front panel. You can install two SFP transceivers in the SFP uplink module and four XFP transceivers in the XFP uplink module. The SFP and XFP transceivers in EX-series switches are hot-removable and hot-insertable.

Ensure you have the following tools and parts available to remove an SFP or XFP transceiver from an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- An electrostatic bag or antistatic mat
- Needlenose pliers
- A rubber safety cap for the transceiver
- A dust cover for the port

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

To remove an SFP or XFP transceiver from an uplink module installed in an EX-series switch (see Figure 60 on page 107):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Label the cable connected to the transceiver so that you can reconnect it correctly.

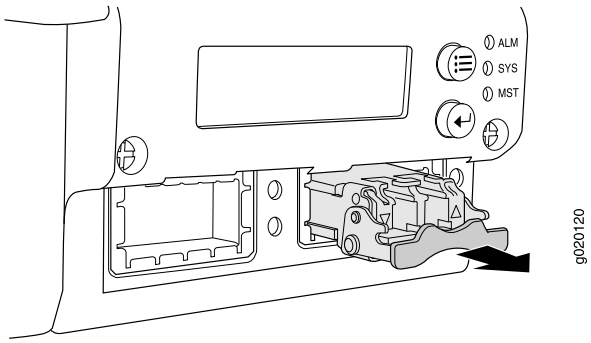
WARNING: Do not look directly into a fiber-optic transceiver or into the end of a fiber-optic cable. Fiber-optic transceivers contain laser light sources that can damage your eyes.

3. Remove the cable connector plugged into the transceiver.
4. Pull the ejector handle out from the transceiver to unlock the transceiver.

CAUTION: Make sure you open the ejector handle completely until you hear it click. This prevents damage to the transceiver.

5. Using the needlenose pliers, pull the ejector handle out from the transceiver.
6. Grasp the transceiver ejector handle and gently slide the transceiver approximately 0.5 in (1.3 cm) out of the uplink module.
7. Grasp the body of the transceiver and pull it out of the uplink module.
8. Place the rubber safety cap over the transceiver.
9. Place the transceiver in the electrostatic bag or on the antistatic mat.
10. Place a dust cover over the empty port in the uplink module.

Figure 60: Removing an SFP or XFP Transceiver from an EX-series Switch



Related Topics

- Installing an SFP or XFP Transceiver in an EX-series Switch on page 104
- Installing an Uplink Module in an EX-series Switch on page 101
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21
- Installing and Removing EX-series Switch Hardware Components on page 100
- Laser and LED Safety Guidelines and Warnings on page 143
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Front-Panel Description on page 9
- EX 4200 Switch—Front-Panel Description on page 11

Installing a Power Supply in an EX-series Switch

The power supply in EX-series switches is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel.

Ensure you have the following tools and parts available to install a power supply in an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 2

Ensure you understand how to prevent ESD damage (see “Preventing Electrostatic Discharge Damage” on page 138).

To install a power supply in an EX-series switch (see Figure 61 on page 108):

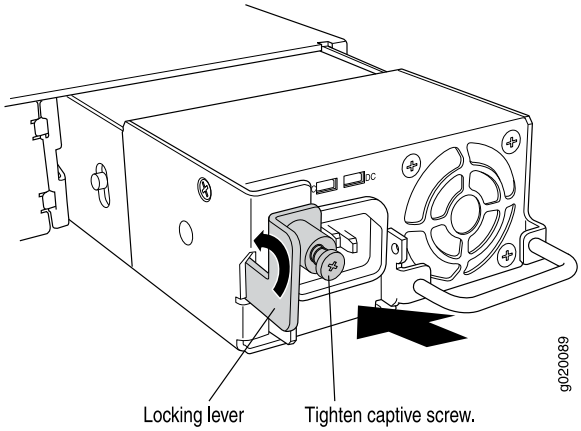
1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Remove the power supply from its bag. Take care not to touch power supply components, pins, leads, or solder connections.
3. Loosen the locking lever screw on the left front of the power supply by using a Phillips (+) screwdriver, number 2.
4. Push down on the locking lever until it is in its lowest position.

5. Using both hands, place the power supply in the power supply slot on the rear panel of the switch and slide it in until it is fully seated.

NOTE: The handle on the 320 W power supply used in an EX-series switch is at the bottom while the handle on the 600 W or 930 W power supply used in an EX-series switch is at the top.

6. Push the locking lever up to its highest position (this action might pull the power supply in).
7. Tighten the locking lever screw by using a Phillips (+) screwdriver, number 2.

Figure 61: Installing a Power Supply in an EX-series Switch



NOTE: Each power supply must be connected to a dedicated power source outlet.

Related Topics

- Removing a Power Supply from an EX-series Switch on page 108
- Installing and Removing EX-series Switch Hardware Components on page 100
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Field-Replaceable Units in EX-series Switches on page 99
- AC Power, Connection, and Power Cord Specifications on page 56
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Removing a Power Supply from an EX-series Switch

The power supply in EX-series switches is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel.

Ensure you have the following tools and parts available to remove a power supply from an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 2
- An electrostatic bag or antistatic mat

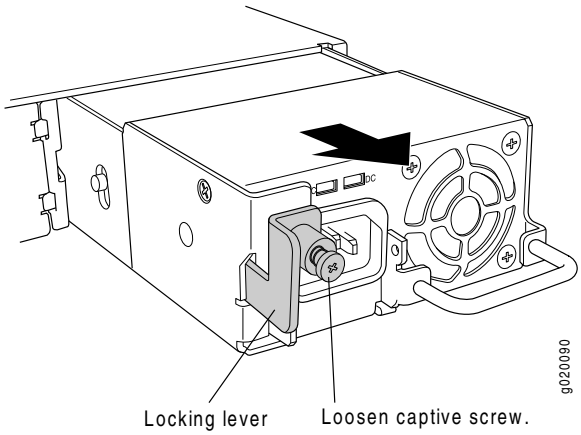
Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

CAUTION: Do not leave the power supply slot empty for a long time while the switch is on. The power supply must remain in the chassis for proper airflow.

To remove a power supply from an EX-series switch (see Figure 62 on page 110):

1. Place an electrostatic bag or antistatic mat on a flat, stable surface so you can keep the power supply on it.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. Disconnect power from the switch by performing one of the following:
   - If the power source outlet has a power switch, set it to the OFF (0) position.
   - If the power source outlet does not have a power switch, gently pull out the male end of the power cord connected the power source outlet.
4. Remove the power cord from the appliance inlet on the power supply faceplate. For instructions on removing the power cord from the appliance inlet, see "Connecting AC Power to an EX 3200 or EX 4200 Switch" on page 79.
5. Loosen the locking lever screw on the left front of the power supply by using a Phillips (+) screwdriver, number 2.
6. Push down on the locking lever until it is in its lowest position.
7. Grasp the power supply handle and pull firmly to slide it halfway out of the chassis.
8. Place one hand under the power supply to support it and slide it completely out of the chassis. Take care not to touch power supply components, pins, leads, or solder connections.
9. Place the power supply in the electrostatic bag or on the antistatic mat.

Figure 62: Removing a Power Supply from an EX-series Switch



Related Topics

- Installing a Power Supply in an EX-series Switch on page 107
- Installing and Removing EX-series Switch Hardware Components on page 100
- Power Supply in EX 3200 and EX 4200 Switches on page 27
- Field-Replaceable Units in EX-series Switches on page 99
- AC Power, Connection, and Power Cord Specifications on page 56
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Installing a Fan Tray in an EX-series Switch

EX-series switches have a single field-replaceable unit (FRU) fan tray on the rear panel. The fan tray is hot-removable and hot-insertable FRU: you can remove and replace it while the switch is functioning without turning off power to the switch or disrupting switch functions.

Ensure you have the following tools and parts available to install a fan tray in an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 2

Ensure you understand how to prevent ESD damage (see “Preventing Electrostatic Discharge Damage” on page 138).

To install a fan tray in an EX-series switch chassis (see Figure 63 on page 111 and Figure 64 on page 111):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

CAUTION: If you are installing a fan tray in an EX 3200 switch, ensure the fan faces upwards. If you are installing a fan tray in an EX 4200 switch, ensure the fans face downwards.

2. Remove the fan tray from its bag. Using both hands, align the tray with the fan tray guides on the fan tray slot on the rear panel of the chassis and slide it in until it is fully seated.
3. Tighten the screw or screws on the fan tray by using a Phillips (+) screwdriver, number 2.

