



Extreme Networks Consolidated ExtremeXOS Hardware Installation Guide

BlackDiamond 8800 Series Switches

BlackDiamond 12800 Series Switches

BlackDiamond 10808 Switch

Summit Family Switches

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For safety compliance information, see [Appendix A, "Safety Information."](#)

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Preface

This preface provides an overview of this guide, describes guide conventions, and lists other publications that might be useful.



WARNING!

Service to all equipment should be performed by trained and qualified service personnel only. Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must thoroughly read the safety information provided in [Appendix A](#) of this guide. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Introduction

This guide provides the required information to install Extreme Networks® BlackDiamond® 8800 series switches, BlackDiamond 10808 switches, BlackDiamond 12800 series switches, and the Summit® family of switches, including the Summit X250e series, Summit X450 series, Summit X450a series, and Summit X450e series. This guide also contains information about site preparation, switch functionality, and switch operation.



NOTE

The Summit X250e series switches, Summit X450 series switches, Summit X450e series switches, and Summit X450a series switches are called the Summit family of switches when referred to collectively.

This guide is intended for use by network administrators responsible for installing and setting up network equipment. It assumes a basic working knowledge of:

- Local area networks (LANs)
- Ethernet concepts
- Ethernet switching and bridging concepts
- Routing concepts
- Simple Network Management Protocol (SNMP)

See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for information about configuring Extreme Networks BlackDiamond 8800 series switches, BlackDiamond 10808 switches, BlackDiamond 12800 series switches, or Summit family switches.



NOTE

If the information in the installation note or release note shipped with your Extreme Networks switch differs from the information in this guide, follow the installation or release note.

Conventions

Table 1 and Table 2 list conventions used throughout this guide.

Table 1: Notice icons

Icon	Notice Type	Alerts you to...
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

Table 2: Text conventions

Convention	Description
Screen displays	This typeface represents information as it appears on the screen, or command syntax.
The words “enter” and “type”	When you see the word “enter” in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says “type.”
[Key] names	Key names appear in text in one of two ways: - Referenced by their labels, such as “the Return key” or “the Escape key” - Written with brackets, such as [Return] or [Esc] If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Words in italicized type	Italics emphasize a point of information or denote new terms at the place where they are defined in the text.

Related Publications

The Extreme Networks ExtremeXOS™ switch documentation set includes:

- *ExtremeXOS 12.0 Concepts Guide*
- *ExtremeXOS 12.0 Command Reference Guide*
- *ExtremeXOS 12.0 Release Notes*

Documentation for Extreme Networks products is available from the Extreme Networks website at the following location:

<http://www.extremenetworks.com/services/documentation>

You can select and download the following Extreme Networks documentation from the Documentation Overview page:

- Software User Guides
- Hardware User Guides

You can find archived user guides for software at:

<http://www.extremenetworks.com/services/documentation/swuserguides.asp>

You can also find archived installation guides for hardware at:

<http://www.extremenetworks.com/services/documentation/hwuserguides.asp>



1

Site Preparation

1 Site Preparation

This chapter describes:

- [Planning Your Site on page 22](#)
- [Meeting Site Requirements on page 22](#)
- [Evaluating and Meeting Cable Requirements on page 30](#)
- [Meeting Power Requirements on page 36](#)
- [Applicable Industry Standards on page 39](#)

The requirements described in this chapter are intended for the system administrator, network equipment technician, or network manager responsible for installing and managing the network hardware. It assumes a working knowledge of local area network (LAN) operations, and a familiarity with communications protocols that are used on interconnected LANs. Installation, maintenance, and removal of a switch, chassis, or its components must be done by qualified service personnel only.

Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves or other people.

By carefully planning your site, you can maximize the performance of your existing network and ensure that it is ready to migrate to future networking technologies.

To learn more about safety issues and to ensure safety compliance, see [Appendix A](#).



WARNING!

Service to all equipment should be performed by trained and qualified service personnel only! Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must read the safety information provided in [Appendix A](#) of this guide.

Planning Your Site

To install your equipment successfully, you should plan your site carefully. The site planning process has three major parts:

- [Meeting Site Requirements](#)
- [Evaluating and Meeting Cable Requirements](#)
- [Meeting Power Requirements](#)

Meeting Site Requirements

Your physical installation site must meet the following requirements for a safe and successful installation:

- Building and electrical code requirements
- Environmental, safety, and thermal requirements for the equipment you plan to install
- Distribution rack requirements

Evaluating and Meeting Cable Requirements

After examining your physical site and ensuring all environment requirements are met, evaluate and compare your existing cable plant with the requirements of the Extreme Networks equipment to determine if you need to install new cables (or cabling).

Meeting Power Requirements

To run your equipment safely, you must meet the specific power requirements for each power supply unit installed in the system.

Meeting Site Requirements

This section addresses the various requirements to consider when preparing your installation site, including:

- [Operating Environment Requirements](#)
- [Rack Specifications and Recommendations](#)

Operating Environment Requirements

Verify that your site meets all environmental and safety requirements.

Virtually all areas of the United States are regulated by building codes and standards. During the early planning stages of installing or modifying your LAN, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

Building and Electrical Codes

Building and electrical codes vary depending on your location. Comply with all code specifications when planning your site and installing cable. The following sections are provided as a resource to obtain additional information.

Information on major building codes is located at the following websites:

- International Code Council (ICC); 5203 Leesburg Pike; Falls Church, Virginia 22041 USA.
<http://www.iccsafe.org>
<http://www.sbcci.org>

Five authorities on electrical codes are:

- National Electrical Code (NEC) Classification (USA only)—a recognized authority on safe electrical wiring. Federal, state, and local governments use NEC standards to establish their own laws, ordinances, and codes on wiring specifications. The NEC classification is published by the National Fire Protection Association (NFPA). The address is NFPA; 1 Batterymarch Park; Quincy, Massachusetts 02169 USA. <http://www.nfpa.org>
- Underwriters' Laboratory (UL) (USA only)—an independent research and testing laboratory. UL evaluates the performance and capability of electrical wiring and equipment to determine whether they meet certain safety standards when properly used. Acceptance is usually indicated by the words "UL Approved" or "UL Listed." The address is UL; 333 Pfingsten Road; Northbrook, Illinois 60062-2096 USA. <http://www.ul.com>
- National Electrical Manufacturing Association (NEMA) (USA only)—an organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components. The address is NEMA; 1300 N. 17th Street; Rosslyn, Virginia 22209. <http://www.nema.org>
- Electronics Industries Alliance (EIA)—a trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry. The address is EIA; 2500 Wilson Boulevard; Arlington, Virginia 22201 USA. <http://www.eia.org>
- Federal Communications Commission (FCC)—a commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of 1934. The FCC regulates all U.S. telephone and cable systems. The address is FCC; 445 12th Street S.W.; Washington, D.C. 20554 USA. <http://www.fcc.gov>

Wiring Closet Considerations

Be aware of the following recommendations for your wiring closet:

- Be sure that your system is easily accessible for installation and service. See [“Rack Specifications and Recommendations” on page 27](#) for information.
- Use appropriate AC power, power distribution, and grounding for your specific installation.
- Use a vinyl floor covering in your wiring closet. (Concrete floors accumulate dust, and carpets can cause static electricity.)
- Prevent unauthorized access to wiring closets by providing door locks. Install the equipment in a secured, enclosed, and restricted access location, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Be sure that each wiring closet has a suitable ground. All distribution racks and equipment installed in the closet should be grounded.
- Be sure that all system environmental requirements are met, such as ambient temperature and humidity.



NOTE

Extreme Networks recommends that you consult an electrical contractor for commercial building and wiring specifications.

Temperature

Extreme Networks equipment generates a significant amount of heat. It is essential that you provide a temperature-controlled environment for both performance and safety.

Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.

Follow these general thermal recommendations for your wiring closet:

- Be sure that the ventilation in the wiring closet is adequate to maintain a temperature below 104° F (40° C).
- Install a reliable air conditioning and ventilation system.
- Keep the ventilation in the wiring closet running during non-business hours; otherwise, the equipment can overheat.
- Maintain ambient operating temperature: 32° to 104° F (0° to 40° C).
- Maintain storage temperature: -40° to 158° F (-40° to 70° C).



NOTE

Like all electrical equipment, product lifetimes degrade with increased temperature. If possible, temperatures should be kept at approximately 78° F (25° C) or lower.

BlackDiamond Family Chassis Spacing Requirements

Extreme Networks recommends placing no more than three chassis next to each other due to chassis-to-chassis heating. The following are some general recommendations for installing your BlackDiamond 10808 switch, BlackDiamond 8800 series of switches, or your BlackDiamond 12804 switch:

- A minimum of one empty 19-inch rack between each set of three adjacent BlackDiamond switches.
or
- Place patch panels between each set of three adjacent BlackDiamond switches. A patch panel does not require any power and does not generate any heat.



NOTE

Up to five adjacent switches will continue to function without safety concerns. However, product lifetime may degrade with continued exposure to high temperatures in close proximity and long term reliability may be compromised.

Summit Family of Switches Spacing Requirements

Be sure that cables and other equipment do not block the air intake or outflow on an Extreme Networks Summit family switch. It is best to have at least 3 inches (8 cm) of clear space in front of the air intake and outflow vents on the sides of the switch; airflow moves from side to side. For proper airflow through a Summit family switch, leave clear space on the left and right sides of the switch.

Depending on other conditions in the equipment room, it may be possible to install the switches closer to each other; consult your Extreme Networks Customer Support representative for guidance.

BlackDiamond Family Chassis Airflow Requirements

To ensure proper airflow through a BlackDiamond switch, refer to the following recommendations when you are installing your switch:

- BlackDiamond 10808 switches require a minimum of 3 inches (8 cm) around both the front and rear of the chassis from any cabinet wall or other obstruction for proper airflow.
- BlackDiamond 8800 and 12804 switches require a minimum of 1.5 inches (4 cm) around both the left and right sides of the chassis from any cabinet wall or other obstruction for proper airflow.
- Air temperature measured approximately 1 inch (2.5 cm) from the fan inlet should be less than 104 °F (40 °C).

The airflow of the BlackDiamond 10808 switch, BlackDiamond 8800 series of switches, and BlackDiamond 12804 switch moves through the power supplies and is independent of the airflow through the modules as shown in [Figure 1](#) and [Figure 2](#).

Figure 1: Airflow through the BlackDiamond 10808 system chassis

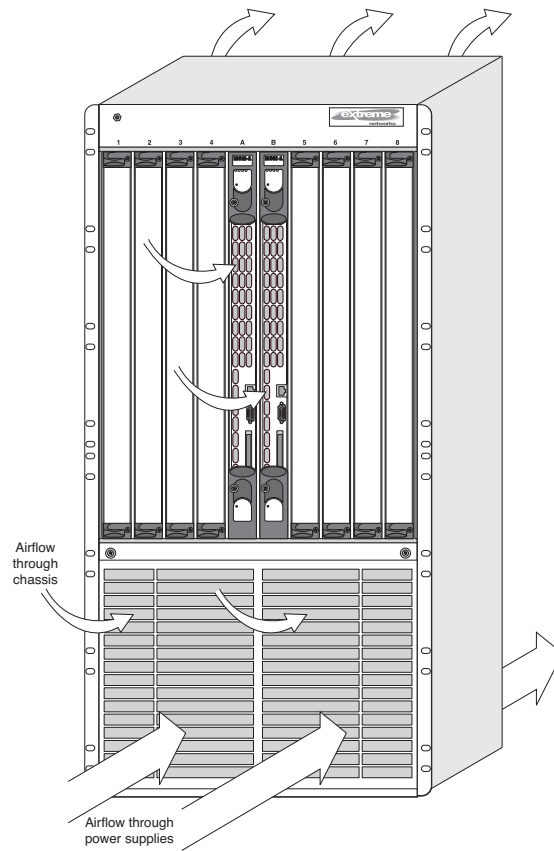
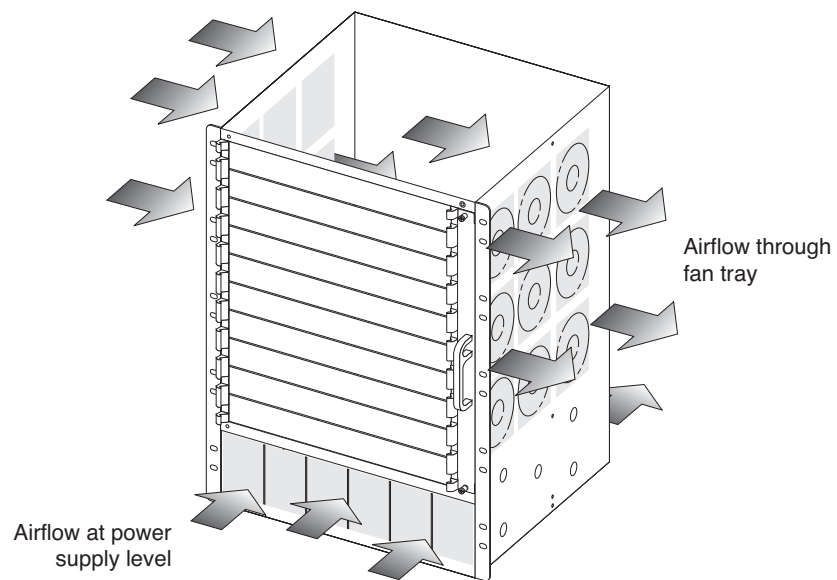


Figure 2: Airflow through the BlackDiamond 8810 chassis

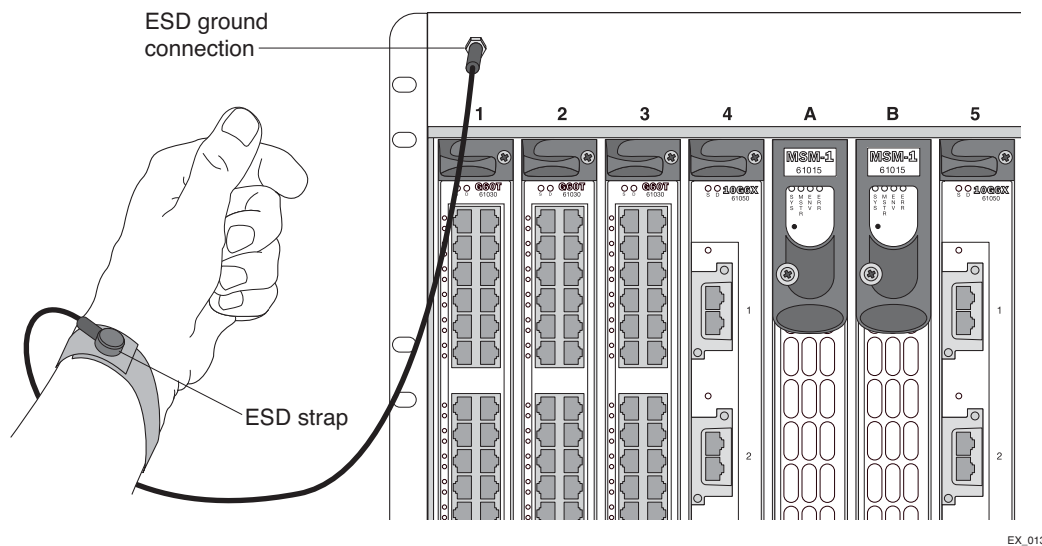


Electrostatic Discharge

Your system must be protected from static electricity or electrostatic discharge (ESD). Take the following measures to ensure optimum system performance:

- Remove materials that can cause electrostatic generation (such as synthetic resins) from the wiring closet. Check the appropriateness of floor mats and flooring.
- Connect metal chassis, conduit, and other metals to ground using dedicated grounding lines.
- Use electrostatically safe equipment and the ESD-preventive wrist strap that is provided with your equipment. All switches come with ESD-preventive wrist strap connectors and an ESD-preventive wrist strap as shown in [Figure 3](#).

Figure 3: Using an ESD-preventive wrist strap



EX_013

Humidity

Operating humidity should be kept between 50 to 70% relative humidity non-condensing during typical operation and 10% to 95% relative humidity (non-condensing) for short intervals to maximize equipment life.

Rack Specifications and Recommendations

Racks should conform to conventional standards. In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment. In countries other than the United States, use IEC Standard 297. In addition, verify that your rack meets the basic mechanical, space, and earthquake requirements that are described in this section.

Mechanical Recommendations for the Rack

Use distribution racks that meet the following mechanical recommendations:

- Use an open style, 19-inch rack to facilitate easy maintenance and to provide proper ventilation.
- Use a rack made of steel or aluminum.
- The rack should use the universal mounting rail hole pattern that is identified in IEC Standard 297.
- The rack should have designated earth grounding connections (typically on the base).
- The rack must meet earthquake safety requirements equal to that of the installed chassis.
- The mounting holes should be flush with the rails to accommodate the chassis.
- Install equipment into the lower half of the rack first to avoid making the rack top-heavy.
- The rack should support approximately 600 pounds (272 kilograms).

Protective Grounding for the Rack

Use a rack grounding kit and a ground conductor that is carried back to earth or to another suitable building ground.

All Extreme Networks switches are designed with mounting brackets that provide solid metal-to-metal connection to the rack. If you do not use equipment racks, you can attach wiring terminals directly to the mounting brackets for appropriate grounding. Extreme Networks switches have grounding terminals that are mounted on the back of the chassis.

At a minimum, follow these guidelines to ground equipment racks to the earth ground:

- CAD weld appropriate wire terminals to building I-beams or earth ground rods.
- Use the appropriate chassis grounding wire for your system, which is dependant upon the available input current to the power supply.
 - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG. The power cable ground should be the same size as the primary.
 - For DC systems using a 15A breaker per PSU (Summit X450a-48tDC switch), the chassis ground can be as small as 14 AWG. The power cable ground should be the same size as the primary.
 - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG. The power cable ground should be the same size as the primary.

This recommendation does not apply to the Summit family of switches, other than the Summit X450a-48tDC switch. Other Summit switches do not need separate chassis grounding for AC or DC systems.



NOTE

For complete details on power supplies and power supply cords, refer to the following: [Chapter 6, “Extreme Networks Power Supply Units for BlackDiamond Switches,”](#) and [“Power Supply Cords Selection” on page 375 in Appendix A, “Safety Information.”](#) Drill and tap wire terminals to equipment racks.

- Position the earth ground as close to the equipment rack as possible to maintain the shortest wiring distance possible.
- Use a ground impedance tester or micro-ohm meter to test the quality of earth ground connection at the chassis. This will insure good grounding between the chassis, rack, and earth ground.

**NOTE**

Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding for your specific installation.

Space Requirements for the Rack

Provide enough space in front of and behind the switch so that you can service it easily. Allow a minimum of 48 inches (122 cm) in front of the rack and 24 inches (61 cm) behind the rack. When using a relay rack, provide a minimum of 24 inches (61 cm) of space behind the mounted equipment. Extra room on each side is optional.

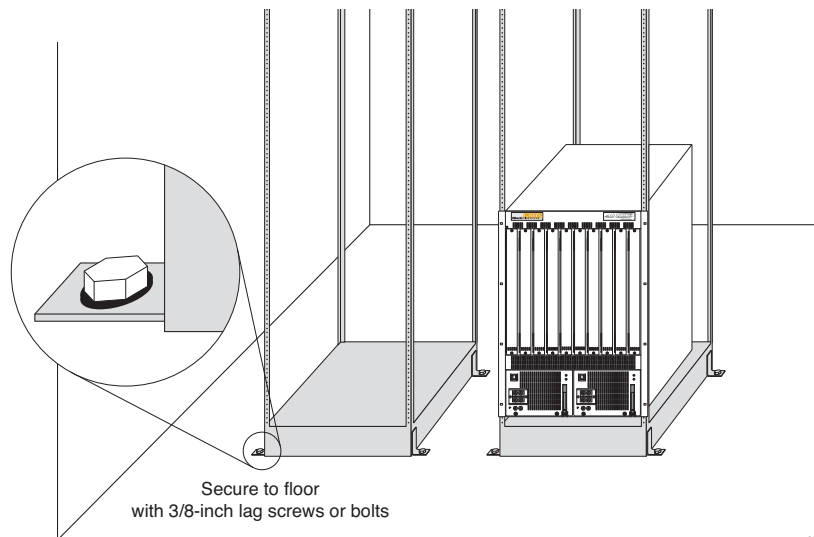
**WARNING!**

The chassis does not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the chassis is disconnected by removing the wall plug from the electrical outlet. For systems using a DC SSI power supply, power to the chassis can be turned off by lifting the handle on the power supply or by de-energizing the circuit that feeds the power supply, which is usually accomplished by turning off a circuit breaker. Power to the Summit X450a-24tDC switch and the EPS-150DC can be turned off by disconnecting the DC wiring harness from the DC power source only, which requires the performance of a qualified, licensed electrician.

Securing the Rack

The rack should be attached to the wiring closet floor with 3/8-inch (9.5 mm) lag screws or equivalent hardware. The floor under the rack should be level within 3/16-inch (5 mm). Use a floor-leveling cement compound if necessary or bolt the racks to the floor as shown in [Figure 4](#).

Figure 4: Properly secured rack



SPG_007

Brace open distribution racks if the channel thickness is less than 1/4 inch (6.4 mm).

Evaluating and Meeting Cable Requirements

This section addresses requirements for the cable you should use when installing your network equipment. It includes:

- [Cabling Standards](#)
- [Cable Labeling and Record Keeping](#)
- [Installing Cable](#)
- [RJ-45 Connector Jackets](#)
- [Radio Frequency Interference](#)

Cabling Standards

Extreme Networks recommends using the Building Industry Consulting Service International (BICSI) Registered Communications Distribution Designer (RCDD), which is globally recognized as a standard in site planning and cabling. For information, go to:

<http://www.bicsi.org>

Cable Labeling and Record Keeping

A reliable cable labeling system is essential when planning and installing a network. Maintaining accurate records helps you to:

- Relocate devices easily.
- Make changes quickly.
- Isolate faults in the distribution system.
- Locate the opposite end of any cable.
- Know the types of network devices that your cabling infrastructure can support.

Consider the following recommendations when setting up a cable labeling system suitable for your installation:

- Identify cables by securely attaching a label to all cable ends.
- Assign a unique block of sequential numbers to the group of cables that run between each pair of wiring closets.
- Assign a unique identification number to each distribution rack.
- Identify all wiring closets by labeling the front panel of your Extreme Networks equipment and other hardware.
- Keep accurate and current cable identification records.
- Post records near each distribution rack. Include the following cable drop information: the cable source, destination, and jumper location.

Installing Cable

Consider the following recommendations when you connect cable to your network equipment:

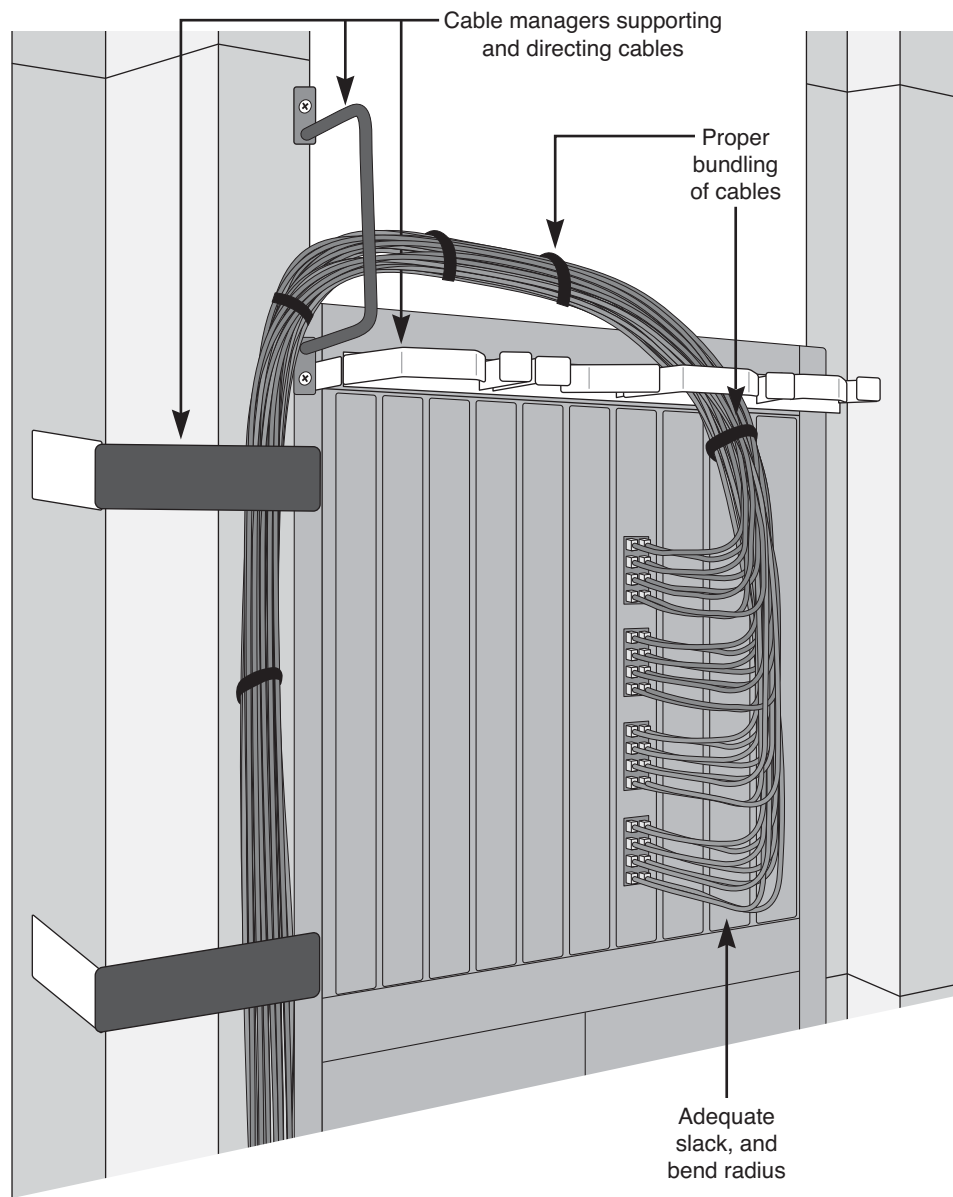
- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Provide enough slack, approximately 2 to 3 inches (5.08 to 7.62 cm), to provide proper strain relief as shown in [Figure 5](#).
- Bundle cable using velcro straps to avoid injuring cables.
- If you build your own cable, be sure that cable is properly crimped.
- When installing a patch panel using twisted pair wiring, untwist no more than 1 inch (2.54 cm) of the cable to avoid radio frequency (RF) interference.
- Discharge the RJ45 Ethernet cable before plugging it into a port on the switch.
- When required for safety and fire rating requirements, use plenum-rated cable. See your local building codes for determining when it is appropriate to use plenum-rated cable, or refer to IEC standard 850.
- Keep all ports and connectors free of dust.



WARNING!

Unshielded twisted pair (UTP) cable can build up ESD charges when being pulled into a new installation. Before connecting any category 5 UTP cable to the switch, discharge ESD from the cable by plugging the RJ45 into a LAN Static Discharge device or use an equivalent method.

Figure 5: Properly installed and bundled cable



SPG_008

Fiber Optic Cable

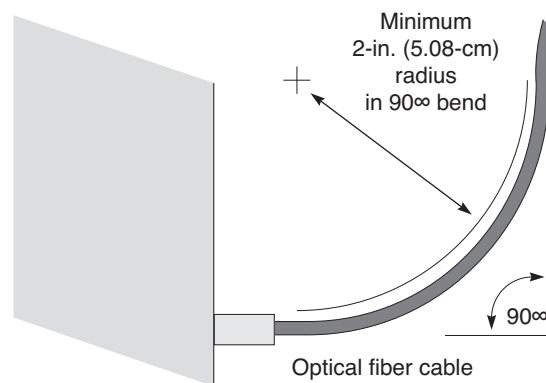
Fiber optic cable must be handled carefully during installation. Every cable has a minimum bend radius, for example, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. We recommend that the bend radius for fiber optic cable equals 2-inch (5.08 cm) minimum for each 90 degree turn as shown in Figure 6.



NOTE

Kinks and sharp bends can destroy or impair the cable's ability to convey light pulses accurately from one end of the cable to the other. Use care in dressing the optical fiber cables: provide satisfactory strain relief to support the cable and maintain an adequate bend radius at all cable turns, particularly where the cable connects to the I/O module.

Figure 6: Bend radius for fiber optic cable



SPG_002

Cable Distances

Table 3 shows cable media types and maximum distances that support reliable transmission in accordance with international standards except where noted.

Table 3: Media types and maximum distances

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-SX (850 nm optical window)	50/125 µm multimode fiber	400	500
	50/125 µm multimode fiber	500	550
	62.5/125 µm multimode fiber	160	220
	62.5/125 µm multimode fiber	200	275
1000BASE-LX (1300 nm optical window)	50/125 µm multimode fiber	400	550
	50/125 µm multimode fiber	500	550
	62.5/125 µm multimode fiber	500	550
	10/125 µm single-mode fiber	—	5,000
1000BASE-LX70 (1550 nm optical window)	10/125 µm single-mode fiber*	—	10,000
	10/125 µm single-mode fiber	—	70,000

Table 3: Media types and maximum distances (Continued)

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-T	Category 5 and higher UTP cable	–	100
100BASE-TX	Category 5 and higher UTP cable	–	100
10BASE-T	Category 3 and higher UTP cable	–	100

* Proprietary to Extreme Networks. Connections between two Extreme Networks 1000BASE-LX interfaces that use 10/125 μ m single-mode fiber can use a maximum distance of 10,000 meters.

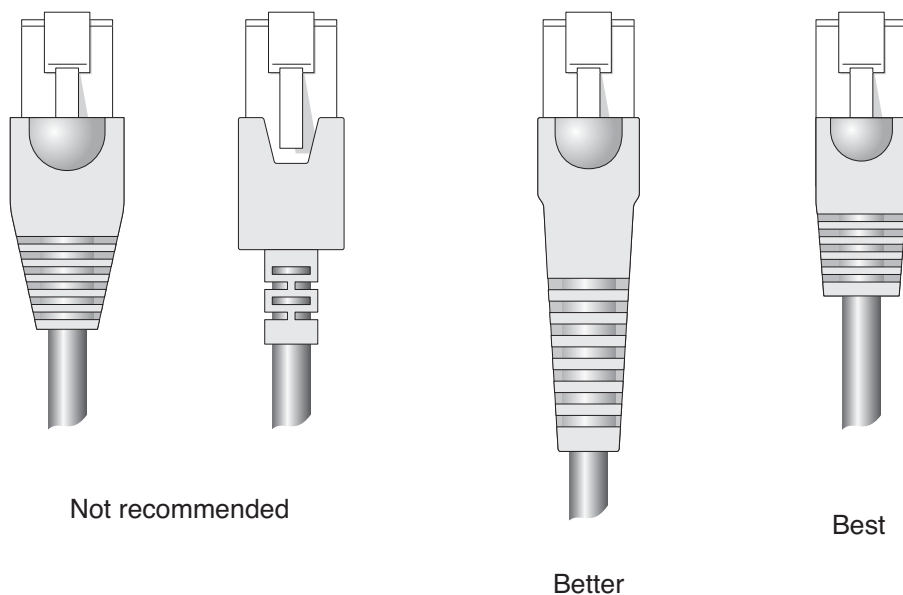
RJ-45 Connector Jackets

Use RJ-45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

Using cable with jackets that are wider than the connectors can cause:

- Connectors that are not properly aligned with the port.
- Crowded cable installation, which can cause connectors to pop out of the port.

Figure 7 shows examples of connector jacket types that are not recommended as well as those that are recommended.

Figure 7: RJ-45 connector jacket types

SPG_001

Radio Frequency Interference

If you use UTP cabling in an installation, take precautions to avoid RF interference. RF interference can cause degradation of signal quality, and, in an Ethernet network environment, can cause excessive collisions, loss of link status, or other physical layer problems that can lead to poor performance or loss of communication.

To prevent RF interference, avoid the following devices or situations:

- Attaching UTP cable to AC power cables
- Routing UTP cable near antennas, such as a ham radio antenna
- Routing UTP cable near equipment that could exhibit RF interference, such as ARC welding equipment
- Routing UTP cable near electrical motors that contain coils
- Routing UTP cable near air conditioner units
- Routing UTP cable near electrical transformers

In areas or applications where these situations cannot be avoided, use fiber optic cabling or shielded twisted pair cabling (STP).

Making Network Interface Cable Connections

Use the appropriate type of cable to connect the ports of your switch to another switch or router.

Working carefully, one port at a time:

- 1 Verify that you have identified the correct cable for the port.
- 2 Use an alcohol wipe or other appropriate cleaning agent to clean the cable connectors; make sure they are free of dust, oil, and other contaminants.
- 3 If you are using optical fiber cable, align the transmit (Tx) and receive (Rx) connectors with the correct corresponding connectors on the switch or the I/O module.
- 4 Press the cable connectors into their mating connectors on the switch or I/O module until the cable connector is firmly seated.
- 5 Repeat steps 1 through 4 for the remaining cables on this or other switches or I/O modules.
- 6 Dress and secure the cable bundle to provide appropriate strain relief and protection against bends and kinks.

Meeting Power Requirements

This section discusses power requirements, including:

- LAN Systems
- PoE Devices
- Power Supply Requirements
- AC Power Cable Requirements
- Uninterruptible Power Supply Requirements

LAN Systems



WARNING!

This equipment is intended for intra-building. Intra-building connections are defined as cable runs that are located in the same building as the unit.

This equipment can be connected between buildings if one of the following requirements are met:

- Cable runs less than 140 ft between buildings
- Cable runs between buildings are directly buried.
- Cable runs between buildings are in an underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

Power Supply Requirements

Adhere to the following requirements to operate your Extreme Networks equipment safely:

- Be sure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Be sure that your power supply meets the site power or AC power requirements of the network equipment.
- When connecting power to installed equipment, avoid connecting through an extension cord or power strip.
- If your switch includes more than one power supply, connect each power supply to different, independent power sources.

If a power source fails, it will affect only the switch power supply to which it is connected. If all switch power supplies are connected to a single power source, the entire switch is vulnerable to a power source failure.

For power specifications for Extreme Networks products, see the Extreme Networks website at:

<http://www.extremenetworks.com>

PoE Devices

When connecting power over Ethernet (PoE) devices to a PoE switch, all connections between the PoE device and the switch must remain within the same building and use a low-voltage power distribution system per IEEE 802.3af.

AC Power Cable Requirements

Use an AC power cable appropriate for your country. Check your local electrical codes and regulatory agencies for power cable requirements. The countries listed in [Table 4](#) have the following additional requirements.

Table 4: AC power cable requirements

Country	Requirements
USA and Canada	- The cable set must be UL-approved and CSA-certified. - The minimum specification for the flexible cable is No. 18 AWG (1.5 mm²), Type SVT or SJT, 3-conductor. - The cable set must have a rated current capacity of at least the amount rated for each specific product. - The attachment plug must be either an Earth-grounding type with a NEMA 5-15P (10 A, 110 V) configuration or a NEMA L6-15P (10 A, 208/240 V)
Denmark	The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
Argentina	The supply plug must comply with Argentinian standards.



NOTE

When using dual power supplies, make sure that each AC power supply attaches to an independent power source.

Replacing the Power Cable

If the power cable plug is unsuitable and must be replaced, connect the power supply wires for the switch according to the following scheme:

- Brown wire to the Live (Line) plug terminal, which may be marked with the letter “L” or colored red.
- Blue wire to the Neutral plug terminal, which may be marked with the letter “N” or colored black.
- Yellow/Green wire to the Ground plug terminal, which may be marked with the letter “E” (the Earth symbol) or colored yellow/green.

Uninterruptible Power Supply Requirements

An uninterruptible power supply (UPS) is a device that sits between a power supply (such as a wall outlet) and a device (such as a switch) to prevent outages, sags, surges, and bad harmonics from adversely affecting the performance of the device.

UPS Features

A UPS traditionally can perform the following functions:

- Absorb relatively small power surges.
- Smooth out noisy power sources.
- Continue to provide power to equipment during line sags.
- Provide power for some time after a blackout has occurred.

In addition, some UPS or UPS plus software combinations provide the following functions:

- Automatically shut down equipment during long power outages.
- Monitor and log power supply status.
- Display the voltage (current draw) of the equipment.
- Restart equipment after a long power outage.
- Display the voltage currently on the line.
- Provide alarms on certain error conditions.
- Provide short circuit protection.

Selecting a UPS

To determine UPS requirements for your switch, ask these questions:

- What are the amperage requirements?
- What is the longest potential time period that the UPS would be required to supply backup power?
- Where will the UPS be installed?
- What is the maximum transition time that your installation will allow?



NOTE

Extreme Networks recommends that you use a UPS that provides online protection.

Calculating Amperage Requirements

To determine the size of UPS that you need:

- 1 Locate the voltage and amperage requirements for each piece of equipment. These numbers are usually located on a sticker on the back or bottom of your equipment. Then multiply the numbers together to get Volt-Amps (VA):

$$\text{VA} = \text{Volts} \times \text{Amperes}$$

- 2 Add the VA from each piece of equipment together to find the total VA requirement.

To determine the minimum amperage requirements for your UPS, we recommend that you add 30% to the total.

UPS Transition Time

Transition time is the time that is necessary for the UPS to transfer from utility power to full-load battery power. For Extreme Networks products, a transition time of less than 20 milliseconds is required for optimum performance.

Applicable Industry Standards

For more information, see the following ANSI/TIA/EIA standards:

- ANSI/TIA/EIA-568-A—discusses the six subsystems of a structured cabling system.
- ANSI/TIA/EIA-569-A—discusses design considerations.
- ANSI/TIA/EIA-606—discusses cabling system administration.
- ANSI/TIA/EIA-607—discusses commercial building grounding and bonding requirements.

You can access these standards at:

<http://www.ansi.org>

or

<http://www.tiaonline.org>

2

BlackDiamond Switches

This chapter describes the Extreme Networks BlackDiamond switches and includes the following sections:

- [Supported Features on page 43](#)
- [Full-Duplex Support on page 44](#)
- [Management Ports on page 44](#)
- [External Compact Flash Memory Card on page 44](#)
- [BlackDiamond 8806 Switch Chassis on page 44](#)
- [BlackDiamond 8810 Switch Chassis on page 46](#)
- [BlackDiamond 12804 Switch Chassis on page 47](#)
- [BlackDiamond 12802 Switch Chassis on page 49](#)
- [BlackDiamond 10808 Switch on page 50](#)

For information about the I/O modules and management modules (MSMs) for the BlackDiamond switches, see the specific chapter describing each module series.

For information about installing the BlackDiamond switches, see [Chapter 2](#), [Chapter 3](#), [Chapter 4](#), or [Chapter 5](#).

Supported Features

The BlackDiamond switches are chassis-based, Ethernet service core switches designed for core applications. For more information about configuring a BlackDiamond switch, see the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide*.

The features of these switches include:

- I/O modules that are hot-swappable and include Gigabit Ethernet copper ports (10/100/1000) and Gigabit Ethernet fiber ports (SFP), or 10 Gigabit Ethernet ports
- Management Switch Fabric Modules (MSMs) that provide the active switching fabric and CPU control subsystem
- Redundant, load-sharing, hot-swappable power supplies
- Field-replaceable, hot-swappable fan trays
- Auto-negotiation for half-duplex or full-duplex operation on 10/100/1000 Mbps ports
- Load sharing on multiple ports

Full-Duplex Support

Extreme Networks switches provide full-duplex support for all ports. Full-duplex support means that frames can be transmitted and received simultaneously, which, in effect, doubles the bandwidth available on a link. Most ports on an Extreme Networks switch will auto-negotiate duplex in the default configuration. Gigabit Ethernet fiber ports and 10 Gigabit Ethernet ports operate only in full-duplex mode in accordance with technical standards.

Management Ports

Each BlackDiamond series Management Switch Fabric Module (MSM) has a 10/100BASE-TX Ethernet management port. This port allows you to communicate directly with the central processing unit (CPU) of the switch. You can plug an Ethernet cable directly from your laptop into the management port, for direct access into the switch. This access allows you to view and locally manage the switch configurations.

External Compact Flash Memory Card

All MSMs in the BlackDiamond family include a compact flash slot next to the console port on the MSM. This slot accepts a compact flash memory card, which can be used to download a new version of ExtremeXOS and for other functions, including capturing debug information and core dump files. See the *ExtremeXOS 12.0 Concepts Guide* for more information regarding the use of the external compact flash memory card.

The external compact flash slot supports third party compact flash cards.



NOTE

You must use an industrial-grade compact flash card in the external compact flash slot of the MSM.

BlackDiamond 8806 Switch Chassis

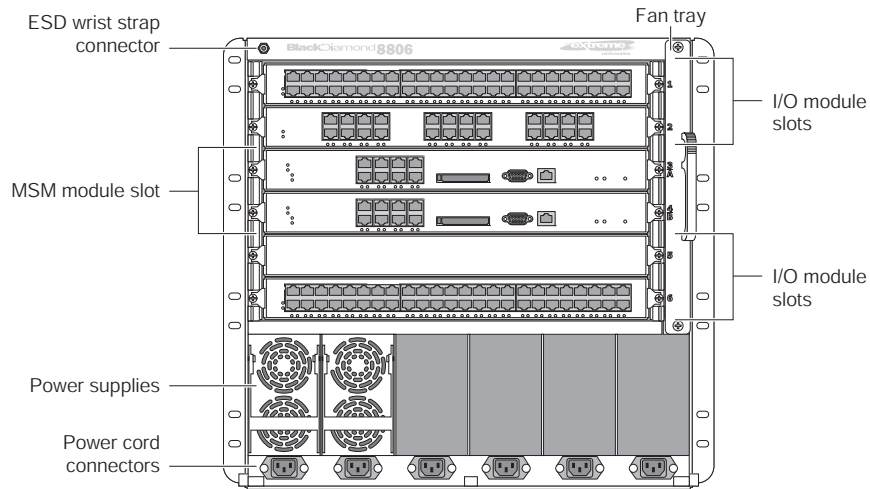
The BlackDiamond 8806 chassis consists of the following components:

- One 6-slot chassis with backplane
- Four dedicated I/O module slots, labeled 1, 2, 5, and 6
- One dedicated MSM slot, labeled 3/A
- One dual use I/O module/MSM slot (labeled 4/B)
- Up to six power supplies, accessed from the front of the unit
- One fan tray, accessed from the front right of the unit
- One connector for an ESD-preventive wrist strap

When two MSMs are installed, the chassis can support up to 48 gigabits of bandwidth per slot.

Figure 8 shows the front of a BlackDiamond 8806 chassis equipped with two MSMs and three optional I/O modules.

