



**Juniper Networks
EX2500 Ethernet Switch**

Hardware Guide

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Juniper Networks EX2500 Ethernet Switch Hardware Guide
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Table of Contents

About This Guide	ix
Objectives	ix
Audience	ix
Supported Platforms	ix
Documentation Conventions	x
List of Technical Publications	xi
Documentation Feedback	xi
Requesting Technical Support	xi
Self-Help Online Tools and Resources	xii
Opening a Case with JTAC	xii
Chapter 1 EX2500 Ethernet Switch Description and Specifications	1
EX2500 Ethernet Switch Overview	1
EX2500 Ethernet Switch Features	2
Performance Features	2
Management Features	2
Software Features	2
EX2500 Ethernet Switch Components	3
Hardware Options	3
EX2500 Switch Unit	3
Ports	4
Reset Button	4
Fans	4
Power Supplies	5
Switch Ports	5
SFP + Ports	5
10/100/1000Base-T Management (MGMT) Ports	6
Console (CON) Port	6
LEDs	7
System and Fan LEDs	7
XGE Port LEDs	8
RJ-45 LEDs	8
EX2500 Ethernet Switch Technical Specifications	8
Physical Characteristics	8
Environmental Specifications	9
Power Specifications	9
EX2500 Ethernet Switch Ordering Information	10
Chapter 2 Installing the EX2500 Ethernet Switch	11
Required Tools	11
Package Contents	12
Environmental Requirements	12
Preventing Electric Shock	13

Preventing Electrostatic Discharge.....	13
Installing the EX2500 Switch in a Standard Equipment Rack	14
Installing the EX2500 Switch in a 4-Post Rack	15
Connecting Power to the EX2500 Ethernet Switch.....	18
Initializing the EX2500 Ethernet Switch	18
Default Configuration	19
Configuring an IP Interface	19
Using the Boot Management Menu	20
Installing and Removing an SFP + Optical Transceiver	21
Troubleshooting	22
System LEDs Do Not Light.....	22
Port Link LED Does Not Light	22
Switch Does Not Initialize (Boot).....	22
Temperature Sensor Warning.....	23
Chapter 3 Contacting Customer Support and Returning Hardware	25
Returning an EX2500 Switch or Hardware for Repair or Replacement.....	25
Locating the Serial Number on an EX2500 Switch	26
Contacting Customer Support to Obtain Return Materials Authorization	26
Information for JTAC	27
Contacting JTAC for an RMA Number	27
Packing an EX2500 Switch for Shipment	27
Packing Switch Hardware for Shipment	29
Chapter 4 EX2500 Ethernet Switch Safety and Compliance Statements	31
General Safety Guidelines and Warnings for EX2500 Switches	31
Definitions of Safety Notice Levels for EX2500 Switches.....	32
EX2500 Safety Messages.....	33
Electric Shock Warning	33
Electrical Current Warning	34
Stacking Caution	36
Power-On Warning	36
Class 1 Laser Product Warning	37
EX2500 Compliance Statements	38
Federal Communications Commission (FCC) Statement	38
Industry Canada Class A Emission Compliance Statement	39
Australia and New Zealand Class A Statement	39
European Union EMC Directive Conformance Statement	39
Japanese Voluntary Control Council for Interference (VCCI) Statement	39
Denan Statement (Japan/Nippon Only)	40
Index.....	41

List of Figures

Figure 1: EX2500 Switch Front Panel	4
Figure 2: EX2500 Switch Rear Panel	4
Figure 3: System Status LEDs and Port LEDs	7
Figure 4: Attaching the Mounting Brackets	14
Figure 5: Rack-Mounting the Switch Unit	15
Figure 6: Attaching the Horizontal Rail	16
Figure 7: Rack-Mounting the Switch Unit	16
Figure 8: Attaching Rear Mounting Brackets.....	17
Figure 9: Securing the Rear Bracket to the Front Bracket	17

List of Tables

Table 1:	Notice Icons	x
Table 2:	EX2500 Text and Syntax Conventions	x
Table 3:	EX2500 Ethernet Switch Documentation	xi
Table 4:	Approved EX2500 SFP + Transceivers and DACs	5
Table 5:	RJ-45 Port Pin Assignments	6
Table 6:	Console Port Pin Assignments	6
Table 7:	Console Cable Pin Assignments	6
Table 8:	System and Fan LEDs	7
Table 9:	System and Fan LEDs Status	8
Table 10:	SFP + LEDs Status	8
Table 11:	RJ-45 LEDs Status	8
Table 12:	Physical Characteristics	8
Table 13:	Environmental Specifications	9
Table 14:	Power Specifications	9
Table 15:	EX2500 Switch Ordering Information	10
Table 16:	2-Post Rack Mount Kit	14
Table 17:	4-Post Rack Mount Kit	15

About This Guide

This preface provides the following guidelines for using the *Juniper Networks EX2500 Ethernet Switch Hardware Guide*:

- Objectives on page ix
- Audience on page ix
- Supported Platforms on page ix
- Documentation Conventions on page x
- List of Technical Publications on page xi
- Documentation Feedback on page xi
- Requesting Technical Support on page xi

Objectives

This guide provides information and instructions for installing an EX2500 Ethernet Switch. To configure and manage the switch, see the *EX2500 Ethernet Switch Configuration Guide* and *EX2500 Ethernet Switch Command Reference*.

Audience

This guide is intended for network installers and system administrators engaged in configuring and maintaining a network. Administrators must be familiar with your EX2500 switch, your Web browser, Ethernet concepts, IP addressing, the IEEE 802.1D Spanning Tree Protocol (STP), and SNMP configuration.

Supported Platforms

The features described in this guide are supported by only the EX2500 software running on EX2500 Ethernet Switches only.

Documentation Conventions

Table 1 describes the notice icons used in this manual.

Table 2 describes the EX2500 text and syntax conventions.

Table 1: 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.

Table 2: EX2500 Text and Syntax Conventions

Convention	Usage	Examples
Bold text like this	Names of windows, dialog boxes, buttons, tabs, and other objects in a user interface that you click or select	Click the Submit button on the bottom of the form.
Bold text like this	In syntax descriptions and set-off command examples, text you must type exactly as shown	Main# sys
Braces { }	Required elements in syntax that has more than one option. You must choose one of the options. Do not type the braces.	show portchannel {<1-12> hash information} (For example, you can enter either show portchannel 3, show portchannel hash, or show portchannel information.)
Brackets []	Optional elements in syntax descriptions. Do not type the brackets.	copy running config tftp [data-port mgt-port] (You enter either copy running config tftp data-port, copy running config tftp mgt-port, or copy running config tftp.)
Fixed-width text like this	Onscreen computer output	EX2500 (config)# reload Reset will use software “image2”...
<i>Italic text like this</i>	Book titles, special terms, and words to be emphasized	See the <i>EX2500 Ethernet Switch Command Reference</i> .
< <i>Italic text like this in angle brackets</i> >	Variables in command syntax. Replace the italic text with the appropriate real name or value when entering the command. Do not type the brackets.	To establish a Telnet session, enter host# telnet <IP address> (For example, you can enter telnet 192.32.10.12.)
Plain text like this	Names of commands, files, and directories used within the text	View the <i>readme.txt</i> file.
Vertical line	Separates choices for command keywords and arguments. Enter only one choice. Do not type the vertical line.	copy running config tftp [data-port mgt-port] (You enter either copy running config tftp data-port, copy running config tftp mgt-port, or copy running config tftp.)

List of Technical Publications

Table 3 lists the documentation supporting the EX2500 Ethernet Switch. All documentation for EX Series Ethernet Switches is available at <http://www.juniper.net/techpubs/>.

Table 3: EX2500 Ethernet Switch Documentation

Document	Description
<i>EX2500 Ethernet Switch Quick Start</i>	Provides brief installation and initial configuration instructions.
<i>EX2500 Ethernet Switch Hardware Guide</i>	Provides information and instructions for installing an EX2500 Ethernet Switch.
<i>EX2500 Ethernet Switch Web Device Manager Guide</i>	Provides an overview of how to access and use the EX2500 Web Device Manager.
<i>EX2500 Ethernet Switch Configuration Guide</i>	Describes how to configure and use the software on the EX2500 Ethernet Switch.
<i>EX2500 Ethernet Switch Command Reference</i>	Describes how to configure and use the software with your EX2500 Ethernet Switch. The reference lists each command and includes the complete syntax and a functional description, using the EX2500 command-line interface (CLI)
<i>EX2500 Ethernet Switch Release Notes</i>	Summarize EX2500 switch features and known problems, provide information that might have been omitted from the manuals, and provide upgrade and downgrade instructions.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. Send e-mail to techpubs-comments@juniper.net with the following information:

- Document URL or title
- Page number
- Software version
- Your name and company

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/customers/support/downloads/710059.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, the Juniper Networks online self-service portal—the Customer Support Center (CSC)—provides the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <http://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product and serial number, use our Serial Number Entitlement (SNE) Tool at <http://tools.juniper.net/SerialNumber/EntitlementSearch/>.

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>.