Figure 63: Installing a Fan Tray in an EX 3200 Switch

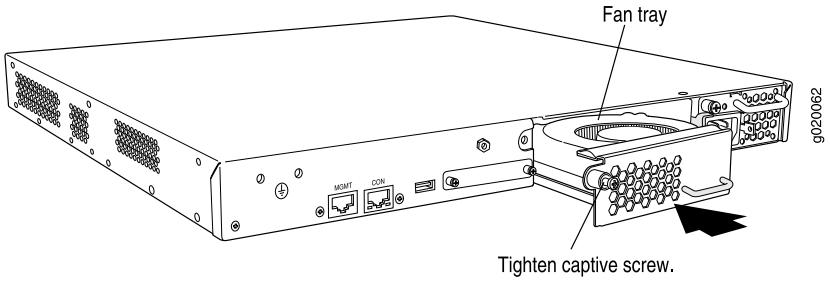
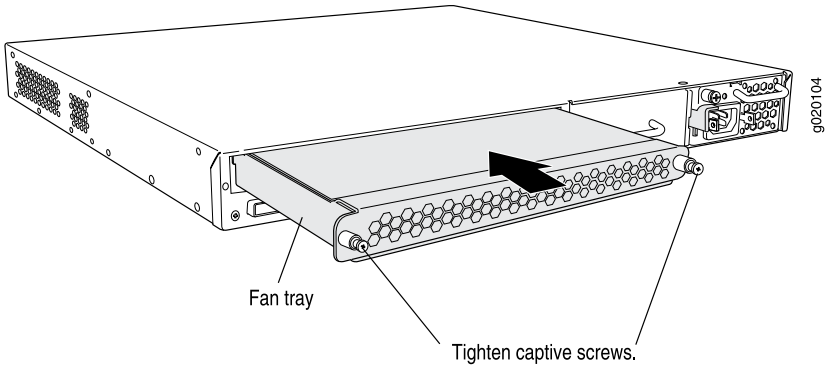


Figure 64: Installing a Fan Tray in an EX 4200 Switch



Related Topics

- Removing a Fan Tray from an EX-series Switch on page 112
- Installing and Removing EX-series Switch Hardware Components on page 100
- Cooling System in an EX 3200 Switch on page 30
- Cooling System in an EX 4200 Switch on page 32
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Removing a Fan Tray from an EX-series Switch

EX-series switches have a single field-replaceable unit (FRU) fan tray on the rear panel. The fan tray is hot-removable and hot-insertable FRU: you can remove and replace it while the switch is functioning without turning off power to the switch or disrupting switch functions.

Ensure you have the following tools and parts available to remove a fan tray from an EX-series switch chassis:

- Electrostatic discharge (ESD) grounding strap
- Phillips (+) screwdriver, number 2
- An electrostatic bag or antistatic mat

Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

To remove a fan tray from an EX-series switch (see Figure 65 on page 112 and Figure 66 on page 113):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Loosen the screw or screws securing the fan tray by using a Phillips (+) screwdriver, number 2.

WARNING: To avoid injury, do not touch the fan with your hands or any tools as you slide the fan tray out of the chassis—the fan may still be running.

3. Grasp the handle on the fan tray and pull firmly to slide the fan tray halfway out of the chassis.
4. When the fan stops spinning, slide the fan tray completely out of the chassis.
5. Place the fan tray in the electrostatic bag or on the antistatic mat.

Figure 65: Removing a Fan Tray from an EX 3200 Switch

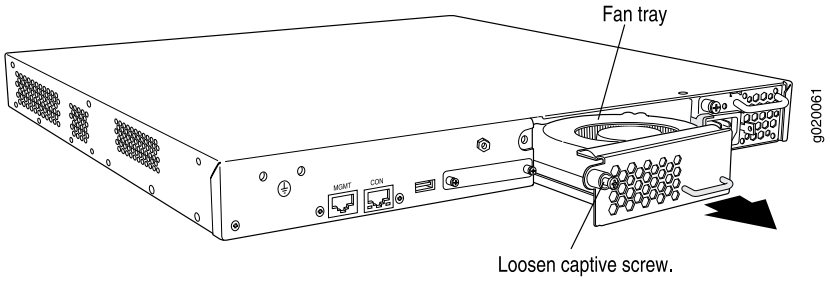
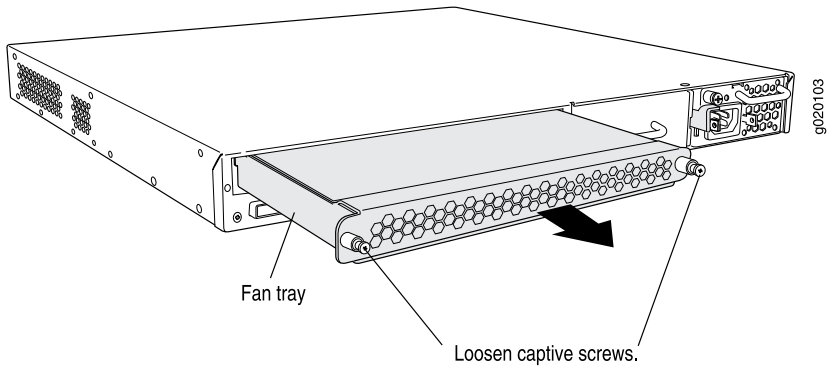


Figure 66: Removing a Fan Tray from an EX 4200 Switch



NOTE: When a fan tray is removed, **Fan/Blower is Absent** is logged in the system log and the system raises a minor alarm.

Related Topics

- Installing a Fan Tray in an EX-series Switch on page 110
- Installing and Removing EX-series Switch Hardware Components on page 100
- Cooling System in an EX 3200 Switch on page 30
- Cooling System in an EX 4200 Switch on page 32
- Field-Replaceable Units in EX-series Switches on page 99
- EX 3200 Switch—Rear-Panel Description on page 10
- EX 4200 Switch—Rear-Panel Description on page 12

Disconnecting a Virtual Chassis Cable from an EX-series Switch

If you need to disconnect an EX 4200 switch from a virtual chassis configuration, you need to disconnect the virtual chassis cable from the virtual chassis ports.

Ensure you have the following tools and parts available to disconnect a virtual chassis cable from an EX-series switch:

- Electrostatic discharge (ESD) grounding strap
- Cross-head screwdriver

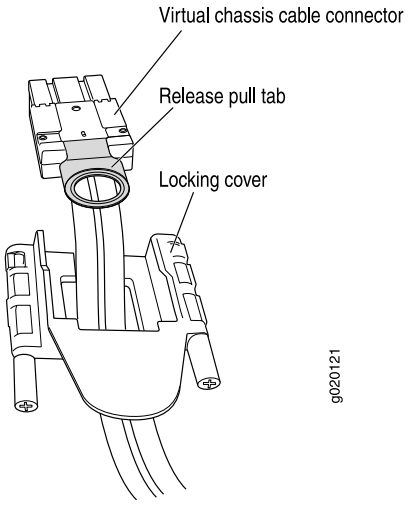
Ensure you understand how to prevent ESD damage (see "Preventing Electrostatic Discharge Damage" on page 138).

To disconnect a virtual chassis cable from an EX 4200 switch (see Figure 67 on page 114):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
2. Loosen the screws on the locking cover by using the cross-head screwdriver.

3. Slide the locking cover back.
4. Gently pull the release pull tab on the virtual chassis cable connector to release the lock holding the virtual chassis cable connector in the virtual chassis port.
5. Gently pull the virtual chassis cable connector out of the virtual chassis port.

Figure 67: Virtual Chassis Cable Connector in an EX 4200 Switch



NOTE: If you order virtual chassis cables separately, you should reuse the locking covers provided with the original cable or order virtual chassis cable locking covers also separately.

Related Topics

- Connecting a Virtual Chassis Cable to an EX 4200 Switch on page 88
- Understanding Virtual Chassis Hardware Configuration on page 58
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 58
- Virtual Chassis Ports Connector Pinout Information on page 42

Replacing a Member Switch of a Virtual Chassis Configuration (CLI Procedure)

You can replace a member switch of a Virtual Chassis configuration without disrupting network service for the other members. You can retain the existing configuration of the member switch and apply it to a new member switch, or you can free up the member ID and make it available for assignment to a new member switch.

To replace a member switch, use the procedure that matches what you need to accomplish:

- Remove, Repair, and Reinstall the Same Switch on page 115
- Remove a Member Switch, Replace with a Different Switch, and Reapply the Old Configuration on page 115
- Remove a Member Switch and Make Its Member ID Available for Reassignment to a Different Switch on page 116

Remove, Repair, and Reinstall the Same Switch

If you need to repair a member switch, you can remove it from the Virtual Chassis configuration without disrupting network service for the other members. The master stores the configuration of the member ID so that it can be reapplied when the member switch (with the same base MAC address) is reconnected.

1. Power off and disconnect the member switch to be repaired.
2. Repair, as necessary.
3. Reconnect and power on the member switch.