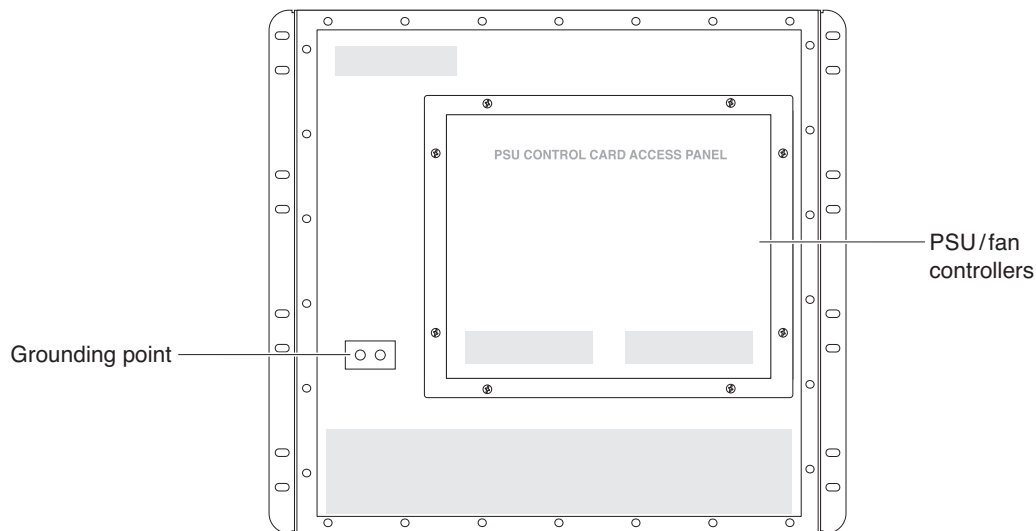
Figure 8: Front of the BlackDiamond 8806 chassis



EX_127

Figure 9 shows the rear panel of the BlackDiamond 8806 chassis.

Figure 9: Rear panel of the BlackDiamond 8806 chassis



EX_128A

The rear panel of the BlackDiamond 8806 chassis provides:

- Chassis serial number
- Ethernet MAC address of the switch
- Symbols of safety certification
- Access to the PSU/fan controllers
- Attachment point for optional chassis ground

BlackDiamond 8810 Switch Chassis

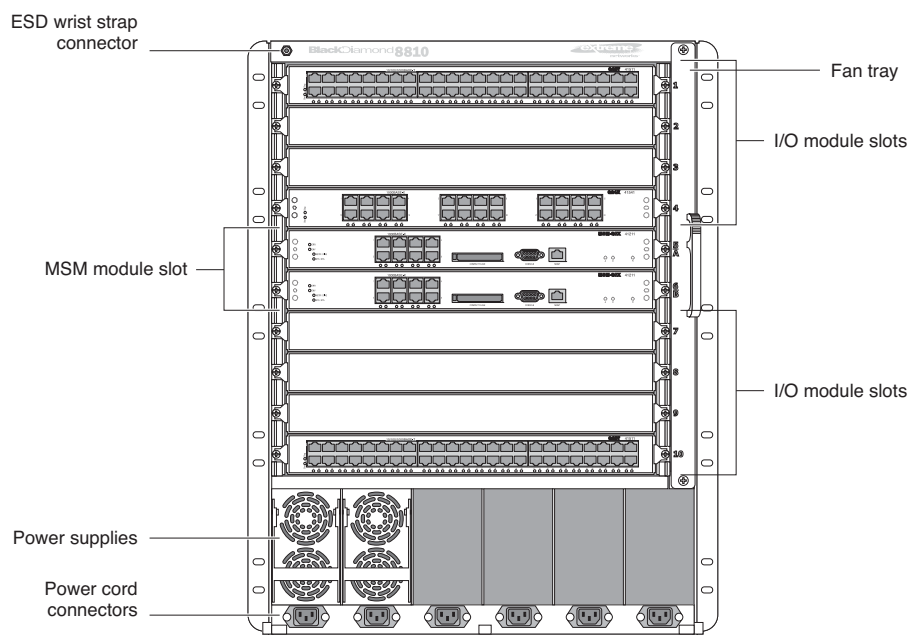
The BlackDiamond 8810 chassis consists of the following components:

- One 10-slot chassis with backplane
- Eight dedicated I/O module slots, labeled 1, 2, 3, 4, 7, 8, 9 and 10
- One dedicated MSM slot, labeled 5/A
- One dual-use I/O module/MSM slot (labeled 6/B)
- Up to six power supplies, accessed from the front of the unit
- One fan tray, accessed from the front right of the unit
- One connector for an ESD-preventive wrist strap

When two MSMs are installed, the chassis can support up to 48 Gigabit bandwidth per slot.

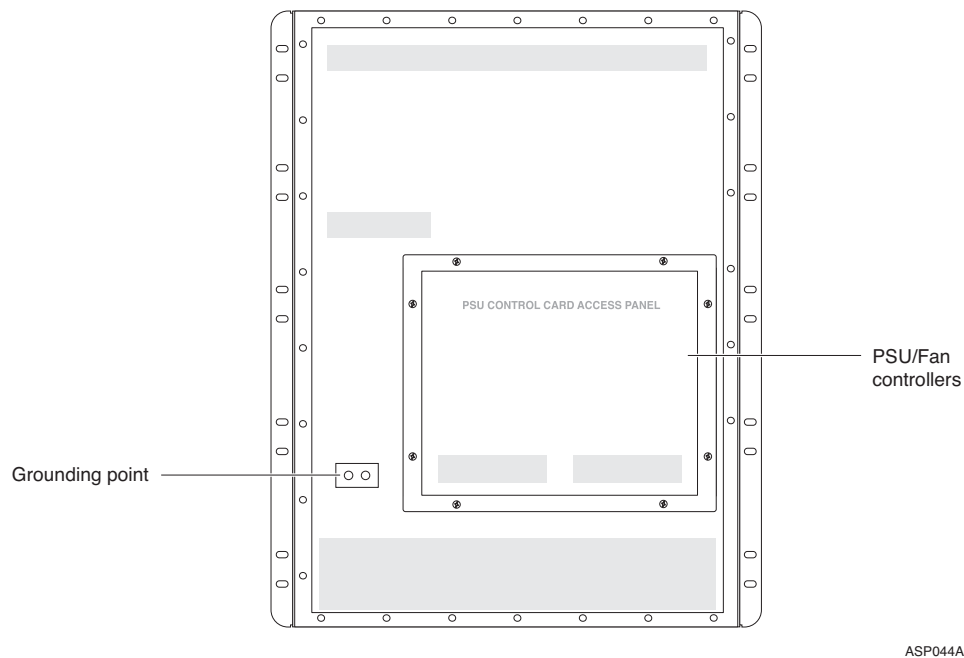
Figure 8 shows the front of a BlackDiamond 8810 chassis equipped with two MSMs and three optional I/O modules.

Figure 10: Front of the BlackDiamond 8810 chassis



ASP042

Figure 9 shows the rear panel of the BlackDiamond 8810 chassis.

Figure 11: Rear panel of the BlackDiamond 8810 chassis

The rear panel of the BlackDiamond 8810 chassis provides:

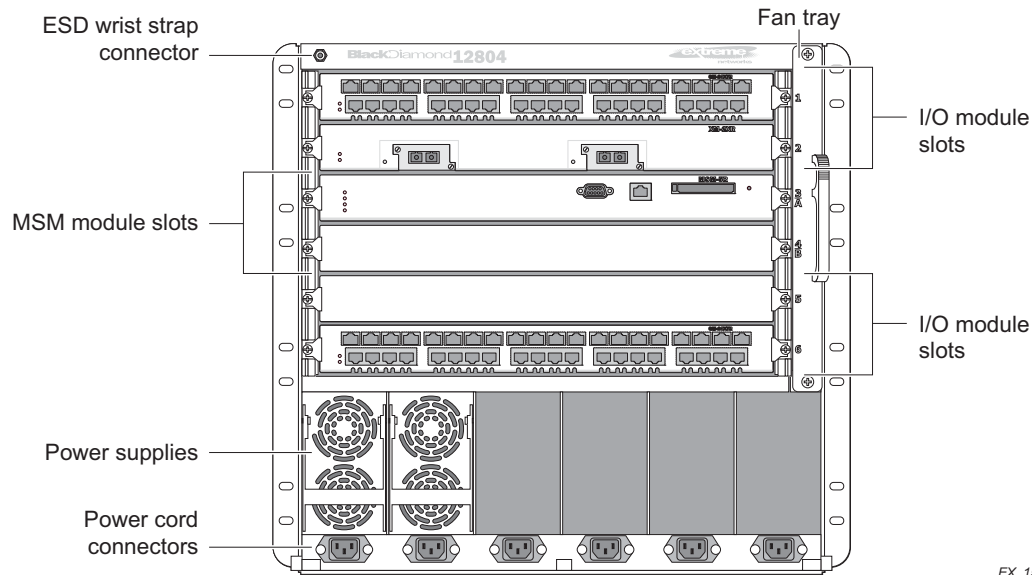
- Chassis serial number
- Ethernet MAC address of the switch
- Symbols of safety certification
- Access to the PSU/fan controllers
- Attachment point for optional chassis ground

BlackDiamond 12804 Switch Chassis

The BlackDiamond 12804 chassis consists of the following components:

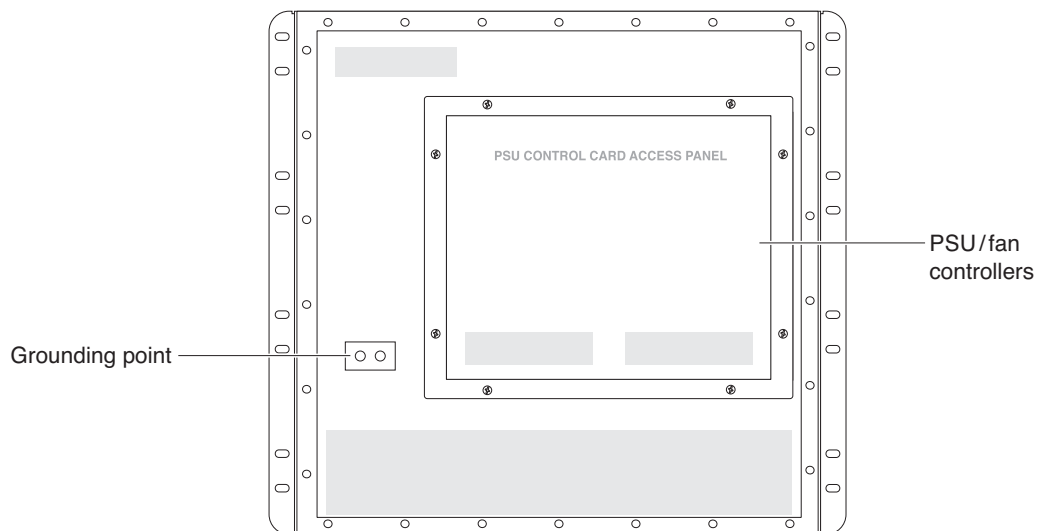
- One 6-slot chassis with backplane
- Four dedicated I/O module slots, labeled 1, 2, 5, and 6
- Two MSM slots, labeled 3/A and 4/B
- Up to six SSI redundant AC/DC power supplies, accessed from the front of the unit
- One fan tray, accessed from the front right of the unit
- One connector for an ESD-preventive wrist strap

Figure 12 shows a BlackDiamond 12804 chassis equipped with one MSM and three optional I/O modules.

Figure 12: Front of the BlackDiamond 12804 chassis

EX_157

Figure 13 shows the rear view of the BlackDiamond 12804 chassis.

Figure 13: Rear panel of the BlackDiamond 12804 chassis

EX_128A

The rear panel of the BlackDiamond 12804 chassis provides:

- Chassis serial number
- Ethernet MAC address of the switch
- Symbols of safety certification
- Access to the PSU/fan controllers
- Attachment point for optional chassis ground

BlackDiamond 12802 Switch Chassis

The BlackDiamond 12802 chassis consists of the following components:

- One 3-slot chassis with backplane
- Two dedicated I/O module slots, labeled 1 and 2
- One MSM slot, labeled MSM
- Up to four redundant AC or DC power supplies, accessed from the back of the unit
- One fan tray, accessed from the back left of the unit
- One connector for an ESD-preventive wrist strap

Figure 14 shows a BlackDiamond 12802 chassis equipped with one MSM and two I/O modules.

Figure 14: Front of the BlackDiamond 12802 chassis

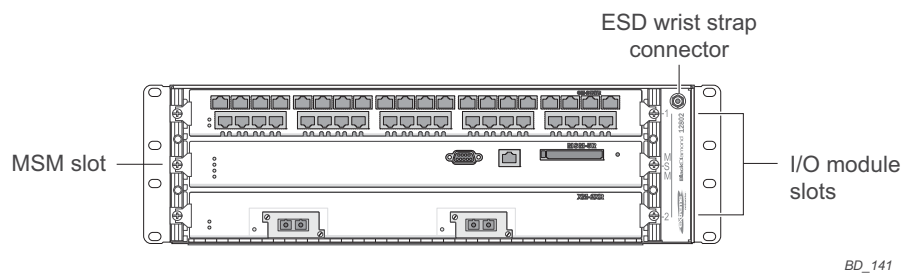
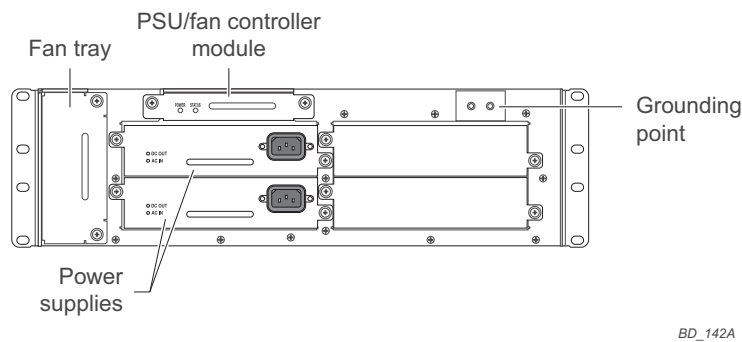


Figure 15 shows the rear panel of the BlackDiamond 12802 chassis.

Figure 15: Rear panel of the BlackDiamond 12802 chassis



The rear panel of the BlackDiamond 12802 chassis provides:

- Access to the fan tray
- Access to the PSU/fan controller module
- Four bays for installing power supplies
- Attachment point for optional chassis ground

The bottom of the chassis has a label showing safety certification symbols and the Ethernet MAC address of the switch. The chassis serial number is on the side near the back of the chassis.

BlackDiamond 10808 Switch

The BlackDiamond 10808 switch includes the following components:

- One 10-slot chassis with backplane
- Eight I/O module slots, labeled 1 through 8
- Two MSM slots, labeled A and B
- Up to six power supplies, accessed from the front of the unit)
- Two fan trays, accessed from the back of the unit. Each fan tray contains two fans.
- One connector for an ESD-preventive wrist strap

Software monitors the fan trays in the BlackDiamond 10808 switch for overheating. All over-temperature events cause the switch to send alerts to the network management station or to the switch log. See the *ExtremeXOS 12.0 Concepts Guide* for more information about switch monitoring. The BlackDiamond 10808 switch fan tray is hot-swappable.



CAUTION

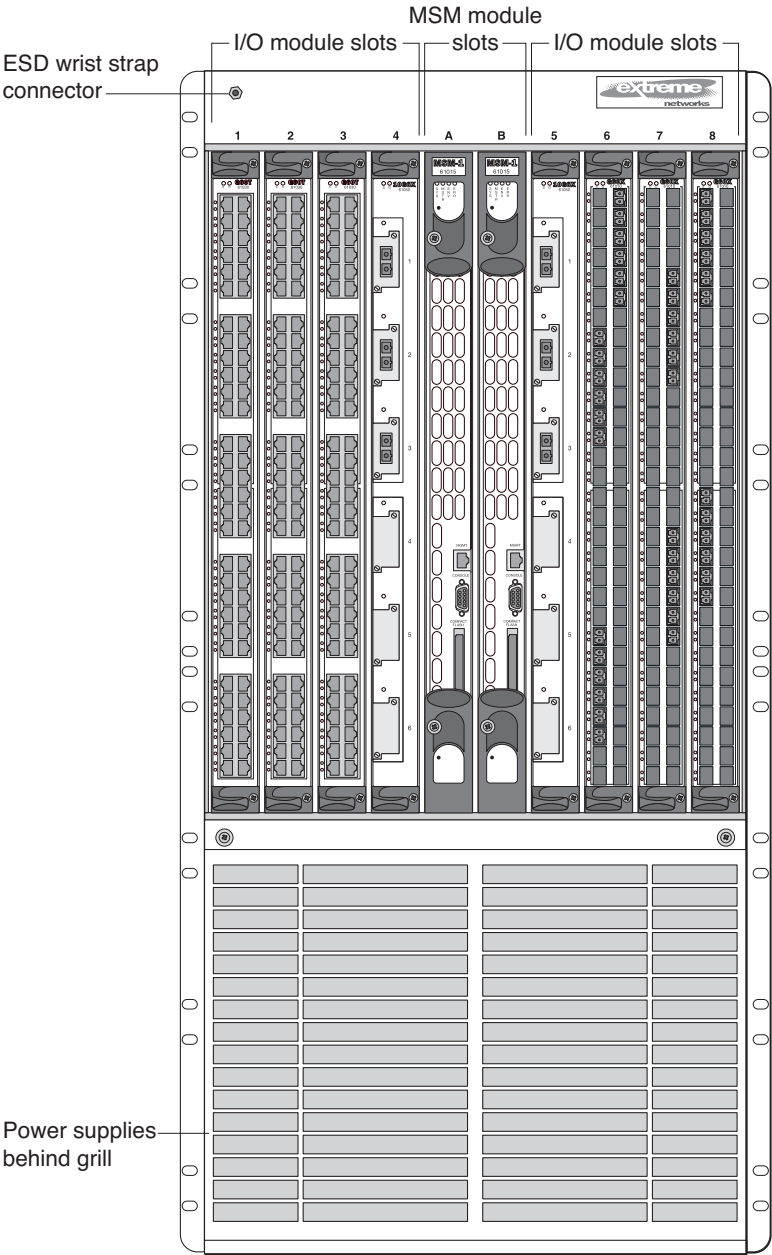
Do not cover or obstruct the fan ventilation holes at the rear of the unit. Doing so can result in overheating and possible damage to the BlackDiamond 10808 switch. Thermal sensors will shut down the BlackDiamond 10808 switch if the internal temperature exceeds 60 degrees Celsius.

The BlackDiamond 10808 switch includes two power supply controllers, located in the back of the chassis, that collect data from the installed power supplies and report the results to the MSM modules. The power supply controllers provide primary/backup redundancy in case one of the controllers fails or is removed. At least one power supply controller must be installed.

When the BlackDiamond 10808 switch is first powered on, the power supply controllers enable the power supplies by providing 48V power. The power supply controller also detects and reports incompatible combinations of power supply types and line voltage feeds and disables the power supply if an unsafe condition arises.

Figure 16 shows a BlackDiamond 10808 switch equipped with two MSM-1 modules and eight optional I/O modules.

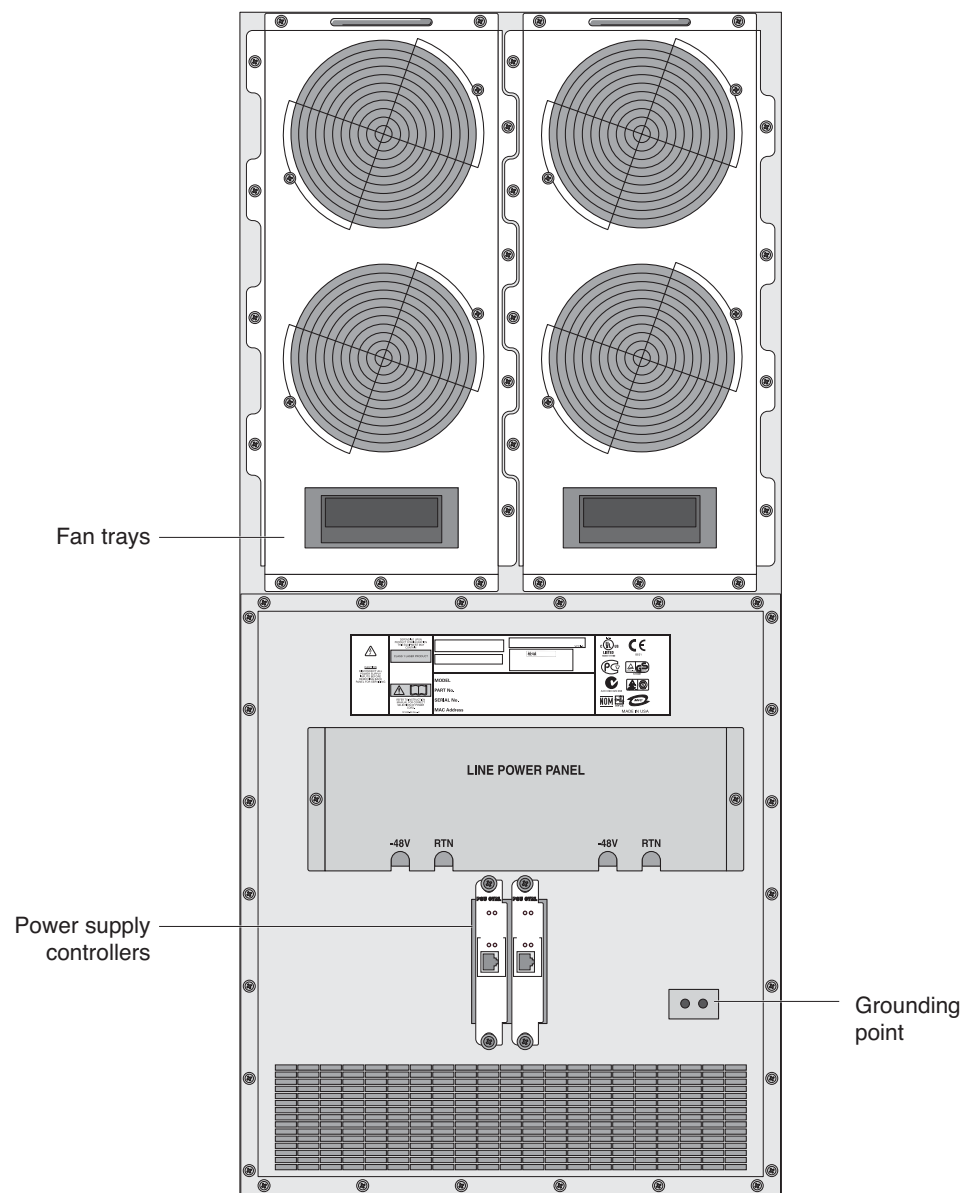
Figure 16: Front view of the BlackDiamond 10808 switch



EX_001

Figure 17 shows the rear panel of the BlackDiamond 10808 switch.

Figure 17: Rear view of the BlackDiamond 10808 switch



EX_007A

The rear panel of the BlackDiamond 10808 switch provides:

- Access to the fan units
- Chassis serial number
- Ethernet MAC address of the switch
- Symbols of safety certification
- Access to power supply controllers
- Attachment point for optional chassis ground

This chapter describes modules for the BlackDiamond 8800 series of switches and includes the following sections:

- [Management Switch Modules \(MSM\) on page 53](#)
- [MSM LEDs on page 56](#)
- [I/O Modules on page 56](#)
- [I/O Module LEDs on page 66](#)



CAUTION

Do not attempt to mix and match modules across Extreme Networks product lines. BlackDiamond 8800 series modules are for use in a BlackDiamond 8800 series switch only, such as a BlackDiamond 8810 or BlackDiamond 8806 switch. When a BlackDiamond 8800 series switch is in use, ExtremeXOS software will not recognize a module from a different product line.

Management Switch Modules (MSM)

The BlackDiamond 8800 MSMs, the MSM-G8X and the MSM-48, provide the active switching fabric and CPU control subsystem. One MSM is required for switch operation; however, adding a second MSM to the chassis increases reliability and throughput. Each MSM provides 192 Gbps of switching throughput through three ASICs. Each module also contains a temperature sensor, nonvolatile random-access memory (NVRAM), and a real-time clock.

The BlackDiamond 8800 MSMs consist of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in the BlackDiamond 8800 series of switches. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

A compact flash slot allows you to insert an external compact flash memory card. (See [Chapter 2](#) for more information about Extreme Networks-supported compact flash cards.)

Slots for BlackDiamond 8800 MSMs

MSMs reside in different slots depending on which BlackDiamond switch you operate:

- If you are using only one MSM in the BlackDiamond 8806 switch, install that MSM in slot 3. If you want to use two MSMs to increase reliability and throughput, install the second MSM in slot 4.
- If you are using only one MSM in the BlackDiamond 8810 switch, install that MSM in slot 5. If you want to use two MSMs to increase reliability and throughput, install the second MSM in slot 6.

See [“Installing a BlackDiamond 8800 or 12800 Series Module” on page 175](#) for information about how to install a BlackDiamond 8800 MSM.

MSM Activity

The BlackDiamond 8800 series of switches can run with a single MSM installed. When you install an additional MSM, one of the MSMs operates as the primary MSM and the other becomes the backup (secondary) MSM.

The primary MSM is responsible for upper-layer protocol processing and system management functions. Packet handling is distributed among the CPUs of all installed MSMs.

When you save the switch configuration, it is saved to all MSMs.

Selection of the primary MSM occurs automatically. The following examples describe the selection process:

- When a switch boots with two MSMs installed, the MSM in the lower-numbered slot becomes the primary MSM. In the BlackDiamond 8810 switch this is slot 5; in the BlackDiamond 8806 switch, this is slot 3.
- When a switch boots with a single MSM (regardless of the slot position), it is selected as the primary MSM.

If a second MSM is added to the switch after it has been powered up, the added MSM becomes the backup MSM. MSMs that operate as backup MSMs can be inserted and removed without disrupting network services.

- If you remove the primary MSM while the switch is operating, the backup MSM performs a soft reset and then becomes the primary MSM.

For example, in a BlackDiamond 8810 switch with a primary MSM in slot 5 and a backup MSM in slot 6, if you remove the primary MSM from slot 5, the backup MSM in slot 6 becomes the primary MSM.

MSM-G8X and MSM-48 Modules

Figure 18 shows the front view of the MSM-G8X.

Figure 18: MSM-G8X

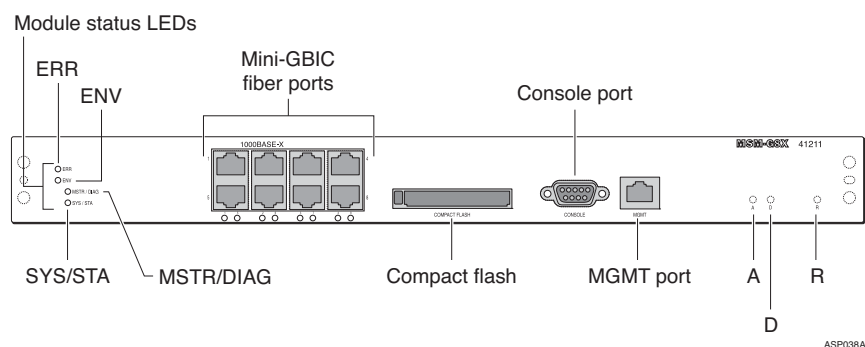
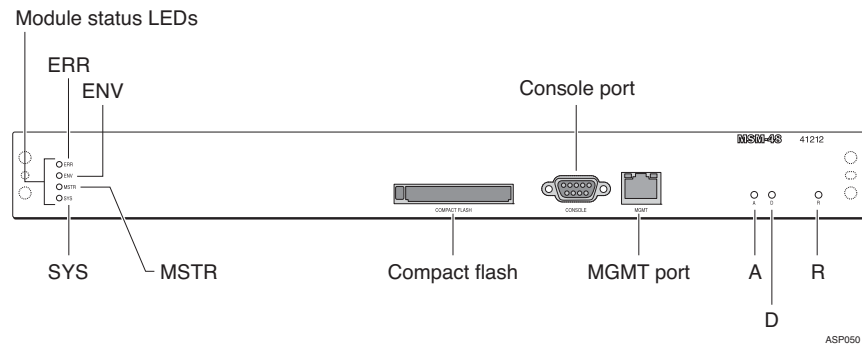


Figure 19 shows the front view of the MSM-48.

Figure 19: MSM-48

The MSM-G8X and the MSM-48 have the following ports and buttons:

- **Console port**—The DB-9 serial console port is used to connect a terminal, allowing you to perform local management.
- **Management port**—The 10/100 Mbps Ethernet management port allows you to connect an Ethernet cable directly from your laptop to the switch to view and locally manage the switch configurations. This port can also be used to connect the system into a parallel management network for administration.
- **A**—Use the A button to select the alternate BootROM image when powering-on the MSM-G8X module. To use the alternate BootROM image, you must hold the A button while pressing the R button simultaneously.
- **D**—Use the D button to force a system dump that dumps the debug information into NVRAM. This information is available on the next reboot. No core file is created.
- **R**—Use the R button to reset the MSM-G8X without removing the module from the chassis.

The MSM-G8X has the following additional ports:

- **Eight SFP fiber mini-GBIC data ports**—These data ports operate the same as the ports on the G24X I/O module. (See [“G24X I/O Module” on page 57](#) for more information about these ports.) The eight data ports are integrated into the MSM and managed by a separate I/O processor, which retains control of the eight Ethernet ports on the MSM during a failover. The backup MSM can take control of the ports.



NOTE

See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for more information about numbering conventions for the modules and ports, as well as configuration and display information.

MSM LEDs

Table 5 describes the LED activity on the MSM-G8X and MSM-48.

Table 5: MSM-G8X and MSM-48 LEDs

LED	Color	Indicates
SYS/STA	Green blinking	Normal operation is occurring.
	Amber blinking	The status LED flashes amber while diagnostic tests are running on the module. If a diagnostic test fails, the status LED becomes solid amber. The LED resets if the diagnostics are terminated. The LED returns to flashing amber if another diagnostic test is started.
	Amber	Diagnostic failure has occurred.
MSTR/DIAG	Off	Switch is not receiving power.
	Green	Module is operating as primary MSM.
	Amber	Module is operating as backup (secondary) MSM.
	Green blinking	Power-on self-test (POST) is running.
ERR	Off	Normal operation for diagnostics.
	Amber	A critical software error has been logged since power-up.
ENV	Off	Normal operation is occurring.
	Green	Environment (temperature, fan, power supply) is operating properly.
Link on MSTR Ethernet port	Amber	Environmental failure has occurred.
	Green	Link is up.
Activity on MSTR	Off	Link is down.
	Amber	Packet activity is occurring.



NOTE

The LEDs on the management Ethernet port are not labeled. The LED on the right is the link LED, and the one on the left is the activity LED.



NOTE

The data port LEDs on the MSM-G8X operate the same as the port status LEDs on the G24X I/O module.

I/O Modules

This section describes the three different series of BlackDiamond 8800 I/O modules available for use in a BlackDiamond 8800 series switch: the BlackDiamond 8800 original series I/O modules, the BlackDiamond 8800 a-series I/O modules, and the BlackDiamond 8800 e-series I/O modules.

No configuration information is stored on the I/O modules; all configuration information is stored on the MSM(s).

When a BlackDiamond 8800 series switch is powered on, the software generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to

participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to NVRAM.

You can configure parameters of the I/O module after it is installed, or preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you preconfigure a slot for a specific module type and then insert a different type of module, the module reverts to its default configuration.



NOTE

See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for feature-specific information pertaining to *BlackDiamond 8800 original series I/O modules*, *BlackDiamond 8800 a-series I/O modules*, and *BlackDiamond 8800 e-series I/O modules*.



CAUTION

When *BlackDiamond 8800 I/O modules* from different series (*original series*, *a-series*, and *e-series*) are installed in the same *BlackDiamond 8800 series chassis*, limitations on feature sets may occur. See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for complete details regarding these limitations.

BlackDiamond 8800 Original Series I/O Modules

The BlackDiamond 8800 original series of I/O modules consists of the following:

- [G24X I/O Module on page 57](#)
- [10G4X I/O Module on page 58](#)
- [G48T I/O Module on page 59](#)
- [G48P I/O Module on page 59](#)



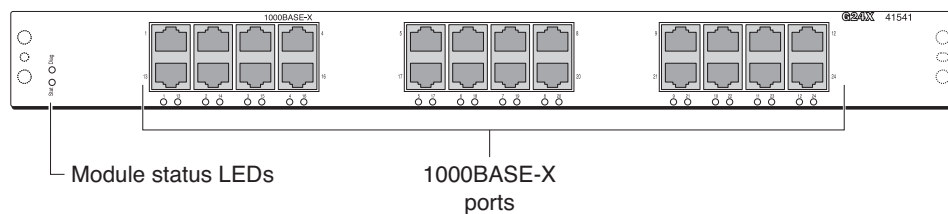
NOTE

The ports on the *MSM-G8X* also have the same operational features as the ports on the *G24X I/O module* and can be included as part of the *BlackDiamond 8800 original series I/O modules*.

G24X I/O Module

Figure 20 shows the G24X I/O module.

Figure 20: G24X I/O module



ASP041A

All Gigabit Ethernet ports on this module use SPF fiber mini-GBIC connectors.

The default configuration of the G24X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

The G24X module has the following LEDs:

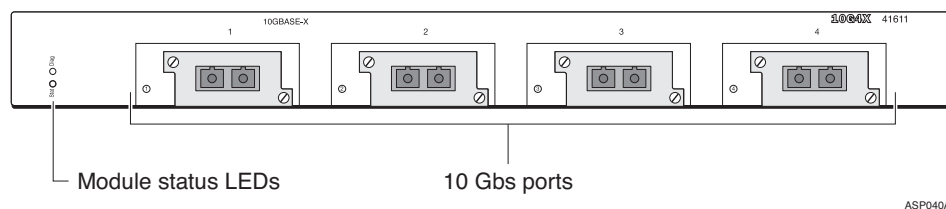
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the G24X module, see [“I/O Module LEDs” on page 66](#).

10G4X I/O Module

[Figure 21](#) shows the 10G4X I/O module.

Figure 21: 10G4X I/O module



The 10G4X I/O module has four unpopulated XENPAK-based 10 Gigabit Ethernet ports.

The default configuration of the 10G4X I/O module is as follows. All ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

The 10G4X I/O module has the following LEDs:

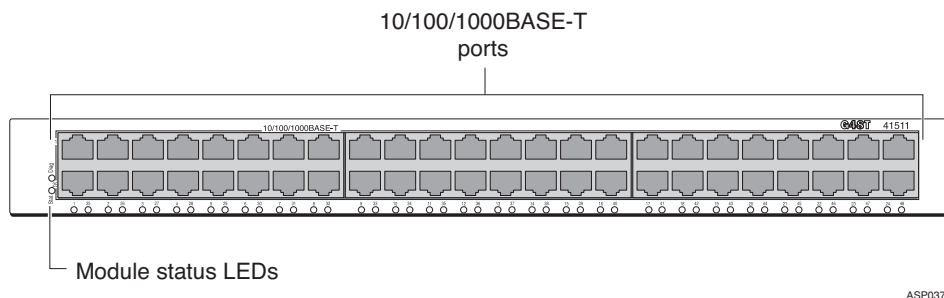
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the 10G4X I/O module, see [“I/O Module LEDs” on page 66](#).

G48T I/O Module

Figure 22 shows the G48T I/O module.

Figure 22: G48T I/O module



The G48T I/O module has 48 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors.

The default configuration of the G48T I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

The G48T I/O module has the following LEDs:

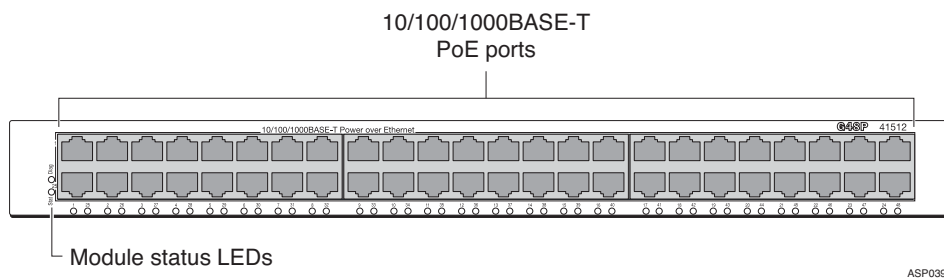
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the G48T I/O module, see [“I/O Module LEDs” on page 66](#).

G48P I/O Module

Figure 23 shows the G48P I/O module.

Figure 23: G48P I/O module



The G48P I/O module has 48 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors and that can deliver Power over Ethernet (PoE) to an attached device as well as the usual Ethernet connection, provided by one cable. The G48P I/O module supports the IEEE 802.3af PoE specification.

When powered devices (PDs) are connected to a port, the PDs are discovered and classified as 802.3af-compliant or as legacy devices. ExtremeXOS implements the following functions:

- Enables the port for discovery, classification, and power delivery
- Enforces port power limits by denying power to a device exceeding the configured limit
- Enforces class limits by denying power to a device exceeding the class limit
- Reports and tracks port power faults

The default configuration of the G48P I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

The G48P I/O module has the following LEDs:

- Module status
- Module diagnostics
- Port status
- Power status

For information about the LEDs and their activity on the G48P I/O module, see [“I/O Module LEDs” on page 66](#).

BlackDiamond 8800 A-Series I/O Modules

The BlackDiamond 8800 a-series I/O modules include:

- [G48Ta I/O Module on page 61](#)
- [G48Xa I/O Module on page 62](#)
- [10G4Xa I/O Module on page 63](#)
- [10G4Ca I/O Module on page 63](#)



CAUTION

BlackDiamond a-series modules require specific minimum versions of ExtremeXOS software to be recognized by the MSM (see [Table 6](#)). Software builds earlier than the listed versions do not support the specified I/O modules.

If you attempt to install one of these I/O modules before upgrading the software on your MSM-G8X, the module will not be recognized by the software and it will not power up. The following error messages are similar to the messages that may be displayed on the console or in the log. (Samples represent an unrecognized module in slot 2.)

- On the console: `ERROR: Unknown cardtype in slot 2 - please program the eeprom`
- In the log: `<Error: HAL.Card.Error> MSM-A: Unable to read cardtype for slot 2`

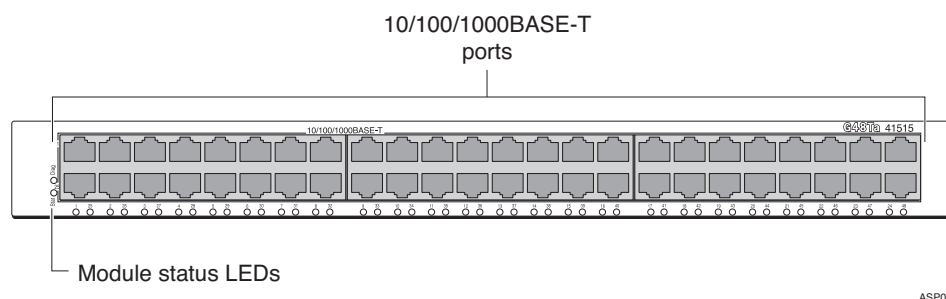
Table 6: Minimum software versions for BlackDiamond 8800 a-series modules

Module	Required ExtremeXOS version
G48Ta	ExtremeXOS 11.5.0 or later
G48Xa	ExtremeXOS 11.5.0 or later
10G4Xa	ExtremeXOS 11.6.0 or later
10G4Ca	ExtremeXOS 12.0.1 or later

G48Ta I/O Module

[Figure 24](#) shows the G48Ta I/O module.

Figure 24: G48Ta I/O module



The G48Ta I/O module has 48 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors.

The default configuration of the G48Ta I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

The G48Ta I/O module has the following LEDs:

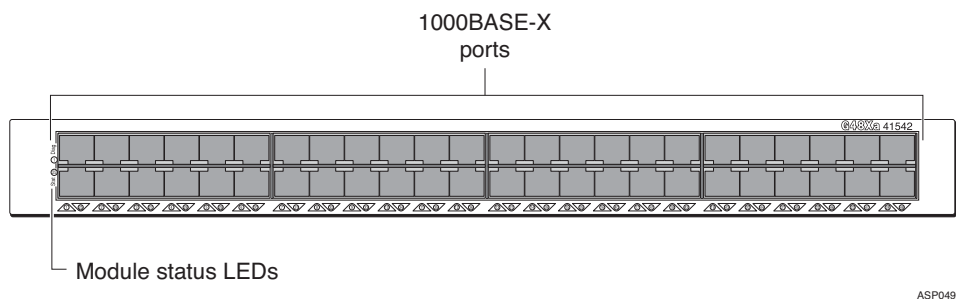
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the G48Ta I/O module, see [“I/O Module LEDs” on page 66](#).

G48Xa I/O Module

Figure 25 shows the G48Xa I/O module.

Figure 25: G48Xa I/O module



The G48Xa I/O module has 48 1000BASE-X ports (SPF fiber mini-GBIC connectors).

The default configuration of the G48Xa module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

The G48Xa module has the following LEDs:

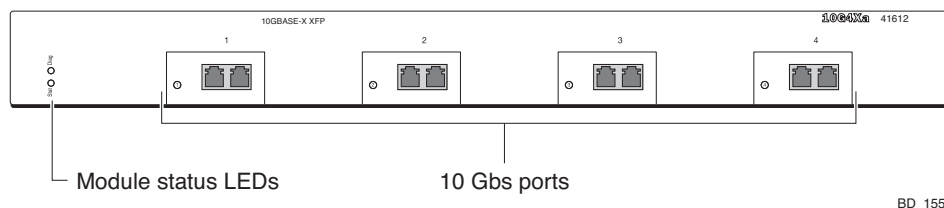
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the G48Xa module, see [“I/O Module LEDs” on page 66](#).

10G4Xa I/O Module

Figure 26 shows the 10G4Xa I/O module.

Figure 26: 10G4Xa I/O module



The 10G4Xa I/O module has four XFP-based 10-gigabit Ethernet ports.

The default configuration of the 10G4Xa I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

The 10G4Xa I/O module has the following LEDs:

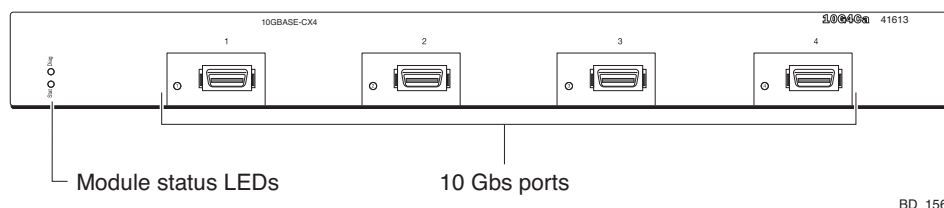
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the 10G4Xa I/O module, see [“I/O Module LEDs” on page 66](#).

10G4Ca I/O Module

Figure 26 shows the 10G4Ca I/O module.

Figure 27: 10G4Ca I/O module



The 10G4Ca I/O module has four 10-gigabit Ethernet ports that use CX4 interface connectors.

The default configuration of the 10G4Ca I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

The 10G4Ca I/O module has the following LEDs:

- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the 10G4Ca I/O module, see [“I/O Module LEDs” on page 66](#).