Chapter 1

EX2500 Ethernet Switch Description and Specifications

This chapter describes EX2500 Ethernet Switch features and hardware components and provides technical specifications and ordering information for the switch:

- EX2500 Ethernet Switch Overview on page 1
- EX2500 Ethernet Switch Features on page 2
- EX2500 Ethernet Switch Components on page 3
- EX2500 Ethernet Switch Technical Specifications on page 8
- EX2500 Ethernet Switch Ordering Information on page 10

EX2500 Ethernet Switch Overview

The EX2500 Ethernet Switch is an all 10-Gigabit Ethernet rackable aggregation switch. The EX2500 switch uses a wire-speed, non-blocking switching fabric that provides simultaneous wire-speed transport of multiple packets at low latency on all ports.

The EX2500 switch contains 24 10-gigabit Small Form-Factor Pluggable Plus (SFP +) ports and 2 1-gigabit management ports. The 10-gigabit SFP + ports can accept 10-gigabit optical transceivers or Direct Attach Cables (DACs).

This 1U switch is rack mountable in either the horizontal or vertical direction, depending on your application.

You can manage the switch through the console port, or through a network connection using Telnet, a Web Device Manager, or SNMP-based network management software.

EX2500 Ethernet Switch Features

This section provides an overview of EX2500 switch features.

Performance Features

- 240-Gbps throughput (full duplex), non-blocking switching architecture
- 100 percent line rate
- Deterministic port-to-port latency less than 700 nanoseconds with 64-byte packets

Management Features

- Clients:
 - EX2500 command-line interface (CLI)
 - EX2500 Web Device Manager
- Protocols:
 - SNMP v1, v2, and v3
 - Remote Monitoring (RMON)
 - Secondary NTP support
 - DHCP
- Software upgrades:
 - Dual software images
 - Upgrade via serial connection, Web browser

Software Features

- Security features:
 - Secure interface login and password
 - RADIUS and TACACS +
 - SSH v1 and v2
 - HTTPS secure Web Device Manager
 - Wire-speed filtering with Access Control Lists (ACLs)

- Layer 2 features:
 - 1024 VLANs (802.1Q), including private VLANs
 - Multi-link trunking, compatible with EtherChannel link aggregation
 - LACP (IEEE 802.3ad)
 - Spanning trees:
 - Rapid Spanning Tree Protocol (RSTP) (802.1D/2004)
 - Multiple Spanning Tree Protocol (MSTP) (802.1Q/2003)
 - Per VLAN Rapid Spanning Tree Plus Protocol (PVRST+) (802.1w)
 - Fast Uplink Convergence
 - 16K forwarding database entries
- Quality of Service (QoS) features:
 - 802.1p priority queues
 - Differentiated Services Code Point (DSCP) support
- Availability—Uplink Failure Detection (UFD)

EX2500 Ethernet Switch Components

This section describes the EX2500 hardware components.

Hardware Options

The following EX2500 hardware is available:

- Switch unit with either front-to-back or back-to-front airflow:
 - Model EX2500-24F-FB provides front-to-back airflow.
 - Model EX2500-24F-BF provides back-to-front airflow.
- Mounting hardware:
 - Standard (2-post) rack-mounting brackets and screws
 - 4-post rack-mounting brackets and screws

EX2500 Switch Unit

The EX2500 switch unit (see Figure 1 and Figure 2 on page 4) is a 1U rack-mountable 10-Gigabit Ethernet switch. You can mount the EX2500 switch in either the horizontal or vertical direction.

Ports

The switch unit (Figure 1 and Figure 2) contains 24 10-gigabit SFP + ports, plus 2 management ports, and 1 serial console port:

- 24 SFP + ports
- 2 RJ-45 management ports
- 1 RS-232 console port (mini-USB)

Figure 1: EX2500 Switch Front Panel

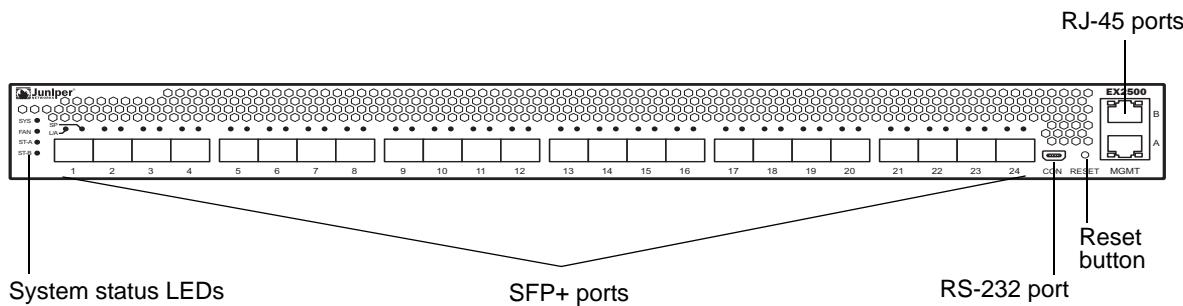
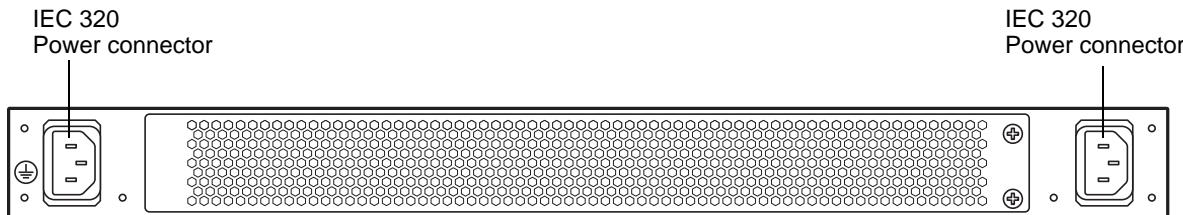


Figure 2: EX2500 Switch Rear Panel



Reset Button

The RESET button is recessed within a hole on the front panel. Use a straightened paper clip or similar object to press the RESET button. The RESET button allows technicians to reset the switch, as follows:

- Press RESET—The switch resets and reloads the configuration files.
- Press and hold RESET for 5 seconds—The switch resets and configures all settings to factory defaults.

Fans

Six internal fans cool the switch unit. If an individual fan fails, the other fans continue to run, and the switch unit continues to operate normally. Fans are not customer replaceable.

Fan operation and internal temperatures are monitored. If the air temperature exceeds a desired threshold, the environmental monitor displays warning messages.



CAUTION: If a fan fails, the maximum operating temperature drops from +40°C to +35°C.

The FAN LED blinks if there is a failure of one or more fans.

Power Supplies

The EX2500 switch has two redundant 275W AC power supplies. Each internal power supply has an individual IEC 320 power connector on the rear panel (Figure 2 on page 4). The power cord attaches to a universal grounded AC power source.



WARNING: To reduce the risk of electric shock, use only power cords that have a grounding path, and always connect the power cord to a properly grounded power outlet.

Each power supply can be connected to a separate AC circuit to mitigate the risk of down time during a power failure. When used in a redundant configuration, the dual power supplies have a load-sharing capability that allows each supply to operate at approximately 50 percent of full load. Using redundant power can minimize the power disruption during a power supply failure and extend the expected lifetime of each supply by operating normally in a conservative power mode.

There is no power switch on the EX2500 switch; the switch unit powers on when power is supplied through the power cord(s).

The SYS LED indicates the status of the power supplies. The LED blinks when only one power cord is connected or if one power supply fails. The LED lights steadily when both power cords are connected and operating.

Switch Ports

The EX2500 switch has 24 SFP+ ports, 2 management ports, and 1 console port.

SFP+ Ports

24 Small Form-Factor Pluggable (SFP+) ports are located on the front panel. These ports accept approved optical SFP+ transceivers or direct access cables (DACs).

Transceivers and DACs are not included with the EX2500 switch unit. Table 4 lists the transceivers and DACs that are approved by Juniper Networks for use with the switch.

Table 4: Approved EX2500 SFP+ Transceivers and DACs (1 of 2)

Model Number	Description
EX-SFP-10GE-SR	SFP+ 10GBASE-SR Short Range Optical Fiber Transceiver
EX-SFP-10GE-LR	SFP+ 10GBASE-LR Long Range Optical Fiber Transceiver

Table 4: Approved EX2500 SFP+ Transceivers and DACs (2 of 2)

Model Number	Description
EX-SFP-10GE-DAC-1M	1-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-3M	3-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-5M	5-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-7M	7-m Direct Access (TwinAx) Cable

10/100/1000Base-T Management (MGMT) Ports

Two 10/100/1000Base-T ports (RJ-45) are located on the front panel. These management ports support in-line management.

Table 5 describes the RJ-45 connector pin assignments.

Table 5: RJ-45 Port Pin Assignments

Pin Number	Signal	Description
Pin 1	BI DA +	Bi-directional data pair A positive
Pin 2	BI DA-	Bi-directional data pair A negative
Pin 3	BI DB +	Bi-directional data pair B positive
Pin 4	BI DC +	Bi-directional data pair C positive
Pin 5	BI DC-	Bi-directional data pair C negative
Pin 6	BI DB-	Bi-directional data pair B negative
Pin 7	BI DD +	Bi-directional data pair D positive
Pin 8	BI DD-	Bi-directional data pair D negative

Console (CON) Port

The RS-232 (mini-USB) serial console port is located on the front panel. An external cable is required to convert the connector to a D9 connector. Table 6 describes the pinouts for the mini-USB port.