Remove a Member Switch, Replace with a Different Switch, and Reapply the Old Configuration

If you are unable to repair a member switch, you can replace it with a different member switch and retain the old configuration. The master stores the configuration of the member that was removed. When you connect a different member switch, the master assigns a new member ID. But the old configuration is still stored under the previous member ID of the previous member switch.

NOTE: If you have used a preprovisioned configuration, use the replace command to change the serial number in the Virtual Chassis configuration file. Substitute the serial number of the replacement member switch (on the back of the switch) for the serial number of the member switch that was removed.

1. Power off and disconnect the member switch to be replaced.
2. If the replacement member switch has been previously configured, revert that switch's configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX-series Switch.
3. Connect and power on the replacement member switch.
4. Note the member ID displayed on the front panel.
5. Use the request virtual-chassis renumber command to change the member switch's current member ID to the member ID that belonged to the member switch that was removed from the Virtual Chassis configuration).

Remove a Member Switch and Make Its Member ID Available for Reassignment to a Different Switch

When you remove a member switch from the Virtual Chassis configuration, the master keeps its member ID on reserve. To make that member switch's member ID available for reassignment, use the request virtual-chassis recycle command.

NOTE: When you add or delete members in a Virtual Chassis configuration, internal routing changes might cause temporary traffic loss for a few seconds.

Related Topics

- Monitoring Virtual Chassis Configuration Status and Statistics
- Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure) on page 75

Chapter 6

Contacting Customer Support and Returning Hardware

Returning an EX-series Switch or Component for Repair or Replacement

If you need to return a switch or hardware component to Juniper Networks for repair or replacement, follow this procedure:

1. Determine the serial number of the component. For instructions, see "Locating an EX-series Switch or Switch Component Serial Number" on page 117.
2. Obtain an RMA number from JTAC as described in "Contacting Customer Support to Obtain Return Materials Authorization" on page 119.

NOTE: Do not return any component to Juniper Networks unless you have first obtained an RMA number. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer via collect freight.

3. Pack the switch or component for shipping as described in "Packing an EX-series Switch or Component for Shipping" on page 120.

For more information about return and repair policies, see the customer support page at http://www.juniper.net/support/guidelines.html.

Related Topics

- EX-series Switch Hardware Overview on page 3

Locating an EX-series Switch or Switch Component Serial Number

If you are returning a switch or hardware component to Juniper Networks for repair or replacement, you must locate the serial number of the switch or component. You

must provide the serial number to the Juniper Networks Technical Assistance Center (JTAC) when you contact them to obtain Return Materials Authorization (RMA).

If the switch is operational and you can access the command-line interface (CLI), you can list serial numbers for the switch and for some components with a CLI command. If you do not have access to the CLI or if the serial number for the component does not appear in the command output, you can locate the serial number label on the physical switch or component (see Figure 68 on page 118 and Figure 69 on page 119).

NOTE: If you have to find the serial number on the physical switch component, you will need to remove the component from the switch chassis, so you must have the required removal tools and parts available.

Listing the Switch and Switch Components Details with the CLI

To list the switch and switch components and their serial numbers, enter the following command-line interface (CLI) command:

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                AL0207391164      EX3200-48T
FPC 0            REV X1   711-021265   AL0207391164      EX3200-48T, 8 POE
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10/100/1000 Base-T
Fan Tray                                                 Fan Tray
```

For information about the **show chassis hardware** command, see the *JUNOS Software System Basics and Services Command Reference* at http://www.juniper.net/techpubs/software/junos/junos90/index.html

Locating EX 3200 and EX 4200 Chassis Serial Number Labels

EX 3200 and EX 4200 switches have serial number ID labels located on the rear panel of the chassis (see Figure 68 on page 118 and Figure 69 on page 119).

Figure 68: Location of the Serial Number Label on EX 3200 Switches

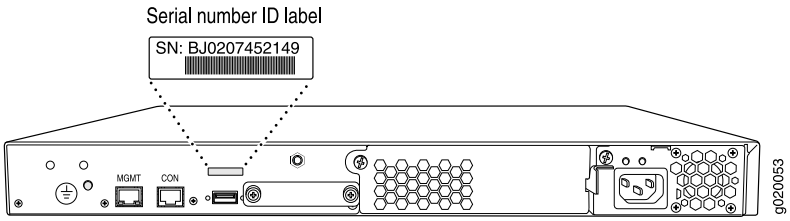
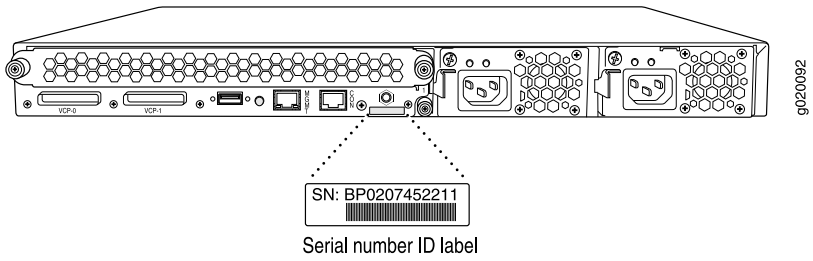


Figure 69: Location of the Serial Number Label on EX 4200 Switches



Locating Switch FRU Component Serial Numbers

The power supplies, fan trays, and uplink modules installed in EX-series switches are field-replaceable units (FRUs).

For each of these FRUs, you must remove the FRU from the switch chassis to see the FRU's serial number.

- **Power Supply**—The serial number is on the top of the power supply. See "Removing a Power Supply from an EX-series Switch" on page 108.
- **Fan tray**—The serial number is on the back of the fan tray. See "Removing a Fan Tray from an EX-series Switch" on page 112.
- **Uplink module**—The serial number is on the circuit board. See "Removing an Uplink Module from an EX-series Switch" on page 102.

Related Topics

- Contacting Customer Support to Obtain Return Materials Authorization on page 119
- Returning an EX-series Switch or Component for Repair or Replacement on page 117

Contacting Customer Support to Obtain Return Materials Authorization

If you are returning a switch or hardware component to Juniper Networks for repair or replacement, obtain a Return Materials Authorization (RMA) from Juniper Networks Technical Assistance Center (JTAC).

After locating the serial number of the switch or hardware component you want to return, open a Case with Juniper Networks Technical Assistance Center (JTAC) on the Web or by telephone. For instructions on locating the serial number of the switch or hardware component you want to return, see "Locating an EX-series Switch or Switch Component Serial Number" on page 117.

Before you request an RMA from JTAC, be prepared to provide the following information:

- Your existing case number, if you have one
- Serial number of the component
- Your name, organization name, telephone number, fax number, and shipping address

- Details of the failure or problem
- Type of activity being performed on the switch when the problem occurred
- Configuration data displayed by one or more show commands

You can contact JTAC 24 hours a day, seven days a week on the Web or by telephone:

- Case Manager at CSC: http://www.juniper.net/cm/
- Telephone: + 1-888-314-JTAC (+ 1-888-314-5822, toll free in U.S., Canada, and Mexico)

NOTE: For international or direct-dial options in countries without toll free numbers, go to http://www.juniper.net/support/requesting-support.html

If you are contacting JTAC by telephone, enter your 11-digit case number followed by the pound (#) key if this is an existing case, or press the star (*) key to be routed to the next available support engineer.

The support representative validates your request and issues an RMA number for return of the component.

Related Topics

- Packing an EX-series Switch or Component for Shipping on page 120
- Returning an EX-series Switch or Component for Repair or Replacement on page 117

Packing an EX-series Switch or Component for Shipping

If you are returning a switch or component to Juniper Networks for repair or replacement, pack the item as described in this topic.

Before you begin packing an EX-series switch or component, ensure you have:

- Retrieved the original shipping carton and packing materials. Contact your JTAC representative if you do not have these materials, to learn about approved packing materials. See “Contacting Customer Support to Obtain Return Materials Authorization” on page 119.
- Obtained an RMA number.
- Obtained the following tools and parts:
  - Blank panels to cover empty slots (for switch return)
  - Electrostatic bag or antistatic mat, one for each component
  - Electrostatic discharge (ESD) grounding wrist strap
  - Flat-blade screwdriver, approximately 1/4 in. (6 mm)
  - Phillips (+) screwdrivers, numbers 1 and 2

This topic describes:

- Packing an EX-series Switch for Shipping on page 121
- Packing EX-series Switch Components for Shipping on page 122

Packing an EX-series Switch for Shipping

To pack an EX-series switch for shipping:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to the ESD point on the chassis or to an outside ESD point if the switch is disconnected from earth ground. For more information about ESD, see "Preventing Electrostatic Discharge Damage" on page 138.
2. On the console or other management device connected to the switch (to the master switch in a virtual chassis), enter the CLI operational mode and issue the following command to shut down the switch software:

   ```
   user@switch> request system halt
   ```

   Wait until a message appears on the console confirming that the operating system has halted. For information about the **request system halt** command, see the *JUNOS Software System Basics and Services Command Reference* at http://www.juniper.net/techpubs/software/junos/junos90/index.html.
3. Disconnect power from the switch by performing one of the following:
   - If the power source outlet has a power switch, set it to the OFF (0) position.
   - If the power source outlet does not have a power switch, gently pull out the male end of the power cord connected the power source outlet.
4. Remove the cables that connect the switch to all external devices.
5. Remove all field-replaceable units (FRUs) from the switch.
6. If the switch is installed on a wall or rack, have one person support the weight of the switch while another person unscrews and removes the mounting screws.
7. Cover the switch with an ESD bag, and place the packing foam on top of and around the switch.
8. Place the switch in the shipping carton.
9. If you are returning accessories or FRUs with the EX-series switch, pack them as instructed in "Packing EX-series Switch Components for Shipping" on page 122.
10. Replace the accessory box on top of the packing foam.
11. Securely tape the box closed.
12. Write the RMA number on the exterior of the box to ensure proper tracking.

Packing EX-series Switch Components for Shipping

CAUTION: Do not stack switch components. Return individual components in separate boxes if they do not fit together on one level in the shipping box.

To pack and ship EX-series switch components:

- Place individual boards in electrostatic bags.
- Ensure that the components are adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Securely tape the box closed.
- Write the RMA number on the exterior of the box to ensure proper tracking.

Related Topics

- Returning an EX-series Switch or Component for Repair or Replacement on page 117

Part 4
Safety and Regulatory Compliance Information

Chapter 7

Safety and Regulatory Compliance Information

Compliance

Agency Approvals

The EX-series switch complies with the following standards:

- Safety
  - CAN/CSA-22.2 No. 60950–1–03/UL 60950–1. Safety of Information Technology Equipment
  - EN 60950–1:2001. Safety of Information Technology Equipment
  - EN 60825-1 Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide
- EMC
  - FCC 47CFR Part 15 Class A (USA)
  - EN 55022 Class A Emissions (Europe)
  - ICES-003 Class A
  - VCCI Class A (Japan)
  - AS/NZS CISPR 22 Class A (Australia/New Zealand)
  - CISPR 22 Class A
  - EN 55024
  - EN 300386

- EN 61000-3-2 Power Line Harmonics
- EN 61000-3-3 Voltage Fluctuations and Flicker
- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Common Immunity
- EN 61000-4-11 Voltage Dips and Sags

Related Topics
- Compliance Statements for EMC Requirements on page 126
- Compliance Statements for Acoustic Noise on page 128

Compliance Statements for EMC Requirements

Canada This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should ensure that it is permissible to connect the equipment to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

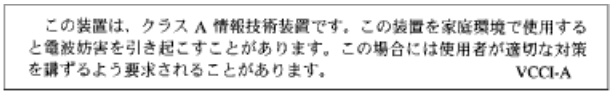
CAUTION: Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

European Community

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japan


この装置は，クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

The preceding translates as follows:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI-A

United States

The EX-series switch has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Part 15 Statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

Non-Regulatory Environmental Standards

NEBS

- SR-3580 NEBS Criteria Levels (Level 3 Compliance)
- GR-63-CORE: NEBS, Physical Protection
- GR-1089-CORE: EMC and Electrical Safety for Network Telecommunications Equipment

Related Topics

- Agency Approvals on page 125
- Compliance Statements for Acoustic Noise on page 128

Compliance Statements for Acoustic Noise

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70 dB(A) oder weniger gemäss EN ISO 7779

Translation:

The emitted sound pressure is below 70 dB(A) per EN ISO 7779.

Related Topics

- Agency Approvals on page 125
- Compliance Statements for EMC Requirements on page 126

Safety Information

General Warnings

Definitions of Safety Warning Levels

The documentation for EX-series switches uses the following three levels of safety warnings:

NOTE: You might find this information helpful in a particular situation, or you might overlook this important information if it was not highlighted in a Note.

CAUTION: You need to observe the specified guidelines to avoid minor injury or discomfort to you or severe damage to the EX-series switch.

WARNING: This symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

WARNING: Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

WARNING: Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

WARNING: Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

WARNING: Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.

WARNING: Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

WARNING: Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

WARNING: Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

WARNING: ¡Atención! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