BlackDiamond 8800 E-Series I/O Modules

The BlackDiamond 8800 e-series of I/O modules consists of the following:

- [G48Te I/O Module on page 64](#)
- [G48Pe I/O Module on page 65](#)



CAUTION

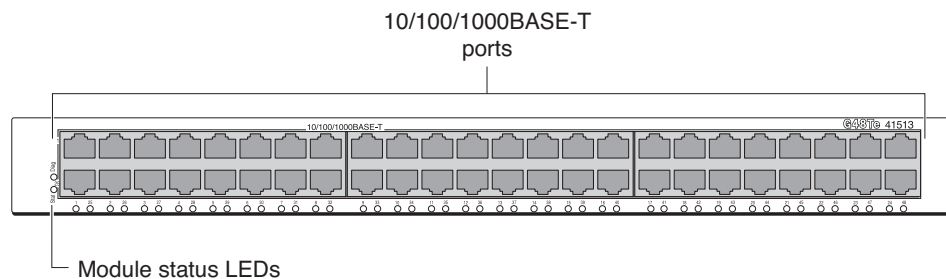
ExtremeXOS software builds earlier than version 11.5.0 do not support G48Te or G48Pe I/O modules. If you attempt to install one of these I/O modules before upgrading the software on your MSM-G8X, the module will not be recognized by the software and it will not power up. The following error messages are similar to the messages that may be displayed on the console or in the log. (Samples represent an unrecognized module in slot 2.)

- *Console:* ERROR: Unknown cardtype in slot 2 - please program the eeprom
- *Log:* <Error: HAL.Card.Error> MSM-A: Unable to read cardtype for slot 2

G48Te I/O Module

[Figure 28](#) shows the G48Te I/O module.

Figure 28: G48Te I/O module



The G48Te I/O module has 48 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors. When an 8800 series switch is running in dual-MSM mode, this module will be oversubscribed 2:1. When the switch is running a single MSM, this module will be oversubscribed 4:1.

The default configuration of the G48Te I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

The G48Te I/O module has the following LEDs:

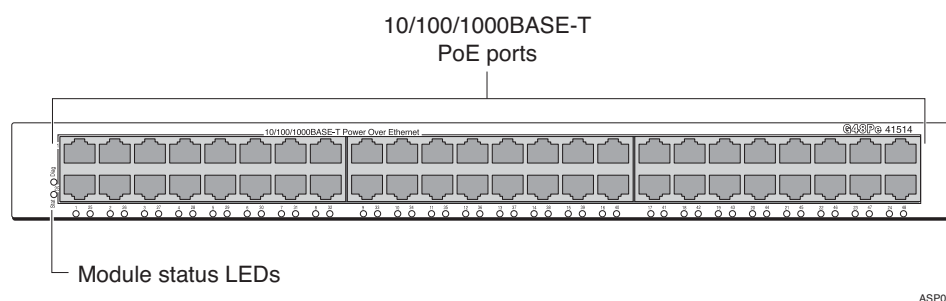
- Module status
- Module diagnostics
- Port status

For information about the LEDs and their activity on the G48Te I/O module, see [“I/O Module LEDs” on page 66](#).

G48Pe I/O Module

Figure 29 shows the G48Pe I/O module.

Figure 29: G48Pe I/O module



The G48Pe I/O module has 48 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors and that can deliver Power over Ethernet (PoE) to an attached device as well as the usual Ethernet connection, provided by one cable. The G48Pe I/O module supports the IEEE 802.3af PoE specification. When an 8800 series switch is running in dual-MSM mode, this module will be oversubscribed 2:1. When the switch is running a single MSM, this module will be oversubscribed 4:1.

When powered devices (PDs) are connected to a port, the PDs are discovered and classified as 802.3af-compliant or as legacy devices. ExtremeXOS implements the following functions:

- Enables the port for discovery, classification, and power delivery
- Enforces port power limits by denying power to a device exceeding the configured limit
- Enforces class limits by denying power to a device exceeding the class limit
- Reports and tracks port power faults

The default configuration of the G48Pe I/O module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

The G48Pe I/O module has the following LEDs:

- Module status
- Module diagnostics
- Port/Power status

For information about the LEDs and their activity on the G48Pe I/O module, see [“I/O Module LEDs” on page 66](#).

I/O Module LEDs

This section describes the LEDs for the module, for the port, and for inline power delivery status for I/O modules in the BlackDiamond 8800 series of switches.



NOTE

Inline power delivery applies only to the ports on the G48P and G48Pe I/O modules.

Module LEDs

Table 7 describes the LED activity for all BlackDiamond 8800 series I/O modules.

Table 7: BlackDiamond 8800 series I/O module LEDs

LED	Color	Indicates
Status	Green blinking	Normal operation
	Amber blinking	Configuration error, code version error, diagnostic failure, or other severe module error
DIAG	Off	No power
	Off	Normal operation
	Amber blinking	Diagnostics in progress
	Amber	Diagnostic failure

Port LEDs on Non-PoE Modules

This section describes the port LEDs for non-PoE BlackDiamond 8800 series I/O modules. These include the G24X, G48T, 10G4X, G48Ta, G48Xa, G48Te, 10G4Xa, and 10G4Ca I/O modules.

Table 8 describes the LED meanings for each port on the non-PoE BlackDiamond 8800 series I/O modules.

Table 8: Port LEDs for the G24X, G48T, 10G4X, G48Ta, G48Xa, G48Te, 10G4Xa, and 10G4Ca I/O modules

LED	Color	Indicates
Port	Solid green	Link up
	Slow green blinking	Port disabled
	Green blinking	Activity
	Off	Link down

Port LEDs on PoE Modules (G48P and G48Pe)

The BlackDiamond 8800 series I/O modules that support PoE are the G48P and G48Pe modules. Port LEDs on these modules indicate the status of the inline power delivered through the ports.

[Table 9](#) describes the LED meanings for each port on the G48P and G48Pe I/O modules.

Table 9: Port LEDs for the G48P and G48Pe I/O modules

LED	Color	Indicates
Port with power enabled	Solid amber	Link up
	Amber blinking	Activity
	Slow amber blinking	Port disabled or Link down
	Blinking amber/green	Power fault or insufficient power
Port with power disabled	Solid green	Link up
	Slow green blinking	Port disabled
	Green blinking	Activity
	Off	Link down
	Blinking amber/green	Power fault or insufficient power

4 BlackDiamond 12800 Series Modules

This chapter describes modules for the BlackDiamond 12800 series of switches and includes the following sections:

- [About BlackDiamond 12800 Series Modules on page 69](#)
- [BlackDiamond 12800 Series MSMs on page 70](#)
- [BlackDiamond 12800 Series I/O Modules on page 73](#)

For information about installing modules in a BlackDiamond 12800 series switch, see [Chapter 7, “Installing BlackDiamond Series Modules.”](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove a BlackDiamond 12800 series MSM or I/O module.

About BlackDiamond 12800 Series Modules

Two sets of modules are available for the BlackDiamond 12800 series switch: the 12800 series of modules and the 12800 R series of modules. All BlackDiamond 12800 series MSM and I/O modules use the Extreme Networks 4th Generation ASICs that enable high availability, advanced security, and deterministic performance independent of traffic mix. The BlackDiamond 12800 series R-series modules further provide hierarchical QoS and larger MAC address, IP route, and ACL capacity for network designs that need the advanced QoS features and scale. The R-series modules support rate limiting, which is the ability to control bandwidth throughout the network. For complete details about rate limiting, refer to the *ExtremeXOS 12.0 Concepts Guide*. [Table 10](#) lists the modules available in each series.

Table 10: Modules for the BlackDiamond 12800 series switches

BlackDiamond 12800 Series	BlackDiamond 12800 R Series
MSM-5 module	MSM-5R module
XM-2X I/O module	XM-2XR I/O module
GM-20XT I/O module	GM-20XTR I/O module
GM-20T I/O module	



CAUTION

Do not attempt to mix modules across Extreme Networks product lines. BlackDiamond 12800 series modules are for use only in a BlackDiamond 12802 or 12804 switch. When a BlackDiamond 12800 series switch is in use, ExtremeXOS software will not recognize a module from a different product line.

**NOTE**

The BlackDiamond R-series modules must be used together to take advantage of the higher feature set and scale. The ExtremeXOS software recognizes the MSM type installed in your BlackDiamond 12800 series switch and only allows use of compatible I/O modules from the same series. An error message is displayed if you attempt to mix modules.

BlackDiamond 12800 Series MSMs

The BlackDiamond 12800 series management system modules (MSMs) are the MSM-5 module and the MSM-5R module. These MSMs provide the active switching fabric and CPU control subsystem for the switch. The BlackDiamond 12802 chassis has one dedicated MSM slot; the BlackDiamond 12804 chassis has two dedicated MSM slots. One MSM is required for switch operation; however, adding a second MSM to a BlackDiamond 12804 chassis increases system availability through redundancy. Each MSM provides 192 Gbps of switching throughput through three ASICs. Each module also contains a temperature sensor, nonvolatile random-access memory (NVRAM), and a real-time clock.

The MSM-5 and MSM-5R modules support different sizes of Ternary Content Addressable Memory (TCAM). The MSM-5R has more memory available for routing tables, learned MAC addresses, and access control lists (ACLs). For specific details about memory allocation, refer to the data sheet for each module.

**CAUTION**

You must use compatible MSMs and I/O modules from either the BlackDiamond 12800 series or the 12800 R-series of modules. Do not attempt to mix MSMs from the two different series. The ExtremeXOS software recognizes the MSM type installed in your BlackDiamond 12800 series switch and only allows use of a second MSM of the same type and compatible I/O modules from the same series. An error message is displayed if you attempt to mix module series.

**NOTE**

In the BlackDiamond 12804 switch, installed MSMs require ExtremeXOS 11.4.1 or later.

In the BlackDiamond 12802 switch, MSMs must be running ExtremeXOS 12.0.1 or later. You must upgrade the MSM before you deploy the BlackDiamond 12802 switch in your network. A BlackDiamond 12802 switch running software earlier than version 12.0.1 will not be fully operational.

To upgrade the software in your BlackDiamond 12802 switch, access the latest 12.0.1 image at the Extreme Networks support website and follow the upgrade instructions in the ExtremeXOS 12.0 Release Notes.

**NOTE**

The MSM slot in the BlackDiamond 12802 switch is labeled MSM on the front panel. The ExtremeXOS software refers to this MSM as MSM-A in all related displays and command output.

Redundant MSM Activity

The BlackDiamond 12804 switch can operate with a single MSM installed, providing full bandwidth with this single MSM. When you install a second MSM, one of the MSMs operates as the primary, and the other becomes the secondary or backup.

The primary MSM is responsible for upper-layer protocol processing and system management functions. The MSMs in the BlackDiamond 12804 switch are not load sharing. MSM(A) or MSM(B) handles packets while the other MSM is idle.

When you save the switch configuration, it is saved to all MSMs.

Selection of the primary MSM occurs automatically. The following examples describe the selection process:

- When a BlackDiamond 12804 switch boots with two MSMs installed, the MSM in slot 3/A becomes the primary.

If a switch is operating with one MSM and a second MSM is added to the switch after it has been powered up, the added MSM becomes the secondary. MSMs that operate as secondary, or backup, MSMs can be inserted and removed without disrupting network services.

- If you remove the primary MSM while the switch is operating, the secondary MSM performs a soft reset and then becomes the primary MSM.

For example, if you have a BlackDiamond 12804 switch with a primary MSM in slot 3/A and a secondary MSM in slot 4/B, and you remove the primary MSM from slot 3/A, the secondary, or backup, MSM in slot 4/B becomes the primary.

MSM LEDs

Table 11 describes the LED activity on the MSM-5 module and MSM-5R module.

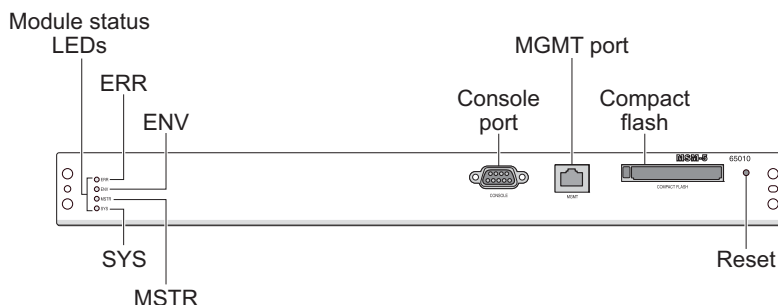
Table 11: BlackDiamond 12800 series MSM LEDs

LED	Color	Meaning
SYS	Green blinking	Normal operation.
	Amber blinking	Diagnostic tests are running on the module. The LED resets if the diagnostics are terminated. The LED returns to blinking amber if another diagnostic test is started.
	Amber steady	Diagnostic failure has occurred.
	Off	Switch is not receiving power.
MSTR	Green steady	Module is operating as primary MSM.
	Amber	Module is operating as secondary, or backup, MSM.
	Green blinking	Power-on self-test (POST) is running.
	Off	Normal operation for diagnostics.
ERR	Amber	A critical software error has been logged since power-up.
	Off	Normal operation.
ENV	Green	Environment (temperature, fan, power supply) is operating properly.
	Amber	Environmental failure has occurred.

MSM-5 and MSM-5R Modules

Figure 30 shows the MSM-5 module.

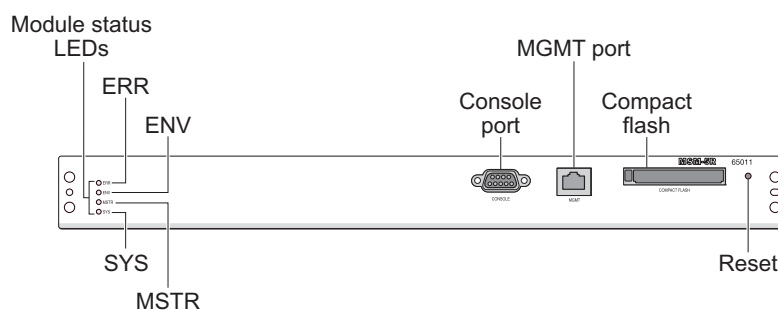
Figure 30: MSM-5 module



EX_150h

Figure 31 shows the MSM-5R module.

Figure 31: MSM-5R module



EX_151h



NOTE

Although the MSM-5 module and MSM-5R module are similar in appearance, the functionality of each MSM varies. The MSM-5R module is part of the R series and includes the rate limiting feature, which the MSM-5 module does not support.



NOTE

You must use BlackDiamond 12800 R-series modules to use rate limiting. You must use the MSM-5R module plus the GM-20XTR I/O module and/or the XM-2XR I/O module.

The MSM-5 module and MSM-5R module consist of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in the BlackDiamond 12800 series switch. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

The MSM-5 and MSM-5R modules have the following features on the front panel:

- Console port—The DB9 serial console port is used to connect a terminal, allowing you to perform local management.
- Management port—The 10/100 Mbps Ethernet management port allows you to connect an Ethernet cable directly from your laptop to the management port to view and locally manage the switch configurations. This port can also be used to connect the system to a parallel management network for administration.
- Compact flash—You can insert an external compact flash memory card into this slot. (See [Chapter 2](#) for more information about Extreme Networks-supported compact flash cards.)
- Reset—Use the Reset button to reset the MSM without removing the module from the chassis.

BlackDiamond 12800 Series I/O Modules

No configuration information is stored on the I/O modules; all configuration information is stored on the MSMs.

When a BlackDiamond 12800 series switch is powered on, the software generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to NVRAM.

You can configure parameters of an I/O module after it is installed, or preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you preconfigure a slot for a specific module type and then insert a different type of module, the module reverts to its default configuration.



NOTE

See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for more information about configuring the modules.

I/O Module LEDs

[Table 12](#) describes the LED activity for the BlackDiamond 12800 series I/O modules.

Table 12: BlackDiamond 12800 series switch I/O module LEDs

LED	Color	Meaning
Status	Green blinking	Normal operation
	Amber blinking	Configuration error, hardware failure, diagnostic failure, or other severe module error
	Off	No power
DIAG	Off	Normal operation
	Amber blinking	Diagnostics in progress
	Amber	Diagnostic failure

I/O Port LEDs

Table 13 describes the LED activity for each port on the GM-20XT, GM-20XTR, XM-2X and XM-2XR I/O modules.

Table 13: Port LEDs for the BlackDiamond GM-20XT, GM-20XTR, XM-2X and XM-2XR I/O modules

LED	Color	Meaning
Port	Solid green	Link up
	Slow green blinking	Port disabled
	Amber blinking	Activity
	Off	Link down

Table 14 describes the LED activity for each port on the BlackDiamond GM-20T I/O module.

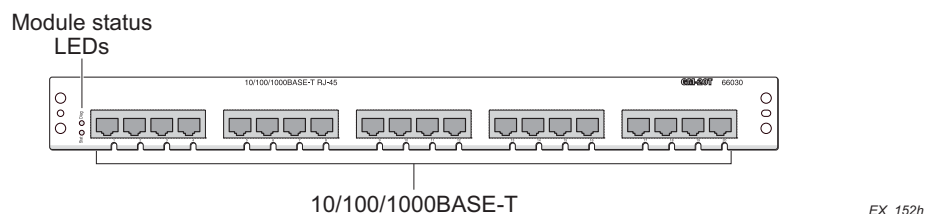
Table 14: Port LEDs for the BlackDiamond GM-20T module

LED	Color	Meaning
Port with power enabled	Solid amber	Link up
	Slow amber blinking	Port disabled
	Amber blinking	Activity
	Slow amber blinking	Link down
	Blinking amber/green	Power fault or insufficient power
Port with power disabled	Solid green	Link up
	Slow green blinking	Port disabled
	Green blinking	Activity
	Off	Link down
	Blinking amber/green	Power fault or insufficient power

GM-20T I/O Module

Figure 32 shows the GM-20T I/O module.

Figure 32: GM-20T I/O module



The GM-20T I/O module has 20 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors.

The default configuration of the GM-20T I/O module is as follows. All ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLANid).
- Operate in autonegotiation mode.

GM-20T LEDs

The GM-20T I/O module has the following LEDs:

- Module status
- Module diagnostics
- Port status
- Power status

GM-20XT and GM-20XTR I/O Modules

Figure 33 shows the GM-20XT I/O module.

Figure 33: GM-20XT I/O module

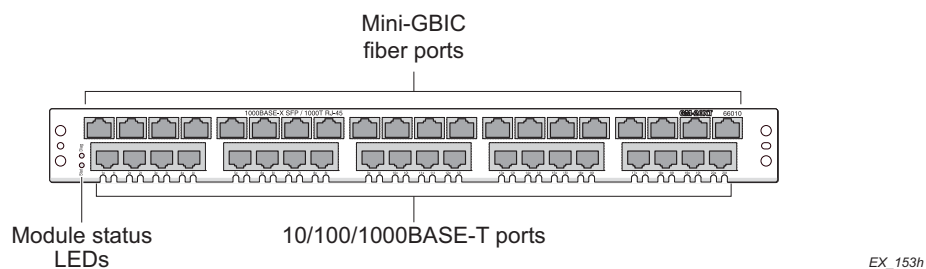
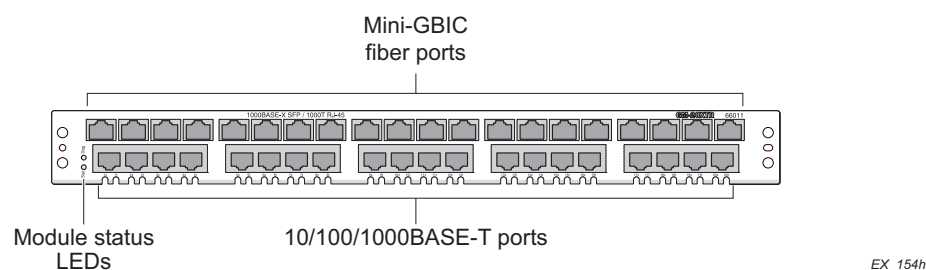


Figure 34 shows the GM-20XTR I/O module.

Figure 34: GM-20XTR I/O module



NOTE

Although the GM-20XT module and the GM-20XTR module are similar in appearance, they have different functionality. The GM-20XTR is part of the R series and includes the rate limiting feature; the GM-20XT module does not support rate limiting.

To use rate limiting, you must install the MSM-5R plus the GM-20XTR I/O module and/or the XM-2XR I/O module.

The GM-20XT module and GM-20XTR I/O module have 20 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors and 20 SFP mini-GBIC ports.

The default configuration of the GM-20XT and GM-20XTR I/O module is as follows. All ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLANid).
- Operate in autonegotiation mode.

GM-20XT and GM-20XTR LEDs

The GM-20XT and GM-20XTR I/O modules have the following LEDs:

- Module status
- Module diagnostics
- Port status

XM-2X and XM-2XR I/O Modules

Figure 35 shows the XM-2X I/O module.

Figure 35: XM-2X I/O module

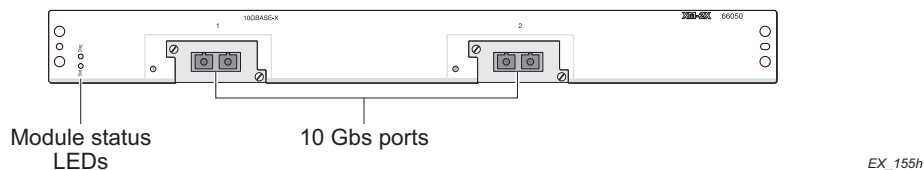
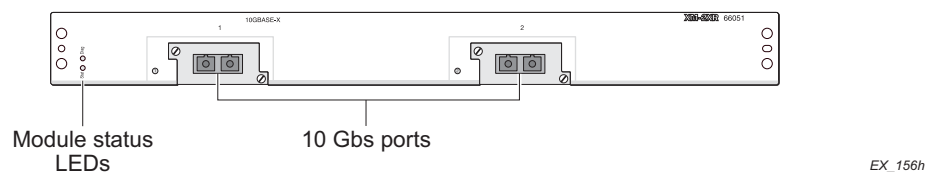


Figure 36 shows the XM-2XR I/O module.

Figure 36: XM-2XR I/O module



NOTE

Although the XM-2X module and the XM-2XR module are similar in appearance, the functionality of each I/O module varies. The XM-2XR module is part of the R series and includes the rate limiting feature; the XM-2X module does not support rate limiting.

To use rate limiting, you must install the MSM-5R plus the GM-20XTR I/O module and/or the XM-2XR I/O module.

The XM-2X module and XM-2XR module have two unpopulated XENPAK-based 10 Gigabit Ethernet ports.

The default configuration of the XM-2X and XM-2XR I/O modules is as follows. All ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLANid).

XM-2X and XM-2XR LEDs

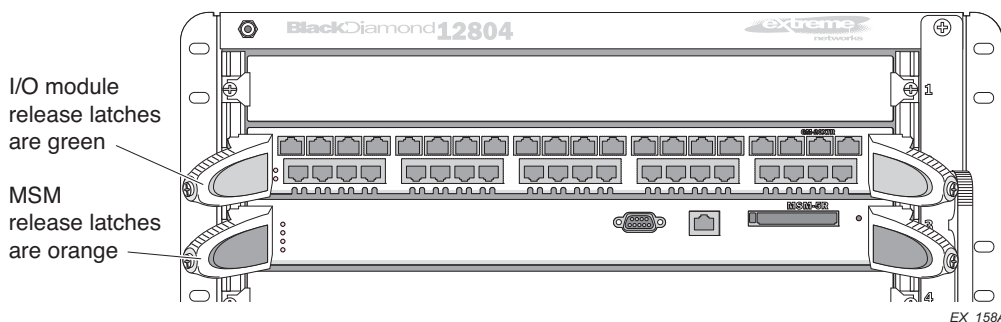
The XM-2X module and XM-2XR module have the following LEDs:

- Module status
- Module diagnostics
- Port status

Distinguishing a BlackDiamond 12800 Series MSM from an I/O Module

A quick way to distinguish a BlackDiamond 12800 series MSM from a BlackDiamond 12800 series I/O module is by the color of the release latch on each injector/ejector handle. Orange injector/ejector release latches indicate that the module is a BlackDiamond 12800 series MSM, and green injector/ejector release latches indicate that the module is a BlackDiamond 12800 series I/O module (see [Figure 37](#)).

Figure 37: Injector/ejector handle colors of the BlackDiamond 12800 series MSM and I/O modules



Module Slot Assignments

The specific slot locations for I/O modules and MSMs in the chassis are as follows:

- BlackDiamond 12804 switch
 - I/O modules in slots 1, 2, 5, and 6
 - MSMs in slots 3/A and 4/B



NOTE

Slots 3/A and 4/B in the BlackDiamond 12804 switch will only run an MSM module.

- BlackDiamond 12802 switch
 - I/O modules in slots 1 and 2 (top and bottom)
 - MSM in slot MSM (middle)



NOTE

The MSM slot in the BlackDiamond 12802 switch is labeled MSM on the front panel. This slot will only operate an MSM. The ExtremeXOS software refers to this MSM as MSM-A in all related displays and command output.

This chapter describes the I/O modules and the Management Switch Module (MSM) that are installed in the BlackDiamond 10808 switch chassis.

For instructions on installing the BlackDiamond 10808 modules, see [Chapter 7, “Installing BlackDiamond Series Modules.”](#)

This chapter includes the following sections:

- [About the BlackDiamond 10808 MSMs on page 79](#)
- [About the BlackDiamond 10808 I/O Modules on page 82](#)

About the BlackDiamond 10808 MSMs

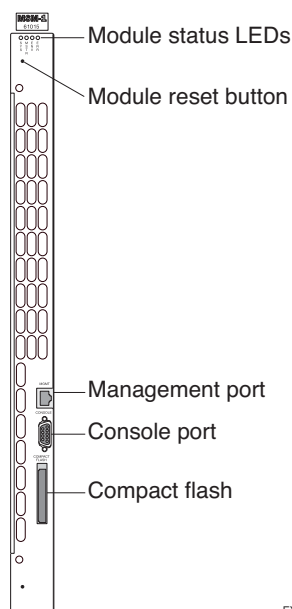
The BlackDiamond MSM holds the control plane and the switch fabric for the switch. In addition, each MSM has two CPUs for protocol processing and network management. The BlackDiamond 10808 chassis has two slots for installing an MSM. Two MSMs are required for full system bandwidth; the system will operate with a single MSM, but bandwidth is reduced.

The MSM-1 and MSM-1XL have different size Ternary Content Addressable Memory (TCAM). The MSM-1XL has more memory available for routing tables, learned MAC addresses, and access control lists (ACLs). For specific details about memory allocation, refer to the data sheet for each module.

MSMs are installed in designated lettered slots in the BlackDiamond 10808 system chassis.

[Figure 38](#) shows the front panel of the BlackDiamond 10808 series MSM.

Figure 38: BlackDiamond 10808 series MSM



EX_003

The MSM consists of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in a BlackDiamond 10808 switch. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

A compact flash slot allows you to insert an external compact flash memory card. (See [“External Compact Flash Memory Card”](#) on page 44 for more information about Extreme Networks-supported compact flash cards.).

The MSM has the following ports:

- Console port—Used to connect a terminal and perform local management.
- Management port—Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations. This port can also be used to connect the system into a parallel management network for administration.

MSM Activity

The BlackDiamond 10808 switch can operate with a single MSM installed. When you install a second MSM, one of the MSMs operates as the *primary*, and the other becomes the *backup*.

The primary MSM is responsible for upper-layer protocol processing and system management functions. For example, OSPF computation and SNMP functions are performed by the primary MSM. Packet handling is distributed among the CPUs of all installed MSMs.

When you save the switch configuration, it is saved to all MSMs. If you download a new ExtremeXOS image, the image is downloaded to all MSMs.

Selection of the primary MSM occurs automatically. The following examples describe the selection process:

- When the BlackDiamond 10808 switch boots with two MSMs already installed, the MSM in slot A becomes the primary MSM.
- When the BlackDiamond 10808 switch boots with a single MSM (regardless of the slot position), it is selected as the primary MSM.

If a second MSM is added to the switch after it has been powered on, the added MSM becomes the backup MSM. MSMs that operate as backups can be inserted and removed without disrupting network services.

- If you remove the primary MSM while the BlackDiamond 10808 switch is operating, the backup MSM experiences a soft reset and then becomes the primary MSM.

For example, in a BlackDiamond 10808 switch with a primary MSM in slot A and a backup MSM in slot B, if you remove the primary MSM from slot A, the backup MSM in slot B becomes the primary MSM.

MSM LEDs

Table 15 describes the LED activity on the BlackDiamond 10808 MSM.

Table 15: MSM LEDs

LED	Color	Indicates
SYS	Green blinking	Normal operation is occurring.
	Amber blinking	Diagnostic test is in progress.
	Amber	Diagnostic failure has occurred.
	Off	Switch is not receiving power.
MSTR	Green	Module is operating as primary.
	Amber	Module is operating as backup.
ENV	Green	Environment (temperature, fan, power supply) is operating properly.
	Amber	Environmental failure has occurred.
ERR	Amber	A critical software error has been logged since power up.
	Off	Normal operation is occurring.
Link/Activity	Off	Link is down.
	Green	Link is up.
	Amber	Packet activity is occurring.



NOTE

To reset the critical software error LED (amber ERR LED), use the `clear log static` command and reboot the switch. If you continue to have critical software errors, or the ERR LED is amber after the `clear log static` command and a switch reboot, contact Extreme Networks Customer Support.

About the BlackDiamond 10808 I/O Modules

BlackDiamond 10808 series I/O modules consist of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in a BlackDiamond 10808 system chassis. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

**NOTE**

On the BlackDiamond 10808 switch, the 10 Gbps module (10G6X module) must have the serial number 804405-00-09 or higher to support untagged frames. To display the serial number of the module, use the `show slot <slot_number>` command. (All the modules on the Black Diamond 8800 series of switches, as well as the Summit X450 switch, support tagged and untagged frames.)

This section describes the BlackDiamond 10808 series I/O modules, including:

- [G60T Module](#)
- [G60X Module](#)
- [G20X Module](#)
- [10G6X Module](#)
- [10G2X Module](#)
- [10G2H Module](#)

No configuration information is stored on the I/O modules; all configuration information is stored on the MSM(s).

When the BlackDiamond 10808 switch is powered on, the software generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to nonvolatile RAM (NVRAM).

You can configure parameters of the I/O module after it is installed or you can preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you preconfigure a slot for a specific module type, and then insert a different type of module, the module reverts to its default configuration.

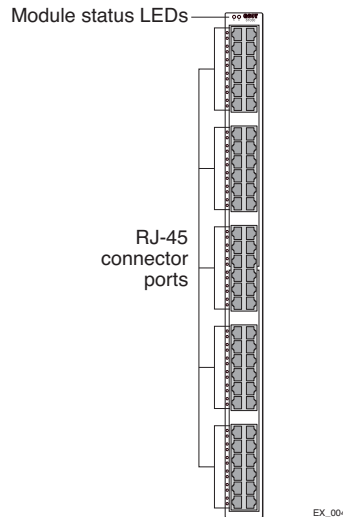
**NOTE**

See the ExtremeXOS 12.0 Concepts Guide and the ExtremeXOS 12.0 Command Reference Guide for more information about configuring I/O modules.

G60T Module

Figure 39 shows the G60T module.

Figure 39: G60T module



The G60T module has 60 autosensing 10/100/1000BASE-T ports that use standard RJ-45 connectors. If you have one MSM installed, all ports on the G60T module are switched through that MSM. If you have two MSMs installed, the top 30 ports on the G60T module are switched through the MSM in slot A, and the bottom 30 ports are switched through the MSM in slot B during normal operation.

The default configuration of the G60T module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)
- Operate in autonegotiation mode

G60T LEDs

The G60T module has the following LEDs:

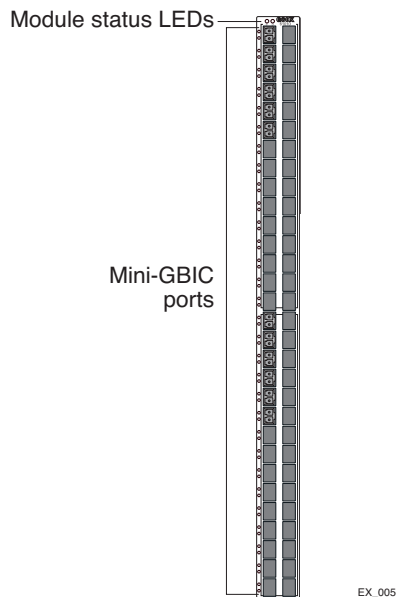
- Module status
- Port status
- Port speed

For information about the LEDs and their activity on the G60T module, see [“I/O Module LEDs” on page 91](#).

G60X Module

Figure 40 shows the G60X module.

Figure 40: G60X module



The G60X module has 60 unpopulated mini-GBIC-based Gigabit Ethernet fiber ports. If you have one MSM installed, all ports on the G60X module are switched through that MSM. If you have two MSMs installed, the top 30 ports on the G60X module are switched through the MSM in slot A, and the bottom 30 ports are switched through the MSM in slot B during normal operation.

All Gigabit Ethernet ports on these modules use SFP fiber mini-GBIC connectors and support 1000BASE-SX, 1000BASE-LX, 1000BASE-LX70, and 1000BASE-ZX ports.

The default configuration of the G60X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

Mini-GBIC Ports

The G60X module supports any of the following mini-GBICs:

- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, which conforms to the IEEE 802.3z standard



NOTE

For more information about the supported mini-GBIC types and specifications, see [“Mini-GBIC Interfaces” on page 338](#).

G60X LEDs

The G60X module has the following LEDs:

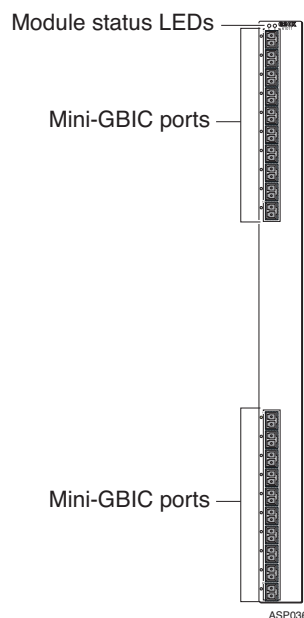
- Module status
- Port status

For information about the LEDs and their activity on the G60X module, see [“I/O Module LEDs” on page 91](#).

G20X Module

Figure 41 shows the G20X module.

Figure 41: G20X module



The G20X module has 20 unpopulated mini-GBIC-based Gigabit Ethernet fiber ports. If you have one MSM installed, all ports on the G20X module are switched through that MSM. If you have two MSMs installed, the top 10 ports on the G20X module are switched through the MSM in slot A, and the bottom 10 ports are switched through the MSM in slot B during normal operation.

Using the G20X module allows you to fulfill line rate traffic.

All Gigabit Ethernet ports on these modules use SFP mini-GBIC connectors, either fiber or copper. The module supports SFP fiber mini-GBICs 1000BASE-SX, 1000BASE-LX, 1000BASE-LX70, and 1000BASE-ZX connectors. If you use SFP copper mini-GBICs, you must use the 1 Gigabit mini-GBIC; the G20X module does not support copper 10/100/1000 SFP copper mini-GBICs.

The default configuration of the G20X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

Mini-GBIC Ports

The G20X module supports any of the following mini-GBICs:

- 1 Gigabit copper mini-GBIC
- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, which conforms to the IEEE 802.3z standard



NOTE

For more information about the supported mini-GBIC types and specifications, see [“Mini-GBIC Interfaces” on page 338](#).

G20X LEDs

The G20X module has the following LEDs:

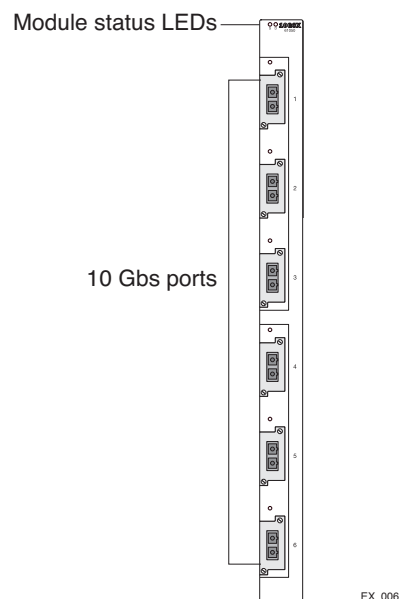
- Module status
- Port status

For information about the LEDs and their activity on the G20X module, see [“I/O Module LEDs” on page 91](#).

10G6X Module

[Figure 42](#) shows the 10G6X module.

Figure 42: 10G6X module



The 10G6X module has six unpopulated XENPAK-based 10 Gigabit Ethernet ports.

If you have one MSM installed, all ports on the 10G6X module are switched through that MSM. If you have two MSMs installed, the top three ports on the 10G6X module are switched through the MSM in slot A, and the bottom three ports are switched through the MSM in slot B during normal operation.

The default configuration of the 10G6X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

XENPAK Ports

The 10G6X module supports any of the following XENPAKs:

- SR XENPAK
- LR XENPAK
- ER XENPAK
- ZR XENPAK
- LX4 XENPAK
- LW XENPAK
- *CX4 XENPAKs are also supported with Extreme Networks devices; contact your vendor to obtain these.*



NOTE

For more information about the supported XENPAK types and specifications, see [“XENPAK Interfaces” on page 354](#).

10G6X LEDs

The 10G6X module has the following LEDs:

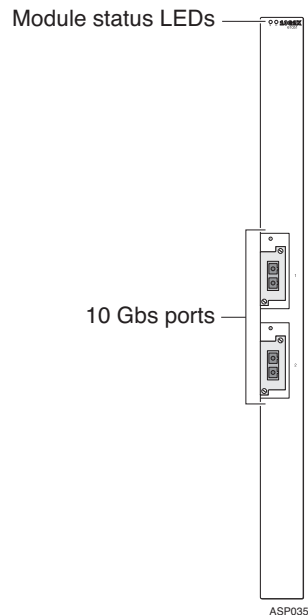
- Module status
- Port status

For information about the LEDs and their activity on the 10G6X module, see [“I/O Module LEDs” on page 91](#).

10G2X Module

Figure 43 shows the 10G2X module.

Figure 43: 10G2X module



The 10G2X module has two unpopulated XENPAK-based 10 Gigabit Ethernet ports.

If you have one MSM installed, all ports on the 10G2X module are switched through that MSM. If you have two MSMs installed, the top port on the 10G2X module is switched through the MSM in slot A, and the bottom port is switched through the MSM in slot B during normal operation.

The default configuration of the 10G2X module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

XENPAK Ports

The 10G2X module supports any of the following XENPAKs:

- SR XENPAK
- LR XENPAK
- ER XENPAK
- ZR XENPAK
- LX4 XENPAK
- LW XENPAK



NOTE

CX4 XENPAKs are also supported with Extreme Networks devices; contact your vendor to obtain these.

For more information about the supported XENPAK types and specifications, see [“XENPAK Interfaces” on page 354](#).

10G2X LEDs

The 10G2X module has the following LEDs:

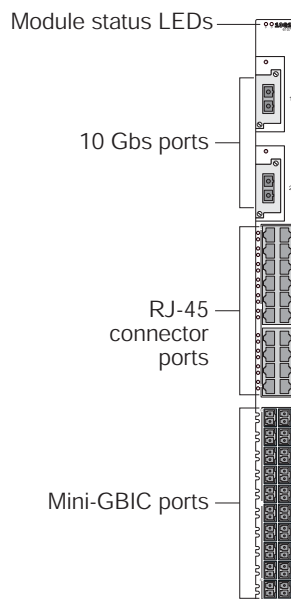
- Module status
- Port status

For information about the LEDs and their activity on the 10G2X module, see [“I/O Module LEDs” on page 91](#).

10G2H Module

[Figure 44](#) shows the 10G2H module.

Figure 44: 10G2H module



EX_116

The 10G2H module has the following:

- 2 unpopulated XENPAK-based 10 Gigabit Ethernet ports
- 20 10/100/1000BASE-T RJ-45-connector ports
- 20 unpopulated mini-GBIC-based Gigabit Ethernet fiber ports

The default configuration of the 10G2H module is as follows. All ports:

- Are added to the default VLAN as untagged
- Inherit the properties of the default VLAN (for example, protocol type and VLANid)

XENPAK Ports

The 10G2X module supports any of the following XENPAKs:

- SR XENPAK
- LR XENPAK
- ER XENPAK
- ZR XENPAK
- LX4 XENPAK
- LW XENPAK



NOTE

CX4 XENPAKs are also supported with Extreme Networks devices; contact your vendor to obtain these.

For more information about the supported XENPAK types and specifications, see [“XENPAK Interfaces” on page 354](#).

Mini-GBIC Ports

The 10G2H module supports any of the following mini-GBICs:

- 1 Gigabit copper mini-GBIC
- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, which conforms to the IEEE 802.3z standard
- 1000BX mini-GBIC (BiDi mini-GBIC), which conforms to the IEEE 802.3ah 1000BASE-BX10 standard



NOTE

For more information about the supported mini-GBIC types and specifications, see [“Mini-GBIC Interfaces” on page 338](#).

10G2H LEDs

The 10G2H module has the following LEDs:

- Module status
- Port status

For information about the LEDs and their activity on the 10G2H module, see [“I/O Module LEDs” on page 91](#).

I/O Module LEDs

Table 16 describes the LED activity on the BlackDiamond 10808 series I/O modules.

Table 16: BlackDiamond 10808 series Ethernet I/O module LEDs

LED	Color	Indicates
Status	Green blinking	Normal operation
	Amber blinking	Configuration error, code version error, diagnostic failure, or other severe module error
	Off	No power
DIAG	Off	Normal operation
	Amber blinking	Diagnostics in progress
	Amber	Diagnostic failure
Port x	Green	Link up
	Green blinking	Link down
	Amber blinking	Packet activity
	Off	Link down

3

Installing BlackDiamond Switches and Modules

6 Installing the BlackDiamond 8810 Chassis

This chapter describes how to install a BlackDiamond 8810 switch chassis.

The BlackDiamond 8810 chassis fits in a standard 19-inch (48.26 cm) rack. You can install the switch either flush against the back of the rack or in a mid-mount position to give you more access behind the rack.

This chapter includes the following sections:

- [Safety Information on page 95](#)
- [Unpacking the BlackDiamond 8810 Chassis on page 96](#)
- [Pre-Installation Requirements on page 99](#)
- [Attaching the BlackDiamond 8810 Mid-Mount Rack Brackets on page 100](#)
- [Rack Mounting the BlackDiamond 8810 Chassis on page 101](#)
- [Grounding the BlackDiamond 8810 Chassis on page 103](#)
- [Initial Management Access on page 104](#)

Safety Information



WARNING!

Correct lifting procedures for the BlackDiamond 8810 chassis require two or more people.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



NOTE

See [Appendix A, "Safety Information"](#) for additional safety information and [Appendix B, "Technical Specifications"](#) for additional information regarding regulatory compliance certifications.



CAUTION

The BlackDiamond 8810 chassis should be empty before being lifted. This will also prevent damage to the system components due to possible system chassis flex when lifting.

Unpacking the BlackDiamond 8810 Chassis

This section describes how to uncrate and unpack the BlackDiamond 8810 chassis. Re-crating and re-packing instructions are also provided in the event that the BlackDiamond 8810 chassis needs to be returned to Extreme Networks, Inc.