Table 6: Console Port Pin Assignments

Pin Number	Function
Pin 1	No connect
Pin 2	RS232_SIN
Pin 3	RS232_SOUT
Pin 4	No connect
Pin 5	Ground

Table 7 describes the wiring of the console cable.

Table 7: Console Cable Pin Assignments (1 of 2)

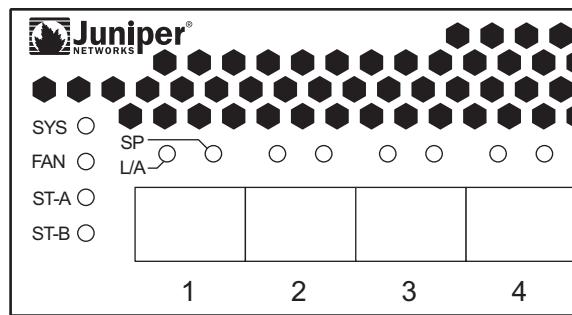
D9 Pin Number	Wire	Mini-USB Pin Number
Pin 2	Black	Pin 3
Pin 3	White	Pin 2
Pin 5	Green	Pin 5

Table 7: Console Cable Pin Assignments (2 of 2)

D9 Pin Number	Wire	Mini-USB Pin Number
Pin 1		
Pin 4	D9 Pins 1, 4, and 6 are connected.	
Pin 6		
Pin 7		
Pin 8	D9 pin 7 is connected to D9 pin 8.	
Shell	Braid	Shell

LEDs

LEDs provide system status and port link status. Figure 3 highlights the system LEDs and SFP + port LEDs.

Figure 3: System Status LEDs and Port LEDs

System and Fan LEDs

The system and fan LEDs are described in Table 8.

Table 8: System and Fan LEDs

SYS	Power supplies and AC power input status
FAN	Fans status
ST-A	Status LED
ST-B	Status LED (reserved for future use)

Table 9 describes the system and fan LED indications.

Table 9: System and Fan LEDs Status

Meaning	SYS	FAN
Total power failure	Off	Off
Service required	Blinking green	Blinking green
Power supplies OK	Solid green	N/A
Power supply failure	Blinking green	N/A
Fans OK	N/A	Solid green
Fan failure	N/A	Blinking green

XGE Port LEDs

Status and link LEDs for the data ports are described in Table 10.

Table 10: SFP+ LEDs Status

LED	Solid Green	Blinking Green	Off
SP (speed)	10Gbps	N/A	1Gbps
L/A (link/activity)	Valid link/no activity	Activity	No link

RJ-45 LEDs

Status LEDs for the RJ-45 ports are described in Table 11.

Table 11: RJ-45 LEDs Status

LED	Solid Green	Blinking Green	Off
Link	Valid link	Activity	No link
Speed	100/1000Mbps	N/A	10Mbps

EX2500 Ethernet Switch Technical Specifications

This section provides specifications for the EX2500 switch.

Physical Characteristics

Physical characteristics of the EX2500 switch units are listed in Table 12.

Table 12: Physical Characteristics

Specification	EX2500-24F-FB	EX2500-24F-BF
Dimensions (H x W x D)	4.4 x 43.9 x 38.1 cm. (1.73 x 17.3 x 15.0 in.)	4.4 x 43.9 x 38.1 cm. (1.73 x 17.3 x 15.0 in.)
Weight	6.4 kg. (14.1 lbs.)	6.4 kg. (14.1 lbs.)
Airflow	Front-to-back	Back-to-front

Environmental Specifications

Environmental specifications for the EX2500 switch unit are listed in Table 13.

Table 13: Environmental Specifications

Specification	Measurement
Temperature, ambient operating	0°C to + 40°C
Temperature (fan failure or power supply failure), operating	0°C to + 35°C
Temperature, storage	-20°C to + 70°C
Relative humidity (non-condensing), operating	10 to 90 %
Relative humidity (non-condensing), storage	10 to 95 %
Altitude, operating	3,050 m (10,000 feet)
Altitude, storage	4,573 m (15,000 feet)
Acoustic noise	Less than 65dB
Heat dissipation	1100 BTU/hour (maximum)

Power Specifications

Power specifications for the EX2500 switch unit are listed in Table 14.

Table 14: Power Specifications

Specification	Measurement
Number of power supplies	2 (1 + 1 redundant)
AC-input frequency (universal)	50 to 60 Hz
AC-input voltage (universal)	100 to 240 VAC
AC-input current	2.75A (RMS) @ 100VAC 1.15A (RMS) @ 240VAC
AC-input fuse	5A (internal)
Power supply output power	275W each
System power dissipation	200W typical
DC-Output voltage	12V nominal
DC-Output current	15A (typical)

EX2500 Ethernet Switch Ordering Information

Table 15 lists the parts that you can order for the EX2500 product family.

Table 15: EX2500 Switch Ordering Information

Model Number	Description
Switch	
EX2500-24F-FB	EX2500 24-port GbE Switch (front-to-back airflow)
EX2500-24F-BF	EX2500 24-port GbE Switch (back-to-front airflow)
Pluggable Optics	
EX-SFP-10GE-SR	SFP + 10GBase-SR Short Range Optical Fiber Transceiver
EX-SFP-10GE-LR	SFP + 10GBase-LR Long Range Optical Fiber Transceiver
EX-SFP-10GE-DAC-1M	1-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-3M	3-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-5M	5-m Direct Access (TwinAx) Cable
EX-SFP-10GE-DAC-7M	7-m Direct Access (TwinAx) Cable
Rack-Mount Kit	
EX2500-RMK-4POST	Generic 4-Post Rack-Mount Kit

Chapter 2

Installing the EX2500 Ethernet Switch

This chapter describes how to install and initialize the EX2500 switch:

- Required Tools on page 11
- Package Contents on page 12
- Environmental Requirements on page 12
- Installing the EX2500 Switch in a Standard Equipment Rack on page 14
- Installing the EX2500 Switch in a 4-Post Rack on page 15
- Connecting Power to the EX2500 Ethernet Switch on page 18
- Initializing the EX2500 Ethernet Switch on page 18
- Using the Boot Management Menu on page 20
- Installing and Removing an SFP + Optical Transceiver on page 21
- Troubleshooting on page 22

Required Tools

You need the following tools or equipment to successfully accomplish the installation procedures in this document:

- Standard flat-blade screwdriver
- Number 2 Phillips screwdriver
- Electrostatic discharge wrist strap

Package Contents

The basic EX2500 switch package contains the following items:

- EX2500 switch unit (one of the following):
 - EX2500-24F-FB (front-to-back airflow)
 - EX2500-24F-BF (back-to-front airflow)
- Standard rack mount kit:
 - Two brackets
 - Screws to attach brackets to the switch unit
 - Screws to attach the switch unit to the equipment rack
- Mini-USB serial cable
- Two AC power cords

Environmental Requirements

This section describes the basic environmental requirements for the EX2500 switch. Make sure the location where you install the switch meets the following requirements:

- Install the switch unit in a dry, clean, well-ventilated area.
- Provide adequate space on all sides of the switch unit to ensure proper air flow.
- Make sure that an adequate grounded power supply is within reach of the switch unit.

The switch does not have a power switch and is powered on when you connect one of the two power cords to an energized AC outlet. You must disconnect the power cords to power off the switch. Always connect each power cord to a power source in a location that is quickly and safely accessible.

- Make sure that twisted-pair cable is routed away from power lines, fluorescent lighting fixtures, and other sources of electrical interference.

Preventing Electric Shock



WARNING: Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Disconnect the power cord before installing, uninstalling, or moving this product.

This product does not contain any user-serviceable parts. Do not remove the cover of this device.

This product is designed to work with single-phase power systems that have a grounded neutral conductor. To reduce the risk of electric shock, always plug the power cord into a grounded power outlet.

Preventing Electrostatic Discharge

Electrostatic discharge (ESD) is a discharge of stored static electricity that can damage equipment and impair electrical circuitry. ESD can cause intermittent or complete equipment failures.

Use the following guidelines to prevent ESD damage while you install and work with the EX2500 switch and optional equipment:

- Use anti-static wrist or ankle straps. Adjust the strap to provide good skin contact.
- Properly ground work surfaces and equipment racks for protection against electrostatic discharge.
- Avoid contact between equipment and clothing. An anti-static wrist or ankle strap protects the equipment from ESD voltages on the body; ESD voltages on clothing also can cause damage.
- Do not touch connector pins.

Installing the EX2500 Switch in a Standard Equipment Rack

This section describes how to install the EX2500 switch in a standard 2-post 19-inch equipment rack. For information about mounting the EX2500 switch in a 4-post rack, see “Installing the EX2500 Switch in a 4-Post Rack” on page 15.

Table 16 lists the parts included in the standard mounting kit.