WARNING: Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

Related Topics

- Warning Statement for Norway and Sweden on page 165
- General Safety Guidelines and Warnings on page 130
- Installation Instructions Warning on page 146
- Maintenance and Operational Safety Guidelines and Warnings on page 131
- Grounded Equipment Warning on page 163
- Laser and LED Safety Guidelines and Warnings on page 143

General Safety Guidelines and Warnings

The following guidelines help ensure your safety and protect the EX-series switch from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in the hardware documentation for this product. Make sure that only authorized service personnel perform other system services.
- Keep the area around the chassis clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Do not wear loose clothing or jewelry, such as rings, bracelets, or chains, which could become caught in the chassis.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.

- Never attempt to lift an object that is too heavy for one person to handle.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the EX-series switch only when it is properly grounded.
- Ensure that the separate protective earthing terminal provided on this product is permanently connected to earth.
- Replace fuses only with fuses of the same type and rating.
- Do not open or remove chassis covers or sheet-metal parts unless instructions are provided in the hardware documentation for this product. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the EX-series switch chassis or onto any switch component. Such an action could cause electrical shock or damage the switch.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.
- Always ensure that all modules, power supplies, and blanks are fully inserted and that the installation screws are fully tightened.

Related Topics

- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Maintenance and Operational Safety Guidelines and Warnings on page 131
- Laser and LED Safety Guidelines and Warnings on page 143
- Installation Instructions Warning on page 146
- Grounded Equipment Warning on page 163

Maintenance and Operational Safety Guidelines and Warnings

While performing the maintenance activities for EX-series switches, observe the following guidelines and warnings:

- Battery Handling Warning on page 132
- Jewelry Removal Warning on page 133
- Lightning Activity Warning on page 134
- Operating Temperature Warning on page 135
- Product Disposal Warning on page 137

Battery Handling Warning

WARNING: Replacing the battery incorrectly might result in an explosion. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING: Waarschuwing Er is ontploffingsgevaar als de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type dat door de fabrikant aanbevolen is. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften weggeworpen te worden.

WARNING: Varoitus Räjähdyksen vaara, jos akku on vaihdettu väärään akkuun. Käytä vaihtamiseen ainoastaan saman- tai vastaavantyyppistä akkua, joka on valmistajan suosittelema. Hävitä käytetyt akut valmistajan ohjeiden mukaan.

WARNING: Attention Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

WARNING: Warnung Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

WARNING: Advarsel Det kan være fare for eksplosjon hvis batteriet skiftes på feil måte. Skift kun med samme eller tilsvarende type som er anbefalt av produsenten. Kasser brukte batterier i henhold til produsentens instruksjoner.

WARNING: Avvertenza Pericolo di esplosione se la batteria non è installata correttamente. Sostituire solo con una di tipo uguale o equivalente, consigliata dal produttore. Eliminare le batterie usate secondo le istruzioni del produttore.

WARNING: Aviso Existe perigo de explosão se a bateria for substituída incorrectamente. Substitua a bateria por uma bateria igual ou de um tipo equivalente recomendado pelo fabricante. Destrua as baterias usadas conforme as instruções do fabricante.

WARNING: ¡Atención! Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

WARNING: Varning! Explosionsfara vid felaktigt batteribyte. Ersätt endast batteriet med samma batterityp som rekommenderas av tillverkaren eller motsvarande. Följ tillverkarens anvisningar vid kassering av använda batterier.

Jewelry Removal Warning

WARNING: Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or can be welded to the terminals.

WARNING: Waarschuwing Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

WARNING: Varoitus Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitäntänapoihin.

WARNING: Attention Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.

WARNING: Warnung Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.

WARNING: Avvertenza Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.

WARNING: Advarsel Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.

WARNING: Aviso Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.

WARNING: ¡Atención! Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.

WARNING: Varning! Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.

Lightning Activity Warning

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

WARNING: Waarschuwing Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.

WARNING: Varoitus Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.

WARNING: Attention Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.

WARNING: Warnung Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.

WARNING: Avvertenza Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.

WARNING: Advarsel Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.

WARNING: Aviso Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).

WARNING: ¡Atención! No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.

WARNING: Varning! Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.

Operating Temperature Warning

WARNING: To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104° F (40° C). To prevent airflow restriction, allow at least 6 inches (15.2 cm) of clearance around the ventilation openings.

WARNING: Waarschuwing Om te voorkomen dat welke switch van de Juniper Networks router dan ook oververhit raakt, dient u deze niet te bedienen op een plaats

waar de maximale aanbevolen omgevingstemperatuur van 40° C wordt overschreden. Om te voorkomen dat de luchtstroom wordt beperkt, dient er minstens 15,2 cm speling rond de ventilatie-openingen te zijn.

WARNING: Varoitus Ettei Juniper Networks switch-sarjan reititin ylikuumentuisi, sitä ei saa käyttää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 40° C. Ettei ilmanvaihto estyisi, tuuletusaukkojen ympärille on jätettävä ainakin 15,2 cm tilaa.

WARNING: Attention Pour éviter toute surchauffe des routeurs de la gamme Juniper Networks switch, ne l'utilisez pas dans une zone où la température ambiante est supérieure à 40° C. Pour permettre un flot d'air constant, dégagez un espace d'au moins 15,2 cm autour des ouvertures de ventilations.

WARNING: Warnung Um einen Router der switch vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene Maximum von 40° C überschreitet. Um Lüftungsverschluß zu verhindern, achten Sie darauf, daß mindestens 15,2 cm lichter Raum um die Lüftungsöffnungen herum frei bleibt.

WARNING: Avvertenza Per evitare il surriscaldamento dei switch, non adoperateli in un locale che ecceda la temperatura ambientale massima di 40° C. Per evitare che la circolazione dell'aria sia impedita, lasciate uno spazio di almeno 15.2 cm di fronte alle aperture delle ventole.

WARNING: Advarsel Unngå overoppheting av eventuelle rutere i Juniper Networks switch Disse skal ikke brukes på steder der den anbefalte maksimale omgivelsestemperaturen overstiger 40° C (104° F). Sørg for at klaringen rundt lufteåpningene er minst 15,2 cm (6 tommer) for å forhindre nedsatt luftsirkulasjon.

WARNING: Aviso Para evitar o sobreaquecimento do encaminhador Juniper Networks switch, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 40° C. Para evitar a restrição à circulação de ar, deixe pelo menos um espaço de 15,2 cm à volta das aberturas de ventilação.

WARNING: ¡Atención! Para impedir que un encaminador de la serie Juniper Networks switch se recaliente, no lo haga funcionar en un área en la que se supere la

temperatura ambiente máxima recomendada de 40° C. Para impedir la restricción de la entrada de aire, deje un espacio mínimo de 15,2 cm alrededor de las aperturas para ventilación.

WARNING: Varning! Förhindra att en Juniper Networks switch överhettas genom att inte använda den i ett område där den maximalt rekommenderade omgivningstemperaturen på 40° C överskrids. Förhindra att luftcirkulationen inskränks genom att se till att det finns fritt utrymme på minst 15,2 cm omkring ventilationsöppningarna.

Product Disposal Warning

WARNING: Disposal of this product must be handled according to all national laws and regulations.

WARNING: Waarschuwing Dit produkt dient volgens alle landelijke wetten en voorschriften te worden afgedankt.

WARNING: Varoitus Tämän tuotteen lopullisesta hävittämisestä tulee huolehtia kaikkia valtakunnallisia lakeja ja säännöksiä noudattaen.

WARNING: Attention La mise au rebut définitive de ce produit doit être effectuée conformément à toutes les lois et réglementations en vigueur.

WARNING: Warnung Dieses Produkt muß den geltenden Gesetzen und Vorschriften entsprechend entsorgt werden.

WARNING: Avvertenza L'eliminazione finale di questo prodotto deve essere eseguita osservando le normative italiane vigenti in materia

WARNING: Advarsel Endelig disponering av dette produktet må skje i henhold til nasjonale lover og forskrifter.

WARNING: Aviso A descartagem final deste produto deverá ser efectuada de acordo com os regulamentos e a legislação nacional.

WARNING: ¡Atención! El desecho final de este producto debe realizarse según todas las leyes y regulaciones nacionales

WARNING: Varning! Slutlig kassering av denna produkt bör skötas i enlighet med landets alla lagar och föreskrifter.

Related Topics

- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Laser and LED Safety Guidelines and Warnings on page 143
- Installation Instructions Warning on page 146
- Grounded Equipment Warning on page 163

Preventing Electrostatic Discharge Damage

Many switch hardware components are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

- Always use an ESD wrist strap or ankle strap, and make sure that it is in direct contact with your skin.

CAUTION: For safety, periodically check the resistance value of the ESD strap. The measurement must be in the range of 1 through 10 Mohms.

- When handling any component that is removed from the chassis, make sure the equipment end of your ESD strap is attached to the electrostatic discharge points on the rear panel of the chassis (see Figure 70 on page 139 and Figure 71 on page 139).