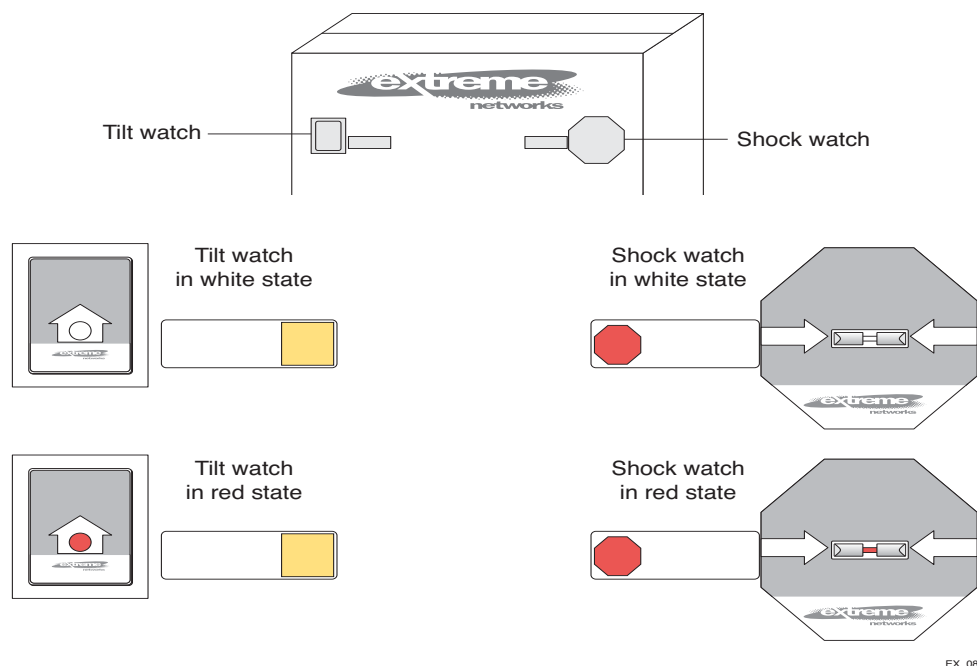
CAUTION

The BlackDiamond 8810 chassis weighs almost 80 pounds. Proper lifting and moving of the chassis requires two people.

To uncrate and unpack the BlackDiamond 8810 chassis:

- 1 Verify that the Tilt Watch and Shock Watch indicators display a **white** state as shown in [Figure 45](#).

Figure 45: Tilt watch and shock watch indicators



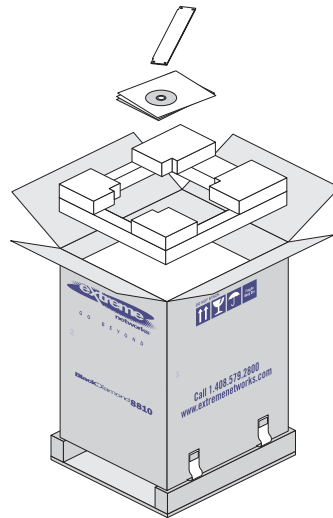
EX_084



CAUTION

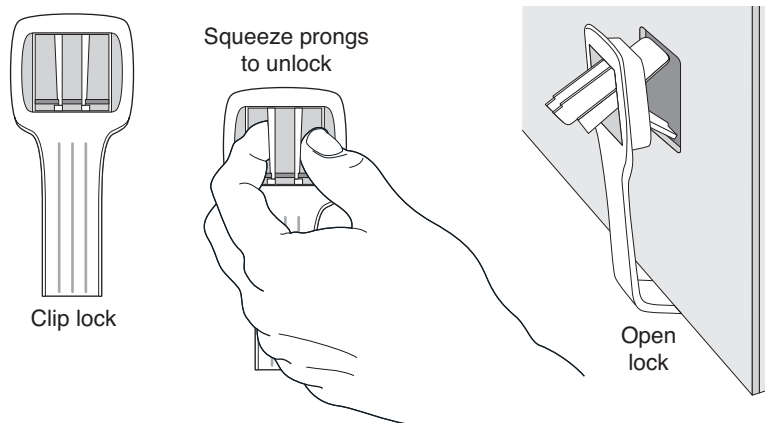
Do not proceed with uncrating and unpacking the chassis if either the Tilt Indicator or the Shock Indicator is displaying a red warning state. Immediately contact Extreme Networks if a red condition occurs.

- 2 Open the flaps and remove the contents from the upper BlackDiamond 8810 shipping carton (see [Figure 46](#)).

Figure 46: Removing contents from the upper BlackDiamond 8810 shipping carton

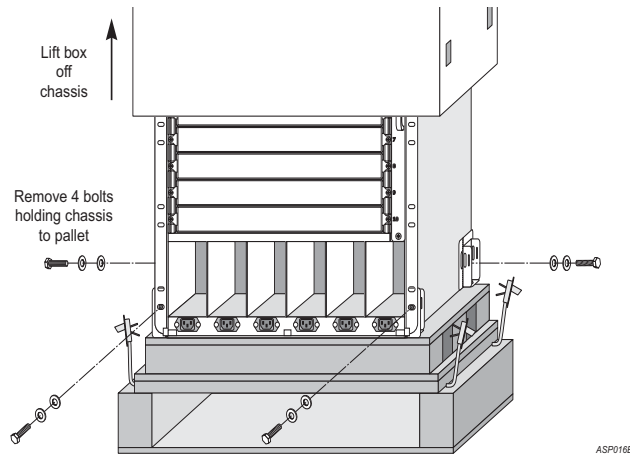
ASP024

- 3 Release the clip locks as shown in [Figure 47](#).
 - a Place your thumb and index finger inside the clip lock touching the prongs.
 - b Squeeze the prongs inward applying equal pressure on each side.
 - c Pull the prongs outward until the clip lock is released from the carton.
 - d Repeat steps 3a through 3c to release each of the remaining clip locks.

Figure 47: Clip locks on the BlackDiamond 8810 shipping carton

EX_087B

- 4 Lift the BlackDiamond 8810 shipping carton up and off the chassis.
- 5 Remove all four restraining bolts that hold the BlackDiamond 8810 chassis to the four shipping brackets on the shipping pallet (see [Figure 48](#)).

Figure 48: Restraining bolts holding the BlackDiamond 8810 chassis onto the wood pallet

- 6 With a person on each side of the chassis, place one hand in the empty power supply bay and the other hand in the recessed hand-hold on the back panel of the BlackDiamond 8810 chassis (see [Figure 49](#)).

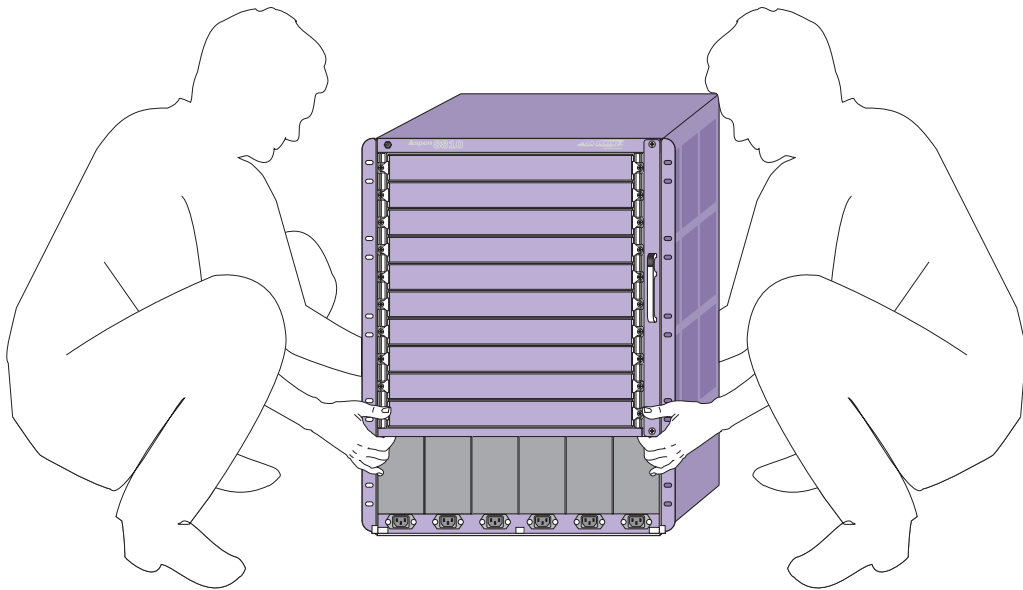
**CAUTION**

Do not use the fan tray handle to lift or maneuver the BlackDiamond 8810 chassis. This handle is not designed to support the weight of the chassis.

**WARNING!**

The BlackDiamond 8810 chassis should be empty before being lifted. This will also prevent damage to the system components due to possible chassis flex when lifting.

- 7 Carefully lift the BlackDiamond 8810 chassis off the shipping pallet and onto the floor as shown in [Figure 49](#).

Figure 49: Correct method for lifting the BlackDiamond 8810 chassis

ASP017A

**NOTE**

Save all packaging, bolts, washers, and clip locks, as well as the box and pallet for future use in the event that the chassis needs to be moved to another location or returned to Extreme Networks.

Pre-Installation Requirements

The following tools and equipment are required for installing the BlackDiamond 8810 chassis:

- ESD-preventive wrist strap (provided)
- 19-inch helper bracket (provided)
- For installing the chassis in a mid-mount position in the rack:
 - Optional BlackDiamond 8810 mid-mount kit, Model 41141. Order this kit separately from the chassis.
- Rack-mount screws appropriate for your organization's rack system, as follows:
 - 4 screws to attach the helper bracket to the rack
 - 8 screws to secure the BlackDiamond 8810 chassis in the rack

The screw size will vary based on your organization's rack system; screws are not provided.
- Screwdriver appropriate for the rack-mounting screws you will use

The screwdriver size will vary based on the requirements of your organization's rack system.

Attaching the BlackDiamond 8810 Mid-Mount Rack Brackets

To install the BlackDiamond 8810 switch in a mid-mount position in the rack, attach the optional BlackDiamond 8810 mid-mount brackets.



CAUTION

The BlackDiamond 8810 chassis weighs almost 80 pounds. Proper lifting and moving of the chassis requires two people.

To attach the BlackDiamond 8810 mid-mount brackets:

- 1 Set the empty chassis in an upright position on a secure flat surface.
- 2 Determine the position for the mid-mount brackets.



NOTE

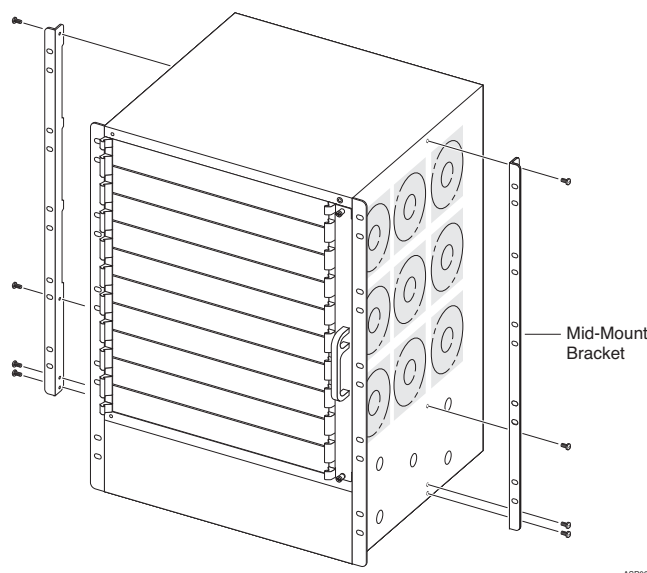
Each side of the chassis has two sets of mounting holes to provide two positions for attaching the mid-mount brackets.

- 3 Identify the left and right brackets.

Each mid-mount bracket is clearly marked for placement on either the right or left side, as viewed from the front of the chassis.

- 4 On each side of the chassis, attach the appropriate mid-mount bracket using the eight mounting screws provided in the kit (see [Figure 50](#)).

Figure 50: Mid-mount brackets attached to the BlackDiamond 8810 chassis



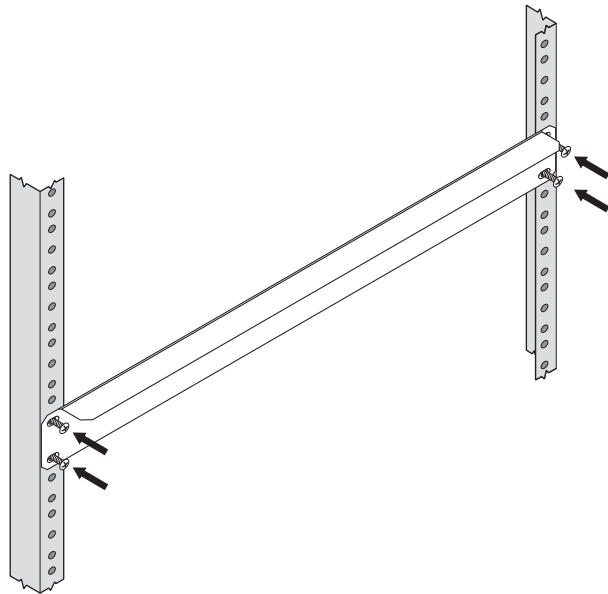
Rack Mounting the BlackDiamond 8810 Chassis

To install the BlackDiamond 8810 chassis in a rack:

- 1 Locate the 19-inch helper bracket that is shipped with the chassis.
- 2 Identify the rack location where the chassis will be installed.
- 3 Using four rack-mounting screws, attach the helper bracket to the system rack immediately below the chassis location as shown in [Figure 51](#).

You must provide the screws for attaching the helper bracket.

Figure 51: Attaching the helper bracket to the system rack



EX_086A

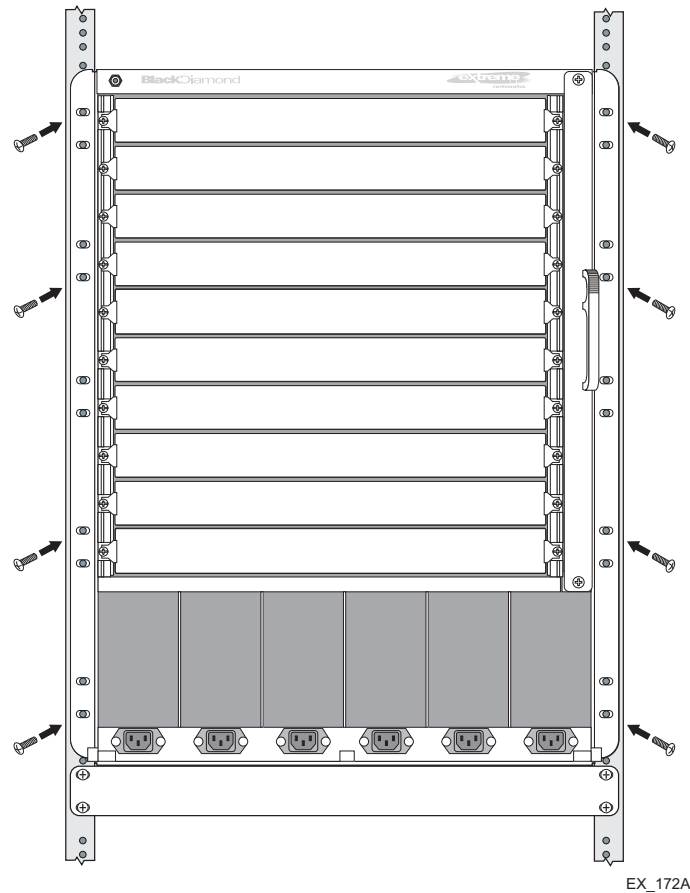
- 4 Lift the back of the empty chassis onto the helper bracket.
- 5 Slowly guide the chassis into the system rack until the mounting brackets are flush against the rack uprights.

- 6 Secure the chassis to the system rack using eight rack mounting screws. (Screws are not provided.) Refer to [Figure 52](#) for the screw locations

**NOTE**

[Figure 52](#) shows a standard rack mount. For mid-mount installation, use the same mounting locations shown in the figure, but insert the screws through the designated slot locations of the mid-mount brackets.

Figure 52: Securing the BlackDiamond 8810 chassis to a standard rack system



- 7 Remove the helper bracket from the system rack after the chassis is secured. Save the bracket for future use if you remove the chassis from the rack.

Grounding the BlackDiamond 8810 Chassis

Although grounding the BlackDiamond 8810 chassis is optional, it is recommended. A grounding point with integrated pem-nuts is provided on the back of the chassis.

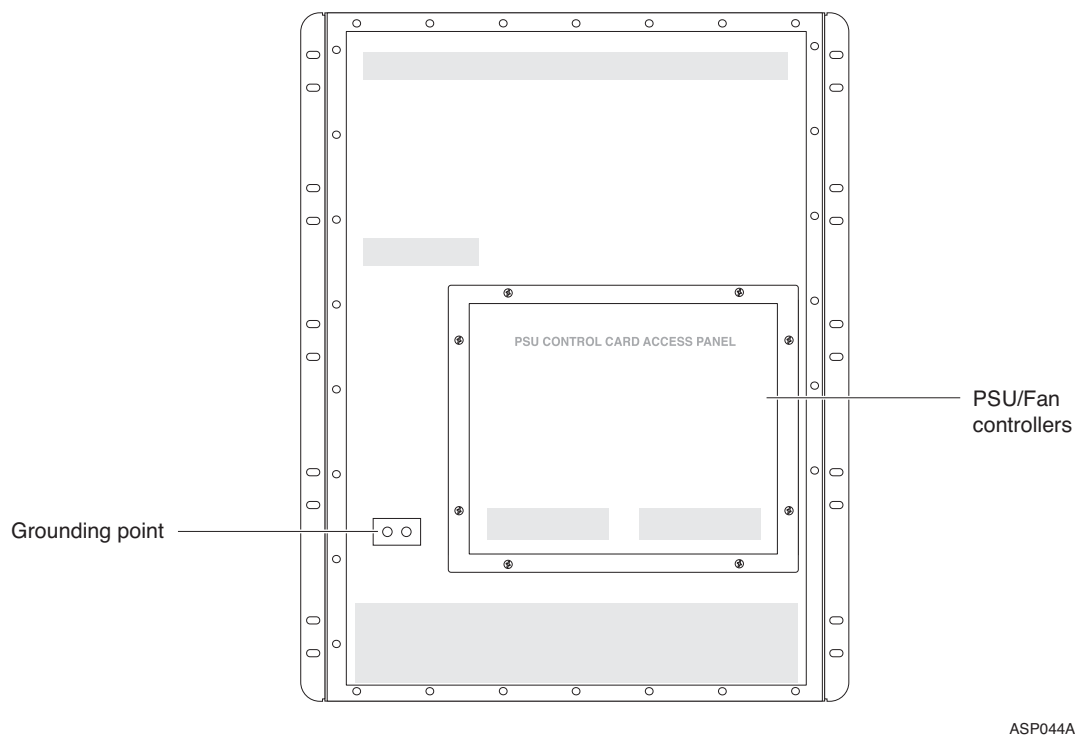
You need the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- Appropriate grounding wire for your system, based on the available input current for the power supply:
 - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG.
 - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG.

To ground the chassis:

- 1 Locate the grounding point on the back of the chassis ([Figure 53](#)).

Figure 53: Back of BlackDiamond 8810 chassis



- 2 Strip 0.5-inch (1.2-cm) of insulation from the stranded copper wire cable.
- 3 Insert the stripped wire into the cable lug.



CAUTION

Be sure that no copper is visible between the lug and the cable insulation.

- 4 Crimp the lug onto the cable according to the manufacturer's specifications.
- 5 Insert the screws through the lug and into the grounding point on the back of the chassis.
- 6 Connect the other end of the wire to a known reliable earth ground point at your site.

Initial Management Access

For instructions on accessing the switch for initial management setup, see [Chapter 2, "Initial Management Access."](#)

7

Installing the BlackDiamond 8806 and BlackDiamond 12804 Chassis

This chapter describes how to install the following BlackDiamond chassis models:

- BlackDiamond 8806 chassis
- BlackDiamond 12804 chassis

The BlackDiamond 8806/12804 chassis fits into a standard 19-inch (48.26 cm) rack. You can install the switch either flush against the back of the rack or in a mid-mount position to give you more access behind the rack.

This chapter includes the following sections:

- [Unpacking the BlackDiamond 8806/12804 Chassis on page 106](#)
- [Pre-installation Requirements on page 109](#)
- [Attaching the BlackDiamond 8806/12804 Mid-Mount Brackets on page 109](#)
- [Rack-Mounting the BlackDiamond 8806/12804 Chassis on page 110](#)
- [Grounding the BlackDiamond 8806/12804 Chassis on page 112](#)
- [Initial Management Access on page 113](#)

**NOTE**

Read the information in this chapter thoroughly before you attempt to install the BlackDiamond 8806/12804 switch.

**WARNING!**

Correct lifting of the BlackDiamond 8806/12804 chassis requires two or more people.

**WARNING!**

The BlackDiamond 8806/12804 chassis should be empty before being lifted. This will also prevent damage to the system components due to possible system chassis flex when lifting.

Unpacking the BlackDiamond 8806/12804 Chassis



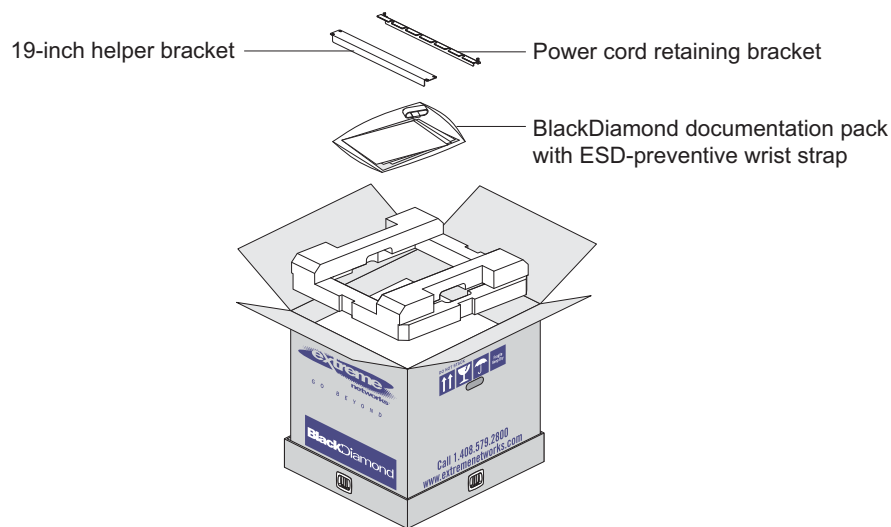
NOTE

Do not remove the nylon straps until you are ready to open the chassis package.

To unpack the BlackDiamond 8806/12804 chassis:

- 1 Remove the nylon straps from around the shipping carton.
- 2 Open the top flaps and remove the accessories and documentation pack from the shipping carton (see [Figure 54](#)). Lift out the packing foam.

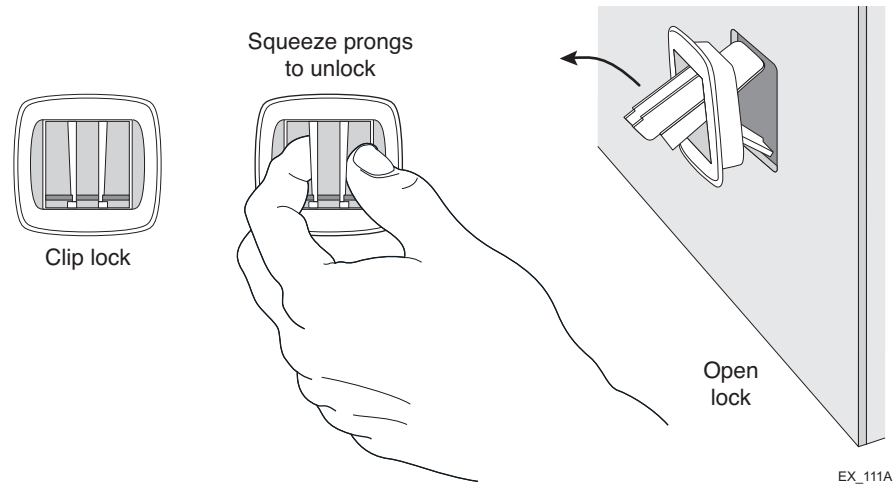
Figure 54: Removing accessories from the BlackDiamond 8806/12804 chassis shipping carton



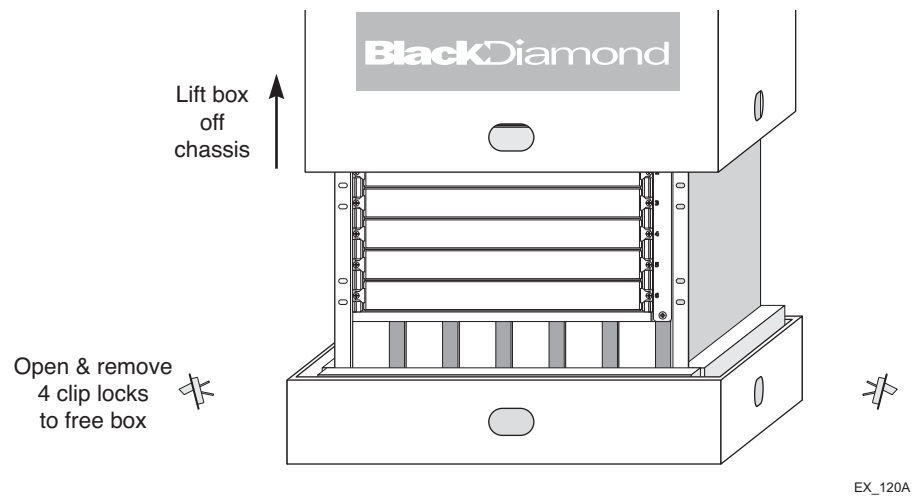
EX_110

- 3 Release the clip locks (see [Figure 55](#)).
 - a Place your thumb and index finger inside the clip lock touching the prongs.
 - b Squeeze the prongs inward, applying equal pressure on each side.
 - c Pull the prongs outward until the clip lock is released from the carton.

Repeat steps 2a through 2c to release each of the remaining clip locks.

Figure 55: Clip locks on the BlackDiamond 8806/12804 chassis shipping carton

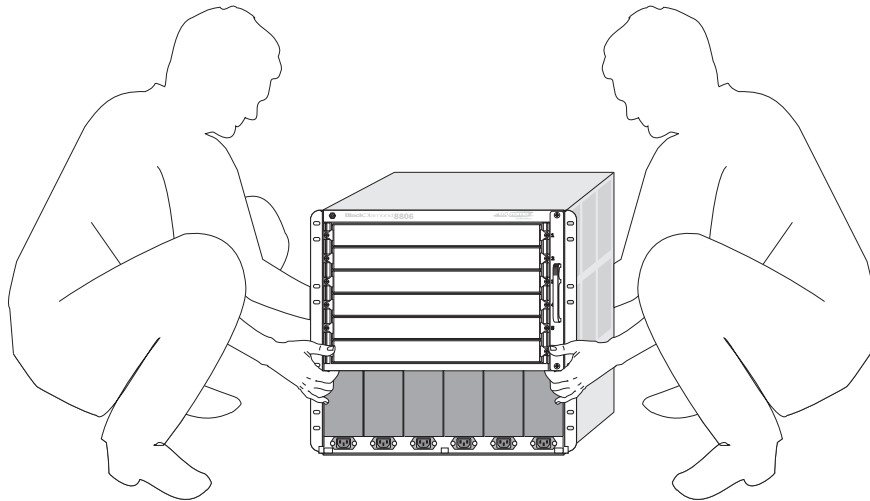
- 4 Slide the shipping carton up over the BlackDiamond 8806/12804 chassis (see [Figure 56](#)).

Figure 56: Removing the carton from the BlackDiamond 8806/12804 chassis

- 5 Unwrap the chassis.

- 6 On each side of the chassis, place one hand in the empty power supply bay and the other hand in the recessed hand-hold on the back panel of the BlackDiamond 8806/12804 chassis. Carefully lift the BlackDiamond 8806/12804 chassis off the foam cushion and onto the floor (see [Figure 57](#)).

Figure 57: Correct method for lifting the BlackDiamond 8806/12804 chassis



EX_112



CAUTION

Do not use the fan tray handle to lift or maneuver the BlackDiamond 8806/12804 chassis. This handle is not designed to support the weight of the chassis.

Verify that the following items are included in the crate:

- BlackDiamond 8806/12804 chassis with four installed blank front panels
- Power cord retaining bracket
- 19-inch helper bracket (installation tray)
- BlackDiamond documentation pack with ESD-preventive wrist strap



NOTE

Save all packaging, clip locks, and box for future use in the event that the BlackDiamond 8806/12804 chassis needs to be moved to another location or returned to Extreme Networks, Inc.

Pre-installation Requirements

The following tools, equipment, and resources are required for installing the BlackDiamond 8806/12804 chassis:

- ESD-preventive wrist strap (provided)
- 19-inch helper bracket (provided)
- For installing the chassis in a mid-mount position in the rack:
 - Optional BlackDiamond 8806/12804 mid-mount kit, part number 65046. Order this kit separately from the chassis.
 - #2 Phillips screwdriver
- Rack-mount screws appropriate for your organization's rack system, as follows:
 - 4 screws to attach the helper bracket
 - 12 screws to secure the BlackDiamond 8810 chassis in the rack

The screw size will vary based on your organization's rack system; screws are not provided.
- Screwdriver appropriate for the rack-mounting screws you will use

The screwdriver size will vary based on the requirements of your organization's rack system.

Attaching the BlackDiamond 8806/12804 Mid-Mount Brackets

To install the BlackDiamond 8806/12804 switch in a mid-mount position in the rack, attach the optional BlackDiamond 8806/12804 mid-mount brackets.

To attach the BlackDiamond 8806/12804 mid-mount brackets:

- 1 Place the empty BlackDiamond 8806/12804 chassis in an upright position on a secure flat surface.



CAUTION

The BlackDiamond 8806/12804 chassis weighs almost 65 pounds. Proper lifting and moving of the chassis requires two people.

- 2 Determine the locations for the mid-mount brackets.

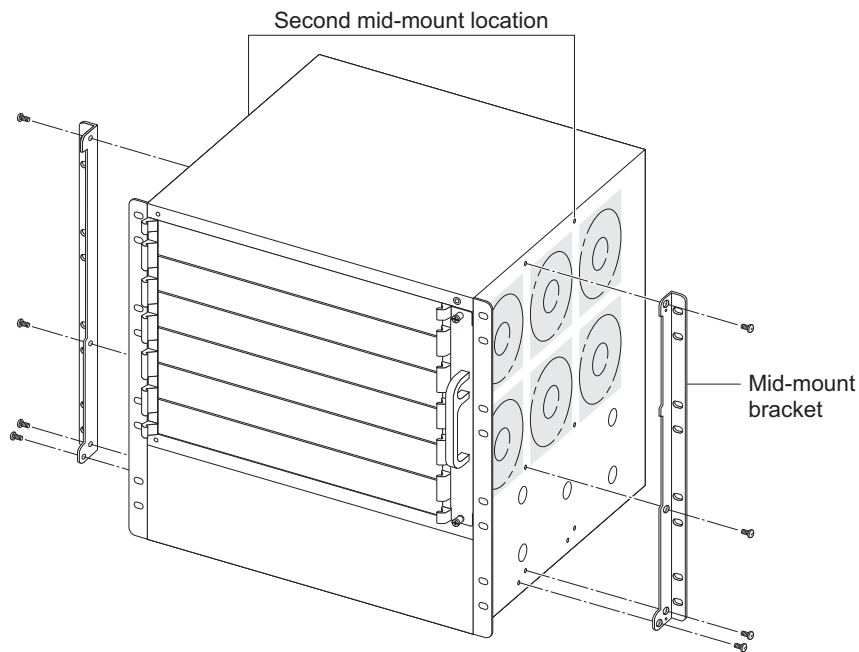


NOTE

Each side of the chassis has two sets of mounting holes to provide two positions for attaching the mid-mount brackets.

- 3 Identify the left and right brackets.

Each mid-mount bracket is clearly marked for placement on either the right or left side, as viewed from the front of the chassis.
- 4 On each side of the chassis, attach the appropriate mid-mount bracket using the eight screws provided in the kit (see [Figure 58](#)).

Figure 58: Attaching the mid-mount brackets to the BlackDiamond 8806/12804 chassis

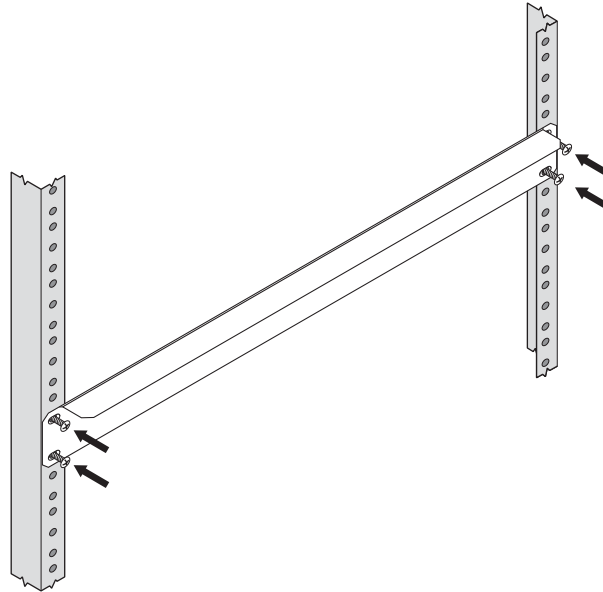
EX_136

Rack-Mounting the BlackDiamond 8806/12804 Chassis

To mount the BlackDiamond 8806/12804 chassis in a rack:

- 1 Locate the 19-inch helper bracket that is shipped with the BlackDiamond 8806/12804 chassis.
- 2 Identify the rack location where the chassis will be installed.
- 3 Using four rack mounting screws, attach the helper bracket to the system rack immediately below the chassis location (see [Figure 59](#)).

You must provide the screws for attaching the helper bracket.

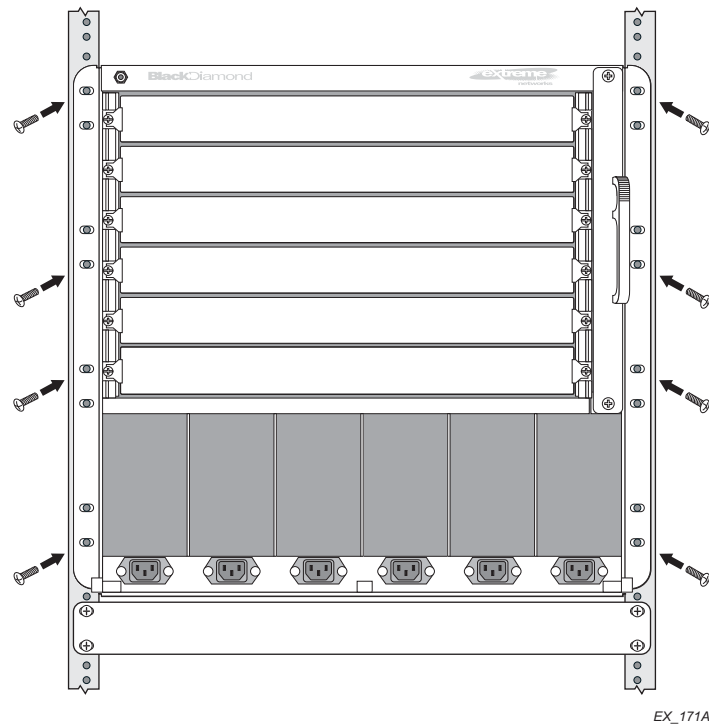
Figure 59: Mounting the 19-inch helper bracket onto the system rack

EX_086A

- 4 Lift the back of the empty BlackDiamond 8806/12804 chassis onto the 19-inch helper bracket.
- 5 Slowly guide the chassis into the system rack until the mounting brackets are flush against the rack uprights.
- 6 Attach the chassis to the system rack using eight rack mounting screws. (Screws are not provided.) Be sure that the screws are secure. Refer to [Figure 60](#) for the screw locations.

**NOTE**

[Figure 60](#) shows a standard rack mount. For mid-mount installation, use the same mounting locations shown in the figure, but insert the screws through the designated slot locations of the mid-mount brackets.

Figure 60: Securing the BlackDiamond 8806/12804 chassis to a standard rack

- 7 Remove the helper bracket from the system rack after the chassis is secured. Save the bracket for future use if you remove the chassis from the rack.

Grounding the BlackDiamond 8806/12804 Chassis

Although grounding the BlackDiamond 8806/12804 chassis is optional, it is recommended. A grounding point with integrated pem-nuts is provided on the back of the chassis.

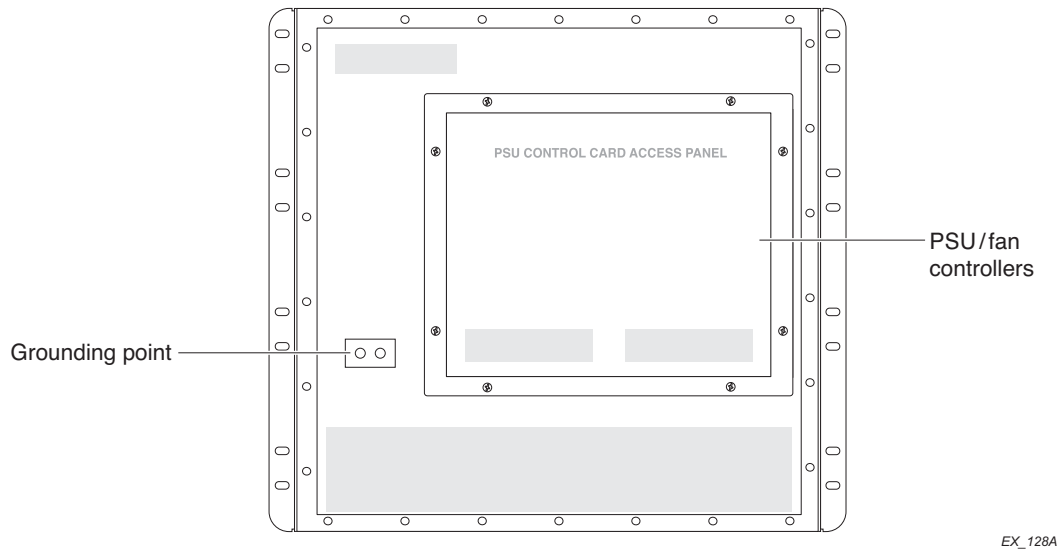
You need the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- Appropriate grounding wire for your system, based on the available input current for the power supply:
 - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG.
 - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG.

To ground the chassis:

- 1 Locate the grounding point on the back of the chassis ([Figure 61](#)).

Figure 61: Back of BlackDiamond 8806/12804 chassis



- 2 Strip 0.5-inch (1.2-cm) of insulation from the stranded copper wire cable.
- 3 Insert the stripped wire into the cable lug.



CAUTION

Be sure that no copper is visible between the lug and the cable insulation.

- 4 Crimp the lug onto the cable according to the manufacturer's specifications.
- 5 Insert the screws through the lug and into the grounding point on the back of the chassis.
- 6 Connect the other end of the wire to a known reliable earth ground point at your site.

Initial Management Access

For instructions on accessing the switch for initial management setup, see [Chapter 2, "Initial Management Access."](#)

8 Installing the BlackDiamond 12802 Chassis

This chapter describes how to install the BlackDiamond 12802 chassis.

The BlackDiamond 12802 chassis fits into a standard 19-inch (48.26 cm) rack. You can install the switch either flush against the back of the rack or in a mid-mount position to give you more access behind the rack.



CAUTION

The minimum required version of ExtremeXOS for an MSM installed in the BlackDiamond 12802 chassis is ExtremeXOS 12.0.1. You must upgrade the MSM before you deploy the BlackDiamond 12802 switch in your network. A BlackDiamond 12802 switch running software earlier than version 12.0.1 will not be fully operational.

To upgrade the software in your BlackDiamond 12802 switch, access the latest 12.0.1 image at the Extreme Networks support website and follow the upgrade instructions in the ExtremeXOS 12.0 Release Notes.

This chapter includes the following sections:

- [Unpacking the BlackDiamond 12802 Chassis on page 115](#)
- [Rack-Mounting the BlackDiamond 12802 Chassis on page 117](#)
- [Grounding the BlackDiamond 12802 Chassis on page 119](#)
- [Initial Management Access on page 120](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install the BlackDiamond 12802 switch.

Unpacking the BlackDiamond 12802 Chassis

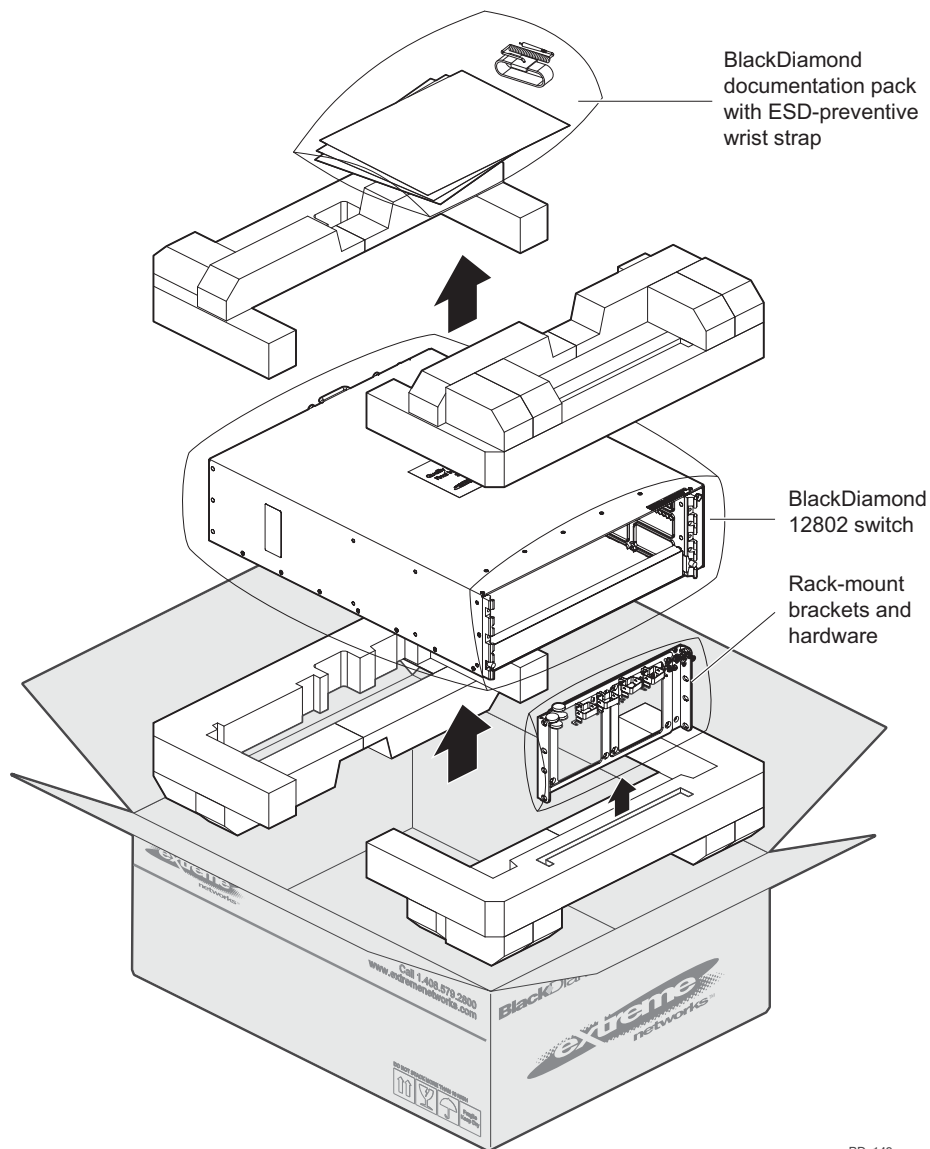


CAUTION

Proper lifting of the BlackDiamond 12802 chassis requires two people.