Table 16: 2-Post Rack Mount Kit

Description	Quantity
Brackets	2
M4 screws	8
M6 screws	4
M6 locking washers	4
M6 clip nuts	4
M6 cage nuts	4

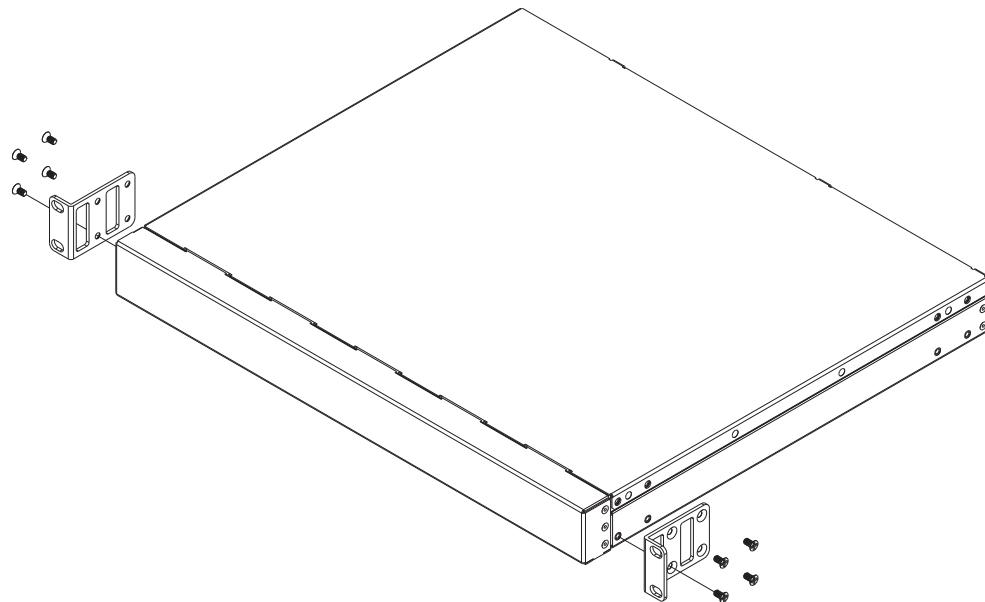


CAUTION: Do not stack other devices on top of the switch unit in the rack. The mounting brackets cannot support multiple devices. Use mounting brackets to secure each device to the rack.

Perform the following steps to mount the EX2500 switch in a 2-post rack:

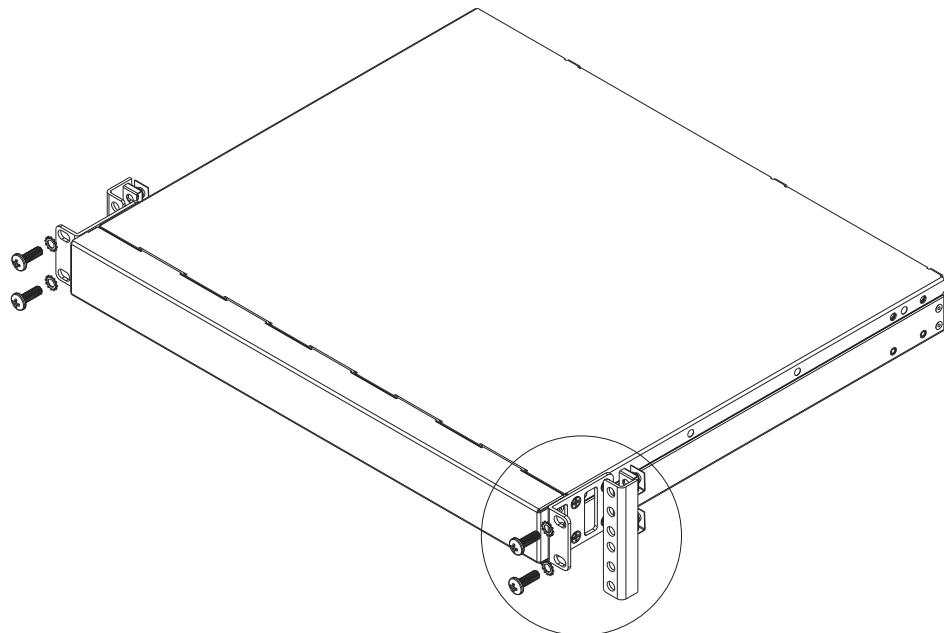
1. Use the M4 screws to attach a mounting bracket to each side of the switch, as shown in Figure 4. Torque the screws to approximately 30 inch-pounds (3.4 Nm).

Figure 4: Attaching the Mounting Brackets



2. Slide the switch into the rack as illustrated in Figure 5.

Figure 5: Rack-Mounting the Switch Unit



3. Use M6 screws, washers, and clip nuts to secure the switch unit to the rack. Torque the screws to approximately 30 inch-pounds (3.5 Nm).

Installing the EX2500 Switch in a 4-Post Rack

This section provides instructions for installing the EX2500 switch in a 4-post rack. For information about mounting the EX2500 switch in a standard 2-post rack, see “Installing the EX2500 Switch in a Standard Equipment Rack” on page 14.

The 4-post mounting kit is ordered separately. Table 17 lists the parts included in the generic 4-post mounting kit. (The item numbers identify the parts shown in Figure 6 through Figure 9.)

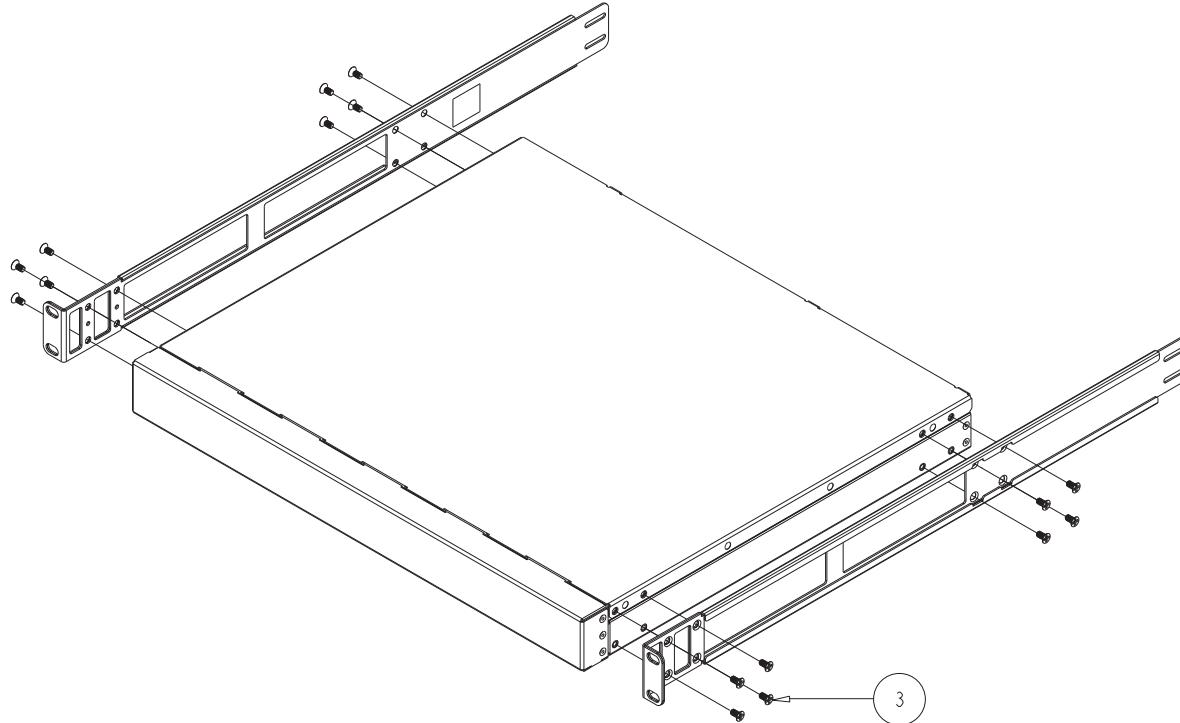
Table 17: 4-Post Rack Mount Kit

Item Number	Description	Quantity
1	M6 clip nuts	8
2	M6 locking washers	8
3	M4 screws	16
4	M6 screws	8
5	M6 cage nuts	8
6	M3 screws	4
7	Front brackets	2
8	Rear brackets	2

Perform the following steps to mount the EX2500 switch in a 4-post rack:

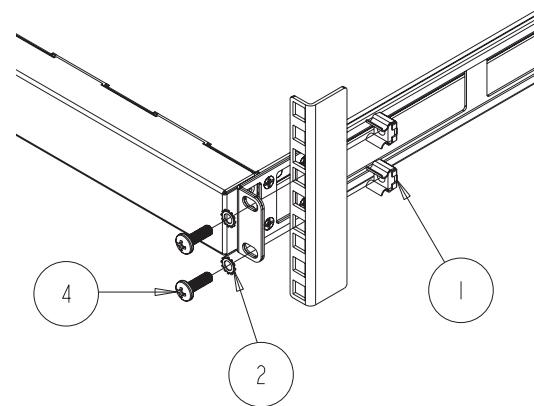
1. Use the M4 screws to attach a horizontal rail to each side of the switch (Figure 6). Torque the screws to approximately 10 inch-pounds (1.1 Nm).