- Avoid contact between the component and your clothing. ESD voltages emitted from clothing can damage components.
- When removing or installing a component, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an electrostatic bag (see Figure 72 on page 139). If you are returning a component, place it in an electrostatic bag before packing it.

Figure 70: EX 3200 Switch Rear Panel

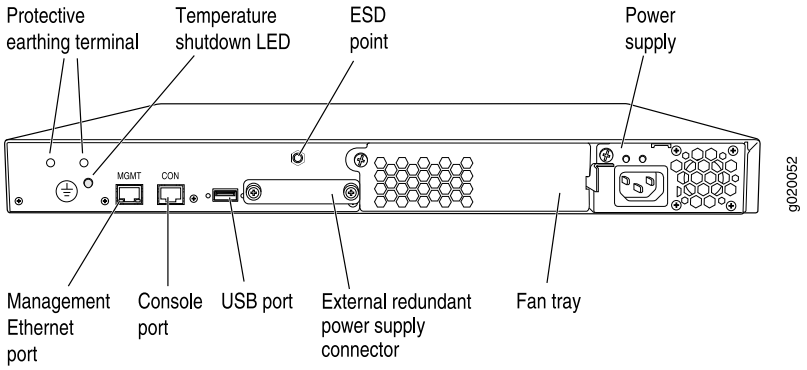


Figure 71: EX 4200 Switch Rear Panel

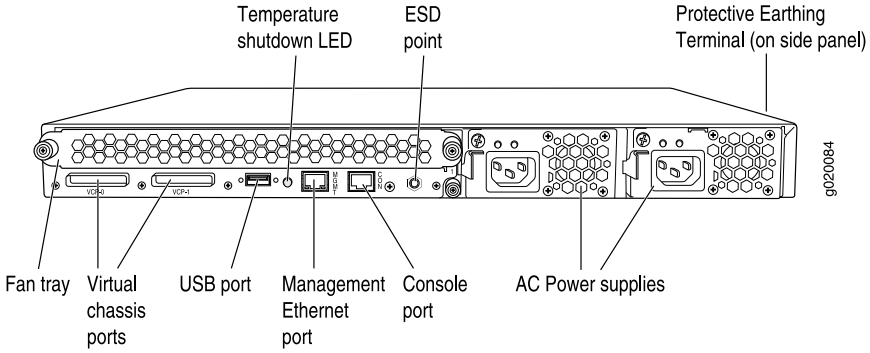
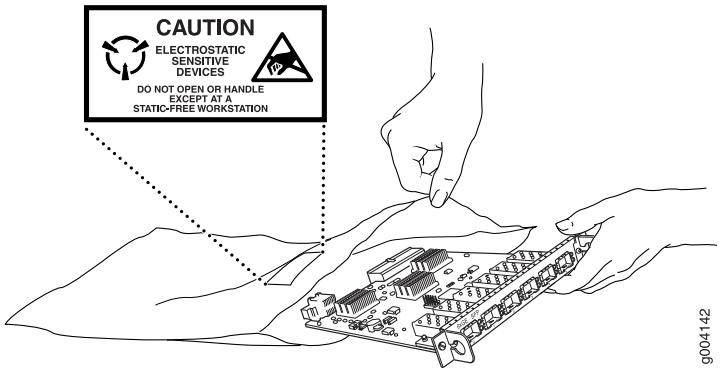


Figure 72: Place a Component into an Electrostatic Bag



NOTE: ANSI/TIA/EIA-568 cables such as category 5e and category 6 can get electrostatically charged. In order to dissipate this charge, always ground the cables to a suitable and safe earth ground before connecting them to the system.

Related Topics ■ General Safety Guidelines and Warnings on page 130

Telecommunication Line Cord Warning

WARNING: To reduce the risk of fire, use only No. 26 AWG or larger UL-listed or CSA-certified telecommunication line cord.

Waarschuwing Om brandgevaar te reduceren, dient slechts telecommunicatielijnsnoer nr. 26 AWG of groter gebruikt te worden.

Varoitus Tulipalovaaran vähentämiseksi käytä ainoastaan nro 26 AWG- tai paksumpaa tietoliikennejohdinta.

Attention Pour réduire les risques d'incendie, n'utiliser que des cordons de lignes de télécommunications de type AWG n° 26 ou plus larges.

Warnung Zur Reduzierung der Feuergefahr eine Fernmeldeleitungsschnur der Größe 26 AWG oder größer verwenden.

Avvertenza Per ridurre il rischio di incendio, usare solo un cavo per linea di telecomunicazioni di sezione 0,12 mm2 (26 AWG) o maggiore.

Advarsel Bruk kun AWG nr. 26 eller telekommunikasjonsledninger med større dimensjon for å redusere faren for brann.

Aviso Para reduzir o risco de incêndio, utilize apenas terminais de fio de telecomunicações Nº. 26 AWG ou superiores.

¡Atención! Para reducir el riesgo de incendios, usar sólo líneas de telecomunicaciones de calibre No. 26 AWG o más gruesas.

Varning! För att minska brandrisken skall endast Nr. 26 AWG eller större telekommunikationsledning användas.

Related Topics ■ General Safety Guidelines and Warnings on page 130

Qualified Personnel Warning

WARNING: Only trained and qualified personnel should install or replace the EX-series switch.

Waarschuwing Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

Varoitus Ainoastaan koulutettu ja pätevä henkilökunta saa asentaa tai vaihtaa tämän laitteen.

Attention Tout installation ou remplacement de l'appareil doit être réalisé par du personnel qualifié et compétent.

Warnung Gerät nur von geschultem, qualifiziertem Personal installieren oder auswechseln lassen.

Avvertenza Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.

Advarsel Kun kvalifisert personell med riktig opplæring bør montere eller bytte ut dette utstyret.

Aviso Este equipamento deverá ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.

¡Atención! Estos equipos deben ser instalados y reemplazados exclusivamente por personal técnico adecuadamente preparado y capacitado.

Varning! Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154

Radiation and Laser Warnings

- Radiation from Open Port Apertures Warning on page 141
- Laser and LED Safety Guidelines and Warnings on page 143

Radiation from Open Port Apertures Warning

WARNING: Because invisible radiation might be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.

WARNING: Waarschuwing Aangezien onzichtbare straling vanuit de opening van de poort kan komen als er geen fiberkabel aangesloten is, dient blootstelling aan straling en het kijken in open openingen vermeden te worden.

WARNING: Varoitus Koska portin aukosta voi emittoitua näkymätöntä säteilyä, kun kuitukaapelia ei ole kytkettynä, vältä säteilylle altistumista äläkä katso avoimiin aukkoihin.

WARNING: Attention Des radiations invisibles à l'il nu pouvant traverser l'ouverture du port lorsqu'aucun câble en fibre optique n'y est connecté, il est recommandé de ne pas regarder fixement l'intérieur de ces ouvertures.

WARNING: Warnung Aus der Port-Öffnung können unsichtbare Strahlen emittieren, wenn kein Glasfaserkabel angeschlossen ist. Vermeiden Sie es, sich den Strahlungen auszusetzen, und starren Sie nicht in die Öffnungen!

WARNING: Avvertenza Quando i cavi in fibra non sono inseriti, radiazioni invisibili possono essere emesse attraverso l'apertura della porta. Evitate di esporvi alle radiazioni e non guardate direttamente nelle aperture.

WARNING: Advarsel Unngå utsettelse for stråling, og stirr ikke inn i åpninger som er åpne, fordi usynlig stråling kan emiteres fra portens åpning når det ikke er tilkoblet en fiberkabel.

WARNING: Aviso Dada a possibilidade de emissão de radiação invisível através do orifício da via de acesso, quando esta não tiver nenhum cabo de fibra conectado, deverá evitar a exposição à radiação e não deverá olhar fixamente para orifícios que se encontrarem a descoberto.

WARNING: ¡Atención! Debido a que la apertura del puerto puede emitir radiación invisible cuando no existe un cable de fibra conectado, evite mirar directamente a las aperturas para no exponerse a la radiación.

WARNING: Varning! Osynlig strålning kan avges från en portöppning utan ansluten fiberkabel och du bör därför undvika att bli utsatt för strålning genom att inte stirra in i oskyddade öppningar.

Related Topics

- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153

Laser and LED Safety Guidelines and Warnings

EX-series switches are equipped with laser transmitters, which are considered a Class 1 Laser Product by the U.S. Food and Drug Administration and are evaluated as a Class 1 Laser Product per EN 60825–1 requirements.

Observe the following guidelines and warnings:

General Laser Safety Guidelines

When working around PIMs, observe the following safety guidelines to prevent eye injury:

- Do not look into unterminated ports or at fibers that connect to unknown sources.
- Do not examine unterminated optical ports with optical instruments.
- Avoid direct exposure to the beam.

WARNING: Unterminated optical connectors can emit invisible laser radiation. The lens in the human eye focuses all the laser power on the retina, so focusing the eye directly on a laser source—even a low-power laser—could permanently damage the eye.

Class 1 Laser Product Warning

WARNING: Class 1 laser product.

Waarschuwing Klasse-1 laser produkt.

Varoitus Luokan 1 lasertuote.

Attention Produit laser de classe I.

Warnung Laserprodukt der Klasse 1.

WARNING: Avvertenza Prodotto laser di Classe 1.

Advarsel Laserprodukt av klasse 1.

Aviso Produto laser de classe 1.

¡Atención! Producto láser Clase I.

Varning! Laserprodukt av klass 1.

Class 1 LED Product Warning

WARNING: Class 1 LED product.

Waarschuwing Klasse 1 LED-product.

Varoitus Luokan 1 valodiodituote.

Attention Alarme de produit LED Class I.

Warnung Class 1 LED-Produktwarnung.

WARNING: Avvertenza Avvertenza prodotto LED di Classe 1.

Advarsel LED-produkt i klasse 1.

Aviso Produto de classe 1 com LED.

¡Atención! Aviso sobre producto LED de Clase 1.

Varning! Lysdiodprodukt av klass 1.

Laser Beam Warning

WARNING: Do not stare into the laser beam or view it directly with optical instruments.

WARNING: Waarschuwing Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

WARNING: Varoitus Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

WARNING: Attention Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

WARNING: Warnung Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

WARNING: Avvertenza Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

WARNING: Advarsel Stirr eller se ikke direkte p strlen med optiske instrumenter.

WARNING: Aviso Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

WARNING: ¡Atención! No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

WARNING: Varning! Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.

Related Topics

- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Radiation from Open Port Apertures Warning on page 141
- Installation Instructions Warning on page 146
- Grounded Equipment Warning on page 163
- Optical Interface Support—EX 3200 and EX 4200 Switches on page 21

Installation Warnings

Installation Instructions Warning

WARNING: Read the installation instructions before you connect the switch to a power source.

Waarschuwing Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

Varoitus Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Attention Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

Avvertenza Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

¡Atención! Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Varning! Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Related Topics

- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Laser and LED Safety Guidelines and Warnings on page 143
- Grounded Equipment Warning on page 163

Chassis Lifting Guidelines

The weight of a fully loaded EX–series switch chassis is approximately 22 lb (10 kg). Observe the following guidelines for lifting and moving an EX-series switch:

- Before installing the EX-series switch, read the guidelines in "Site Preparation Checklist for EX-series Switches" on page 49 to verify that the intended site meets the specified power, environmental, and clearance requirements.
- Before lifting or moving the EX-series switch, disconnect all external cables.
- As when lifting any heavy object, lift most of the weight with your legs rather than your back. Keep your knees bent and your back relatively straight and avoid twisting your body as you lift. Balance the load evenly and be sure that your footing is solid.

Related Topics

- General Safety Guidelines and Warnings on page 130
- Mounting an EX-series Switch on page 65
- Installation Instructions Warning on page 146

Rack-Mounting Requirements and Warnings

Ensure that the equipment rack into which the EX-series switch is installed is evenly and securely supported, to avoid the hazardous condition that could result from uneven mechanical loading.

WARNING: To prevent bodily injury when mounting or servicing the switch in a rack, take the following precautions to ensure that the system remains stable. The following directives help maintain your safety:

- The switch must be installed into a rack that is secured to the building structure.
- The switch should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the switch 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 switch in the rack.

WARNING: Waarschuwing Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- De Juniper Networks switch moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.
- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

WARNING: Varoitus Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- Juniper Networks switch on asennettava telineeseen, joka on kiinnitetty rakennukseen.
- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.
- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

WARNING: Attention Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

- Le rack sur lequel est monté le Juniper Networks switch doit être fixé à la structure du bâtiment.
- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

WARNING: Warnung Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:

- Der Juniper Networks switch muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.
- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

WARNING: Avvertenza Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:

- Il Juniper Networks switch deve essere installato in un telaio, il quale deve essere fissato alla struttura dell'edificio.
- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
- Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
- Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

WARNING: Advarsel Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:

- Juniper Networks switch må installeres i et stativ som er forankret til bygningsstrukturen.
- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.

- Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
- Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

WARNING: Aviso Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:

- O Juniper Networks switch deverá ser instalado numa prateleira fixa à estrutura do edificio.
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

WARNING: ¡Atención! Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:

- El Juniper Networks switch debe instalarse en un bastidor fijado a la estructura del edificio.
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

WARNING: Varning! För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda

försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- Juniper Networks switch måste installeras i en ställning som är förankrad i byggnadens struktur.
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Related Topics

- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Laser and LED Safety Guidelines and Warnings on page 143
- Installation Instructions Warning on page 146
- Grounded Equipment Warning on page 163

Wall-Mounting Requirements and Warnings

Ensure that the wall onto which the EX-series switch is installed is stable and securely supported.

If you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs, use hollow wall anchors capable of supporting the combined weight of two fully-loaded chassis, up to 44 lb (20 kg). Insert the screws into wall studs wherever possible to provide added support for the chassis.

WARNING: When mounted in a vertical position, an EX 3200 or EX 4200 chassis must be oriented with the front panel of the chassis pointing down in order to ensure proper air flow and meet safety requirements in the event of a fire.

WARNING: Avertissement : lorsqu'installé en position verticale, un châssis de commutation EX 3200 ou EX 4200 doit être orienté avec le panneau avant dirigé vers le bas.

WARNING: Warnhinweis: Bei der Befestigung in vertikaler Position muss ein EX 3200- oder EX 4200-Switch-Gehäuse so ausgerichtet werden, dass das vordere Bedienfeld des Switch-Gehäuses nach unten zeigt.

Related Topics
- Mounting an EX 3200 or EX 4200 Switch on a Wall on page 69

Ramp Warning

WARNING: When installing the switch, do not use a ramp inclined at more than 10 degrees.

Waarschuwing Gebruik een oprijplaat niet onder een hoek van meer dan 10 graden.

Varoitus Älä käytä sellaista kaltevaa pintaa, jonka kaltevuus ylittää 10 astetta.

Attention Ne pas utiliser une rampe dont l'inclinaison est supérieure à 10 degrés.

Warnung Keine Rampen mit einer Neigung von mehr als 10 Grad verwenden.

Avvertenza Non usare una rampa con pendenza superiore a 10 gradi.

Advarsel Bruk aldri en rampe som heller mer enn 10 grader.

Aviso Não utilize uma rampa com uma inclinação superior a 10 graus.

¡Atención! No usar una rampa inclinada más de 10 grados

Varning! Använd inte ramp med en lutning på mer än 10 grader.

Related Topics
- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154
- General Electrical Safety Guidelines on page 153
- Laser and LED Safety Guidelines and Warnings on page 143
- Installation Instructions Warning on page 146
- Grounded Equipment Warning on page 163

Power and Electrical Warnings

- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154
- In Case of Electrical Accident on page 155
- Power Disconnection Warning on page 156
- Multiple Power Supplies Disconnection Warning on page 156

General Electrical Safety Guidelines

WARNING: Certain ports on the switch are designed for use as intrabuilding (within-the-building) interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed outside plant (OSP) cabling. To comply with NEBS requirements and protect against lightning surges and commercial power disturbances, the intrabuilding ports *must not* be metallically connected to interfaces that connect to the OSP or its wiring. The intrabuilding ports on the switch are suitable for connection to intrabuilding or unexposed wiring or cabling only. The addition of primary protectors is not sufficient protection for connecting these interfaces metallically to OSP wiring.

CAUTION: To comply with intrabuilding lightning and surge requirements, intrabuilding wiring must be shielded, and the shield for the wiring must be grounded at both ends.

CAUTION: Before removing or installing components of a switch, attach an ESD strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the switch.

- Install the EX-series switch in compliance with the following local, national, and international electrical codes:
  - United States—National Fire Protection Association (NFPA 70), United States National Electrical Code.
  - Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7.

  - Evaluated to the TN power system.
  - Canada—Canadian Electrical Code, Part 1, CSA C22.1.
- Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.
- Make sure that grounding surfaces are cleaned and brought to a bright finish before grounding connections are made.
- Do not work alone if potentially hazardous conditions exist anywhere in your workspace.
- Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.
- Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.
- Operate the EX-series switch within marked electrical ratings and product usage instructions.
- To ensure that the EX-series switch and peripheral equipment function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.

You can remove and replace many switch components without powering off or disconnecting power to the switch, as detailed elsewhere in the hardware documentation for this product. Never install equipment if it appears damaged.

Related Topics
- General Safety Guidelines and Warnings on page 130
- AC Power Electrical Safety Guidelines on page 154

AC Power Electrical Safety Guidelines

CAUTION: For switches with AC power supplies, an external surge protective device (SPD) must be used at the AC power source.

The following electrical safety guidelines apply to AC-powered switches:

- AC-powered switches are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.
- You must provide an external certified circuit breaker rated minimum 15 A in the building installation.
- The power cord serves as the main disconnecting device. The socket outlet must be near the switch and be easily accessible.

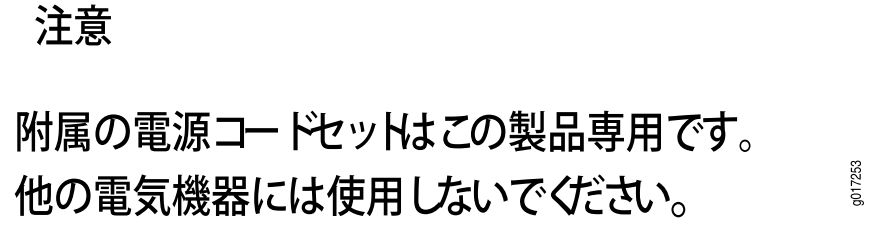
- When a switch is equipped with two AC power supplies, both power cords (one for each power supply) must be unplugged to completely disconnect power to the switch.
- Note the following warnings printed on the label next to the power supplies:

  "**CAUTION:** THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK."

  "**ATTENTION:** CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. AFIN DE PRÉVENIR LES CHOCS ÉLECTRIQUES, DÉBRANCHER TOUT CORDON D'ALIMENTATION AVANT DE FAIRE LE DÉPANNAGE."

Power Cable Warning (Japanese)

WARNING: The attached power cable is only for this product. Do not use the cable for another product.



Related Topics
- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153

In Case of Electrical Accident

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.
2. Disconnect power from the switch.
3. If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, then call for help.

Related Topics
- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154

Power Disconnection Warning

WARNING: Before working on the switch or near power supplies, unplug the power cord from an AC switch.

Waarschuwing Voordat u aan een frame of in de nabijheid van voedingen werkt, dient u bij wisselstroom toestellen de stekker van het netsnoer uit het stopcontact te halen.

Varoitus Kytke irti vaihtovirtalaitteiden virtajohto, ennen kuin teet mitään asennuspohjalle tai työskentelet virtalähteiden läheisyydessä.

Attention Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.

Warnung Bevor Sie an einem Chassis oder in der Nähe von Netzgeräten arbeiten, ziehen Sie bei Wechselstromeinheiten das Netzkabel ab bzw.

Avvertenza Prima di lavorare su un telaio o intorno ad alimentatori, scollegare il cavo di alimentazione sulle unità CA.

Advarsel Før det utføres arbeid på kabinettet eller det arbeides i nærheten av strømforsyningsenheter, skal strømledningen trekkes ut på vekselstrømsenheter.

Aviso Antes de trabalhar num chassis, ou antes de trabalhar perto de unidades de fornecimento de energia, desligue o cabo de alimentação nas unidades de corrente alternada.

¡Atención! Antes de manipular el chasis de un equipo o trabajar cerca de una fuente de alimentación, desenchufar el cable de alimentación en los equipos de corriente alterna (CA).

Varning! Innan du arbetar med ett chassi eller nära strömförsörjningsenheter skall du för växelströmsenheter dra ur nätsladden.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154

Multiple Power Supplies Disconnection Warning

WARNING: EX 4200 series switches have more than one power supply connection. All connections must be removed completely to remove power from the unit completely.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153

- AC Power Electrical Safety Guidelines on page 154

DC Power Electrical Safety Guidelines for EX 3200 and EX 4200 Switches

The following electrical safety guidelines apply to a DC-powered switch:

- A DC-powered switch is equipped with a DC terminal block that is rated for the power requirements of a maximally configured switch. To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 8 A @ –48 VDC. Incorporate an easily accessible disconnect device into the facility wiring. Be sure to connect the ground wire or conduit to a solid office (earth) ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.
- Run two wires from the circuit breaker box to a source of 48 VDC.
- In the United States, a restricted access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.

NOTE: Primary overcurrent protection is provided by the building circuit breaker. This breaker must protect against excess currents, short circuits, and earth faults in accordance with NEC ANSI/NFPA 70.

- Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.
- For personal safety, connect the green and yellow wire to safety (earth) ground at both the switch and the supply side of the DC wiring.
- The marked input voltage of –48 VDC for a DC-powered switch is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.
- Because the switch is a positive ground system, you must connect the positive lead to the terminal labeled RTN, the negative lead to the terminal labeled –48 VDC, and the earth ground to the chassis grounding points.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- DC Power Disconnection Warning for EX 3200 and EX 4200 Switches on page 161
- DC Power Grounding Requirements and Warning for EX 3200 and EX 4200 Switches on page 158
- DC Power Wiring Sequence Warning for EX 3200 and EX 4200 Switches on page 159
- DC Power Wiring Terminations Warning for EX 3200 and EX 4200 Switches on page 160

DC Power Grounding Requirements and Warning for EX 3200 and EX 4200 Switches

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors but is identifiable by green and yellow stripes is installed as part of the branch circuit that supplies the unit. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

WARNING: When you install the switch, the ground connection must always be made first and disconnected last.

Waarschuwing Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.

Varoitus Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

Attention Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.

Warnung Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

Avvertenza In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

Advarsel Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

Aviso Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

Varning! Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- DC Power Electrical Safety Guidelines for EX 3200 and EX 4200 Switches on page 157
- DC Power Disconnection Warning for EX 3200 and EX 4200 Switches on page 161
- DC Power Wiring Sequence Warning for EX 3200 and EX 4200 Switches on page 159
- DC Power Wiring Terminations Warning for EX 3200 and EX 4200 Switches on page 160

DC Power Wiring Sequence Warning for EX 3200 and EX 4200 Switches

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, + RTN to + RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, + RTN to + RTN, then ground to ground. Note that the ground wire must always be connected first and disconnected last.

Waarschuwing De juiste bedradingsvolgorde verbonden is aarde naar aarde, + RTN naar + RTN, en –48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en –48 naar –48 V, + RTN naar + RTN, aarde naar aarde.

Varoitus Oikea yhdistettava kytkentajarjestys on maajohto maajohtoon, + RTN varten + RTN, –48 V varten – 48 V. Oikea irrotettava kytkentajarjestys on –48 V varten – 48 V, + RTN varten + RTN, maajohto maajohtoon.

Attention Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité de câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, + RTN à + RTN, puis –48 V à –48 V. En débranchant la puissance, l'ordre approprié de câblage est –48 V à –48 V, + RTN à + RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.

Warnung Die Stromzufuhr ist nur mit geeigneten Ringösen an das DC Netzteil anzuschliessen. Die richtige Anschlusssequenz ist: Erdanschluss zu Erdanschluss, + RTN zu + RTN und dann -48V zu -48V. Die richtige Sequenz zum Abtrennen der Stromversorgung ist -48V zu -48V, + RTN zu + RTN und dann Erdanschluss zu Erdanschluss. Es ist zu beachten dass der Erdanschluss immer zuerst angeschlossen und als letztes abgetrennt wird.

Avvertenza Mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoplingssekvens er jord til jord, + RTN til + RTN, –48 V til – 48 V. Riktig frakoples tilkoplingssekvens er –48 V til – 48 V, + RTN til + RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, + RTN a + RTN, entonces –48 V a –48 V. Al desconectar potencia, la secuencia apropiada del cableado es –48 V a –48 V, + RTN a + RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.

¡Atención! Wire a fonte de alimentação de DC Usando os talões apropriados na extremidade da fiação. Ao conectar a potência, a seqüência apropriada da fiação é moída para moer, + RTN a + RTN, então –48 V a –48 V. Ao desconectar a potência,

a seqüência apropriada da fiação é –48 V a –48 V, + RTN a + RTN, moeu então para moer. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último.

Varning! Korrekt kopplingssekvens ar jord till jord, + RTN till + RTN, –48 V till –48 V. Korrekt kopplas kopplingssekvens ar –48 V till –48 V, + RTN till + RTN, jord till jord.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- DC Power Electrical Safety Guidelines for EX 3200 and EX 4200 Switches on page 157
- DC Power Disconnection Warning for EX 3200 and EX 4200 Switches on page 161
- DC Power Grounding Requirements and Warning for EX 3200 and EX 4200 Switches on page 158
- DC Power Wiring Terminations Warning for EX 3200 and EX 4200 Switches on page 160

DC Power Wiring Terminations Warning for EX 3200 and EX 4200 Switches

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations must be the appropriate size for the wires and must clamp both the insulation and conductor.

Waarschuwing Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

Varoitus Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

Attention Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

Warnung Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

Avvertenza Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcella con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

Advarsel Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

Varning! När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
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DC Power Disconnection Warning for EX 3200 and EX 4200 Switches

WARNING: Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de

stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

Varoitus Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

Attention Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.

Warnung Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

Avvertenza Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

Advarsel Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

Aviso Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

Varning! Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

Related Topics

- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154
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- DC Power Grounding Requirements and Warning for EX 3200 and EX 4200 Switches on page 158
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- DC Power Wiring Terminations Warning for EX 3200 and EX 4200 Switches on page 160

Grounded Equipment Warning

WARNING: The switch is intended to be grounded. During normal use, ensure that you have connected earth ground to the switch chassis.

Waarschuwing Deze apparatuur hoort geaard te worden Zorg dat de host-computer tijdens normaal gebruik met aarde is verbonden.

Varoitus Tämä laitteisto on tarkoitettu maadoitettavaksi. Varmista, että isäntälaite on yhdistetty maahan normaalikäytön aikana.

Attention Cet équipement doit être relié à la terre. S'assurer que l'appareil hôte est relié à la terre lors de l'utilisation normale.

Warnung Dieses Gerät muß geerdet werden. Stellen Sie sicher, daß das Host-Gerät während des normalen Betriebs an Erde gelegt ist.

Avvertenza Questa apparecchiatura deve essere collegata a massa. Accertarsi che il dispositivo host sia collegato alla massa di terra durante il normale utilizzo.

Advarsel Dette utstyret skal jordes. Forviss deg om vertsterminalen er jordet ved normalt bruk.

Aviso Este equipamento deverá estar ligado à terra. Certifique-se que o host se encontra ligado à terra durante a sua utilização normal.

¡Atención! Este equipo debe conectarse a tierra. Asegurarse de que el equipo principal esté conectado a tierra durante el uso normal.

Varning! Denna utrustning är avsedd att jordas. Se till att värdenheten är jordad vid normal användning.

Related Topics
- General Safety Guidelines and Warnings on page 130

Power Sources for Redundant Power Supplies

EX 4200 switches have a redundant power supply. When you have redundant power supplies in a switch, you must connect each power supply to a different input power source. Failure to do so makes the switch susceptible to total power failure if one of the power supplies fails.

冗余电源

如果 Juniper Networks 设备包含一个可选的冗余电源　请将两个电源连接到不同的输入电源。不这样做的结果是 Juniper Networks 设备一路供电出问题时导致全部的电源故障

Related Topics
- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153
- AC Power Electrical Safety Guidelines on page 154

TN Power Warning

WARNING: The switch is designed to work with a TN power system.

Waarschuwing Het apparaat is ontworpen om te functioneren met TN energiesystemen.

Varoitus Koje on suunniteltu toimimaan TN-sähkövoimajärjestelmien yhteydessä.

Attention Ce dispositif a été conçu pour fonctionner avec des systèmes d'alimentation TN.

Warnung Das Gerät ist für die Verwendung mit TN-Stromsystemen ausgelegt.

Avvertenza Il dispositivo è stato progettato per l'uso con sistemi di alimentazione TN.

Advarsel Utstyret er utfomet til bruk med TN-strømsystemer.

Aviso O dispositivo foi criado para operar com sistemas de corrente TN.

¡Atención! El equipo está diseñado para trabajar con sistemas de alimentación tipo TN.

Varning! Enheten är konstruerad för användning tillsammans med elkraftssystem av TN-typ.

Related Topics
- General Safety Guidelines and Warnings on page 130
- General Electrical Safety Guidelines on page 153

- AC Power Electrical Safety Guidelines on page 154

Warning Statement for Norway and Sweden

WARNING: The equipment must be connected to an earthed mains socket-outlet.

Advarsel Apparatet skal kobles til en jordet stikkontakt.

Varning! Apparaten skall anslutas till jordat nätuttag.

Related Topics

- General Safety Guidelines and Warnings on page 130

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