To unpack the BlackDiamond 12802 chassis:

- 1 Break the inspection seal and cut the packing tape on the top of the shipping carton.
- 2 Open the top of the carton and remove the documentation pack (see [Figure 62](#)).
- 3 Remove the packing foam on top of the chassis (see [Figure 62](#)).
- 4 At the side of the chassis, remove the package of mounting brackets and hardware (see [Figure 62](#)).

Figure 62: Unpacking the BlackDiamond 12802 chassis

BD_149

- 5 To lift the BlackDiamond chassis, on each side have one person support the bottom of the chassis as you lift the chassis off the bottom foam cushion.

**CAUTION**

Do not lift the chassis using the top of the front opening. The weight of the chassis may cause the enclosure to deform.

Set the chassis on a secure, flat work surface.

- 6 Break the inspection seal on the packing bag and remove the chassis from the bag.

**NOTE**

Save the box and all packaging for future use in case the BlackDiamond 12802 chassis must be returned to Extreme Networks, Inc.

Rack-Mounting the BlackDiamond 12802 Chassis

The BlackDiamond 12802 chassis is shipped with mounting brackets that allow you to position the mounting flanges at either the front or the middle of the chassis sides.

Required Tools and Equipment

In addition to the hardware shipped with the BlackDiamond 12802 chassis, you need the following tools and equipment to install the chassis in a rack:

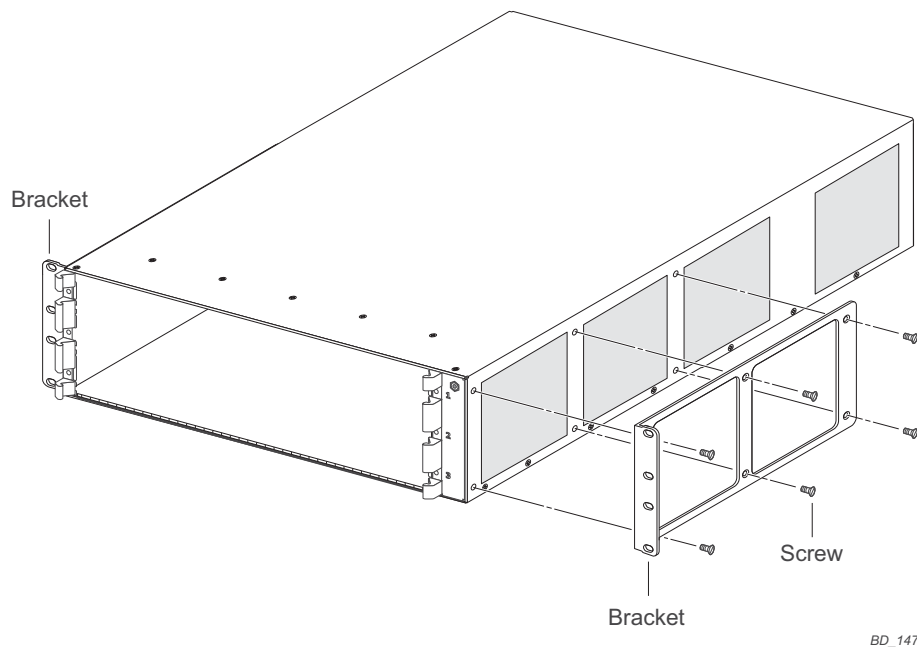
- 8 rack system mounting screws
The screw size will vary based on your organization's rack system; screws are not provided.
- Screwdriver appropriate for the selected rack mounting screws

Front-Mounting a BlackDiamond 12802 Chassis

To front-mount the BlackDiamond 12802 chassis in a rack:

- 1 Place each mounting bracket against the switch chassis with the mounting flange at the front edge of the chassis ([Figure 63](#)).
- 2 Insert and tighten the provided flat-head screws to secure the brackets to the chassis.

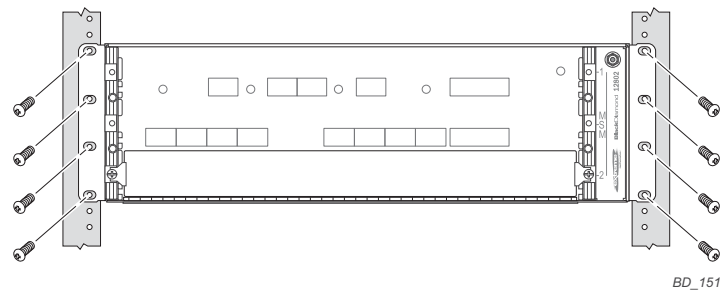
Figure 63: Mounting flanges at the front



- 3 Slide the chassis into the system rack.

- 4 Attach the chassis to the system rack using eight rack system mounting screws (screws not provided). Refer to [Figure 64](#) for the screw locations.

Figure 64: Securing the BlackDiamond 12802 chassis to the rack (front-mount position)

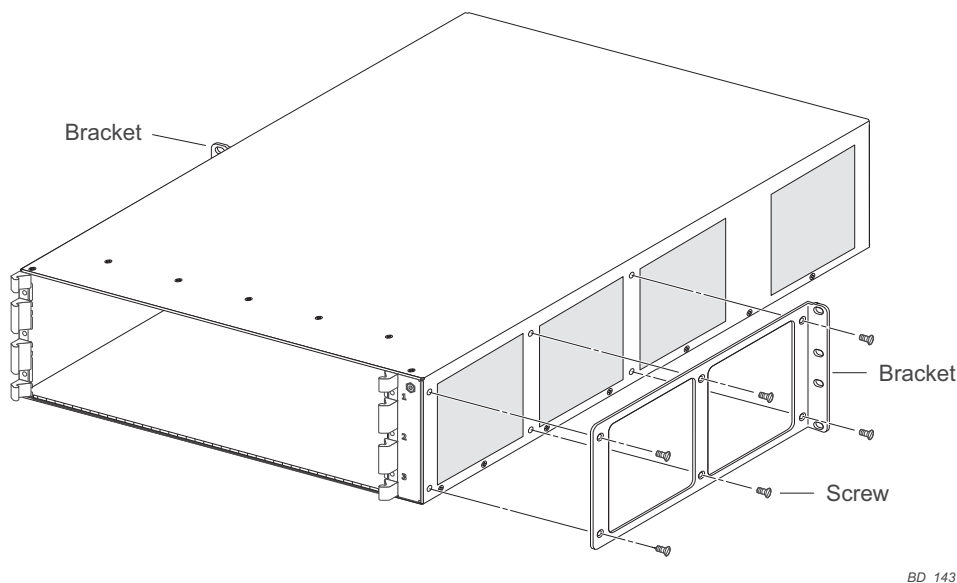


Mid-Mounting a BlackDiamond 12802 Chassis

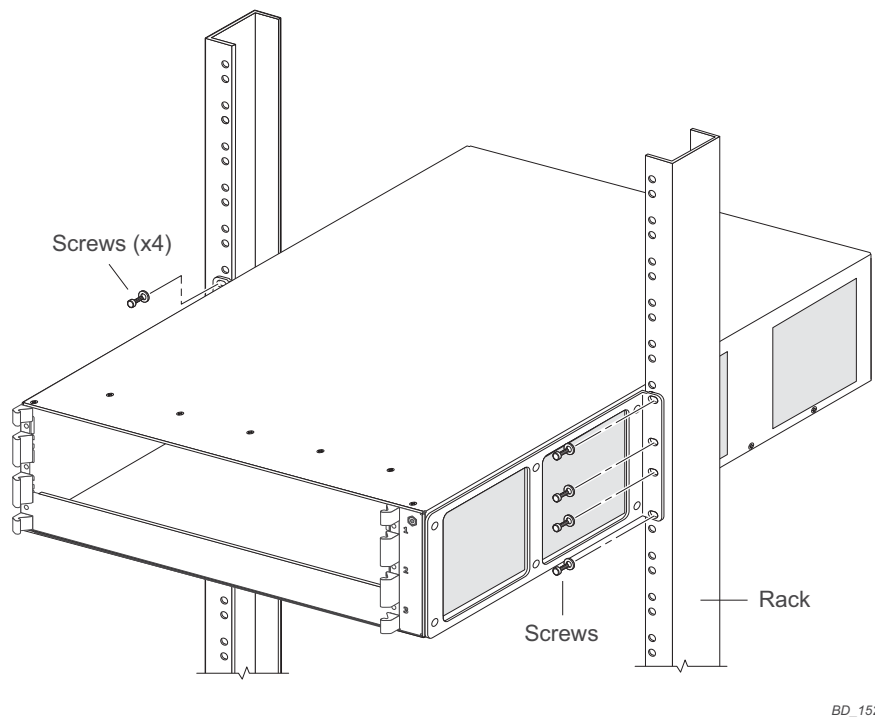
To mid-mount the BlackDiamond 12802 chassis in a rack:

- 1 Place each mounting bracket against the switch chassis with the mounting flange at the middle of the chassis side ([Figure 65](#)).

Figure 65: Mounting flanges at the middle



- 2 Insert and tighten the provided flat-head screws to secure the brackets to the chassis.
- 3 Slide the chassis into the equipment rack.
- 4 Attach the chassis to the system rack using eight rack system mounting screws (screws not provided). Refer to [Figure 66](#) for the screw locations.

Figure 66: Securing the BlackDiamond 12802 switch to the rack (mid-mount position)

BD_152

Grounding the BlackDiamond 12802 Chassis

Although grounding the BlackDiamond 12802 chassis is optional, it is recommended. A grounding point with integrated pem-nuts is provided on the back of the chassis.

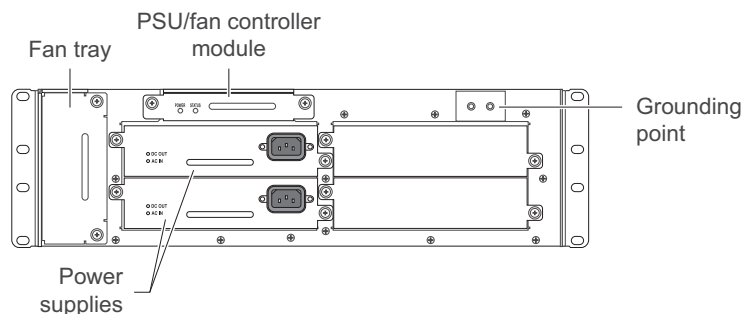
You need the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- Appropriate grounding wire for your system, based on the available input current for the power supply:
 - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG.
 - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG.

To ground the chassis:

- 1 Locate the grounding point on the back of the chassis (Figure 67).

Figure 67: Back of BlackDiamond 12802 chassis



BD_142A

- 2 Strip 0.5-inch (1.2-cm) of insulation from the stranded copper wire cable.
- 3 Insert the stripped wire into the cable lug.



CAUTION

Be sure that no copper is visible between the lug and the cable insulation.

- 4 Crimp the lug onto the cable according to the manufacturer's specifications.
- 5 Insert the screws through the lug and into the grounding point on the back of the chassis.
- 6 Connect the other end of the wire to a known reliable earth ground point at your site.

Initial Management Access

For instructions on accessing the switch for initial management setup, see [Chapter 2, "Initial Management Access."](#)

This chapter describes how to install the BlackDiamond 10808 chassis.

The BlackDiamond 10808 chassis fits into a standard 19-inch (48.26 cm) rack. You can install the switch either flush against the back of the rack or in a mid-mount position to give you more access behind the rack.

This chapter includes the following sections:

- [Safety Information on page 121](#)
- [Required Tools and Resources on page 122](#)
- [Unpacking the Chassis and Preparing the Rack on page 122](#)
- [Installing the Chassis on page 128](#)
- [Grounding the BlackDiamond 10808 Chassis on page 134](#)
- [Initial Management Access on page 136](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove the BlackDiamond 10808 switch.

Safety Information



CAUTION

Correct lifting procedures for the BlackDiamond 10808 chassis requires two or more people.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



NOTE

See [Appendix A, "Safety Information"](#) for additional safety information and [Appendix B, "Technical Specifications"](#) for additional information regarding regulatory compliance certifications.



CAUTION

Before you lift a BlackDiamond 10808 chassis, make sure the chassis is empty to prevent unnecessary weight. This will also prevent damage to the system components due to possible system chassis flex when lifting.

Required Tools and Resources

This section lists the necessary tools, equipment, and resources for installing the BlackDiamond 10808 chassis.

To unpack the chassis, you need:

- Utility knife for opening the shipping carton and accessory box
- Adjustable wrench for removing the chassis restraining bolts from the pallet

To install the chassis you need:

- Helper bracket (provided)
- Rack mount screws appropriate for your organization's rack system:
 - Four screws to secure the helper bracket (not provided)
 - 12 screws to secure the chassis to the rack (not provided)
- Screwdriver appropriate for the rack mount screws
- A minimum of two people to help install the chassis into the rack

Unpacking the Chassis and Preparing the Rack

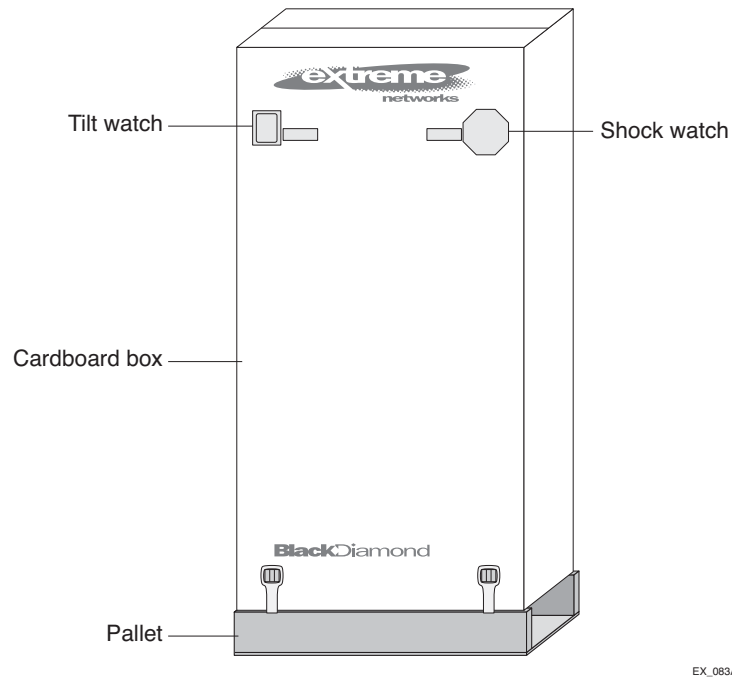
The BlackDiamond 10808 chassis is shipped bolted to a wooden pallet, with a carton fastened over the pallet. An accessory box is inside the top of the carton. To begin the installation process, unpack the accessories and remove the shipping carton from the pallet.

Unpacking the chassis includes the following tasks:

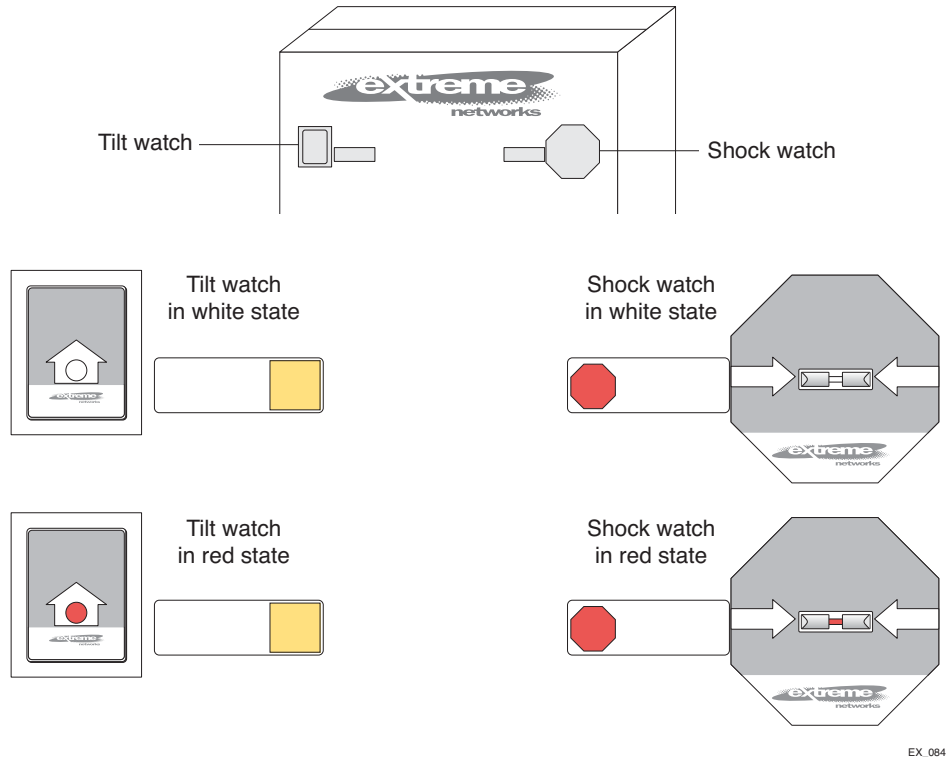
- Check the shipping status indicators.
- Open the top of the shipping carton and remove the accessories box.
- Remove the shipping carton from the chassis.

Checking the Shipping Status Indicators

Before you begin unpacking the chassis from the carton, locate the tilt watch and shock watch shipping status indicators on the side of the shipping carton ([Figure 68](#)).

Figure 68: Shipping status indicators

Each indicator has two color-coded states, or modes: a good, white state, and a warning, red state. A smooth shipping procedure should leave all four indicators in good, white states. [Figure 69](#) shows the tilt watch and shock watch indicators in both conditions.

Figure 69: Tilt watch and shock watch indicators**CAUTION**

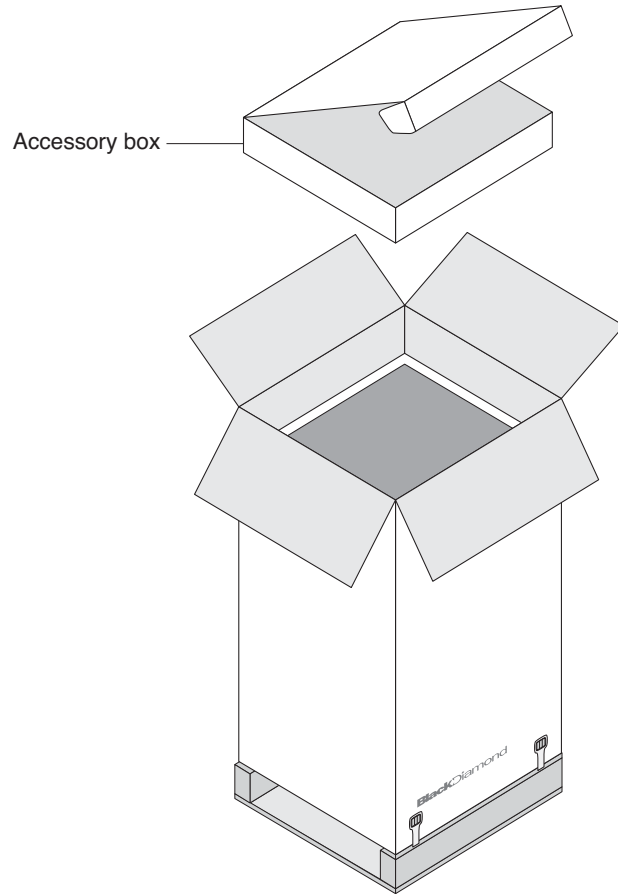
If either the tilt watch or shock watch indicator is showing a red warning condition, do not proceed with unpacking. Contact your shipping company or Extreme Networks and speak to a representative before continuing.

Removing the Accessories Box

Begin unpacking the chassis from the carton by removing the accessories box from the top of the carton.

To remove the accessories box from the carton:

- 1 Cut away the plastic that wraps the carton.
- 2 Cut the tape that seals the top of the carton.
- 3 Open the top carton flaps and lift out the accessories box, as shown in [Figure 70](#).

Figure 70: Accessories box in top of carton

EX_085

4 Set the accessories box aside in a safe place.

The accessories box contains:

- 19-inch helper bracket for installing the chassis in a rack
- ESD-preventive wrist strap
- Front bezel for shielding the switch after installation
- Documentation and media

Removing the Carton from the Chassis

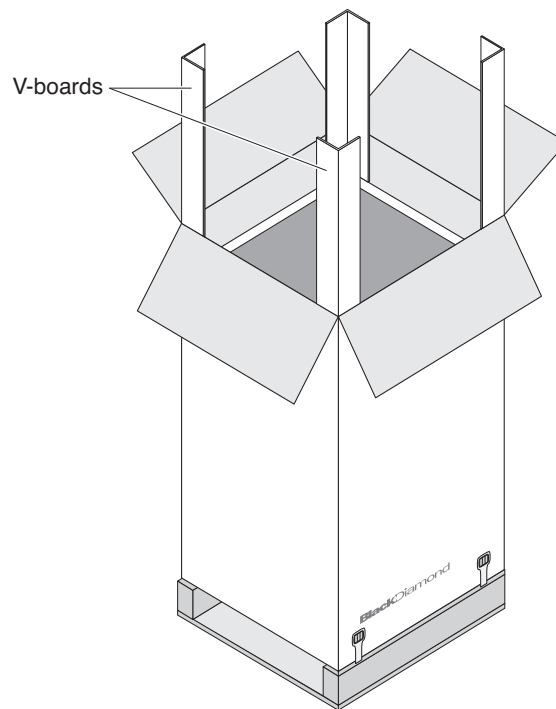
**NOTE**

You need at least 10 feet of overhead clearance to remove the shipping carton from the chassis.

To remove the carton from the chassis:

- 1 Remove the four v-boards from the corners of the crate, as shown in [Figure 71](#).

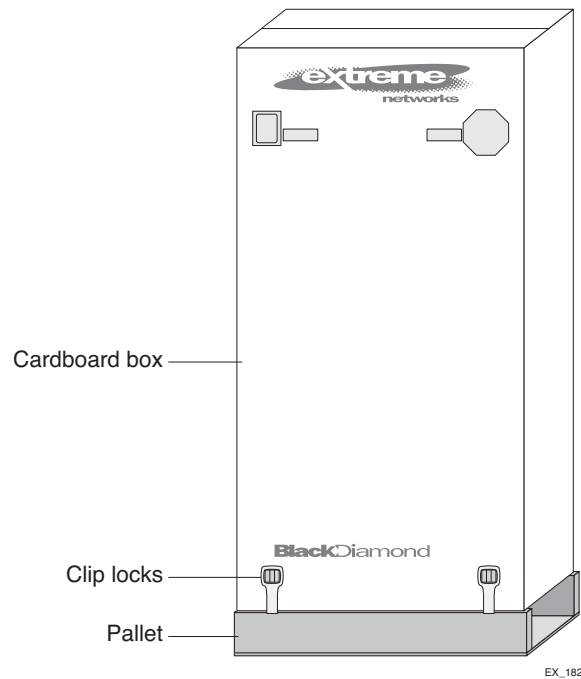
Figure 71: V-boards in the chassis carton



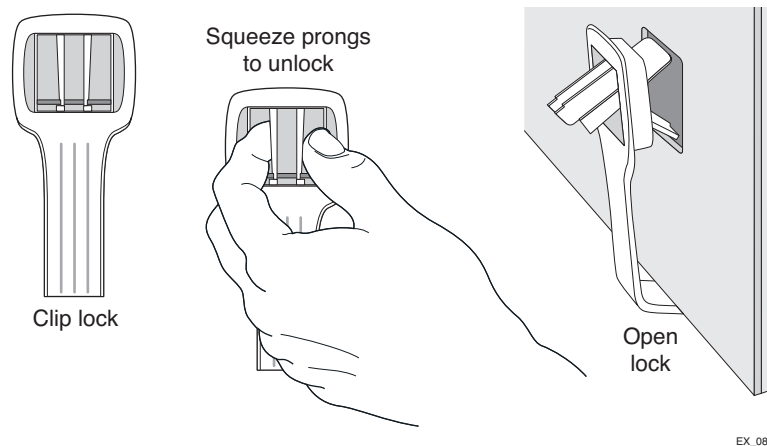
EX_093A

- 2 Remove the four detachable plastic clip locks found near the bottom of the shipping carton, as shown in [Figure 72](#).

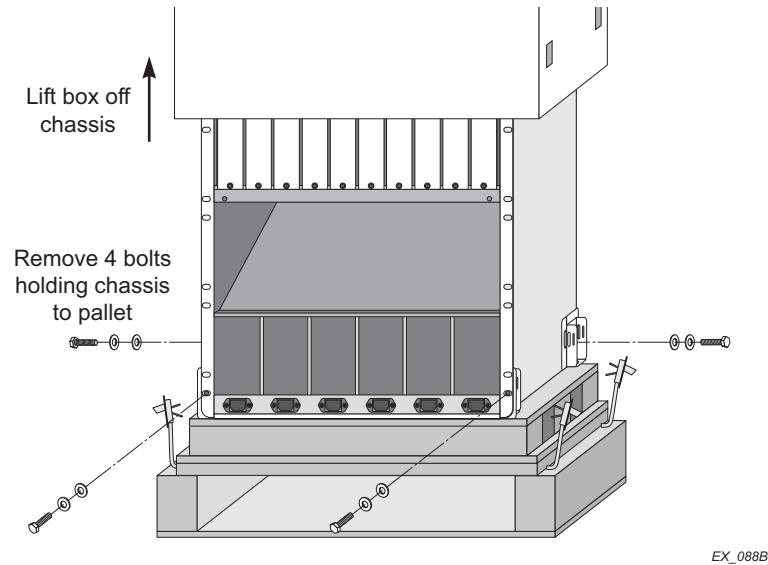
Two clip locks are located on each side of the carton.

Figure 72: Location of clip locks

- a Place your thumb and index finger inside the clip lock (see [Figure 73](#)) adjacent to the two vertical prongs located there.
- b Press the prongs inward, applying equal pressure on each side.
- c Pull the prongs toward you until the clip lock is released from the carton.
- d Repeat steps 2a through 2c to release each of the remaining three clip locks.

Figure 73: Removing the clip locks

- 3 Slide the carton up over the chassis, as shown in [Figure 74](#).

Figure 74: Removing the shipping carton

- 4 Remove the restraining bolts that hold the BlackDiamond 10808 chassis to the shipping brackets on the shipping pallet (see [Figure 74](#)).

Continue with the instructions in “[Installing the Chassis](#)” to install the chassis in an equipment rack.

**NOTE**

Save the packaging, including the carton, bolts, and attached washers for future use, in case you need to return the BlackDiamond 10808 switch.

Installing the Chassis

The BlackDiamond 10808 switch is shipped with a pre-installed fan tray. For your safety, because of the increased weight of the chassis after components are installed and to prevent damage to the equipment, Extreme Networks strongly recommends that you install the I/O modules after you mount the chassis in a rack.

**NOTE**

Mount the chassis in a rack before installing any switch components.

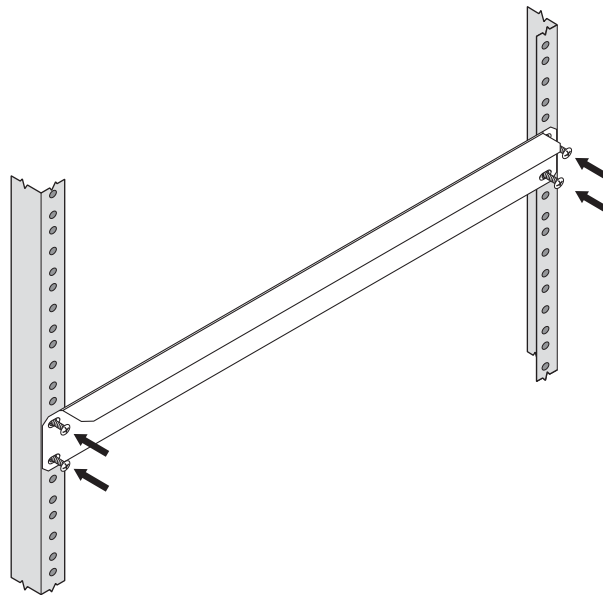
You can install the chassis using either the attached rack mount brackets at the front of the chassis (standard rack position) or the optional mid-mount brackets.

Standard Rack Installation

To mount the chassis in the standard rack position:

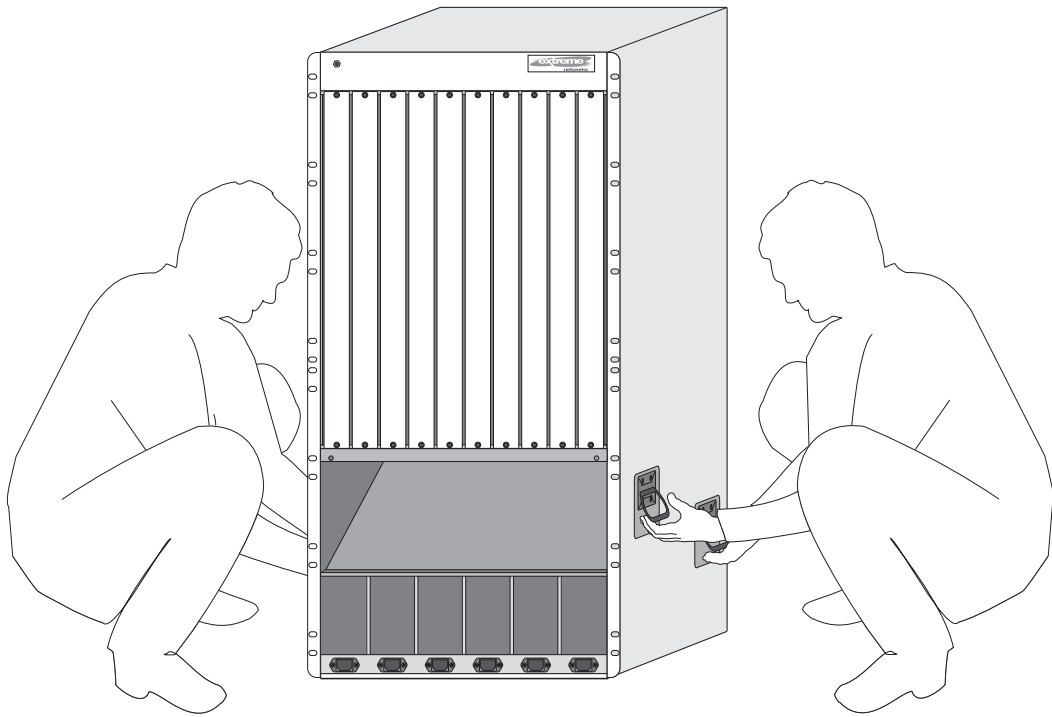
- 1 Locate the helper bracket.
- 2 Mount the helper bracket in the lowest available position in the rack using four appropriate screws (not provided), as shown in [Figure 75](#).

Figure 75: Helper bracket for mounting the BlackDiamond 10808 switch



EX_086A

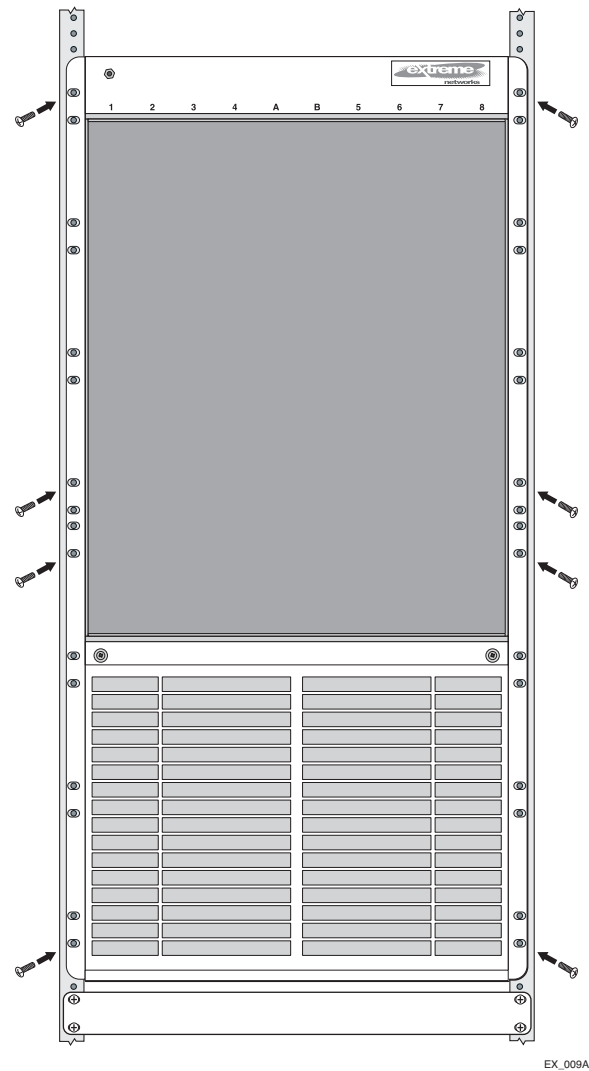
- 3 Using all four handles, lift the switch from the pallet, as shown in [Figure 76](#).

Figure 76: Lifting the switch from the pallet

EX_090A

- 4 Place the back of empty chassis on the helper bracket in the equipment rack.
- 5 Using the higher handles at the front, slowly guide the chassis into the rack until it is securely seated.
- 6 While holding the empty chassis, secure the chassis to the rack, using eight rack-mount screws (see [Figure 77](#)).

Figure 77: Securing the BlackDiamond 10808 chassis to a standard rack



- 7 After you secure the chassis to the rack, remove the helper bracket.
Store the bracket for future use; for example, if you need to remove the chassis from the rack.

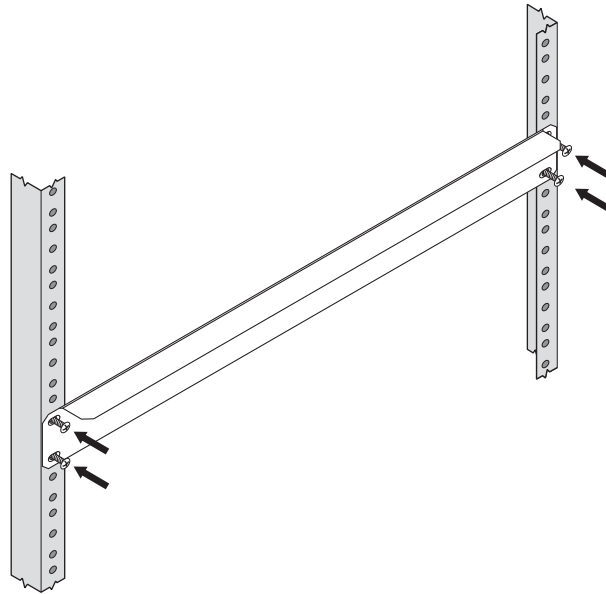
Mid-Mount Rack Installation

To install the chassis in a mid-mount position, use the optional mid-mount kit.

To mount the chassis into the rack using the mid-mount kit:

- 1 Locate the helper bracket.
- 2 Mount the helper bracket in the lowest available position in the rack using four appropriate screws (not provided), as shown in [Figure 78](#).

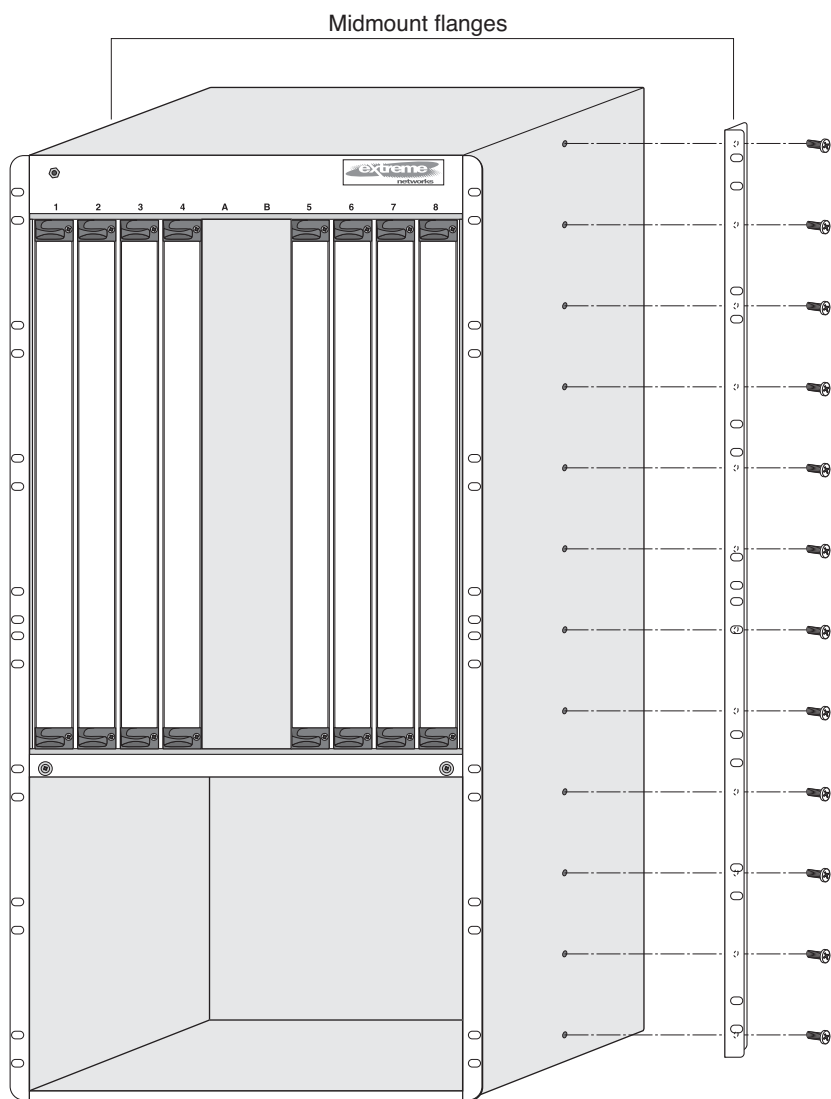
Figure 78: Helper bracket for mounting the BlackDiamond 10808 switch



EX_086A

- 3 Attach a mid-mount flange to each side of the BlackDiamond 10808 chassis using the provided screws.

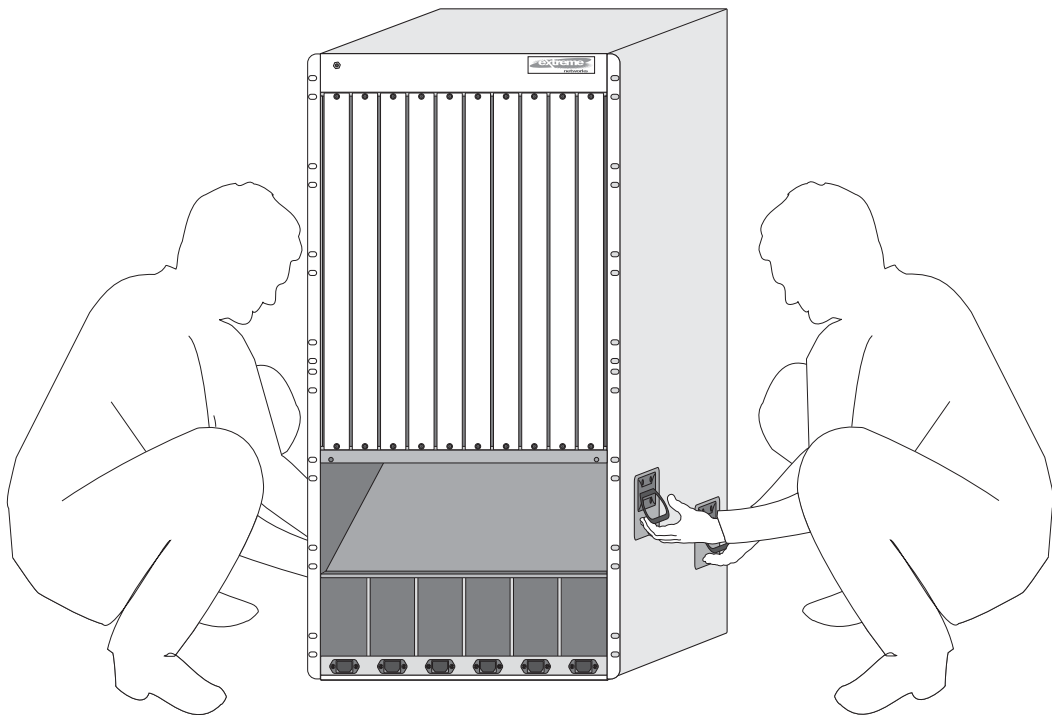
Use the appropriate flange for the left and right side, as shown in [Figure 79](#).

Figure 79: Mid-mount flange for the BlackDiamond 10808 chassis

EX_075

- 4 Using all four handles on the switch, lift the switch from the pallet, as shown in [Figure 80](#).

Figure 80: Lifting the switch from the pallet



EX_090A

- 5 Place the empty chassis on the helper bracket, and slowly guide the chassis halfway into the rack until the mid-mount flanges meet the front of the rack.
- 6 While holding the empty chassis, secure the chassis to the rack using eight rack-mounting screws.
- 7 After you secure the chassis, remove the helper bracket.

Store the bracket for future use, for example, if you need to remove the chassis from the rack.

Grounding the BlackDiamond 10808 Chassis

Although grounding the BlackDiamond 10808 chassis is optional, it is recommended. A grounding point with integrated pem-nuts is provided on the back of the chassis.