Figure 6: Attaching the Horizontal Rail



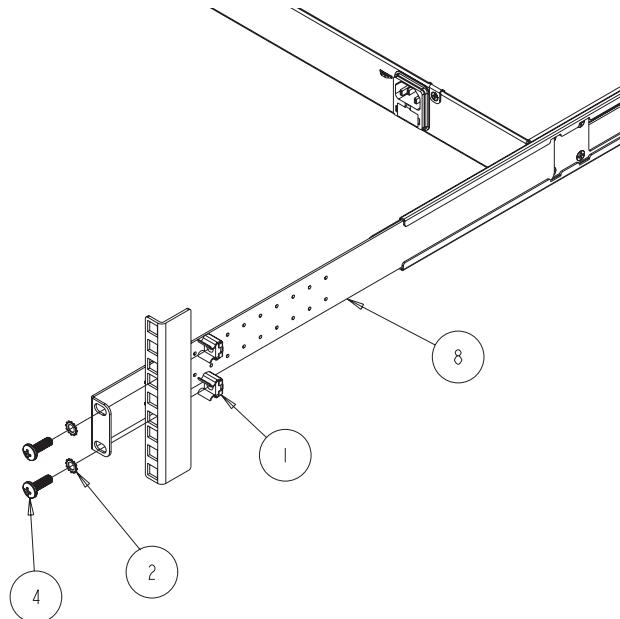
2. Use the M6 screws, washers, and clip nuts to connect the horizontal rail to the front posts in the rack (Figure 7). Torque the screws to approximately 70 inch-pounds (8.0 Nm).

Figure 7: Rack-Mounting the Switch Unit



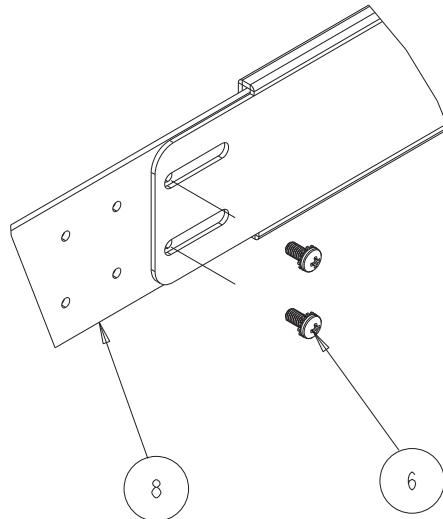
3. Secure the rear mounting brackets to the rack with M6 screws, washers, and clip nuts (Figure 8). Torque the screws to approximately 30 inch-pounds (3.4 Nm).

Figure 8: Attaching Rear Mounting Brackets



4. Secure the front mounting brackets and the rear mounting brackets with M3 screws (Figure 9). Torque the screws to approximately 4 inch-pounds (0.5 Nm).

Figure 9: Securing the Rear Bracket to the Front Bracket



Connecting Power to the EX2500 Ethernet Switch



WARNING: The EX2500 switch does not have a power switch. When you connect one of the two power cords to a suitable, energized AC power outlet, the switch powers on immediately. You must disconnect the power cords to power off the EX2500 switch. Always connect each power cord to a universal grounded power source in a location that is quickly and safely accessible.

The EX2500 Ethernet Switch has two AC power supplies, each with its own IEC 320 power connector. When connected to separate AC circuits, the dual power supplies share the power load to mitigate the risk of down time during a power failure. To connect power to the switch:

1. Connect one AC power cord to one of the two IEC 320 power connections on the rear panel of the switch, and connect the second power cord to the other IEC connector.
 2. If the AC power source outlets have a power switch, set each outlet switch to the OFF (0) position.
 3. Insert one power cord into one AC power source outlet, and then insert the second power cord into an AC power source on a separate circuit.
- If the outlet does not have a power switch, the switch powers on immediately.
4. If the AC power source outlets have a power switch, set each outlet switch to the ON (1) position.
- The switch powers on immediately.
5. Verify overall system status:
 - **SYS**—Must be solid green if both power cords are connected, or blinking green if only one power cord is connected
 - **FAN**—Must be solid green if all fans are running.



CAUTION: A blinking green FAN LED indicates a fan failure. Contact Juniper Networks technical support.

Initializing the EX2500 Ethernet Switch

When you plug in an EX2500 switch power cord, the switch initializes automatically.

Use the mini-USB console cable to connect the RS-232 serial (CON) port on the switch unit's front panel to a terminal or a PC running a terminal emulation program. You can access the command-line interface (CLI) to perform initial configuration tasks.

The console port's terminal-emulation requirements are as follows:

- Default baud rate = 9,600 bps
- Character size = 8 characters
- Parity = none
- Stop bits = 1
- Data bits = 8
- Flow control = none

The switch performs initial self tests, and displays the **Password:** prompt:

```

Memory Test .....  

Production Mode  

PPCBoot 0.0.0.10 (new flash)  

Memory Test (0x00) .....PASSED  

...  

Juniper Networks EX2500 Ethernet Switch  

Jan 1 00:01:27 2009:  

NOTICE-5:Interface Oper Status Indication - Port 7 State UP  

Password:
```

At the **Password:** prompt, enter the switch password, and press Enter. The default password is **admin**

Default Configuration

The switch software contains default configuration files that are loaded at the factory. The default configuration is part of the software; it cannot be deleted or changed. The default settings allow the switch to perform basic functions with minimal effort by the system administrator.

Configuring an IP Interface

To manage the switch using Telnet, SNMP, or a Web browser, you must configure an IP interface. Configure the following IP parameters:

- IP address
- Subnet mask
- Gateway address

To configure an IP interface:

1. Log in to the switch.
2. Enter Global Configuration mode.

```
ex2500> enable
ex2500# configure terminal
```

3. Configure the management IP address, subnet mask, and gateway. For example:

```
ex2500(config)# interface ip-mgmt address 10.10.10.2
ex2500(config)# interface ip-mgmt netmask 255.255.255.0
ex2500(config)# interface ip-mgmt enable
ex2500(config)# interface ip-mgmt gateway 10.10.10.1
ex2500(config)# interface ip-mgmt gateway enable
ex2500(config)# exit
```

Once you configure the IP address for your switch, you can connect to the management port and use the Telnet program from an external management station to access and control the switch. The management station and your switch must be on the same IP subnet.

The EX2500 switch supports a command-line interface (CLI) that you can use to configure and control the switch using Telnet. You can use the CLI to perform many basic network management functions. In addition, you can configure the switch for management using an SNMP-based network management system or a Web browser.

For more information about using the CLI, see the *EX2500 Ethernet Switch Command Reference*.

Using the Boot Management Menu

The Boot Management menu allows you to switch the software image, reset the switch to factory defaults, and recover from a failed software download.

You can interrupt the boot process and enter the Boot Management menu from the serial console port. When the system displays Memory Test, press Shift + B simultaneously. The Boot Management menu appears.

```
Resetting the System ...
Memory Test .....
```

```
Boot Management Menu
1 - Change booting image
2 - Change configuration block
3 - Xmodem download
4 - Exit
```

```
Please choose your menu option: 1
Current boot image is 1. Enter image to boot: 1 or 2: 2
Booting from image 2
```

The Boot Management menu allows you to perform the following actions:

- To change the boot image, type **1** and follow the screen prompts.
- To change the configuration block, type **2**, and follow the screen prompts.
- To perform an Xmodem download, type **3** and follow the screen prompts.
- To exit the Boot Management menu, type **4**. The boot process continues.

Installing and Removing an SFP+ Optical Transceiver

The EX2500 switch supports the following Small Form Factor Pluggable Plus (SFP+) transceivers:

- SFP+ 10GBase-SR Short Range Optical Fiber Transceiver
- SFP+ 10GBase-LR Long Range Optical Fiber Transceiver

The EX2500 switch accepts only approved SFP+ transceivers. The SFP+ optical transceiver provides two fiber-optic cable connectors for connecting to external ports.



WARNING: Class 1 Laser Product

- Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables.
 - Fiber-optic transceivers and fiber-optic cable connected to a transceiver emit laser light that can damage your eyes.
 - Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable.
- The safety cap keeps the port clean and prevents accidental exposure to laser light.
- Always inspect and clean the LC connector end faces before making any connections.

Perform the following steps to install an SFP+ optical transceiver in an SFP+ port on the EX2500 switch and connect the cable:



CAUTION: To avoid damage to the cable or the SFP+ transceiver, do not connect the fiber-optic cable before you install the transceiver.

1. Remove the safety cap and pull the locking lever into the down (unlocked) position.
2. Insert the transceiver into the port until it clicks into place. Use minimal pressure when you insert the transceiver into the port.

Do not use excessive force when you insert the transceiver; you can damage the transceiver or the SFP+ port. The transceiver has a mechanical guide key to prevent you from inserting the transceiver incorrectly.