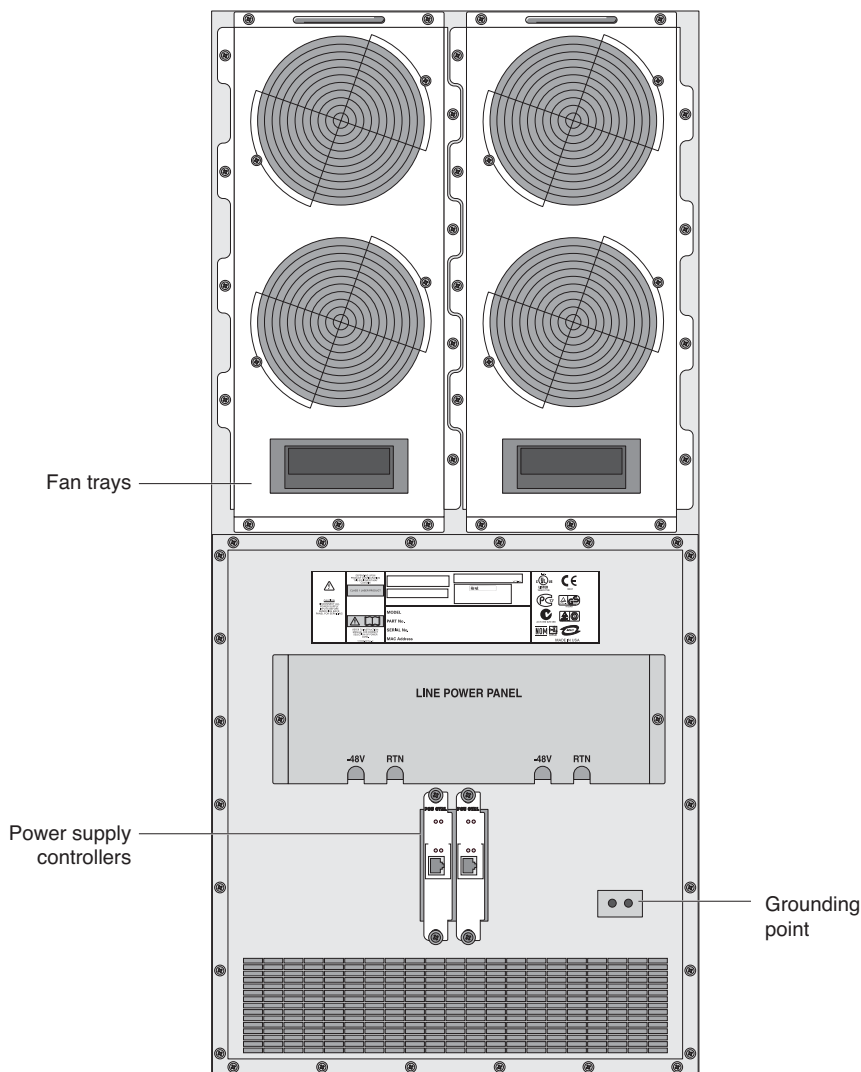
You need the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- Appropriate grounding wire for your system, based on the available input current for the power supply:
 - For AC systems using a 20A breaker per PSU (SSI AC), the chassis ground can be as small as 14 AWG.
 - For DC systems using a 40A breaker per PSU (SSI DC), the chassis ground can be as small as 10 AWG.

To ground the chassis:

- 1 Locate the grounding point on the back of the chassis (Figure 81).

Figure 81: Back of BlackDiamond 10808 chassis



EX_007A

- 2 Strip 0.5-inch (1.2-cm) of insulation from the stranded copper wire cable.
- 3 Insert the stripped wire into the cable lug.



CAUTION

Be sure that no copper is visible between the lug and the cable insulation.

- 4 Crimp the lug onto the cable according to the manufacturer's specifications.
- 5 Insert the screws through the lug and into the grounding point on the back of the chassis.
- 6 Connect the other end of the wire to a known reliable earth ground point at your site.

Initial Management Access

For instructions on accessing the switch for initial management setup, see [Chapter 2, “Initial Management Access.”](#)

10

Extreme Networks Power Supply Units for BlackDiamond Switches

This chapter includes specifications and describes the installation process for power supply units used in BlackDiamond switches.

This chapter includes the following topics:

- [Safety on page 137](#)
- [BlackDiamond PSU Compatibility on page 138](#)
- [Extreme Networks 1200 W DC PSU on page 139](#)
- [Extreme Networks 700/1200 W AC PSU on page 146](#)
- [Extreme Networks 600/900 W AC PSU on page 152](#)
- [Extreme Networks 325 W DC Power Supply on page 158](#)
- [Extreme Networks 325 W AC Power Supply on page 165](#)

Safety

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

Before installing an Extreme Networks PSU into your network:

- Read the latest installation and safety information provided in this chapter and in [Appendix A, "Safety Information."](#)
- See [Appendix A, "Safety Information"](#) for additional information regarding regulatory compliance certifications.



NOTE

For central DC power connections, the 1200 W DC PSU and 325 W DC PSU are intended to be installed only in restricted access locations (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA-70. All wiring methods involving the DC input cable assembly must be performed according to the relevant articles of the National Electrical Code.



CAUTION

Building codes vary worldwide; therefore, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation.

**WARNING!**

Field operators must not attempt to open the PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective PSU to Extreme Networks for repair or replacement.

BlackDiamond PSU Compatibility

The BlackDiamond power supply units are intended for use in specific BlackDiamond switches only. Table 17 lists the BlackDiamond switches and their compatible power supply units.

Table 17: PSU compatibility in the BlackDiamond switches

BlackDiamond Switch	Compatible PSU	Compatibility Notes
BlackDiamond 8806	600W/ 900W AC PSU AND/OR 700W/ 1200W AC PSU OR 1200W DC PSU	The 700/1200 W AC PSU can be used in conjunction with a 600/900 W AC PSU in the same BlackDiamond 8806 system only. Extreme Networks does not recommended using the 600/900 W AC PSU or the 700/1200 W AC PSU in conjunction with a 1200W DC PSU.
BlackDiamond 8810	700W/ 1200W AC PSU OR 1200W DC PSU	Extreme Networks does not recommended using the 700/1200 W AC PSU in conjunction with a 1200W DC PSU.
BlackDiamond 10808	700W/ 1200W AC PSU OR 1200W DC PSU	Extreme Networks does not recommended using the 700/1200 W AC PSU in conjunction with a 1200W DC PSU.
BlackDiamond 12804	700W/ 1200W AC PSU OR 1200W DC PSU	Extreme Networks does not recommended using the 700/1200 W AC PSU in conjunction with a 1200W DC PSU.
BlackDiamond 12802	325 W AC PSU, Model # 65021 OR 325 W DC PSU, Model # 65022	Extreme Networks does not recommended using the 325 W AC PSU in conjunction with the 325 W DC PSU.

**NOTE**

When a combination of 600/900 W AC PSUs and 700/1200 W AC PSUs are powered on in the same BlackDiamond 8806 chassis, all PSUs will be budgeted down to the lower-powered 600/900 W AC output values to avoid PSU shutdown due to over-current. Refer to their respective sections for complete details.

**NOTE**

The MSM running in your BlackDiamond 8806 switch requires ExtremeXOS version 11.6.1 (or later) to recognize an Extreme Networks 600/900 W AC PSU. In ExtremeXOS releases 11.3.4, 11.4.2, and 11.5.1, the 600/900 W AC PSU is disabled on all chassis. In ExtremeXOS releases before those, the software does not recognize the 600/900 W AC PSU and the PSU will not be budgeted properly, possibly resulting in PSU shutdown and/or chassis reboot.

Extreme Networks 1200 W DC PSU

The Extreme Networks 1200 W DC UL-listed accessory power supply unit (Model # 60021/PS 2350) is compatible only with the following UL-listed BlackDiamond® switches:

- BlackDiamond 8800 series of switches
- BlackDiamond 10808 switch
- BlackDiamond 12804 switch

Extreme Networks 1200 W DC PSUs are fully fault-tolerant, hot-swappable, and load-sharing in an N+1 configuration. If one DC PSU fails in this configuration, the others will provide sufficient power to operate a fully loaded switch.

The power supply bay can accommodate up to six hot-swappable Extreme Networks 1200 W DC PSUs. In an N+N configuration, each group of power supplies can provide A/B feed redundancy for the system.



NOTE

Extreme Networks does not recommended using the 1200 W DC PSU in conjunction with any Extreme Networks AC PSU in the same BlackDiamond 8800 series, BlackDiamond 10808, or BlackDiamond 12804 system. Extreme Networks recommends that DC and AC PSU units not be used together in the same BlackDiamond switch.



NOTE

For central DC power connections, the 1200 W DC PSU is intended to be installed only in restricted access locations (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA-70.



CAUTION

Building codes vary worldwide; therefore, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation.



WARNING!

Field operators must not attempt to open the 1200 W DC PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective 1200 W DC PSU to Extreme Networks for repair or replacement.

Minimum Software Required

You must be running ExtremeWare XOS version 11.3 or later for the system to recognize the DC PSU.

Pre-Installation Requirements

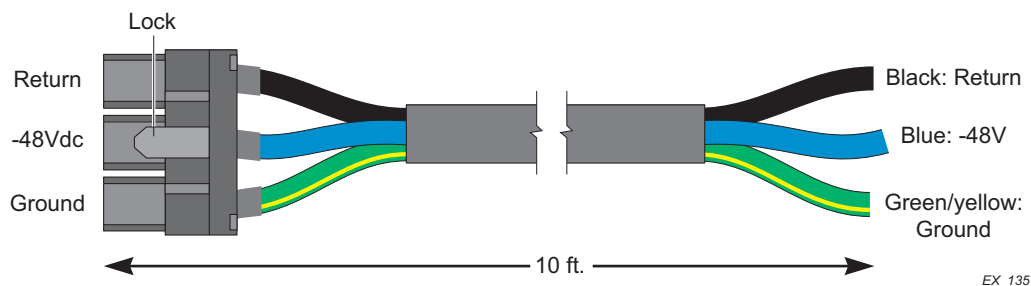
You need the following tools and equipment to install or remove a 1200 W DC PSU:

- ESD preventive wrist strap
- Input DC power cable (provided with the DC PSU)
- -48 V DC power source capable of providing 50 A dedicated power to each of the 1200 W DC PSUs installed in the switch
- Thermal protective gloves (required for removal)

Installing the DC Wiring

The input DC cable for the DC PSU is supplied along with the 1200 W DC PSU (see [Figure 82](#)); you *must* use this cable with the DC PSU.

Figure 82: Input DC power cable for the 1200 W DC PSU



Each 1200 W DC PSU must be powered by a 50 A dedicated power source that delivers -40 to -72 VDC of constant power. Power distribution to the 1200 W DC PSU shall be provided using the -48 VDC harness provided. Power to the 1200 W DC PSU can be from either a 50 A UL-approved overcurrent protection breaker or an SELV- approved power source in accordance with IEC 60950-1 utilizing 50 A overcurrent protection.

The input DC cable has an input connector on one end and precut wire on the other end that goes to the DC power source. The connector end has a locking mechanism that locks onto the DC PSU to prevent accidental removal of the input DC cable.

If necessary, use appropriate termination lugs for 8 AWG (10 mm²) copper-stranded wire on cable ends of the cable to connect to the DC power source.

The blue termination (-48 V) connects to a 50 A overcurrent protection circuit device, and the black (return) termination connects directly to the RTN bus of the DC power source. The green/yellow termination (ground) must connect to the same earth ground point as the switch.

Installing an Extreme Networks 1200 W DC PSU

To install an Extreme Networks 1200 W DC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle, which is located on the top-left corner of the switch front panel.



CAUTION

Be sure that the grounding point on the back of the switch is securely connected to earth ground. For information about grounding the switch, see [“Grounding the BlackDiamond 8810 Chassis” on page 103](#), [“Grounding the BlackDiamond 8806/12804 Chassis” on page 112](#), or [“Grounding the BlackDiamond 10808 Chassis” on page 134](#).

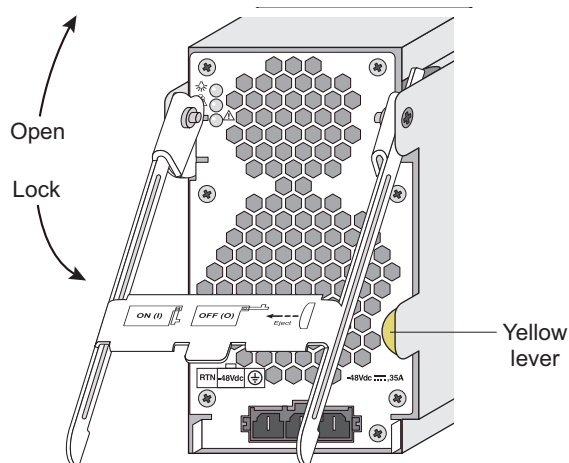
- 2 Verify that the 1200 W DC PSU is right side up, and press the yellow locking lever to the left while lifting the handle (see [Figure 83](#)).



NOTE

Do not connect the input DC cable to the DC PSU before inserting the DC PSU into the switch.

Figure 83: 1200 W DC PSU with locking handle open



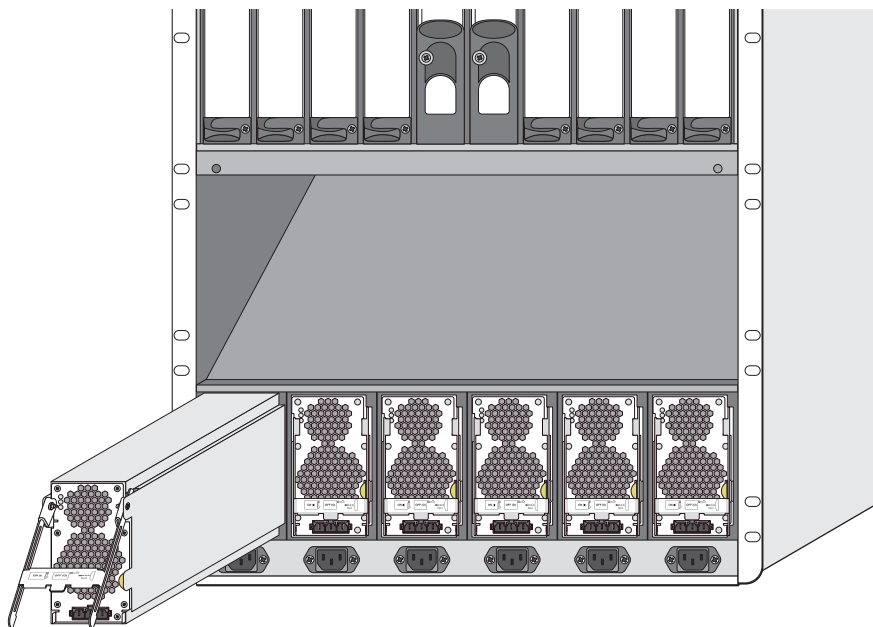
EX_130

- Carefully slide the 1200 W DC PSU all the way into the power supply bay (see [Figure 84](#)). Be sure that the DC PSU is fully seated in the switch.

**CAUTION**

Do not slam the 1200 W DC PSU into the system switch backplane.

Figure 84: 1200 W DC PSU sliding into the power supply bay



EX_131

- Connect the input DC cable to the front of the 1200 W DC PSU as shown in [Figure 85](#).

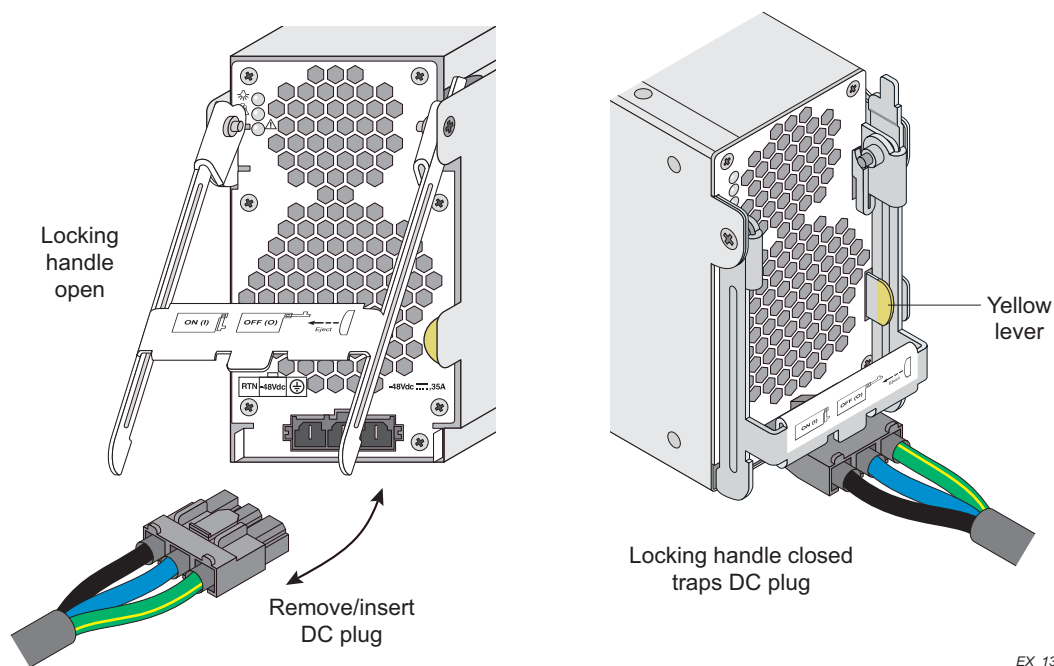
**NOTE**

An AC power cord is not required for proper functioning of the DC PSU.

- Rotate the locking handle down to latch the input cable connector onto the DC PSU.

**CAUTION**

Always be sure that the DC circuit is not energized before you connect the input cable to the 1200 W DC PSU.

Figure 85: Connecting the cable to the front of the 1200 W DC PSU

- 6 Secure the 1200 W DC PSU into the power supply bay by pushing down on the locking handle until it clicks in place.

**NOTE**

The DC PSU does not energize until the locking handle latches.

**CAUTION**

Use caution when routing the cable harnesses to minimize stress on the cables. It is recommended that the left most cable harness be routed across the switch and exit out the right side of the grate. The right most cable harness should be routed across the switch and exit out the left side of the grate. It is important to route each of the outer most cables out the opposite side of installation to maximize the bend radius and to avoid stress on the cables. The four middle cables can route in either direction.

- 7 Energize the DC circuit for the 1200 W DC PSU.

To install additional 1200 W DC PSUs, repeat steps 2 through 6.

**NOTE**

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Removing an Extreme Networks 1200 W DC PSU



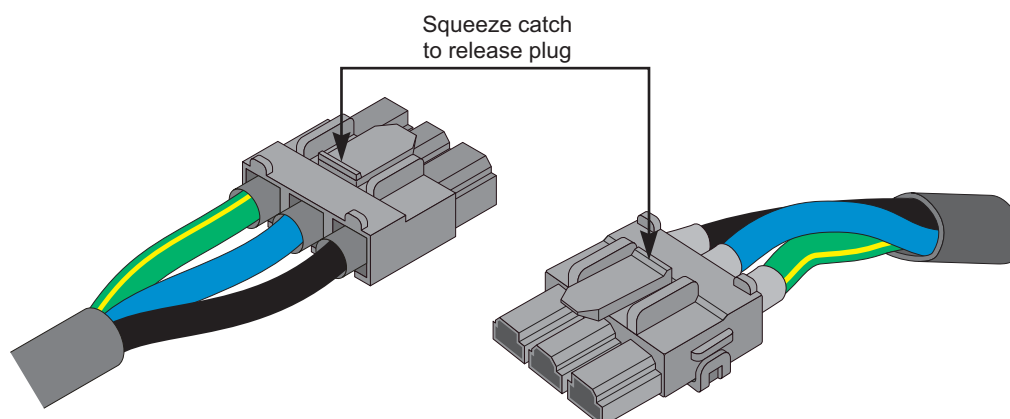
CAUTION

The DC PSU may be hot to the touch; use thermal protective gloves when handling the 1200 W DC PSU during removal.

To remove an Extreme Networks 1200 W DC PSU:

- 1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top-left corner of the switch front panel (if not already attached).
- 2 De-energize the DC circuit for the 1200 W DC PSU to be removed.
- 3 Press the yellow lever on the DC PSU to the left while lifting the handle up on the 1200 W DC PSU.
- 4 Disconnect the cable from the front of the DC PSU by pressing down the catch (see [Figure 86](#)) and pulling out the cable.

Figure 86: Disconnecting the cable from the DC PSU



EX_133



WARNING!

Always be sure that the 1200 W DC PSU does not have the input cabled connected at any time when the DC PSU is not installed into the switch. Do not remove the DC PSU from the switch before disconnecting the input DC cable from the PSU.

- 5 Pull on the handle of the 1200 W DC PSU to remove it from the power supply bay.
- 6 Using thermal protection gloves, place both hands underneath the 1200 W DC PSU to support the weight after it is pulled out from the switch.

To remove additional 1200 W DC PSUs, repeat steps 2 through 6.



NOTE

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Front Panel LEDs

The front panel of the 1200 W DC PSU provides status LEDs. [Table 18](#) identifies the symbols and describes the LED behavior.

Table 18: Extreme Networks 1200 W DC PSU front panel LED behavior

PSU Condition	 Power Green	 Predictive Fail Amber	 Fail Amber
Power supply DC outputs working normally	On	Off	Off
DC input power present/standby output on	Blinking	Off	Off
Current limit on 48 VDC output	On	Off	Blinking
Predictive failure	On	Blinking	Off
No input power to this PSU only	Off	Off	On
No input power to any PSU	Off	Off	Off
Power supply failure	Off	Off	On

Airflow enters from the front vents on the 1200 W DC PSU and exits to the rear vents of the switch. Airflow through the 1200 W DC PSU is independent from the airflow that exists through the rest of the switch.

Extreme Networks 700/1200 W AC PSU

This section describes important safety information, specifications, and correct procedures for installing and removing Extreme Networks® 700/1200 W AC UL Listed Accessory power supply units (Model # 60020/PS 2336) into and out of the following UL-listed BlackDiamond® switches only:

- BlackDiamond 8800 series of switches
- BlackDiamond 10808 switch
- BlackDiamond 12804 switch

Extreme Networks 700/1200 W AC PSUs are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, should one Extreme Networks 700/1200 W AC PSU fail, the others will provide sufficient power to operate a fully loaded switch. The power supply bay can accommodate up to six hot-swappable Extreme Networks 700/1200 W AC PSUs. See the *ExtremeXOS 12.0 Concepts Guide* for information about configuring your Extreme Networks BlackDiamond switch.



NOTE

The Extreme Networks 700W/1200 W AC PSU can be used in conjunction with an Extreme Networks 600/900 W AC PSU in the same BlackDiamond 8806 system.



NOTE

Extreme Networks does not recommended using the 700/1200 W AC PSU in conjunction with an Extreme Networks 1200W DC PSU in the same BlackDiamond 8800 series, BlackDiamond 10808, or BlackDiamond 12804 system.



WARNING!

Field operators must not attempt to open the 700/1200 W AC PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective 700/1200 W AC PSU to Extreme Networks for repair or replacement.

Pre-Installation Requirements



WARNING!

Extreme Networks 700/1200 W AC PSUs do not have switches for turning the unit on and off. Remove the wall plug from the electrical outlet to disconnect the power to an Extreme Networks 700/1200 W AC PSU. Make sure that this connection is always easily accessible.

Do not plug the power supply into an electrical outlet outside of the chassis, doing so would expose a hazardous energy and poses a potential shock and/or fire hazard.

You need the following tools and equipment to install or remove an Extreme Networks 700/1200 W AC PSU:

- ESD-preventive wrist strap
- Power supply cord (110 V AC, 220 V AC, or applicable to country of use)
- Thermal protective gloves (required for removal)

Installing an Extreme Networks 700/1200 W AC PSU



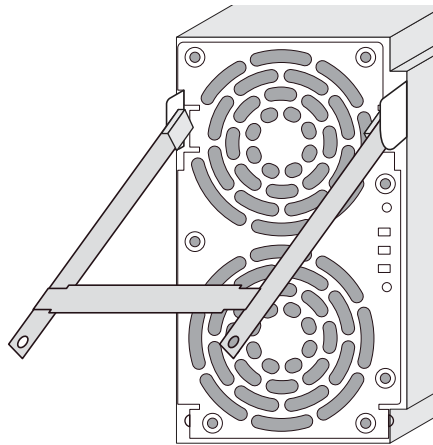
CAUTION

Make sure that the Extreme Networks 700/1200 W AC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install an Extreme Networks 700/1200 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle, which is located on the top-left corner of the switch front panel.
- 2 Verify that the Extreme Networks 700/1200 W AC PSU is right side up and the locking handle is open (see [Figure 87](#)).

Figure 87: Extreme Networks 700/1200 W AC PSU with locking handle open



EX_015

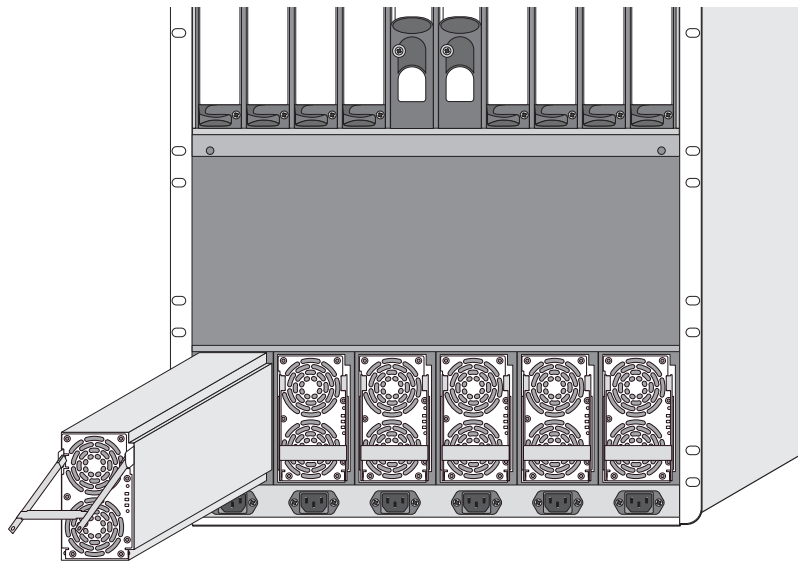
- 3 Carefully slide the Extreme Networks 700/1200 W AC PSU all the way into the power supply bay (see [Figure 88](#)).



CAUTION

Do not slam the Extreme Networks 700/1200 W AC PSU into the system switch backplane. Use the locking handle to secure the Extreme Networks 700/1200 W AC PSU into the system switch.

Figure 88: Extreme Networks 700/1200 W AC PSU sliding into the power supply bay



EX_011

- 4 Secure the Extreme Networks 700/1200 W AC PSU into the power supply bay by pushing down on the locking handle until it clicks in place.
- 5 Connect the AC power supply cord:
 - a If you are just replacing a power supply, you do not need to unplug the AC power cord.
 - b If you are installing a new power supply into a previously unused slot on a switch with a retaining bracket, remove the power cord retaining bracket. (See [Chapter 2, “BlackDiamond AC Power Cord Retaining Brackets”](#) for information on removing the power cord retaining bracket and re-installing it.) Connect the AC power cord to the AC input on the front of the switch and to the wall outlet on the other end. Then, re-install the power cord retaining bracket.
 - c If you are installing the power supply on a switch that does not have a power cord retaining bracket, connect the AC power cord to the AC input on the front of the switch and to the wall outlet on the other end. Then, install the power cord retaining bracket. (See [Chapter 2, “BlackDiamond AC Power Cord Retaining Brackets”](#) for information on removing the power cord retaining bracket and re-installing it.)



NOTE

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

To install additional Extreme Networks 700/1200 W AC PSUs, repeat steps 1 through 5.

Removing an Extreme Networks 700/1200 W AC PSU



CAUTION

The AC PSU may be hot to the touch; use thermal protective gloves when handling the 700/1200 W AC PSU during removal.

To remove an Extreme Networks 700/1200 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel (if not already attached).
- 2 For the AC power cord:
 - a If you are going to use the same AC power cord for the new unit, you do not need to touch the power cord at all.
 - b If you are going to use a new AC power cord, remove the power cord retaining bracket. (See [Chapter 2, "BlackDiamond AC Power Cord Retaining Brackets"](#) for information on removing the power cord retaining bracket and re-installing it.) Connect the AC power cord to the AC input on the front of the switch and to the wall outlet on the other end. Then, re-install the power cord retaining bracket.
- 3 Lift the handle up on the Extreme Networks 700/1200 W AC PSU.
- 4 Pull on the handle of the Extreme Networks 700/1200 W AC PSU to remove it from the power supply bay.
- 5 Place both hands underneath the Extreme Networks 700/1200 W AC PSU to support the weight after it is pulled out from the switch.



NOTE

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Front Panel LEDs

The front panel of the Extreme Networks 700/1200 W AC PSU provides status LEDs. [Table 19](#) describes the LED behavior on the front panel.

Table 19: Extreme Networks 700/1200 W AC PSU front panel LED behavior

PSU Condition	 Power Green	 Predictive Fail Amber	 Fail Amber
Power supply AC outputs working normally	On	Off	Off
AC input power present/standby output on	Blinking	Off	Off
Current limit on 48 VDC output	On	Off	Blinking
Predictive failure	On	Blinking	Off
No input power to this PSU only	Off	Off	On
No input power to any PSU	Off	Off	Off
Power supply failure	Off	Off	On

The front panel on each Extreme Networks 700/1200 W AC PSU contains two cooling fans as shown in [Figure 87](#). Airflow enters from the front vents on the Extreme Networks 700/1200 W AC PSU and exits to the rear vents of the switch. Airflow through the Extreme Networks 700/1200 W AC PSU AC is independent from the airflow that exists through the rest of the switch.

The AC input is located on the switch directly in back of each power supply bay. The front of the Extreme Networks 700/1200 W AC PSU has a handle with a lever mechanism for both insertion and removal as shown in [Figure 88](#).

Power Supply Cords

Extreme Networks 700/1200 W AC PSU(s) come with both 110 V AC and 220 V AC power supply cords. The 110 V AC power supply cord allows for a maximum DC output power of 700 W. The 220V AC power supply cord allows for a maximum DC output power of 1200 W.



CAUTION

All power supply cords provided by Extreme Networks are designed for use in North America only. Power supply cords for use outside of North America are typically provided by a third-party distribution center and must meet the following requirements:

- Power supply cords must be agency certified for country of use.
- Power supply cords must contain an IEC 320 C13 connector on the end of the PSU.
- Power supply cords must contain an appropriately rated and approved wall plug applicable to the country of installation.
- Power supply cords must be less than 5 m long.
- Wire size must be a minimum of 16 AWG (1.0 mm²) copper-stranded.

**WARNING!**

Always be sure that the source outlet is properly grounded before plugging the AC power cord into the Extreme Networks 700/1200 W AC PSU.

Fuse

The Extreme Networks 700/1200 W AC PSU line and neutral legs are both fused. Power to the switch may still be live if the neutral fuse is open. This is not a field operator replaceable fuse. In the event of failure, immediately return the Extreme Networks 700/1200 W AC PSU for a complete replacement.

**WARNING!**

Field operators must not attempt to configure or replace fuses in Extreme Networks 700/1200 W AC PSUs! In the event of failure, immediately return the defective Extreme Networks 700/1200 W AC PSU for a complete replacement.

Specifications

The 700/1200 W AC PSU functions from 90 V to 264 V and 47 Hz to 63 Hz AC Input. Each PSU provides 700 W to the system if the AC input is in the 110 V low-line output power range and 1200 W to the system if the AC input is in the 220 V high-line output power range.

A greater number of PSUs are needed to support the load if the low-line power range is used to power the switch. The software determines the maximum available power required for the switch and enables the modules accordingly.

When a mixture of AC PSU types, the 600/900 W AC PSU and the 700/1200 W AC PSU, are powered on in the same BlackDiamond 8806 chassis, all PSUs will be budgeted “down” to the lower powered 600/900 W AC output values to avoid PSU shutdown due to over-current. ExtremeXOS optimizes total system power, avoiding the possibility of over-current, by deciding whether to budget down PSUs with 220 V AC inputs when PSUs with 110 V AC inputs are present, or to keep 110 V AC PSUs disabled.

**CAUTION**

Even though this process avoids the possibility of over-current, an I/O module may be powered off if a 600/900 W AC PSU is added to a BlackDiamond 8806 system running in the following configuration:

- *System is powered by three 700/1200 W AC PSUs at 220 V AC.*
- *System includes four or more PoE I/O modules with a PoE power requirement that falls between 2391 W and 2438 W of inline power.*

To avoid causing an I/O module to be powered off, do not add a 600/900 W AC PSU to an existing BlackDiamond 8806 system running in the configuration listed above. Extreme Networks also recommends that you avoid mixing 220 V AC and 110 V AC inputs when both PSU types, 600/900 W and 700/1200 W, are present. When a combination of 220 V AC and 110 V AC inputs is applied, ExtremeXOS is designed to optimize total chassis power for each individual PSU type but not for a mixture of PSU types.

**CAUTION**

The 700/1200 W AC PSU does not have a switch for turning the unit on and off. Remove the plug from the electrical outlet to disconnect power to the 700/1200 W AC PSU. Make sure that this connection is easily accessible.

- *Make sure that the 700/1200 W AC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.*

Extreme Networks 600/900 W AC PSU

This section describes important safety information, specifications, and correct procedures for installing and removing an Extreme Networks® 600/900 W AC UL Listed Accessory power supply unit (Model # 41050/PS 2431) into and out of the following UL Listed BlackDiamond® switch only:

- BlackDiamond® 8806 switch

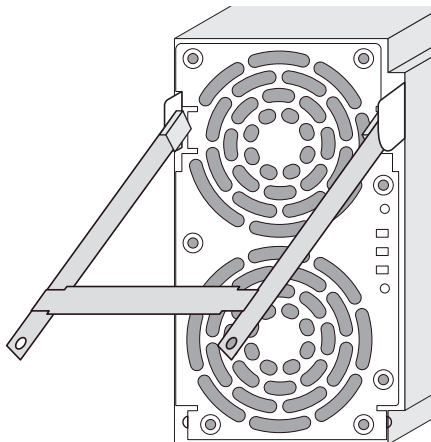
Extreme Networks 600/900 W AC PSUs are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, should one Extreme Networks 600/900 W AC PSU fail, the others will provide sufficient power to operate a fully loaded switch. The power supply bay can accommodate up to six hot-swappable Extreme Networks 600/900 W AC PSUs. See the *ExtremeXOS Concepts Guide* for information on configuring your Extreme Networks BlackDiamond 8806 switch.

The front panel on each Extreme Networks 600/900 W AC PSU contains two cooling fans and a handle for insertion and removal of the unit (see [Figure 89](#)). Airflow enters from the front vents of the PSU and exits to the rear vents of the switch. Airflow through the PSU is independent of the airflow through the rest of the switch.

**CAUTION**

To ensure proper cooling of the PSU, do not block the front vents of the Extreme Networks 600/900 W AC PSU or the rear vents of the switch.

Figure 89: Extreme Networks 600/900 W AC PSU



**NOTE**

The Extreme Networks 600/900 W AC PSU can be used in conjunction with an Extreme Networks 700W/1200W AC PSU in the same BlackDiamond 8806 system.

**NOTE**

Extreme Networks does not recommend using the 600W/900W AC PSU in conjunction with an Extreme Networks 1200W DC PSU in the same BlackDiamond 8806 system.

**WARNING!**

Field operators must not attempt to open the 600W/900W AC PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective 600W/900W AC PSU to Extreme Networks for repair or replacement.

Minimum Software Required

The MSM running in your BlackDiamond 8806 switch requires ExtremeXOS version 11.6.1 (or later) in order to recognize an Extreme Networks 600/900 W AC PSU. In ExtremeXOS releases 11.3.4, 11.4.2, and 11.5.1, the 600/900 W AC PSU is disabled on all chassis. In ExtremeXOS releases earlier than those, the software does not recognize the 600/900 W AC PSU and the PSU will not be budgeted properly, possibly resulting in PSU shutdown and/or chassis reboot.

Pre-Installation Requirements

**WARNING!**

Extreme Networks 600/900 W AC PSUs do not have switches for turning the unit on and off. Remove the wall plug from the electrical outlet to disconnect the power to an Extreme Networks 600/900 W AC PSU. Make sure that this connection is easily accessible.

When the PSU is outside of the chassis (not installed), do not plug the PSU into an electrical outlet. Plugging an uninstalled PSU into an electrical outlet exposes you to a hazardous energy and is a potential fire hazard.

You need the following tools and equipment before installing or removing an Extreme Networks 600/900 W AC PSU(s):

- ESD-preventive wrist strap
- Power supply cord (110 V AC, 220 V AC, or applicable to country of use)

A power cord for use in the United States is provided with each PSU. For use outside of the United States, this PSU requires a power supply cord set certified for country of use. See input specifications under [AC PS Model #41050 \(600/900 W AC PSU\)](#) on page 395.
- Thermal protective gloves (required for removal; the PSU is hot to the touch)

Installing an Extreme Networks 600/900 W AC PSU



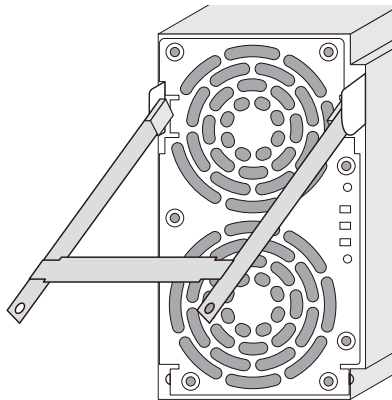
CAUTION

Make sure that the Extreme Networks 600/900 W AC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install an Extreme Networks 600/900 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle, which is located on the top-left corner of the switch front panel.
- 2 Verify that the Extreme Networks 600/900 W AC PSU is right side up and the locking handle is open (see [Figure 90](#)).

Figure 90: Extreme Networks 600/900 W AC PSU with locking handle open



EX_015

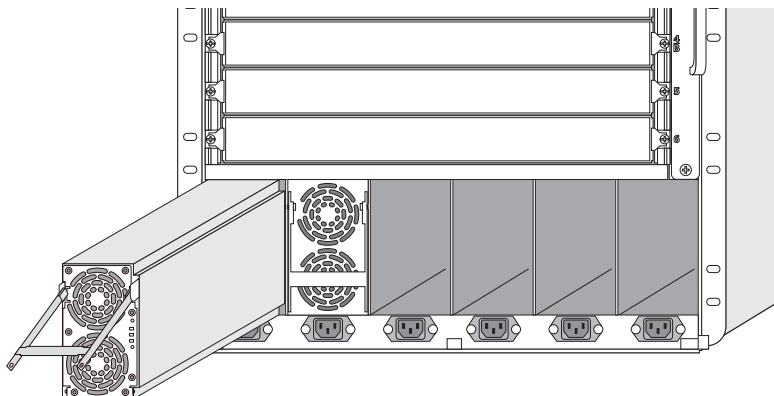
- 3 Carefully slide the Extreme Networks 600/900 W AC PSU all the way into the power supply bay (see [Figure 91](#)).



CAUTION

Do not slam the Extreme Networks 600/900 W AC PSU into the system switch backplane. Use the locking handle to secure the Extreme Networks 600/900 W AC PSU into the system switch.

Figure 91: Inserting a 600/900 W AC PSU into the power supply bay



FY 174

- 4 Secure the Extreme Networks 600/900 W AC PSU into the power supply bay by pushing down on the locking handle until it clicks in place.
- 5 Connect the AC power supply cord:

If you are just replacing a power supply, you do not need to unplug the AC power cord.

- If you are installing a new power supply into a previously unused slot on a switch with a retaining bracket, remove the power cord retaining bracket as described in [Chapter 2, “BlackDiamond AC Power Cord Retaining Brackets.”](#) Connect the AC power cord to the AC input on the front of the switch and then connect the opposite end of the AC power cord to the wall outlet. After the cord is connected, re-install the power cord retaining bracket.
- If you are installing the power supply on a switch that does not have a power cord retaining bracket, connect the AC power cord to the AC input on the front of the switch and then connect the opposite end of the AC power cord to the wall outlet. After the cord is connected, install the power cord retaining bracket as described in [Chapter 2, “BlackDiamond AC Power Cord Retaining Brackets.”](#)



NOTE

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

To install additional Extreme Networks 600/900 W AC PSUs, repeat steps 1 through 5.

Removing or Replacing an Extreme Networks 600/900 W AC PSU



CAUTION

The AC PSU is hot to the touch; use thermal protective gloves when handling the 600/900 W AC PSU during removal.

To remove or replace an Extreme Networks 600/900 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle that is located on the top-left corner of the switch front panel (if not already attached).
- 2 For the AC power cord:
 - If you are replacing a power supply only and you are going to use the existing AC power cord for the new PSU, you do not need to unplug the AC power cord.
 - If you are removing and replacing an AC power cord, remove the power cord retaining bracket. (See [Chapter 2, “BlackDiamond AC Power Cord Retaining Brackets”](#) for information on removing the power cord retaining bracket and re-installing it.) Completely disconnect and remove the old power cord. Connect the new AC power cord to the AC input on the front of the switch and then connect the opposite end of the AC power cord to the wall outlet. After the cord is connected, re-install the power cord retaining bracket.
- 3 Lift the handle up on the Extreme Networks 600/900 W AC PSU.
- 4 Pull on the handle of the Extreme Networks 600/900 W AC PSU to disconnect it from the power connector at the back of the power supply bay.
- 5 Place both hands underneath the Extreme Networks 600/900 W AC PSU to support the weight as it is pulled out from the switch.

- 6 To install a replacement PSU, follow the steps in the previous section: [“Installing an Extreme Networks 600/900 W AC PSU” on page 154.](#)

**NOTE**

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Front Panel LEDs

The front panel of the Extreme Networks 600/900 W AC PSU provides status LEDs. [Table 20](#) describes the operation of these LEDs.

Table 20: Extreme Networks 600/900 W AC PSU front panel LED operation

PSU Condition	 Power Green	 Predictive Fail Amber	 Fail Amber
Power supply AC outputs working normally	On	Off	Off
AC input power present/standby output on	Blinking	Off	Off
Current limit on 48 VDC output	On	Off	Blinking
Predictive failure	On	Blinking	Off
No input power to this PSU only	Off	Off	On
No input power to any PSU	Off	Off	Off
Power supply failure	Off	Off	On

Power Supply Cords

Extreme Networks 600/900 W AC PSU(s) are shipped with both 110 V AC and 220 V AC power supply cords. The 110 V AC power supply cord allows for a maximum DC output power of 600 W. The 220V AC power supply cord allows for a maximum DC output power of 900 W.

**CAUTION**

All power supply cords provided by Extreme Networks are designed for use in the United States and Canada only. Power supply cords for use outside of North America are typically provided by a third-party distribution center and must meet the following requirements:

- Power supply cords must be agency certified for country of use.
- Power supply cords must contain an IEC 320 C13 connector on the end of the PSU.
- Power supply cords must contain an appropriately rated and approved wall plug applicable to the country of installation.
- Power supply cords must be less than 5 m long.
- Wire size must be a minimum of 16 AWG (1.0 mm²) copper-stranded.

**WARNING!**

Be sure that the source outlet is properly grounded before plugging the AC power cord into the Extreme Networks 600/900 W AC PSU.

Fuse

The Extreme Networks 600/900 W AC PSU line and neutral legs are both fused. Power to the system may still be live if the neutral fuse is open. This is not a field operator replaceable fuse. In the event of failure, immediately return the Extreme Networks 600/900 W AC PSU for a complete replacement.



WARNING!

Field operators must not attempt to configure or replace fuses in Extreme Networks 600/900 W AC PSUs! In the event of failure, immediately return the defective Extreme Networks 600/900 W AC PSU for a complete replacement.

Specifications

The 600/900 W AC PSU functions from 90 V to 264 V and 47 Hz to 63 Hz AC Input. Each PSU provides 600 W to the system if the AC input is in the 110 V low-line output power range and 900 W to the system if the AC input is in the 220 V high-line output power range.

A greater number of PSUs are needed to support the load if the low-line power range is used to power the switch. The software determines the maximum available power required for the switch and enables the modules accordingly.

When a combination of 600/900 W AC PSUs and 700/1200 W AC PSUs is powered on in the same BlackDiamond 8806 chassis, all PSUs will be budgeted down to the lower powered 600/900 W AC output values to avoid PSU shutdown due to over-current. ExtremeXOS optimizes total system power, avoiding the possibility of over-current, by deciding whether to budget down PSUs with 220 V AC inputs when PSUs with 110 V AC inputs are present, or to keep 110 V AC PSUs disabled.



CAUTION

Even though this process avoids the possibility of over-current, an I/O module may be powered off if a 600/900 W AC PSU is added to an existing BlackDiamond 8806 system running in the following configuration:

- *The system is powered by three 700/1200 W AC PSUs at 220 V AC*
- *The system includes four or more PoE I/O modules with a PoE power requirement that falls between 2391 W and 2438 W of inline power*

To avoid causing an I/O module to be powered off, do not add a 600/900 W AC PSU to an existing BlackDiamond 8806 system running in the configuration listed above. Extreme Networks also recommends that you not mix 220 V AC and 110 V AC inputs along with the mixing of both PSU types, 600/900 W and 700/1200 W. When a combination of 220 V AC and 110 V AC inputs is applied, ExtremeXOS is designed to optimize total chassis power for each individual PSU type but not for a mixture of PSU types.



CAUTION

The 600/900 W AC PSU does not have a switch for turning the unit on and off. Remove the plug from the electrical outlet to disconnect power to the 600/900 W AC PSU. Make sure that this connection is easily accessible.

Make sure that the 600/900 W AC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

Extreme Networks 325 W DC Power Supply

The Extreme Networks® 325 W DC UL-listed accessory power supply unit (PSU), Model # 65022, can be installed only in the following UL-listed BlackDiamond switch:

- BlackDiamond 12802 switch

**NOTE**

For centralized DC power connection, this product is intended to be installed in restricted access locations (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Extreme Networks 325 W DC PSUs are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, if one Extreme Networks 325 W DC PSU fails, the others will provide sufficient power to operate a fully loaded switch. The power supply bay can accommodate up to four hot-swappable Extreme Networks 325 W DC PSUs. See the *ExtremeXOS 12.0 Concepts Guide* for information about configuring your Extreme Networks BlackDiamond switch.

**NOTE**

The Extreme Networks 325 W DC PSU cannot be used in conjunction with any other Extreme Networks PSU.

The 325 W DC PSU should be connected to a DC power source using the Extreme Networks DC power input cable Model # 65025. This cable is shipped separately from the power supply.

Minimum Software Required

You must be running ExtremeWare XOS version 12.0 or later for the system to recognize the DC PSU.

Pre-Installation Requirements



WARNING!

Extreme Networks 325 W DC PSUs do not have switches for turning the unit on and off. Make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cord and socket on the Extreme Networks 325 W DC PSU.

Wiring the 325 W DC PSU DC power cord to your facility DC source voltage must be performed by a qualified, licensed electrician.

Do not put your hand into an open power supply bay when a power supply is not present. Empty power supply bays require a cover plate at all times.

You need the following tools and equipment before installing or removing an Extreme Networks 325 W DC PSU:

- ESD-preventive wrist strap
- #2 Phillips screwdriver
- DC power supply cord, Model # 65052 (shipped separately from the PSU)
- Thermal protective gloves (required for removal)

Installing the DC Wiring

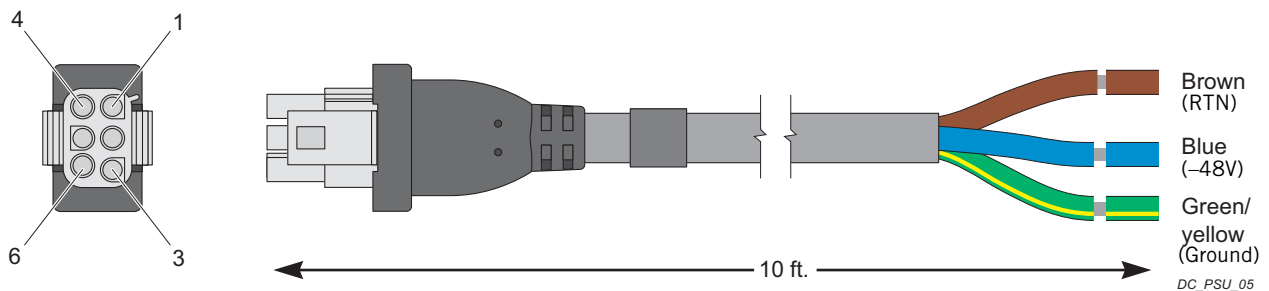


NOTE

All wiring methods involving the DC input cable assembly must be performed according to the relevant articles of the National Electrical Code.

The Extreme Networks 325 W DC PSU requires input DC cable Model # 65025 (see [Figure 92](#)). This cable is shipped separately from the power supply unit. You *must* use this cable with the Extreme Networks 325 W DC PSU.

Figure 92: Input DC cable for the Extreme Networks 325 W DC PSU



Each Extreme Networks 325 W DC PSU must be powered by a 15 A dedicated power source that delivers -40 to -72 VDC constant power to each 325 W DC PSU. Power distribution to the 325 W DC PSU shall be provided using the Model # 65025 -48 V DC cable. Power to the 325 W DC PSU can be from either a 15 A UL-approved overcurrent protection breaker or an SELV-approved power source in accordance with IEC 60950-1 utilizing 15 A overcurrent protection.

The input DC cable has an input connector on one end and precut wire on the other end that goes to the DC power source. The connector end has a locking mechanism that locks onto the DC PSU to prevent accidental removal of the input DC cable.

If necessary, use appropriate termination lugs for 14 AWG (1.3 mm²) copper-stranded wire on the precut ends of the cable to connect to the DC power source.

The blue termination (-48 V) connects to a 15 A overcurrent protection circuit device, and the brown (return) termination connects directly to the RTN bus of the DC power source. The green/yellow termination (ground) must connect to the same earth ground point as the switch.

Installing an Extreme Networks 325 W DC PSU



WARNING!

Make sure that the DC circuit is de-energized before you connect the DC power cord to the 325 W DC PSU or disconnect the DC power cord from the 325 W DC PSU.



WARNING!

Wiring the 325 W DC PSU DC power cord to your facility DC source voltage must be performed by a qualified, licensed electrician. After the DC power cord is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace and maintain the 325 W DC PSU without further electrician assistance. However, make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cord and socket on the Extreme Networks 325 W DC PSU.



CAUTION

The DC power cord must be properly connected to a DC main circuit breaker or fuse rated no greater than 15 A.



CAUTION

Provide proper connection and strain relief on the DC power cord in accordance with all local and national electrical codes.



CAUTION

Make sure that the Extreme Networks 325 W DC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit breaker, to prevent over-current conditions.



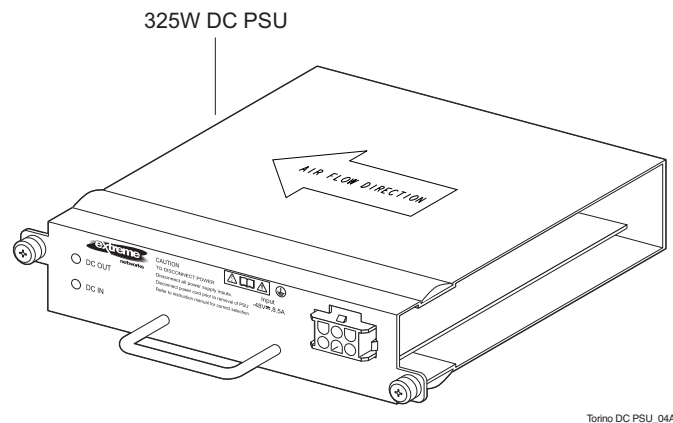
NOTE

A minimum of two Extreme Networks 325 W DC PSUs are required to run a BlackDiamond 12802 switch.

To install an Extreme Networks 325 W DC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
- 2 Make sure that the Extreme Networks 325 W DC PSU is right side up (see [Figure 93](#)).

Figure 93: Extreme Networks 325 W DC PSU



- 3 Carefully slide the PSU all the way into an open power supply bay (see [Figure 94](#)) until you hear a click.

Extreme Networks recommends that you populate the two left power supply bays before the two right power supply bays. Refer to [Table 21](#) for the recommended installation sequence.

Table 21: Recommended installation sequence (view from rear of chassis)

Left Power Supply Bays	Right Power Supply Bays
Installation # 1	Installation # 3 (If this bay is empty, a cover plate is required.)
Installation # 2	Installation # 4 (If this bay is empty, a cover plate is required.)

NOTE

A minimum of two Extreme Networks 325 W DC PSUs are required to run a BlackDiamond 12802 switch.

WARNING!

Do not put your hand into an open power supply bay when a power supply is not present. Empty power supply bays require a cover plate at all times.

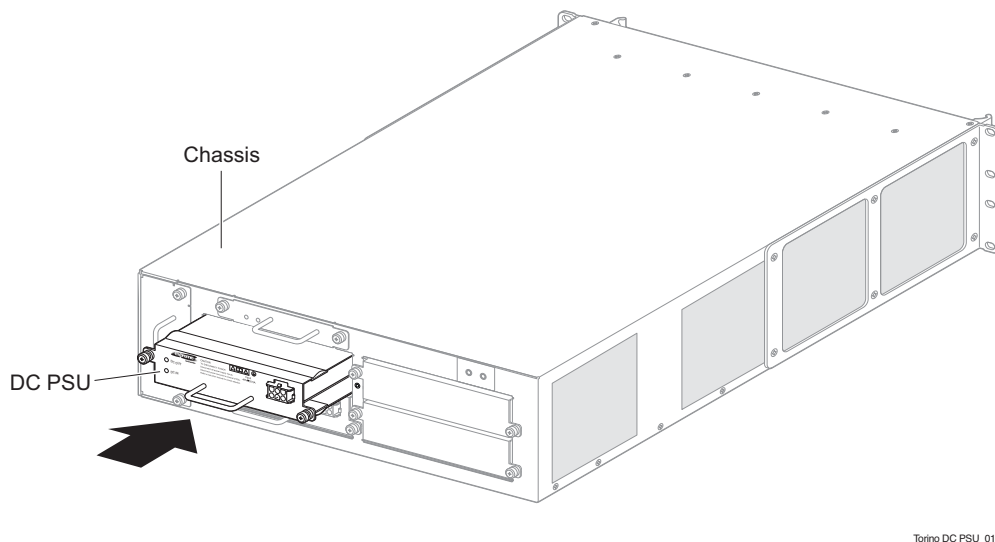
 CAUTION

Do not slam the Extreme Networks 325 W DC PSU into the system switch backplane.

 CAUTION

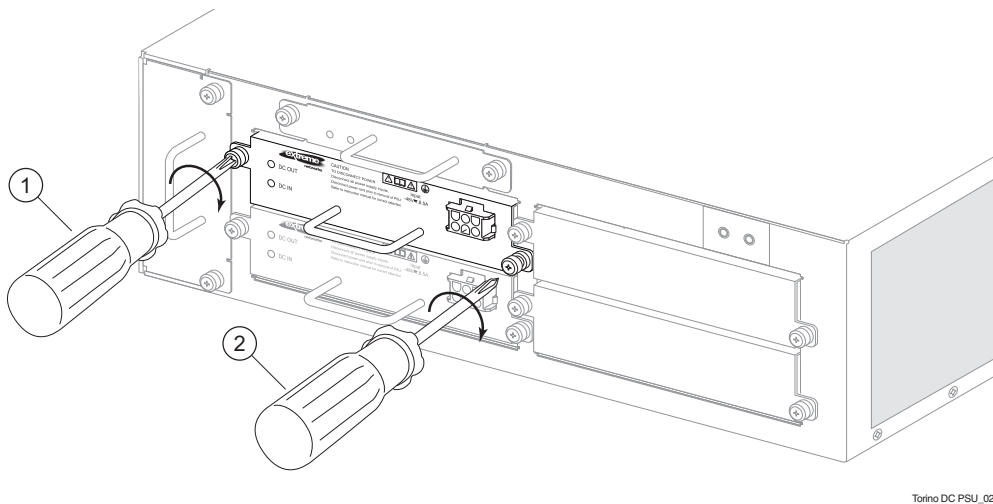
To prevent an electrical hazard, make sure before you install the PSU in the power supply bay that the DC power cord is not connected to the PSU.

Figure 94: Installing the Extreme Networks 325 W DC PSU



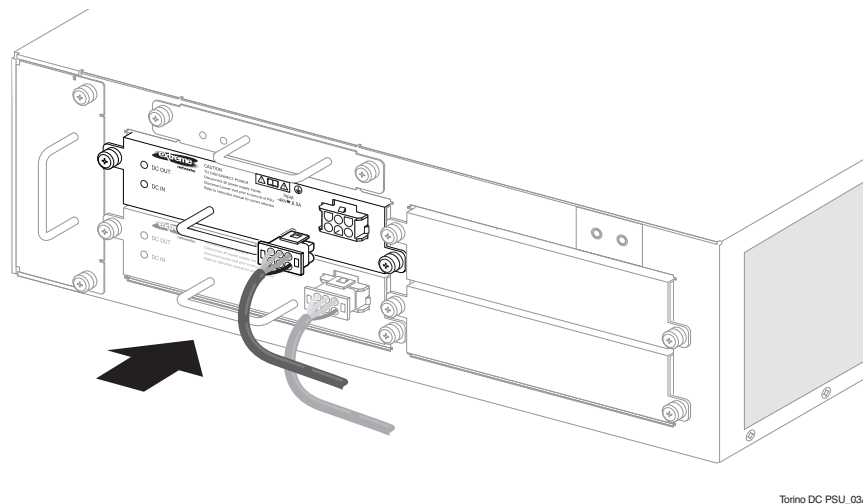
- 4 To secure the 325 W DC PSU in the power supply bay, align and tightening the two captive screws on the PSU front panel. When you tighten the screws, work from left to right (see [Figure 95](#)).

Figure 95: Securing the Extreme Networks 325 W DC PSU



- 5 Verify that the DC input cord was connected to a permanent DC voltage source by a qualified, licensed electrician.
- 6 Verify that the DC power is turned off at the source.
- 7 Plug the DC input cord into the DC input socket on the front of the 325 W DC PSU (see [Figure 96](#)). Verify that the input connector latch locks onto the connector on the DC PSU.

The pins must align properly for the cable to connect. Do not force the cable into the socket.

Figure 96: Connecting the DC power cord**NOTE**

Leave the ESD strap permanently connected to the switch so that it is always available when you need to handle ESD-sensitive components.

Removing an Extreme Networks 325 W DC PSU

**CAUTION**

An operating 325 W DC PSU may be hot to the touch. Use thermal protective gloves when handling the 325 W DC PSU during removal.

**CAUTION**

To disconnect system power, disconnect ALL power supply units. Disconnect the power cord before you remove the PSU from the chassis.

To remove an Extreme Networks 325 W DC PSU:

- 1 Turn off the DC power at the source.
- 2 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
- 3 Press down the catch on the DC input connector and disconnect the DC power cord from the front of the PSU.
- 4 Loosen the captive retaining screws on the PSU front panel.
- 5 Use the handle to pull the PSU from the chassis.

**NOTE**

Disconnection of the DC power cord from the DC source voltage must be performed by a qualified, licensed electrician.

**NOTE**

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

LEDs

The front panel of the Extreme Networks 325 W DC PSU provides status LEDs. [Table 20](#) describes the meanings of these LEDs.

Table 22: Extreme Networks 325 W DC PSU front panel LED indications

PSU Condition	DC In LED Status	DC Out LED Status
No DC input power	Off	Off
No DC input power (receiving standby power from the chassis)	Amber	Off
DC input good (main outputs disabled)	Green	Off
DC input good, output fault	Green	Amber
DC input good, DC output good	Green	Green

Fuse

The Extreme Networks 325 W DC PSU line is fused. This fuse is not replaceable in the field. In the event of failure, immediately return the Extreme Networks 325 W DC PSU for a complete replacement.

**WARNING!**

Field operators must not attempt to configure or replace fuses inside Extreme Networks 325 W DC PSUs! In the event of failure, immediately return the defective Extreme Networks 325 W DC PSU for a complete replacement.

Specifications

The 325 W DC PSU functions from 40 V to –72 V DC input. The software determines the maximum available power required for the switch and enables the modules accordingly.

**CAUTION**

The 325 W DC PSU does not have a switch for turning the unit on and off. Remove DC power by de-energizing the DC power circuit.

**CAUTION**

Make sure that the 325 W DC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

Extreme Networks 325 W AC Power Supply

The Extreme Networks 325 W AC UL-listed accessory power supply unit, Model # 65021, can be installed only in the following BlackDiamond switch:

- BlackDiamond 12802 switch

Extreme Networks 325 W AC PSUs are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, should one Extreme Networks 325 W AC PSU fail, the others will provide sufficient power to operate a fully loaded switch. The power supply bay can accommodate up to four hot-swappable Extreme Networks 325 W AC PSUs. See the *ExtremeXOS 12.0 Concepts Guide* for information about configuring your Extreme Networks BlackDiamond switch.



NOTE

The Extreme Networks 325 W AC PSU cannot be used in conjunction with any other Extreme Networks PSU.

Pre-Installation Requirements



WARNING!

Extreme Networks 325 W AC PSUs do not have switches for turning the unit on and off. Remove the wall plug from the electrical outlet to disconnect the power to an Extreme Networks 325 W AC PSU. Make sure that this connection is easily accessible.

Do not connect the power supply to an electrical outlet when the power supply is outside of the chassis; doing so would expose a hazardous energy and poses a potential shock and fire hazard.

Do not put your hand into an open power supply bay when a power supply is not present. Empty power supply bays require a cover plate at all times.

You need the following tools and equipment to install or remove an Extreme Networks 325 W AC PSU:

- ESD-preventive wrist strap
- Power supply cord (110 V AC, 220 V AC, or applicable to country of use)
- #2 Phillips screwdriver
- Thermal protective gloves (required for removal)



NOTE

A minimum of two Extreme Networks 325 W AC PSU are required to run a BlackDiamond 12802 switch.

Installing an Extreme Networks 325 W AC PSU



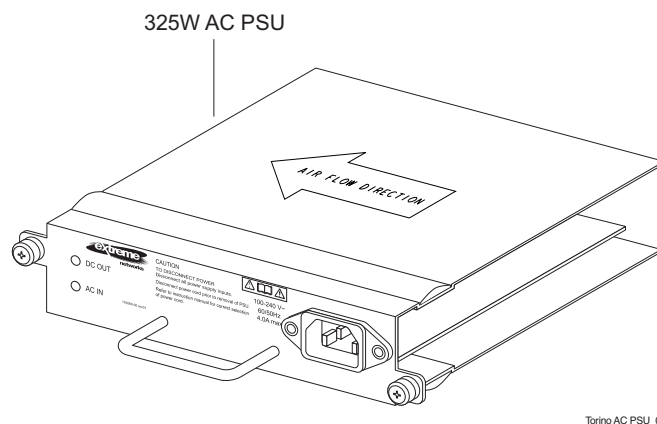
CAUTION

Make sure that the Extreme Networks 325 W AC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install an Extreme Networks 325 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-right corner of the switch front panel.
- 2 Make sure that the Extreme Networks 325 W AC PSU is right side up (see [Figure 97](#)).

Figure 97: Extreme Networks 325 W AC PSU



- 3 Carefully slide the Extreme Networks 325 W AC PSU all the way into an open power supply bay (see [Figure 98](#)) until you hear a click.

Extreme Networks recommends that you populate the two left power supply bays before the two right power supply bays. Refer to [Table 21](#) for the recommended installation sequence.

Table 23: Recommended installation sequence (view from rear of chassis)

Left Power Supply Bays	Right Power Supply Bays
Installation # 1	Installation # 3 (If empty, cover plate is required.)
Installation # 2	Installation # 4 (If empty, cover plate is required.)



NOTE

A minimum of two Extreme Networks 325 W AC PSUs are required to run a BlackDiamond 12802 switch.



WARNING!

Do not put your hand into an open power supply bay when a power supply is not present. Empty power supply bays require a cover plate at all times.

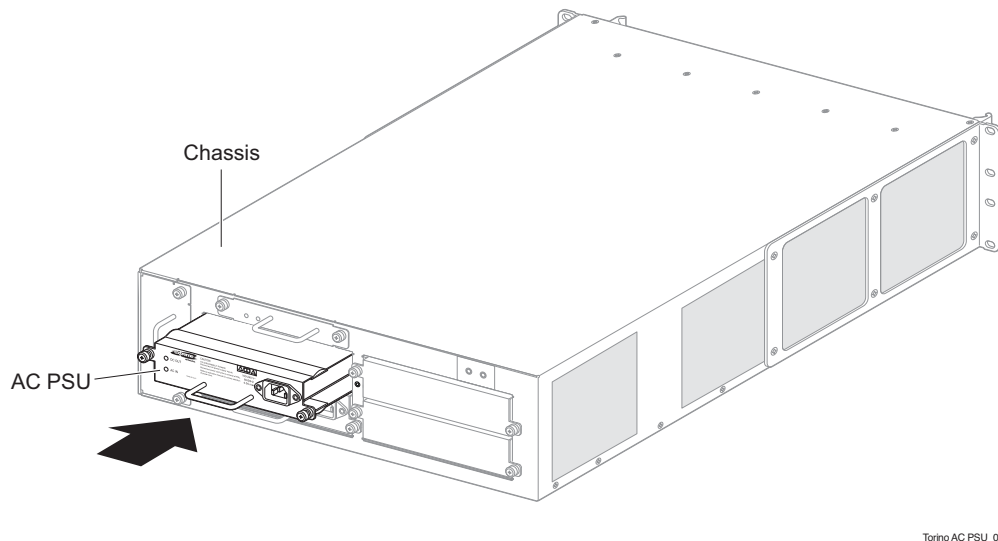
**CAUTION**

Do not slam the Extreme Networks 325 W AC PSU into the system backplane.

**CAUTION**

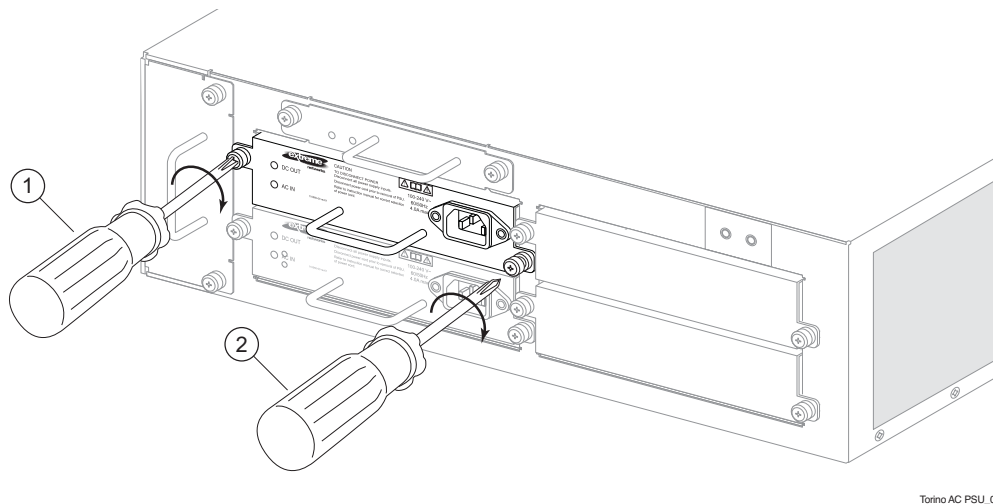
To prevent an electrical hazard, make sure before you install the PSU in the power supply bay that the AC power cord is not connected to the PSU.

Figure 98: Installing a 325 W AC PSU



- 4 To secure the 325 W AC PSU in the power supply bay, align and tightening the two captive screws on the PSU front panel. As you tighten the screws, work from left to right (see [Figure 99](#)).

Figure 99: Securing the Extreme Networks 325 W AC PSU



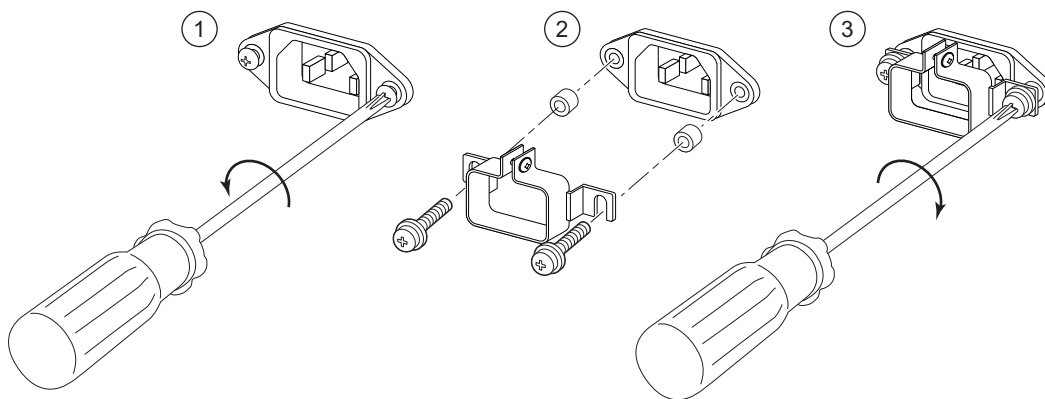
Installing Retaining Brackets and Connecting Power

A power cord retaining bracket is shipped with each 325 W AC PSU. These brackets hold the power connectors in the power sockets and prevent accidental disconnection due to earthquakes, vibration, or other disturbances. Install the power cord retaining brackets before you connect the power cords.

To install the brackets and connect power to the switch:

- 1 Attach a power cord retaining bracket to each installed PSU as follows:
 - a Remove the two screws from the AC input socket on the PSU (see [Figure 100](#)).
 - b Using the screws and spacers provided with the bracket, attach the retaining bracket to the AC input socket as shown in [Figure 100](#).
 - c Tighten the screws to secure the power cord bracket.

Figure 100: Attaching the AC power cord retaining bracket

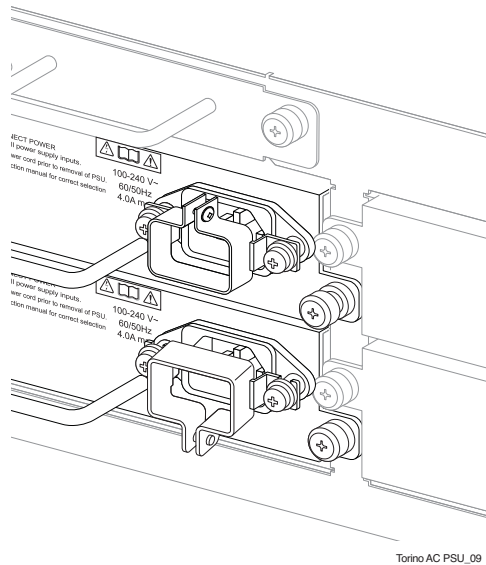


Torino AC PSU_07



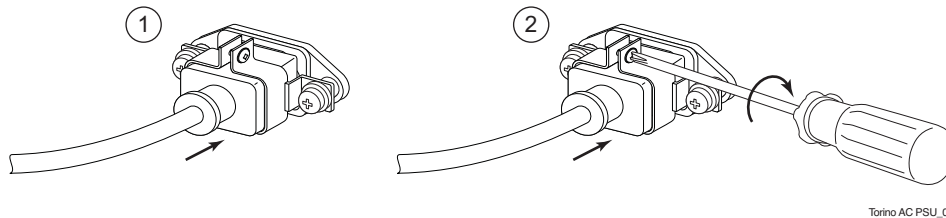
NOTE

On each two vertically adjacent PSUs, attach the power cord bracket with the tightening screw on top and the lower power cord bracket with the tightening screw underneath, as shown in [Figure 101](#).

Figure 101: Power cord brackets on two adjacent power supplies

2 Connect the AC power cord to the PSU as follows:

- a Connect the AC power cord to the AC input on the front of the PSU (see [Figure 102](#)). If needed, loosen the middle screw of the power cord bracket to allow installation of the power cord.
- b After the power cord is connected, tighten the middle screw of the bracket to secure the power cord in place (see [Figure 102](#)).

Figure 102: Connecting the AC power cord

3 Connect the opposite end of the AC power cord to the wall outlet.

**NOTE**

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Removing an Extreme Networks 325 W AC PSU



CAUTION

An operating 325 W AC PSU may be hot to the touch; use thermal protective gloves when handling the 325 W AC PSU during removal.



CAUTION

To disconnect the system power, disconnect ALL power supply units. Disconnect the power cord before you remove the PSU from the chassis.

To remove an Extreme Networks 325 W AC PSU:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
- 2 Disconnect the AC power cord from the wall outlet.
- 3 Loosen the middle screw on the power cord bracket to allow removal of the power cord. After the screws are loosened, disconnect the AC power cord from the AC input on the front of the PSU.
- 4 Loosen the two captive screws that secure the PSU front panel to the chassis frame.
- 5 Use the handle to slide the PSU out of the chassis.



NOTE

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Front Panel LEDs

The front panel of the Extreme Networks 325 W AC PSU provides status LEDs. [Table 20](#) describes the meanings of these LEDs.

Table 24: Extreme Networks 325 W AC PSU front panel LED behavior

PSU Condition	AC In LED Status	DC Out LED Status
No AC input power	Off	Off
No AC input power (receiving standby power from the chassis)	Amber	Off
AC input good (main outputs disabled)	Green	Off
AC input good, output fault	Green	Amber
AC input good, DC output good	Green	Green

Power Supply Cords

Each Extreme Networks 325 W AC PSU is shipped with a 110 V AC UL Listed power cord.

All power supply cords provided by Extreme Networks are designed for use in the United States and Canada only. Power supply cords for use outside of North America are typically provided by a third-party distribution center and must meet the following requirements:

- Power supply cords must be agency certified for country of use.
- Power supply cords must contain an IEC 320 C13 connector for insertion into the IEC 320 C14 receptacle on the PSU.
- Power supply cords must contain an appropriately rated and approved wall plug applicable to the country of installation.
- Power supply cords must be less than 5 m long.
- Wire size must be a minimum of 18 AWG (0.82 mm²) copper-stranded.



WARNING!

Make sure that the source outlet is properly grounded before plugging the AC power cord into the Extreme Networks 325 W AC PSU.

Fuse

The Extreme Networks 325 W AC PSU line is fused. This is not a field operator replaceable fuse. In the event of failure, immediately return the Extreme Networks 325 W AC PSU for a complete replacement.



WARNING!

Field operators must not attempt to configure or replace fuses in Extreme Networks 325 W AC PSUs! In the event of failure, immediately return the defective Extreme Networks 325 W AC PSU for a complete replacement.

Specifications

The 325 W AC PSU functions from 90 V to 264 V and 47 Hz to 63 Hz AC Input. The software determines the maximum available power required for the switch and enables the modules accordingly.

This chapter provides important safety information and correct installation procedures for the MSMs and I/O modules in the BlackDiamond 8800 series switches, BlackDiamond 12800 series switches, and BlackDiamond 10808 switches. All module types are hot-swappable.

The chapter includes the following sections:

- [Module Slot Assignments on page 173](#)
- [Distinguishing a BlackDiamond 8800 or 12800 MSM from an I/O Module on page 174](#)
- [Installing a BlackDiamond 8800 or 12800 Series Module on page 175](#)
- [Connecting and Disconnecting Cables on the 10G4Ca Module on page 178](#)
- [Installing a BlackDiamond 10808 Series Module on page 179](#)
- [Installing a Backup MSM on page 182](#)
- [Verifying the Module Installation on page 182](#)
- [Removing a BlackDiamond 8800 or 12800 Series Module on page 183](#)
- [Removing a BlackDiamond 10808 Series Module on page 184](#)
- [BlackDiamond Series Blank Front Panels on page 185](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove an 8800 series MSM or I/O module.



CAUTION

Do not attempt to mix modules across Extreme Networks product lines. BlackDiamond 8800 series modules are for use only in a BlackDiamond 8810 or 8806 switch. Blackdiamond 12800 series modules are for use only in a BlackDiamond 12804 or 12802 switch. When a BlackDiamond switch is in use, ExtremexOS software will not recognize a module from a different product line.

Module Slot Assignments

The specific slot locations for I/O modules and MSMs in the chassis are as follows:

- BlackDiamond 8810 switch:
 - Slots 1, 2, 3, 4, 7, 8, 9, and 10 must have I/O modules.
 - Slot 5/A must have an MSM.
 - Slot 6/B can have an MSM or I/O module.
- BlackDiamond 8806 switch:
 - Slots 1, 2, 5, and 6 must have I/O modules.
 - Slot 3/A must have an MSM.
 - Slot 4/B can have an MSM or I/O module.

- BlackDiamond 12804 switch
 - Slots 1, 2, 5, and 6 must have I/O modules.
 - slots 3/A and 4/B must have MSMs.
- BlackDiamond 12802 switch
 - Slots 1 and 2 (top and bottom) must have I/O modules.
 - Slot MSM (middle) must have an MSM.
- BlackDiamond 10808 switch
 - Slots 1, 2, 3, 4, 5, 6, 7, and 8 must have I/O modules.
 - Slots A and B must have MSMs.

**NOTE**

The MSM slot in the BlackDiamond 12802 switch is labeled MSM on the front panel. This slot will only operate an MSM. The ExtremeXOS software refers to this MSM as MSM-A in all related displays and command output.

**NOTE**

The following slots will only operate an MSM: Slot 5/A in the BlackDiamond 8810 chassis; slot 3/A in the BlackDiamond 8806 chassis; slots 3/A and 4/B in the BlackDiamond 12804 switch; and slots A and B in the BlackDiamond 10808 switch.

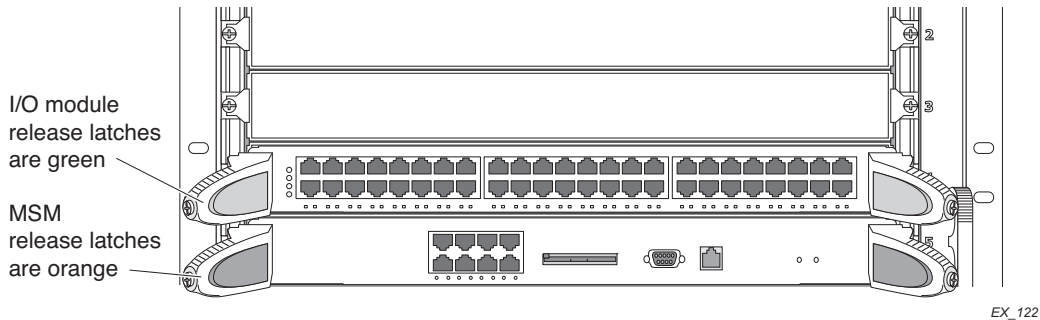
MSMs reside in different slots depending on which BlackDiamond switch you operate:

- If you are using only one MSM in the BlackDiamond 8806 switch, install that MSM in slot 3. If you want to use two MSMs to increase reliability and throughput, install the second MSM in slot 4.
- If you are using only one MSM in the BlackDiamond 8810 switch, install that MSM in slot 5. If you want to use two MSMs to increase reliability and throughput, install the second MSM in slot 6.
- The BlackDiamond 12802 switch supports a single MSM, which must be installed in slot A.

Distinguishing a BlackDiamond 8800 or 12800 MSM from an I/O Module

One quick way to distinguish a BlackDiamond 8800 or 12800 MSM from an I/O module is by the color of the release latch located on each injector/ejector handle. Orange injector/ejector release latches indicate that the module is a BlackDiamond MSM, and green injector/ejector release latches indicate that the module is a BlackDiamond I/O module (see [Figure 103](#)).

Figure 103: Injector/ejector release latch colors on I/O modules and MSMs (BlackDiamond 8800 series switch shown)



Installing a BlackDiamond 8800 or 12800 Series Module

You will need the following tools and equipment to install a BlackDiamond 8800 MSM or I/O module:

- ESD-preventive wrist strap
- #2 Phillips screwdriver
- Appropriate type of cable for the module if you are installing an I/O module



CAUTION

The module series number must be the same as the switch series number. For example, install BlackDiamond 8800 modules only in a BlackDiamond 8800 series switch.

To install a module in a BlackDiamond 8800 or 12800 series switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the chassis.
On a BlackDiamond 12804 or 8800 series chassis, the ground receptacle is at the top left corner.
On a BlackDiamond 12802 chassis, the ground receptacle is at the top right corner.
- 2 Select a slot for the module. (See “[Module Slot Assignments](#)” on page 173.)
- 3 Remove a blank front panel from a chassis slot, if applicable.



NOTE

Any unoccupied module slot in the chassis should have a blank faceplate installed to ensure satisfactory protection from EMI and to maintain adequate airflow through the chassis.

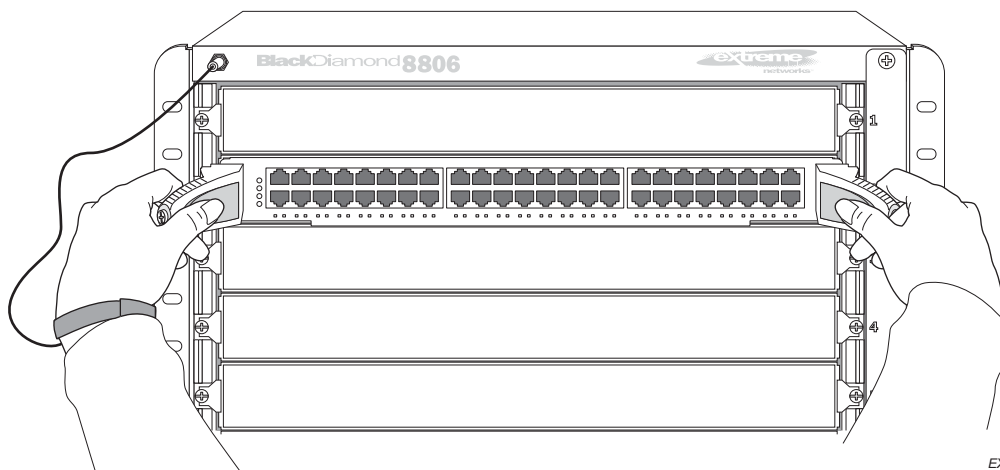
- 4 Remove the module from the antistatic packaging as follows:
 - a Place the antistatic bag containing the module on a flat ESD surface that is clear of any debris.
 - b Break the quality seal, the ESD warning seal, and the Read Installation Note seal.
 - c Open the antistatic bag and firmly grasp the rail of the module.
 - d Pull the antistatic bag off while holding the rail of the module.

**CAUTION**

To prevent ESD damage, hold the module by the metal rail and front panel only. Never touch the components on the PCB or pins on any of the connectors.

- 5 Verify that the module injector/ejector handles are open (Figure 104).

Figure 104: Injector/ejector handles in an open position



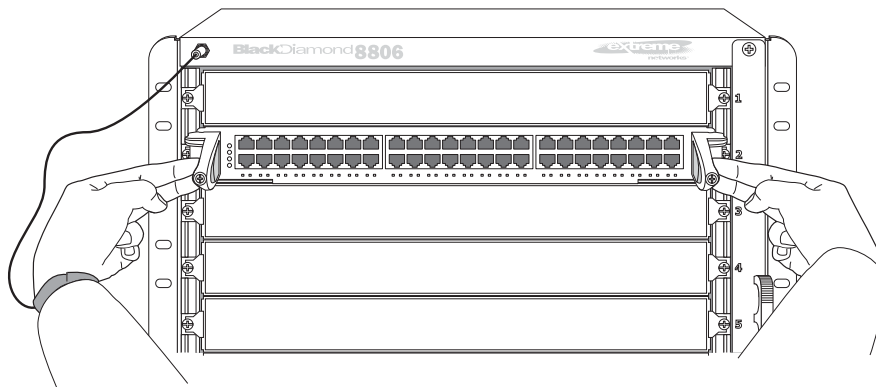
- 6 Keep the injector/ejector handles in the open position as you slide the module into the chassis slot.

**CAUTION**

Do not slide the module into the open chassis slot if the injector/ejector handles are in the latched position.

- 7 Use both hands to latch the injector/ejector handles, by simultaneously pushing both handles toward the center of the module as shown in Figure 105.

Figure 105: Injector/ejector handles shown in the latched position

**CAUTION**

There are two styles of ejector/injector handles on the BlackDiamond 8800 and 12800 series modules. Pay careful attention to the instructions in the next step.

- 8 Using a #2 Phillips screwdriver, lock the module into place in one of the following ways (Figure 106):
- If the captive screw on each handle has a yellow band around the head of the screw, turn the screw on each injector/ejector handle clockwise and *completely* down. When the screw is completely tightened, the yellow band around the captive screw is completely hidden.

**CAUTION**

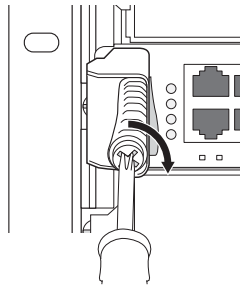
Be careful to avoid over-torquing and stripping the screw heads.

- If the captive screw on each handle has a red line on the head (see Figure 107), turn each captive screw one-quarter turn (90 degrees) clockwise. When the module is correctly locked, the red line on the captive screw in each injector/ejector handle is in a vertical position.

**CAUTION**

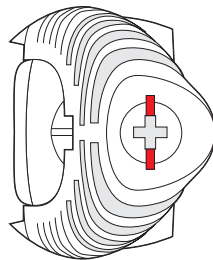
Be sure to turn each captive screw only 90 degrees or one-quarter turn clockwise. Tightening the captive screws beyond 90 degrees will damage the injector/ejector handles on the modules.

Figure 106: Locking the module into place



EX_125

Figure 107: Captive screw with red line



EX_162

- 9 Store the module packaging for future use.

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the chassis so that the strap is always available when you need to handle ESD-sensitive components.

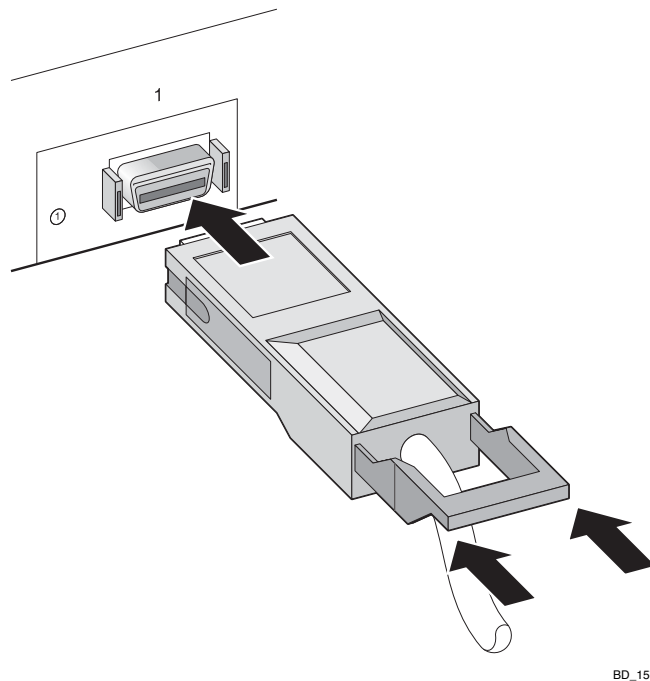
Connecting and Disconnecting Cables on the 10G4Ca Module

The ports on the 10G4Ca I/O module use copper CX4 interface connectors. The cables that connect to these ports include a latch that mechanically stabilizes the connection. You must be sure to correctly engage the latch when you connect cables, and to correctly disengage the latch when you disconnect cables.