3. Pull up the locking lever to lock the transceiver into place.
4. Connect the fiber-optic cable.

To remove an SFP + transceiver, disconnect the fiber-optic cable, and pull down the locking lever to release the transceiver. After you remove the transceiver, replace the safety cap.

Troubleshooting

This section contains basic troubleshooting information. Use it to help resolve problems that might occur during installation and operation of your switch. If you have problems accessing the switch or working with switch software, see your *EX2500 Ethernet Switch Configuration Guide* or *EX2500 Ethernet Switch Command Reference*.

If you need additional technical assistance, refer to “Requesting Technical Support” on page xi.

System LEDs Do Not Light

Symptom: The SYS and FAN LEDs do not light.

Solution: Verify that the power cord or cords are properly connected to the power plug or plugs. Verify that AC power is available from the power source.

Port Link LED Does Not Light

Symptom: The port link LED does not light.

Solution 1: Check the software configuration for the port (see the *EX2500 Ethernet Switch Command Reference*). If the port is configured with a specific speed or duplex mode, verify that the other device it is set to the same configuration. If the switch port is set to autonegotiate, verify that the other device is set to autonegotiate.

Solution 2: Verify that the cables connecting the port to the other device are of the correct type and are connected properly.

Switch Does Not Initialize (Boot)

Symptom: All switch LEDs stay on, and the command prompt does not appear on the console.

Solution: The operating system might have been damaged. Use the console port to perform a serial upgrade of the switch software. For instructions, see the *EX2500 Ethernet Switch Command Reference*.

Temperature Sensor Warning

Symptom: A temperature warning is displayed on the management console.

Solution:

1. Make sure that the air circulation vents on the front and back of the switch are free from obstruction by cables, panels, rack frames, or other materials.
2. Make sure that all cooling fans inside the switch are running. The FAN LED blinks to indicate a failure of one or more fans.
3. Use the following command to display fan status:

show sys-info

If any fan stops during switch operation, contact Juniper Networks technical support.

4. If necessary, cool the room to a lower temperature or provide a fan for greater air circulation.

Chapter 3

Contacting Customer Support and Returning Hardware

This chapter describes how to return an EX2500 switch or switch hardware to Juniper Networks for repair or replacement:

- Returning an EX2500 Switch or Hardware for Repair or Replacement on page 25
- Locating the Serial Number on an EX2500 Switch on page 26
- Contacting Customer Support to Obtain Return Materials Authorization on page 26
- Packing an EX2500 Switch for Shipment on page 27
- Packing Switch Hardware for Shipment on page 29

Returning an EX2500 Switch or Hardware for Repair or Replacement

To return an EX2500 switch or switch hardware for repair or replacement, follow this procedure:

1. Determine the serial number of the switch—or hardware, if any. For the switch serial number, see “Locating the Serial Number on an EX2500 Switch” on page 26.
2. Obtain a Return Materials Authorization (RMA) number from JTAC as described in “Contacting Customer Support to Obtain Return Materials Authorization” on page 26.



NOTE: Do not return any hardware 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 by collect freight.

-
3. Pack the switch or hardware for shipping as described in “Packing an EX2500 Switch for Shipment” on page 27 or “Packing Switch Hardware for Shipment” on page 29.

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

Locating the Serial Number on an EX2500 Switch

Before returning a switch to Juniper Networks for repair or replacement, you must locate the serial number of the switch unit. 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), enter the following command to display the serial number for the switch. The serial number appears above the manufacturing date in the output.

```
EX2500> show sys-info
Juniper Networks EX2500 Ethernet Switch

System Information at
Thu Feb 02 21:04:11 2009

Switch has been up for 4 days, 15 hours, 36 minutes and 13 seconds
Last boot:(power cycle)

MAC Address: 00:24:dc:61:83:00
Management Port MAC Address: 00:24:dc:7d:56:fe
Management Port IP Address: 127.16.2.54
Software Version 3.0R1, Boot Version 3.0R1, active config block

PCBA Part Number: *****
FAB Number: *****
Serial Number: ***** <----- Manufacturing Date
Manufacturing Date: ****
Hardware Revision: 255
Board Revision: *****
PLD Firmware version: *****
...
...
```

If you do not have access to the CLI, locate the serial number ID label on the rear panel of the switch unit or on the bottom of the unit. The switch has a serial number label in both locations.

Contacting Customer Support to Obtain Return Materials Authorization

After you have located the serial number of the switch you are returning—or of a hardware component with a serial number that you are returning separately—collect additional information and then open a case with the Juniper Networks Technical Assistance Center (JTAC), on the Web or by telephone.

Information for JTAC

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

- Serial number of the switch—or of separately returned hardware with a serial number
- 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

Contacting JTAC for an RMA Number

You can contact JTAC 24 hours a day, 7 days a week on the Web or by telephone:

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



NOTE: For international or direct-dial options in countries without toll-free numbers, see <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 for 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 switch or hardware.

Packing an EX2500 Switch for Shipment

To prevent damage during transport of the switch to another location or return to Juniper Networks, you must pack the switch securely in its original packaging.

You need the following materials:

- Shipping carton and packing materials in which the switch was originally shipped

If you do not have these materials, contact your Juniper Networks representative about approved packaging materials.

- ESD grounding strap
- Safety caps to cover ports
- Antistatic bag to cover the switch

- Two people to remove the switch from the rack
- Packing tape

To pack the switch:

1. Follow instructions for preventing electric shock and electrostatic discharge. See “Preventing Electric Shock” on page 13 and “Preventing Electrostatic Discharge” on page 13.
2. Disconnect power from the switch by doing one of the following:
 - If the power source outlets have a power switch, set them to the OFF (0) position.
 - If the power source outlets do not have power switches, gently pull out the male end of the power cord from the power source outlet.
3. Remove the cables that connect the switch to all external devices.
4. Remove all transceivers from the switch, and install safety caps over open ports. See “Installing and Removing an SFP + Optical Transceiver” on page 21.
5. If the switch is installed on a wall or in a rack, have one person support the weight of the switch while another person unscrews and removes the mounting screws.
6. Cover the switch with an antistatic bag, and place packing foam on top of and around the switch.
7. Place the switch in the shipping carton.
8. Place the power cords in the box.
9. Replace the accessory box containing the mounting brackets and hardware shipped with the switch and the mini-USB serial cable on top of the packing foam.
10. Securely tape the shipping carton closed.
11. Write the RMA number on the exterior of the carton to ensure proper tracking.

Packing Switch Hardware for Shipment

To separately pack EX2500 power cords, transceivers, rack-mount kits, or direct access cables (DACs) for shipment to Juniper Networks for return and replacement, follow these instructions.



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

You need the following materials:

- Original packing materials if they are available.

If the original materials are unavailable, use materials that ensure each component is adequately packed to prevent damage during transit. The packing material must be able to support the weight of the component.

- ESD grounding strap
- Antistatic bag for each electronic component
- Packing tape

To pack switch hardware for separate shipment:

1. Place individual electronic components in antistatic bags.
2. Wrap each component well with packing materials for adequate protection.
3. Pack the components in the original box or in an oversized box, with extra packing material around each item to prevent it from moving around inside the box.
4. Securely tape the box closed.
5. Write the RMA number on the exterior of the box to ensure proper tracking.

Chapter 4

EX2500 Ethernet Switch Safety and Compliance Statements

- General Safety Guidelines and Warnings for EX2500 Switches on page 31
- Definitions of Safety Notice Levels for EX2500 Switches on page 32
- EX2500 Safety Messages on page 33
- EX2500 Compliance Statements on page 38

General Safety Guidelines and Warnings for EX2500 Switches

The following guidelines help ensure your safety and protect the EX2500 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 switch 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 EX2500 switch only when it is properly grounded.
- Ensure that the separate protective earthing terminal provided on this product is permanently connected to earth.
- Do not push or force any objects through any opening in the switch frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the EX2500 switch 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 transceivers and cables are fully inserted.

Definitions of Safety Notice Levels for EX2500 Switches

The documentation for EX2500 switches uses the following levels of safety notices.



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, loss of data, or severe damage to the 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: 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: ¡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: 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: Class 1 Laser Product.

WARNING: Attention—Produit Laser de Classe 1.

WARNING: PRECAUCIÓN—Producto Del Laser De la Clase 1

WARNING: VORSICHT—Kategorie 1 Laser Produkt.

EX2500 Safety Messages

This section lists the safety messages that appear within this manual:

- Electric Shock Warning on page 33
- Electrical Current Warning on page 34
- Stacking Caution on page 36
- Power-On Warning on page 36
- Class 1 Laser Product Warning on page 37

Electric Shock Warning



WARNING: To reduce the risk of electric shock, use only power cords that have a grounding path, and always connect the power cord to a properly grounded power outlet.

ATTENTION—Afin de réduire les risques de chocs électriques, utilisez toujours une prise de secteur courant alternatif munie d'une mise à la terre et branchez le fil électrique à une prise de courant proprement installée.

PRECAUCIÓN—Para reducir el riesgo de la descarga eléctrica, utilice solamente los cables eléctricos que tienen una trayectoria que pone a tierra, y para conectar siempre el cable eléctrico con un enchufe de energía correctamente puesto a tierra.

VORSICHT—Um die Gefahr des elektrischen Schlages zu verringern, benutzen Sie nur Netzanschlußkabeln die einen Massenverbindung haben, und schliessen Sie das Netzanschlußkabel nur an einen richtig geerdeten Elektroanschluß.

Electrical Current Warning



WARNING: Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
 - Connect all power cords to a properly wired and grounded electrical outlet.
 - Connect to properly wired outlets any equipment that will be attached to this product.
 - When possible, use one hand only to connect or disconnect signal cables.
 - Never turn on any equipment when there is evidence of fire, water, or structural damage.
 - Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
 - Disconnect the power cord before installing, uninstalling, or moving this product.
-



DANGER—Le courant électrique de câble d'alimentation, de câble téléphonique, et de câbles de communication est dangereux. Pour éviter un risque de choc:

- Ne branchez ni ne débranchez les câbles ou ne procédez à l'installation, l'entretien, ou la reconfiguration de ce produit pendant un orage électrique.
 - Reliez tous les câbles de tension à une sortie électrique correctement installée avec prise à terre.
 - Tout équipement attaché à ce produit doit être connecté à une prise de courant proprement installée.
 - Si possible, utilisez une main seulement pour brancher ou débrancher les câbles de signaux.
 - Ne mettez jamais en marche un équipement quand il y a évidence de feu, d'eau, ou de dommages structuraux.
 - Débranchez les câbles de tension, les systèmes de télécommunications, les réseaux, et les modems attachés avant que vous ouvriez les couvercles du dispositif, à moins d'instructions particulières notées dans les procédures d'installation et de configuration.
 - Débranchez le cordon de tension avant d'installer, de démanteler ou de déplacer ce produit.
-



PELIGRO—La corriente eléctrica de la energía, del teléfono, y de los cables de la comunicación es peligrosa. Para evitar un peligro de choque:

- No conecte ni desconecte ningunas cables o no realice la instalación, el mantenimiento, o la reconfiguración de este producto durante una tormenta eléctrica.
- Conecte todos los cables eléctricos con un enchufe eléctrico correctamente atado con alambre y puesto a tierra.
- Conecte con los enchufes correctamente atados con alambre cualquier equipo que sea unido a este producto.
- Cuando es posible, utilice una mano para conectar o para desconectar solamente los cables de la señal.
- Nunca gire cualquier equipo cuando hay evidencia del fuego, del agua, o del daño estructural.
- Desconecte los cables eléctricos, los sistemas de las telecomunicaciones, las redes, y los módems unidos antes de que usted abra las cubiertas del dispositivo, a menos que esté mandado de otra manera en los procedimientos de la instalación y de la configuración.
- Desconecte el cable eléctrico antes de instalar, de uninstalling, o de mover este producto.



GEFAHR—Elektrischer Strom von Strom-, vom Telefon- und Kommunikations-Kabeln ist gefährlich. Um eine Schlaggefahr zu vermeiden:

- schließen Sie an oder trennen Sie keine Kabel oder führen Sie keine Installation, Wartung oder Neukonfiguration dieses Produktes während eines Gewitter durch.
- schließen Sie alles Netzanschlußkabel an einen richtig verdrahteten und geerdeten elektrischen Anschluß an.
- schließen Sie diesem Produkt nur an Geräte mit mit korrekte angeschlossene Stromverbindungen.
- wenn möglich, benutzen Sie nur einen Hand, um einen Signalkabel anzuschließen oder zu trennen.
- schalten Sie nie Geräte ein, wenn es Beweise für Feuer-, Wasser- oder der Strukturellen-Beschädigungen gibt.
- trennen Sie das angebrachte Netzanschlußkabel, die Nachrichtentechniksysteme, die Netze und das Modem, bevor Sie die Abdeckungen des Gerätes öffnen, es sei denn Sie werden anders angewiesen in den Installations- und Konfigurationshinweise.
- trennen Sie das Netzanschlußkabel, bevor Sie dieses Produkt installieren, de-installieren oder umziehen.

Stacking Caution



CAUTION: Do not stack other devices on top of the switch unit in the rack. The mounting brackets cannot support multiple devices. Use mounting brackets to secure each device to the rack.

ATTENTION—N'empilez aucun appareil supplémentaire sur le commutateur sans support additionnel. Les supports du châssis ne peuvent soutenir plusieurs appareils. Utilisez les supports métalliques pour fixer chaque appareil au châssis.

PRECAUCIÓN—No apile otros dispositivos encima de la unidad del interruptor en el estante. Los soportes de montaje no pueden apoyar los dispositivos múltiples. Utilice los soportes de montaje para asegurar cada dispositivo al estante.

VORSICHT—Stapeln Sie keine anderen Geraete auf die Schaltermaßeinheit im Einbaugehause. Die Schienenplatten können nicht mehrere Geraete tragen. Benutzen Sie immer Schienenplatten, um jedes Geraet an die Einbaugehause zu befestigen.

Power-On Warning



WARNING: The EX2500 switch does not have a power switch. When you connect the power cord to a suitable, energized AC power outlet, the switch powers on immediately. Disconnecting the power cord is the only way to power off the EX2500 switch. Always connect the power cord in a location that is quickly and safely accessible.

ATTENTION—Le EX2500 ne dispose pas d'un commutateur de puissance. Quand vous connectez le cordon sous tension à la prise secteur de courant alternatif, le commutateur est activé immédiatement. La seule manière d'éteindre le commutateur est de débrancher le câble d'alimentation (courant alternatif). Assurez-vous de connecter le câble d'alimentation à un endroit qui permet un accès rapide et sans risque.

PRECAUCIÓN—El EX2500 no tiene un interruptor. Cuando usted conecta el cable eléctrico con un conveniente, enchufe energizado de la corriente ALTERNA, las energías del interruptor para arriba inmediatamente. Desconectar el cable eléctrico es la única manera de accionar abajo el EX2500. Conecte siempre el cable eléctrico en una localización que esté rápidamente y con seguridad accesible.

VORSICHT—Das EX2500 hat keinen Netzschalter. Wenn Sie das Netzanschlußkabel an ein verwendbares Steckdose anschließen, schaltet das Geraet sofort ein. Das Netzanschlußkabel zu trennen ist die einzige Weise, das EX2500 abzuschalten. Schließen Sie immer das Netzanschlußkabel in einer Einbauort an, die schnell und sicher zugänglich ist.

Class 1 Laser Product Warning**WARNING: Class 1 Laser Product**

- Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables.
- Fiber-optic transceivers and fiber-optic cable connected to a transceiver emit laser light that can damage your eyes.
- Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable.
- The safety cap keeps the port clean and prevents accidental exposure to laser light.
- Always inspect and clean the LC connector end faces before making any connections.

**ATTENTION—Le Produit de Laser de la Classe 1**

- Ne regardez pas directement dans un émetteur/récepteur de fibre optique ou dans l'extrémité du câble de fibre optique.
- Les émetteurs/récepteurs de fibre optique et de câble de fibre optique sont reliés à un émetteur/récepteur qui émet un faisceau lumineux qui peut endommager la rétine.
- Ne laissez jamais un émetteur/récepteur de fibre optique à découvert excepté en insérant ou en enlevant le câble.
- Le capuchon de sûreté garde l'orifice propre et empêche l'exposition accidentelle à la lumière de laser.
- Inspectez et nettoyez toujours les facettes d'extrémité du connecteur de LC avant d'établir toutes les connexions.

**PRECAUCIÓN—Producto Del Laser De la Clase 1**

- No mire directamente en un transmisor-receptor fiber-optic o en los extremos de cables fiber-optic.
- Los transmisores-receptores fiber-optic y el cable fiber-optic conectaron con un transmisor-receptor emiten la luz laser que puede dañar sus ojos.
- No deje un transmisor-receptor fiber-optic destapado excepto al insertar o quitando el cable.
- El casquillo de seguridad guarda el portuario para limpiar y previene la exposición accidental a la luz laser.
- Examine y limpие siempre las caras del extremo del conectador del LC antes de hacer cualesquier conexiones.

**VORSICHT—Kategorie 1 Laser Produkt**

- Schauen Sie nicht direkt in einen Glasfaserlautsprecherempfänger oder in der offene Ende der Glasfaserkabel.
- Glasfasertransceiver und Glasfaserkabel an einen Transceiver angeschlossen strahlen Laserlicht aus, das Ihre Augen beschädigen kann.
- Lassen Sie nicht einen Glasfasertransceiver unbedeckt, wenn Sie Kabel einsetzen oder entfernen. - der Sicherheitsverschluß hält das Port sauber und verhindert versehentliche.
- Ausstrahlung vom Laserlicht. Kontrollieren Sie und säubern Sie die LC Stecker-Ende, bevor Sie irgendwelche Verbindungen durchfuehren.

EX2500 Compliance Statements

This section contains the following regulatory compliance statements for the EX2500 Ethernet Switch:

- Federal Communications Commission (FCC) Statement on page 38
- Industry Canada Class A Emission Compliance Statement on page 39
- Australia and New Zealand Class A Statement on page 39
- European Union EMC Directive Conformance Statement on page 39
- Japanese Voluntary Control Council for Interference (VCCI) Statement on page 39
- Denan Statement (Japan/Nippon Only) on page 40

Federal Communications Commission (FCC) 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 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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Juniper Networks is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A Emission Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A Statement

Attention: 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.

European Union EMC Directive Conformance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Juniper Networks cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of unsupported option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: 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.

Japanese Voluntary Control Council for Interference (VCCI) Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス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。

Denan Statement (Japan/Nippon Only)

本製品を安全にご使用頂くため、以下のことにご注意ください。

- 接続ケーブル、電源コード、ACアダプタなどの部品は、必ず製品に同梱されております添付品または指定品をご使用ください。添付品・指定品以外の部品をご使用になると故障や動作不良、火災の原因となることがあります。
- 同梱されております付属の電源コードを他の機器には使用しないでください。上記注意事項を守らないと、死亡や大怪我など人身事故の原因となることがあります。

Index

Numerics

10/100/1000Base-T ports	6
2-post rack-mount kit	
contents	14
installation with	14
packing for RMA replacement	29
4-post rack-mount kit	
contents	15
installation with	15
model number	10
packing for RMA replacement	29

A

AC power cords	
connecting	18
shipped with switch	12
admin, default password	19
airflow, switch	8
audience for this manual	ix
Australia and New Zealand Class A compliance statement	39
availability features	3

B

back panel	4
blinking LEDs, status indications	8
boot failure, troubleshooting	22
Boot Management menu	20
box, shipping	
contents	12
for returning hardware	27

C

cables	
AC power cords	12, 18
checking when port LEDs are not lit	22
checking when system LEDs are not lit	22
console, wiring	6
direct access (DACs)	5
mini-USB	12, 18
packing for RMA replacement	29
Canada Class A Emission Compliance Statement	39
caution icon	x
Class 1 Laser Product warning	37
CLI support	20

command-line interface (CLI) support	20
commands	
configure terminal	20
enable	20
exit	20
interface ip-mgmt address	20
interface ip-mgmt enable	20
interface ip-mgmt gateway	20
interface ip-mgmt gateway enable	20
interface ip-mgmt netmask	20
show sys info	23
show sys-info	26
compliance statements	
Australia and New Zealand Class A	39
Canada Class A Emission	39
Denan Statement, Japan/Nippon	40
European Union EMC Directive Conformance	39
FCC	38
Japanese Voluntary Control Council for Interference (VCCI) Statement	39
summary	38
CON port	6
connecting at startup	18
pin assignment	6
terminal emulation requirements	19
configuration	
default files	19
IP interface	19
configure terminal command	20
console cable wiring	6
console port	6
connecting at startup	18
pin assignments	6
terminal emulation requirements	19

D

D9 connector	6
DACs (direct access cables)	
model numbers	5
packing for RMA replacement	29
default configuration files, description	19
default password	19
depth, switch	8
dimensions, switch	8

direct access cables (DACs)	
model numbers	5
packing for RMA replacement.....	29
E	
electric current warning	34
electric shock warning.....	33
electrostatic discharge (ESD), preventing.....	13
enable command	20
environmental requirements for installation	12
environmental specifications, switch	9
ESD, preventing.....	13
European Union EMC Directive Conformance Statement	39
EX2500 documentation.....	xi
EX2500 switch	
boot management	20
CLI support	20
compliance statements	38
connecting power	18
default password.....	19
description	3
environmental requirements for installation.....	12
environmental specifications	9
failure to initialize, troubleshooting	22
features	2
front panel	4
hardware components	3
initializing	18
installing.....	11
model numbers	10
optics, model numbers	10
ordering information	10
overview.....	1
package contents	12
powering off	18
powering on.....	18
rear panel.....	4
returning hardware.....	25
RMA process.....	25
safety and compliance information.....	31
serial number	26
startup self test	19
technical specifications	8
transceiver installation	21
troubleshooting, basic	22
exit command	20
F	
failure to initialize, troubleshooting	22
FAN LED	
does not light, troubleshooting.....	22
indications	8
fans	
description	4
displaying status.....	23
failure temperature	9
FAN LED	8
temperature sensor warning, troubleshooting	23
FCC (Federal Communications Commission)	
compliance statement.....	38
Federal Communications Commission (FCC)	
Statement	38
front panel.....	4
H	
hardware	
model numbers	3
mounting.....	3
returning.....	25
specifications	8
switch components	3
switch ports	4
height, switch.....	8
help, requesting	xi
I	
icons, notice	x
initializing the switch	
failure to initialize, troubleshooting	22
startup	18
installation	
environmental requirements	12
in a 2-post rack	14
in a 4-post rack	15
SFP + transceivers	21
standard rack	14
tools and equipment required	11
interface ip-mgmt address command	20
interface ip-mgmt enable command	20
interface ip-mgmt gateway command	20
interface ip-mgmt gateway enable command	20
interface ip-mgmt netmask command	20
IP interface configuration, basic	19
J	
Japan/Nippon Denan compliance statement	40
Japanese Voluntary Control Council for Interference (VCCI) compliance statement	39
JTAC, contacting	xi
for hardware return	26
information for JTAC	27
obtaining RMA number	27
L	
label, serial number	26
laser product warning	21

laser warning icon	x
Layer 2 features	3
L	
LEDs	
data port LEDs, troubleshooting	22
data ports	8
FAN indications	8
FAN LEDs, troubleshooting	22
fan status	7
illustration	7
MGMT ports	8
RJ-45 ports	8
summary	7
SYS indications	8
SYS LEDs, troubleshooting	22
system status	7
length, switch	8
M	
management features	2
management ports	6
MGMT ports	6
mini-USB port	6
mini-USB serial cable	
connecting at startup	18
shipped with switch	12
model numbers	
DACs	5
direct access cables (DACs)	10
EX2500 switch	3
rack-mount kit, 4-post	10
SFP + transceivers	5, 10
mounting hardware	3
N	
New Zealand and Australia Class A compliance statement	39
Nippon/Japan Denan compliance statement	40
note icon	x
notice icons, usage	x
O	
operating temperature	9
ordering information	10
P	
packing	
switch for RMA replacement or repair	27
switch hardware for RMA replacement	29
password, default	19
performance features	2
physical characteristics	8
pinouts	
CON port	6
console cable	6
MGMT ports	6
RJ-45	6
platforms supported	ix
ports	
10/100/1000Base-T	6
console	6
IP interface configuration	19
LEDs	8
link LEDs do not light, troubleshooting	22
MGMT	6
mini-USB	6
RJ-45	6
RS-232	6
SFP +	5
summary	4
power cords	
packing for RMA replacement	29
warning	5
power specifications	9
power supplies	5
power switch, not present on switch	12
powering off	18, 28
powering on	18
power-on warning	36
problems, resolving	22
Q	
Quality of Service (QoS) features	3
R	
rack-mount kit, 2-post	
installation with	14
packing for RMA replacement	29
shipped with switch	12
rack-mount kit, 4-post	
installation with	15
model number	10
packing for RMA replacement	29
rear panel	4
RESET button	4
Return Materials Authorization (RMA)	
obtaining RMA number	26
process	25
returning hardware	25
contacting JTAC	26
information for JTAC	27
obtaining RMA number	26
packing switch hardware for shipment	29
packing the switch for shipment	27
process	25
RJ-45 connector pin assignments	6

RJ-45 ports	
description	6
LEDs.....	8
RMA (Return Materials Authorization)	
obtaining RMA number	26
process	25
RS-232 port	6
S	
safety	
guidelines and warnings summary	31
messages.....	33
safety notice definitions	32
security features	2
self test process at startup.....	19
serial number	
determining	26
location on switch.....	26
SFP + ports	5
SFP + transceivers	
installation	21
model numbers	5
packing for RMA replacement	29
show sys-info command	23, 26
software features.....	2
solid LEDs, status indications	8
specifications	
environmental	9
physical	8
power	9
technical.....	8
stacking caution.....	36
startup	
failure, troubleshooting	22
process	18
storage temperature.....	9
support, technical, requesting	xi
syntax conventions	x
SYS LED	
does not light, troubleshooting	22
indications	8
system and fan LEDs	7
T	
technical specifications.....	8
technical support, requesting	xi
temperature	
ambient operating	9
fan failure.....	9
storage.....	9
warning, troubleshooting	23
temperature sensor warning.....	23
terminal emulation requirements	19
text conventions	x
tools required for switch installation.....	11
transceivers, SFP +	5
installation.....	21
packing for RMA replacement.....	29
troubleshooting	
FAN LEDs do not light	22
port link LEDs do not light	22
switch does not initialize	22
SYS LEDs do not light	22
temperature sensor warning	23
turning off the switch.....	18, 28
turning on the switch	18
V	
VCCI compliance statement, Japan	39
W	
warning icon	x
warnings	
Class 1 Laser Product.....	21, 37
electric current	34
electrical shock	13, 33
no power switch.....	18
power cord	5
power-on	18, 36
stacking caution	36
summary	31
temperature sensor, troubleshooting	23
weight, switch	8
width, switch.....	8