To connect cables to the 10G4Ca module:

- 1 Make sure that the connector latch is pulled back to the unlatched position.
- 2 Align the connector with the module port and push it into place until the connector is flush with the front panel of the module ([Figure 108](#)).
- 3 Evenly push the latch toward the module port to secure the connection ([Figure 108](#)). Make sure that the latch engages equally on both sides.

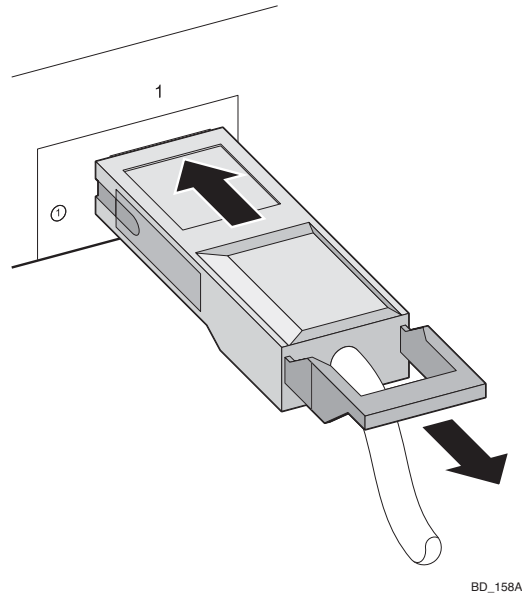
Figure 108: Connecting a 10G4Ca module port



To disconnect a cable from a 10G4Ca module:

- 1 Holding the cable connector with one hand, press it against the module front panel as you use the other hand to pull back evenly on the latch (Figure 109).

Figure 109: Disconnecting a cable from a 10G4Ca port



- 2 Make sure the latch is pulled into the fully disengaged position.
- 3 Pull the cable connector straight off the port connector.

Installing a BlackDiamond 10808 Series Module

BlackDiamond 10808 series modules are hot-swappable. You can insert a BlackDiamond 10808 series MSM or I/O module at any time, without causing disruption of network services. Complete the action of inserting a BlackDiamond 10808 series module in a reasonable time frame. Be sure to insert the module completely to avoid partial connection of backplane connectors.

The BlackDiamond 10808 switch comes with eight blank front panels already installed. Use a blank front panel to fill slots not occupied by I/O modules or switch management modules. For information about how to install a blank front panel, see [“BlackDiamond Series Blank Front Panels” on page 185](#).

You need the following tools and equipment to install a module

- ESD-preventive wrist strap (provided)
- #2 Phillips screwdriver
- Appropriate type of cable for the module if you are installing an I/O module

To install the module:

- 1 Select a slot for the module: (See “Module Slot Assignments” on page 173.)

**CAUTION**

MSMs and I/O modules only fit properly into their designated slots. Forceful insertion into the wrong slot type can damage the module.

- 2 Attach the ESD-preventive wrist strap to your wrist and connect the metal end of the wrist strap to the ground receptacle on the top left corner of the switch front panel.
- 3 Remove the blank faceplate from the slot to make room for the module, if applicable.

**NOTE**

Any unoccupied module slot in the chassis should have a blank faceplate installed to ensure satisfactory protection from EMI and to maintain adequate airflow through the chassis.

- 4 Remove the module from the anti-static bag as follows:
 - a Place the anti-static bag containing the module on a flat surface that is clear of any debris.
 - b Break any seals on the bag.
 - c Open the bag and firmly grasp the rail of the module.
 - d Holding the rail of the module, pull the ESD bag off the module.

**NOTE**

By holding the rail of the module and pulling the ESD bag off the module, you will prevent damage to the module that might be caused by sliding the module on the ESD surface.

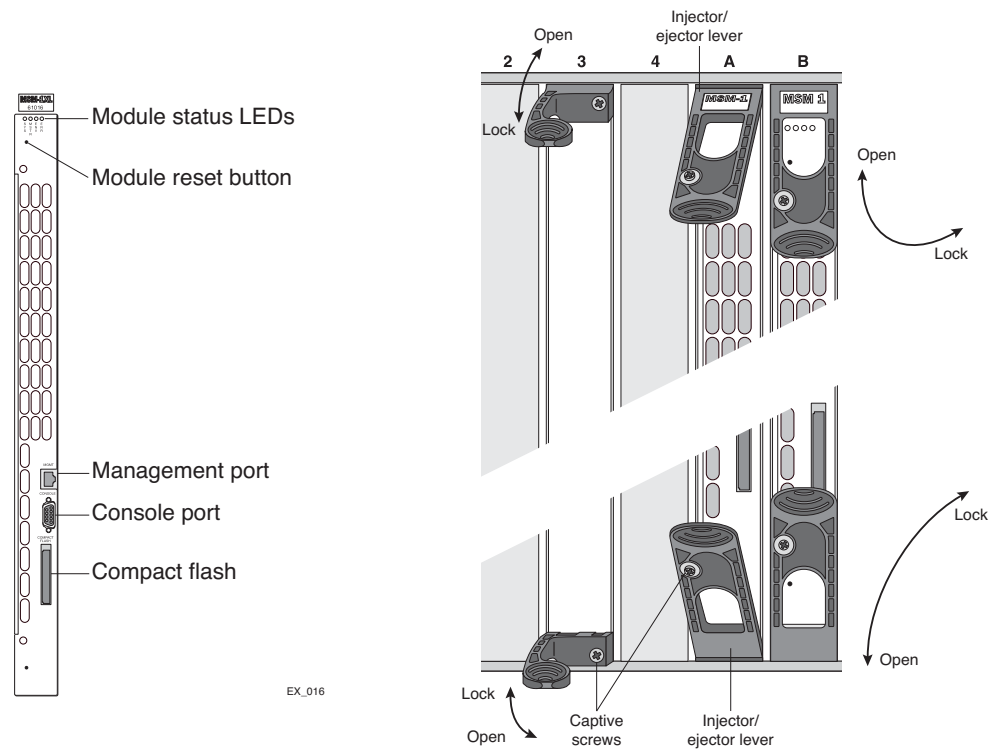
Store the module packaging for future use.

- 5 Check the connectors for dust and packing materials.

**CAUTION**

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the printed circuit board or the pins on any of the connectors.

- 6 Extend the injector/ejector levers and hold the module vertically with the module name at the top (see [Figure 110](#)).

Figure 110: Module orientation for insertion in a BlackDiamond 10808 system chassis

- 7 Slide the module into the slot until it makes contact with the backplane.

**NOTE**

Use the metal panel, not the circuit board, to guide the module into place.

As the module begins to seat in the chassis, the injector/ejector levers begin to close.

- 8 Close the injector/ejector levers, using both hands simultaneously to push the handles toward the center of the module as shown in [Figure 110](#).
- 9 Secure the module by tightening the two screws.

**NOTE**

Tighten the screws of each installed module before you insert additional modules. Otherwise, you might unseat modules that you have not secured.

To install additional modules, repeat steps 3 through 9.

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

Installing a Backup MSM

If you install a backup MSM, use the `synchronize` command to replicate all saved images and configurations from the primary MSM to the backup MSM.

You are not prompted to synchronize the images and the configurations from the primary to the backup. If not synchronized, the backup uses its image and the primary configuration. This image/configuration mismatch will likely cause the switch to operate differently after failover.



CAUTION

Depending on the size and complexity of your network, you should install and configure a backup MSM when network disruption will be minimal. You may need to reboot your switch after you use the `synchronize` command.

Verifying the Module Installation

After you install a module, verify that it is working correctly by checking the LEDs on the front panel of the module. [Table 25](#) shows normal LED operation for correctly installed MSMs and I/O modules.

Use the command line interface (CLI) `show slot <slot number>` command to display slot-specific information about the newly installed module.

Table 25: Module LED activity for normal operation

MSM		I/O Module	
LED	State/Meaning	LED	State/Meaning
SYS	Green blinking	STATUS	Green blinking
MSTR	Green: MSM is primary Amber: MSM is backup	DIAG	Off
ENV	Green	Port status (per port)	Green Amber blinking
Link/Activity	Green: Link is up. Amber: Packet activity is occurring.		

For more information about LED activity, see the module chapter for each switch series.

Displaying Slot Status Information

Assuming the module has no problems, the command `show slot <slot>` (where `<slot>` is the number of the slot where you installed the module) displays information about the module including: general information about the module (name, serial number, part number), the state of the module (power down, operational, mismatch between the slot configuration and the module in the slot), and the number of ports on the module.

For more information about slot status information, see the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide*.

Removing a BlackDiamond 8800 or 12800 Series Module



CAUTION

There are two styles of ejector/injector handles on the BlackDiamond 12800 series modules. Pay careful attention to the instructions in step 2.

This section describes how to remove modules from a BlackDiamond 8800 or 12800 series switch. BlackDiamond modules are hot-swappable. You do not need to power the system off to remove a module.

You will need the following tools and equipment to install a BlackDiamond 8800 MSM or I/O module:

- ESD-preventive wrist strap
- #2 Phillips screwdriver

To remove a BlackDiamond 8800 or 12800 series module:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the chassis.

On a BlackDiamond 12804 or 8800 series chassis, the ground receptacle is at the top left corner.

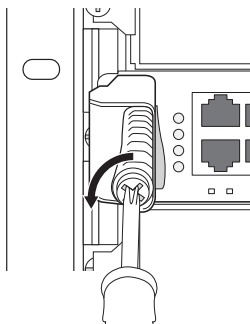
On a BlackDiamond 12802 chassis, the ground receptacle is at the top right corner.
- 2 Unlock the module in one of the following ways:
 - On a module *without* red lines on the screwheads, turn each captive screw counter-clockwise (Figure 111). Verify that the yellow band around the captive screw head of each injector/ejector handle is completely visible (Figure 111). This position ensures that the module is unlocked.
 - On a module *with* red lines on the screwheads, turn each captive screw counter-clockwise one-quarter turn (90 degrees) (Figure 111). Verify that the red line on each captive screw is in a horizontal position (Figure 112). This position ensures that the MSM or I/O module is unlocked.



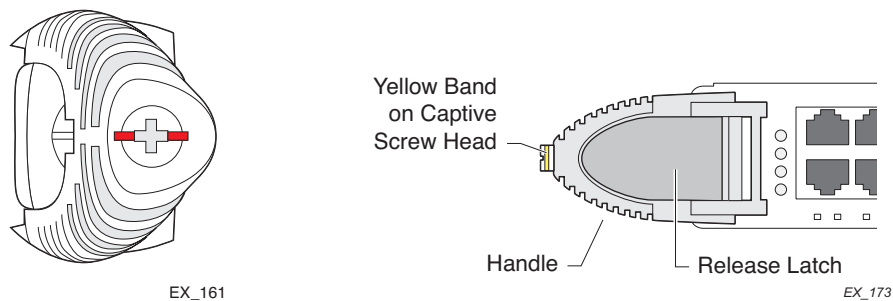
CAUTION

Be sure to turn each captive screw only 90 degrees or one-quarter turn counter-clockwise. Loosening the captive screws beyond 90 degrees will damage the injector/ejector handles on the module.

Figure 111: Unlocking a module



EX_125a

Figure 112: Indications that the module is unlocked

- 3 Squeeze the release latch on each injector/ejector handle and rotate both handles outward to disconnect the module from the chassis backplane (see [Figure 112](#)).

**CAUTION**

To prevent ESD damage, hold the module by the metal panel edges only. Never touch the components on the PCB or the pins on any of the connectors.

- 4 Slide the module out of the chassis slot.
- 5 Place the module into the anti-static bag to protect it from potential ESD damage. The bag will also prevent dust from collecting on the module connectors.
- 6 If you are not going to install a replacement module, install a blank front panel. To install a replacement module, follow the installation procedure starting [on page 175](#).

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to touch ESD-sensitive components.

Removing a BlackDiamond 10808 Series Module

All BlackDiamond 10808 series modules are hot-swappable. You do not need to power off the system to remove a module.

You need the following tools and equipment to remove a module:

- ESD-preventive wrist strap (provided)
- #2 Phillips screwdriver
- Replacement module or blank faceplate if you are not replacing the module

To remove a module:

- 1 Attach the ESD-preventive wrist strap to your wrist. If it is not already connected, connect the metal end of the wrist strap to the ground receptacle on the top-left corner of the switch front panel.
- 2 At each end of the module front panel, loosen the retaining screws with a #1 Phillips screwdriver.
- 3 Simultaneously rotate the ejector/injector levers outward to disengage the module from the backplane.

- 4 Grasp the module front panel with one hand, and slide the module out of the chassis. Place your free hand under the metal panel to support the weight of the module.

**CAUTION**

To prevent ESD damage, handle the module by the metal panel edges only. Never touch the components on the PCB or the pins on any of the connectors.

- 5 Immediately place the module into an antistatic bag to protect it from ESD damage and to prevent dust from collecting on the module connectors.
- 6 If you are not going to install a replacement module, cover the slot with a blank faceplate. To install a replacement module, follow the installation procedure starting [on page 179](#).

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

BlackDiamond Series Blank Front Panels

BlackDiamond switches are shipped with blank front panels installed over one or more chassis slots. You can remove or install a blank front panel at any time without disrupting network services. Complete the action of installing a blank front panel in a reasonable time-frame to avoid disruption to adequate airflow.

**CAUTION**

All unoccupied slots in a BlackDiamond 8800 or 12800 series switch must have blank front panels correctly installed to ensure conformance to FCC requirements as well as to maintain adequate airflow through the switch.

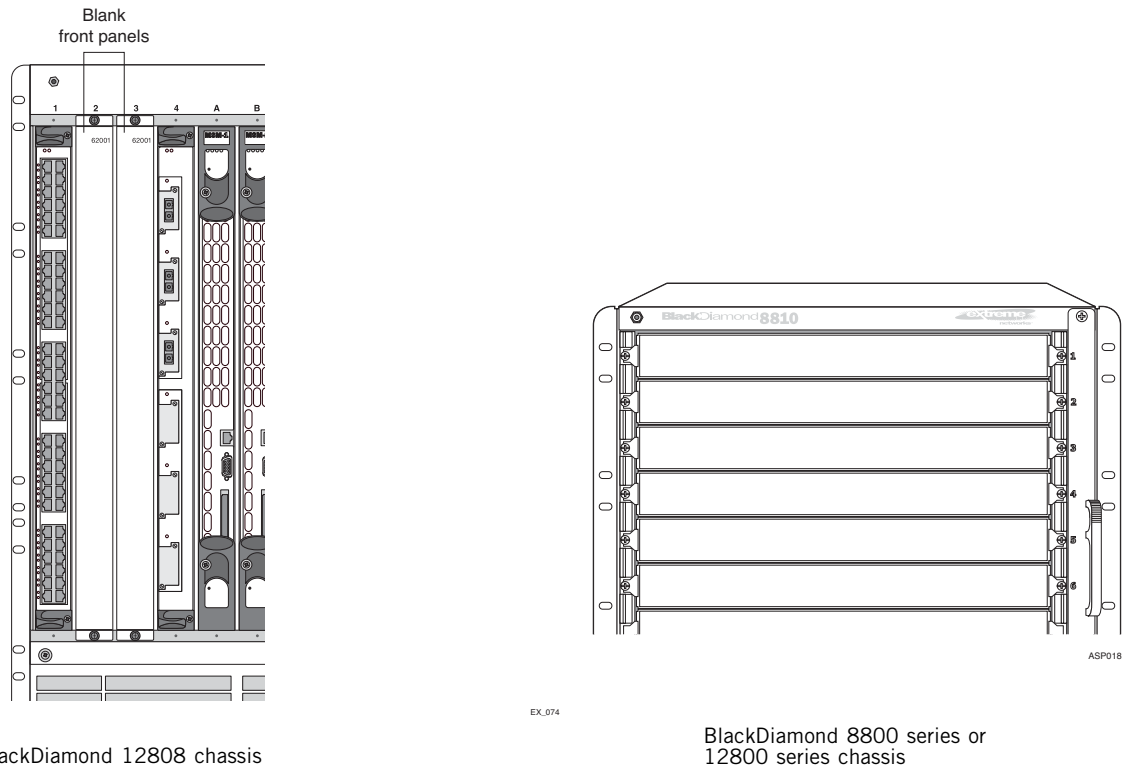
You need the following tools and equipment to install or remove a blank front panel:

- ESD-preventive wrist strap
- #2 Phillips screwdriver

Installing a Blank Front Panel

To install the blank front panel:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the BlackDiamond chassis.
On a BlackDiamond 12804 or 8800 series chassis or a BlackDiamond 12808 chassis, the ground receptacle is at the top left corner.
On a BlackDiamond 12802 chassis, the ground receptacle is at the top right corner.
- 2 Align the blank front panel over the open slot on the chassis (see [Figure 113](#)).
On a BlackDiamond 8800 series or 12800 series chassis, make sure that the EMI gasket is on the top of the panel and the stenciled part number is right side up.
On a BlackDiamond 10808 chassis, position the blank front panel with the EMI gasket to the right.

Figure 113: Blank front panels in BlackDiamond series chassis

- 3 Use a #2 Phillips screwdriver to tighten the captive screws at each end of the blank front panel.

**NOTE**

Tighten the screws of each installed blank front panel before inserting additional modules or blank front panels. Otherwise, you might unseat modules or blank front panels that you have not secured.

**NOTE**

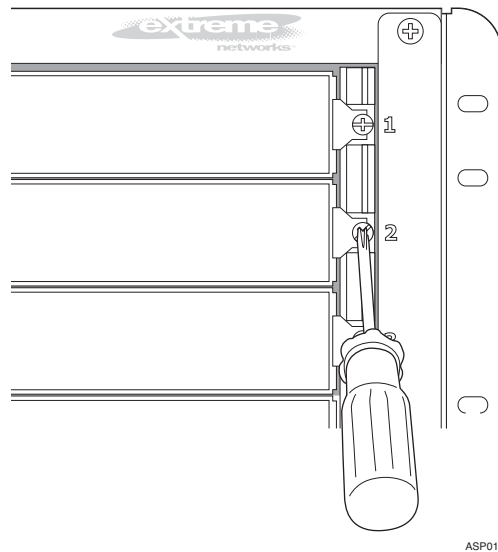
Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to touch ESD-sensitive components.

Removing a Blank Front Panel

To remove a BlackDiamond blank front panel:

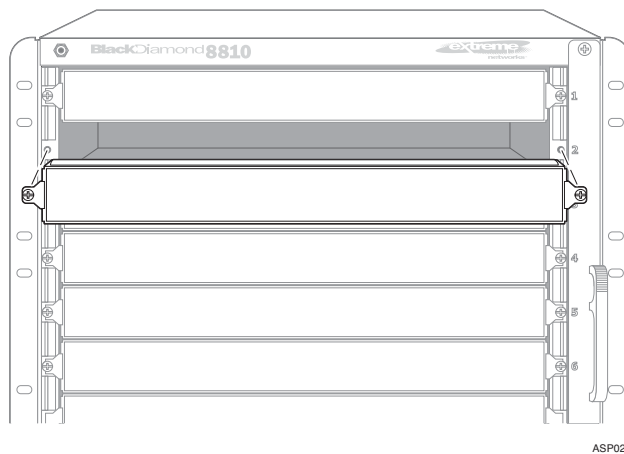
- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the switch front panel.
On a BlackDiamond 12804 or 8800 series chassis or a BlackDiamond 12808 chassis, the ground receptacle is at the top left corner.
On a BlackDiamond 12802 chassis, the ground receptacle is at the top right corner.
- 2 Loosen the captive screw at each end of the blank front panel, using a #2 Phillips screwdriver (see [Figure 114](#)).

Figure 114: Captive screw on a BlackDiamond 8800/12800 blank front panel



- 3 Remove the blank front panel from the intended slot on the BlackDiamond switch (see [Figure 115](#)).

Figure 115: Blank front panel being removed from a BlackDiamond 8800 series or 12800 series switch



- 4 Install an I/O module or MSM in the open slot as described in [“Installing a BlackDiamond 8800 or 12800 Series Module” on page 175](#) or [“Installing a BlackDiamond 10808 Series Module” on page 179](#).



NOTE

Leave the ESD-preventive wrist strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Installing or Removing an External Compact Flash Memory Card

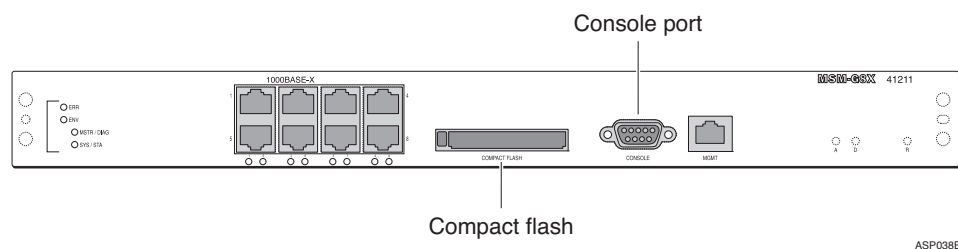
You do not need to power off the system or remove the MSM from the chassis to install or remove an external compact flash memory card.

You need an ESD-preventive wrist strap to install a compact flash memory card.

To install the memory card:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the chassis front panel.
- 2 Locate the compact flash slot on the MSM, as shown in [Figure 116](#).

Figure 116: Typical compact flash slot location (BlackDiamond 8800 series MSM)



- 3 Hold the memory card between your thumb and forefinger.
For the BlackDiamond 8800 and 12800 series switches, the side with the ridge faces toward the bottom of the chassis.
For the BlackDiamond 10808 switch, the side with the ridge faces to the left of the chassis.
- 4 Slide the card into the compact flash slot until you feel resistance.; a portion of the card will protrude from the slot.
- 5 Carefully push the card until it is seated into the slot. The card should be fully inserted, or seated, inside the slot.
- 6 To verify that the card is fully seated, use the `show memorycard` command.

To remove the external compact flash memory card:

- 1 Use the `eject memorycard` command to ensure that you will not lose any data when you remove the card.
After you use the `eject memorycard` command, you can physically remove the card from the external compact flash slot on the MSM. For more information about the `eject memorycard` command, see the *ExtremeXOS 12.0 Concepts Guide*.
- 2 Attach the ESD-preventive wrist strap to your wrist and connect the metal end of the strap to the ground receptacle on the chassis front panel.
- 3 Locate the black release pin just above the compact flash slot.
- 4 Press the release pin until the card releases from the slot.
The card releases to an intermediate position; the card remains partially inserted but is no longer seated in the slot.
- 5 Remove the card completely and place it in a safe location.

4

Installing BlackDiamond Switch Accessories

12

BlackDiamond AC Power Cord Retaining Brackets

The AC power cord retaining brackets for BlackDiamond switches hold the power connectors in the power sockets and prevent accidental disconnection due to earthquakes, vibration, or other disturbances. Power cord retaining brackets are provided with the BlackDiamond 8800 series switches and the 12800 series switches.

This chapter includes the following sections:

- [BlackDiamond 8810 AC Power Cord Retaining Bracket on page 191](#)
- [BlackDiamond 8806/12804 AC Power Cord Retainer Channel on page 194](#)



WARNING!

These BlackDiamond switches do not have a switch for turning the power of the unit on and off. Power to the switch is disconnected by removing the wall plug from the electrical outlet. Always be sure that all plugs and electrical outlets are easily accessible.

BlackDiamond 8810 AC Power Cord Retaining Bracket

Connect all AC power cords before you install the power cord retaining bracket.

The following tools and equipment are required to install or remove the AC power cord retaining bracket:

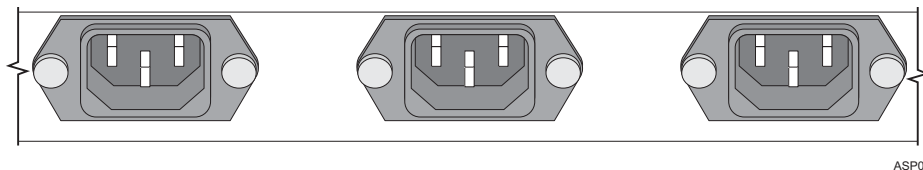
- ESD-preventive wrist strap
- #2 Phillips screwdriver

Installing the BlackDiamond 8810 AC Power Cord Retaining Bracket

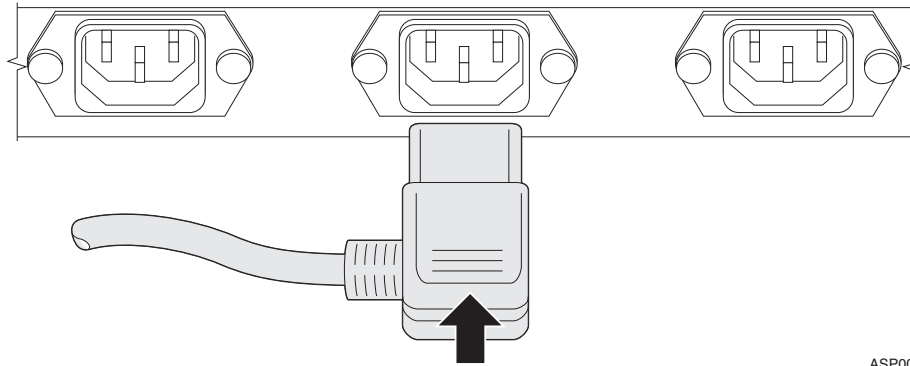
To install the BlackDiamond 8810 AC power cord retaining bracket:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-left corner of the BlackDiamond 8810 chassis.
- 2 Locate the power outlets on the front of the BlackDiamond 8810 switch (see [Figure 117](#)).

Figure 117: Power outlets on the BlackDiamond 8810 switch

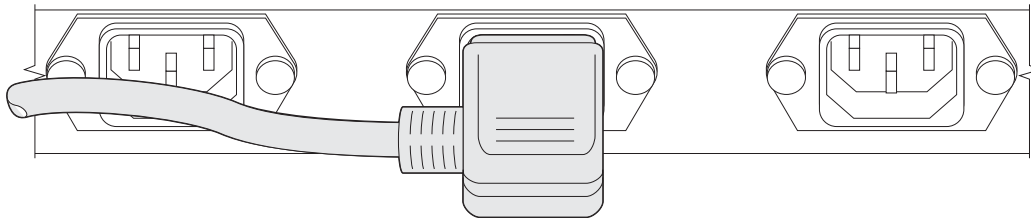


- 3 Connect each AC power cord to a power outlet on the BlackDiamond 8810 switch as shown in [Figure 118](#).

Figure 118: Connecting an AC power cord to the BlackDiamond 8810 switch

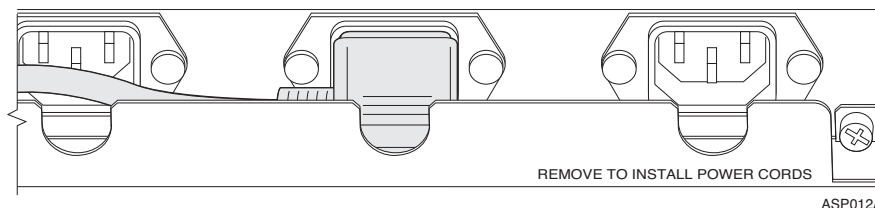
ASP009

- 4 Make sure that each AC power cord is firmly plugged into the power outlet as shown in [Figure 119](#).

Figure 119: AC power cord plugged into the BlackDiamond 8810 switch power outlet

ASP010

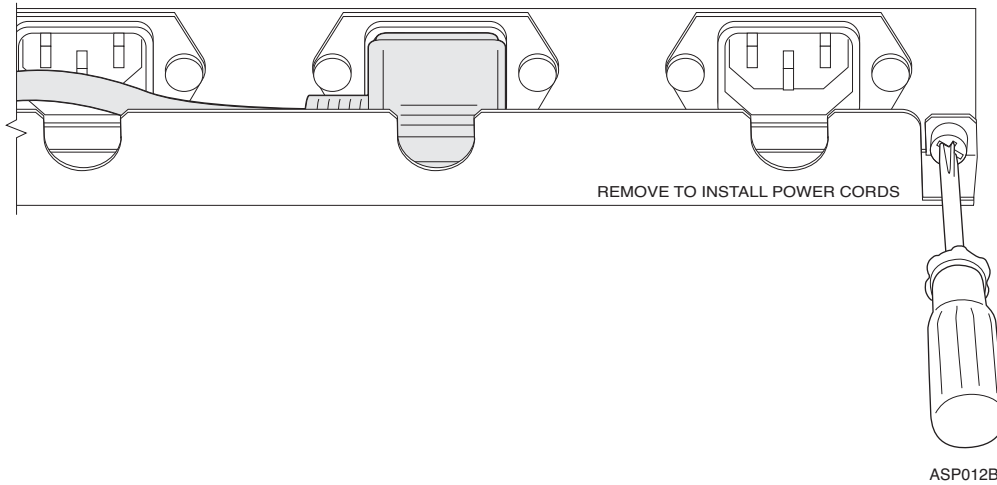
- 5 Align the BlackDiamond 8810 AC power cord retaining bracket over the AC power cord ends as shown in [Figure 120](#).

Figure 120: AC power cord retaining bracket correctly aligned

ASP012A

- 6 Tighten the captive screws in the middle and on each end of the power cord retaining bracket (see Figure 121).

Figure 121: Securing the BlackDiamond 8810 AC power cord retaining bracket



- 7 To power the system on, connect the other end of each installed AC power cord to the power source.



NOTE

Leave the ESD-preventive wrist strap permanently connected to the switch so that it is always available when you need to touch ESD-sensitive components.

Disconnecting a BlackDiamond 8810 AC Power Cord

To disconnect a BlackDiamond 8810 AC power cord:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top left corner of the switch chassis.
- 2 Disconnect the AC power cord from the power source.
- 3 Loosen the captive screws in the middle and on each end of the BlackDiamond AC power cord retaining bracket, using a #2 Phillips screwdriver.
- 4 Remove the BlackDiamond AC power cord retaining bracket from the front of the switch.
- 5 Remove the end of the AC power cord from the power outlet(s) on the front of the switch.



NOTE

Leave the ESD-preventive wrist strap permanently connected to the switch so that it is always available when you need to touch ESD-sensitive components.

BlackDiamond 8806/12804 AC Power Cord Retainer Channel

This power cord retainer is compatible with the following BlackDiamond switches:

- Extreme Networks BlackDiamond 8806 switch
- Extreme Networks BlackDiamond 12804 switch

Pre-Installation Requirements

Connect all AC power cords before you install the power cord retaining bracket.

The following tools and equipment are required before installing or removing the BlackDiamond 8806/12804 AC power cord retainer channel bracket:

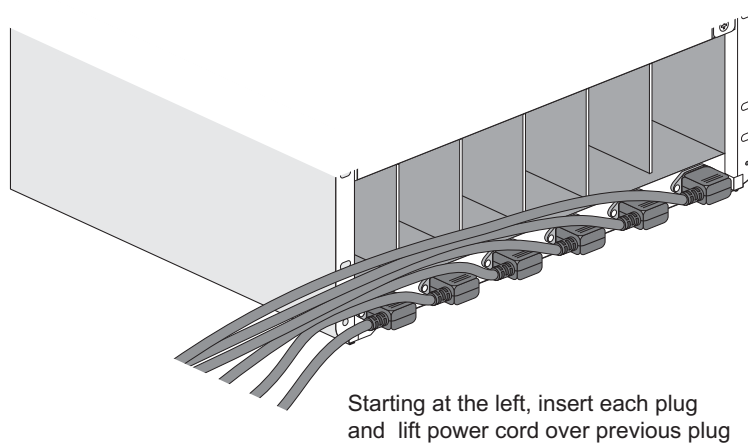
- ESD-preventive wrist strap
- #2 Phillips screwdriver

Installing the BlackDiamond 8806/12804 AC Power Cord Retainer Channel

To install the BlackDiamond 8806/12804 AC power cord retainer channel:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-left corner of the switch front panel.
 - 2 Starting at the left, insert the plug of each AC power cord into the power connectors on the switch, and lift each installed power cord over the previous plug (see [Figure 122](#)).
- Verify that all installed AC power cords are firmly plugged into the power connectors.

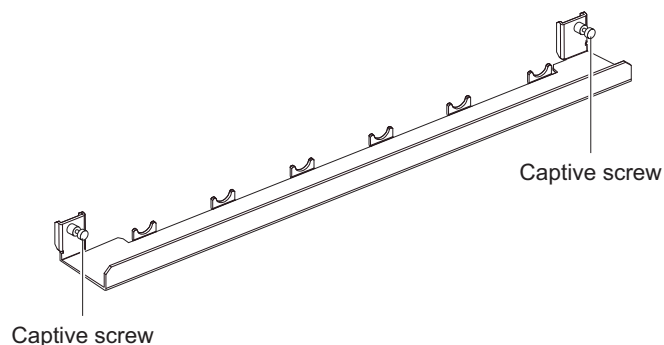
Figure 122: Installing and routing the AC power cords



EX_138

- 3 Hold the AC power cord retainer channel in the position shown in [Figure 123](#).

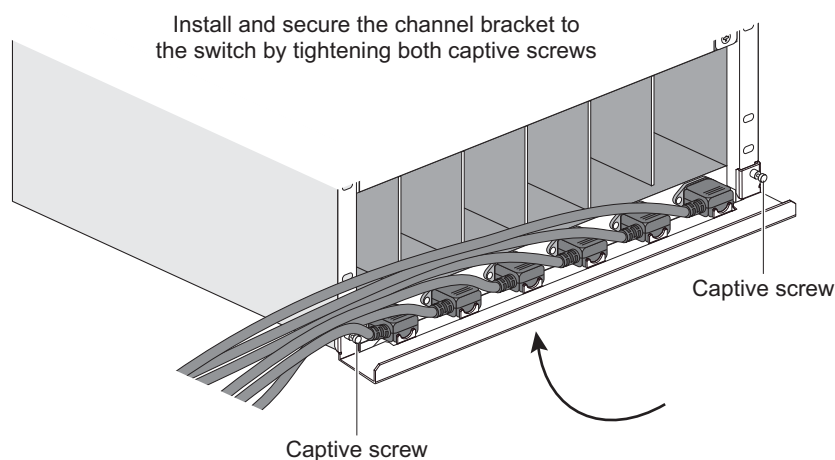
Figure 123: BlackDiamond 8806/12804 AC power cord retainer channel



EX_141

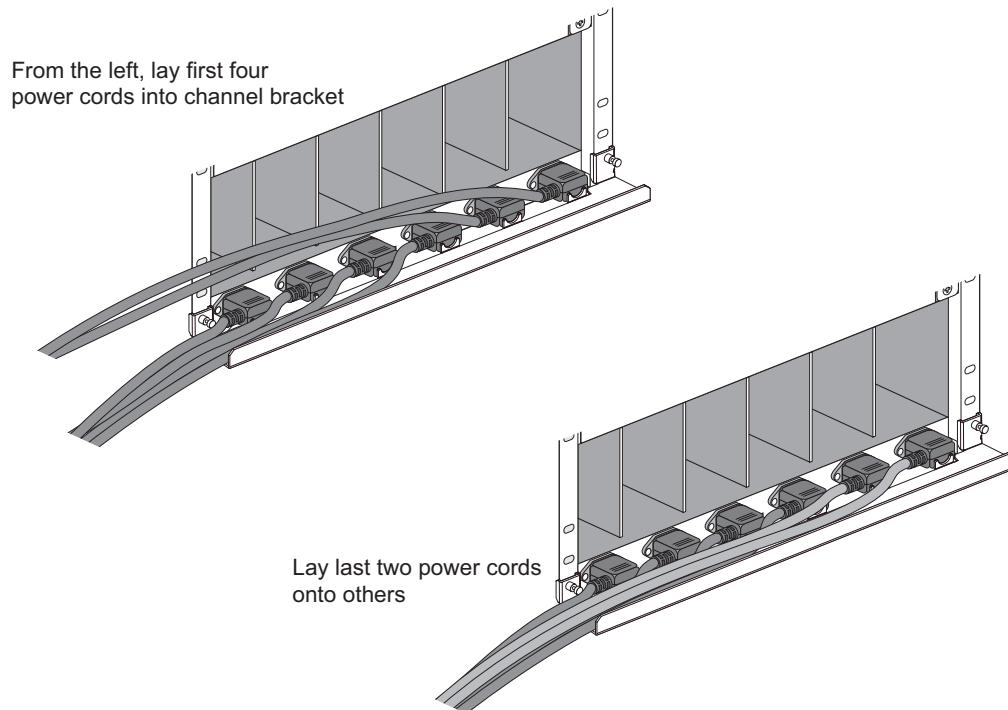
- 4 Place the retainer channel against the switch as shown in [Figure 124](#). Tighten the captive screw at each end of the channel.

Figure 124: Securing the BlackDiamond 8806/12804 AC power cord retainer channel



EX_139

- 5 Starting from the left, lay the first four power cords into the channel (see [Figure 125](#)).
- 6 Lay the last two power cords on top of the bottom four cords (see [Figure 125](#)).

Figure 125: Routing the power cords in the channel**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Removing the BlackDiamond 8806/12804 AC Power Cord Retainer Channel

To remove the BlackDiamond 8806/12804 AC power cord retainer channel:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-left corner of the switch front panel.
- 2 Using a #2 Phillips screwdriver, loosen the captive screw located on each end of the AC power cord retainer channel.
- 3 Remove the retainer channel from the switch.

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

The BlackDiamond cable manager, cable holders, and cable clips provide a way to organize and contain masses of cables connected to a BlackDiamond switch. This chapter describes how to install and use these cable management accessories.

This chapter includes the following sections:

- [About BlackDiamond Cable Management on page 197](#)
- [Installing the BlackDiamond 10808 Cable Manager on page 197](#)
- [Using the Cable Holders and Cable Clips on page 202](#)

About BlackDiamond Cable Management

The BlackDiamond cable manager is a rack-mounted case that provides channels for routing cable bundles above the chassis. Interlocking cable holders and cable clips provide additional free-standing, rigid structural support for individual cables and cable bundles in front of the switch. You can use the cable holders and cable clips individually or connect them together to manage multiple cable bundles.

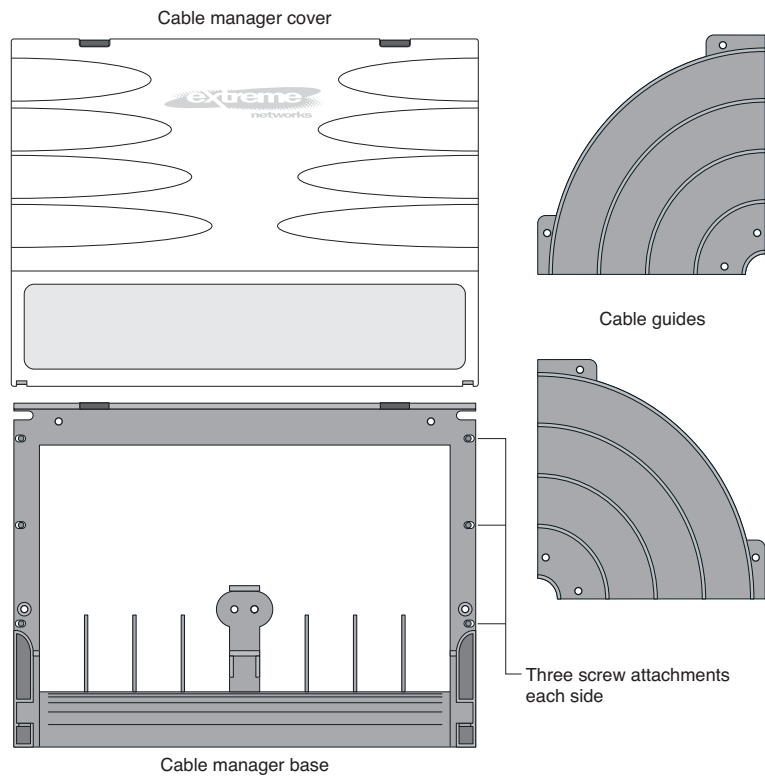
The cable management accessories keep cables collected in one place, rather than all just hanging free. If you must remove a module from the chassis for replacement or repair, the cable clips and holders maintain the cable arrangement in front of the chassis for ease of connection when you reinsert the module.

Installing the BlackDiamond 10808 Cable Manager

You need the following tools and equipment to install the cable manager:

- #2 Phillips screwdriver
- Six rack-mounting screws appropriate for your organization's rack system
- Screwdriver suitable for the rack-mounting screws

The BlackDiamond cable manager consists three parts: the mounting base, the cable guides, and a cover (see [Figure 126](#)).

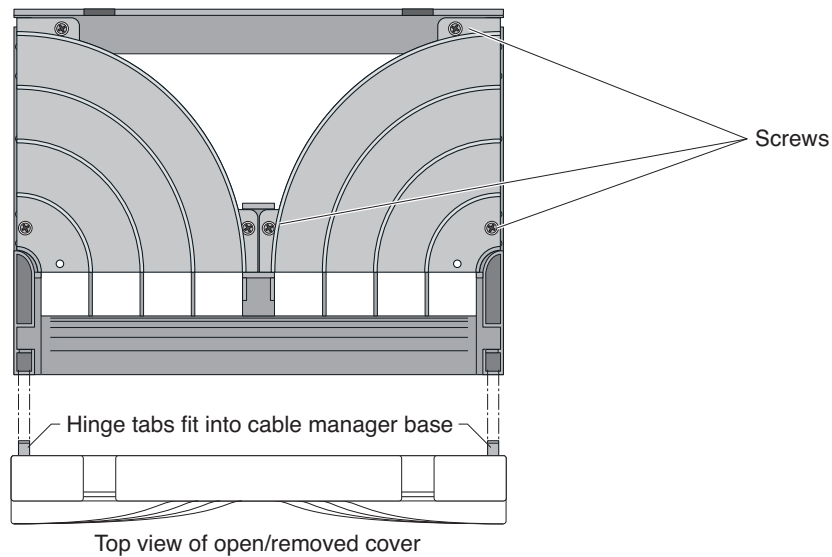
Figure 126: Cable manager components

The cable manager is shipped assembled. You must remove the cover and the cable guides in order to attach the cable manager base to the rack.

To install the cable manager:

- 1 At the top of the cover, lift the latches as you pull out on the corners to open the cover.
- 2 Rotate the cover outward and lift it off the base.

Removing the cover exposes the six screws holding the cable guides onto the mounting base (see [Figure 127](#)).

Figure 127: Cable guide screw locations

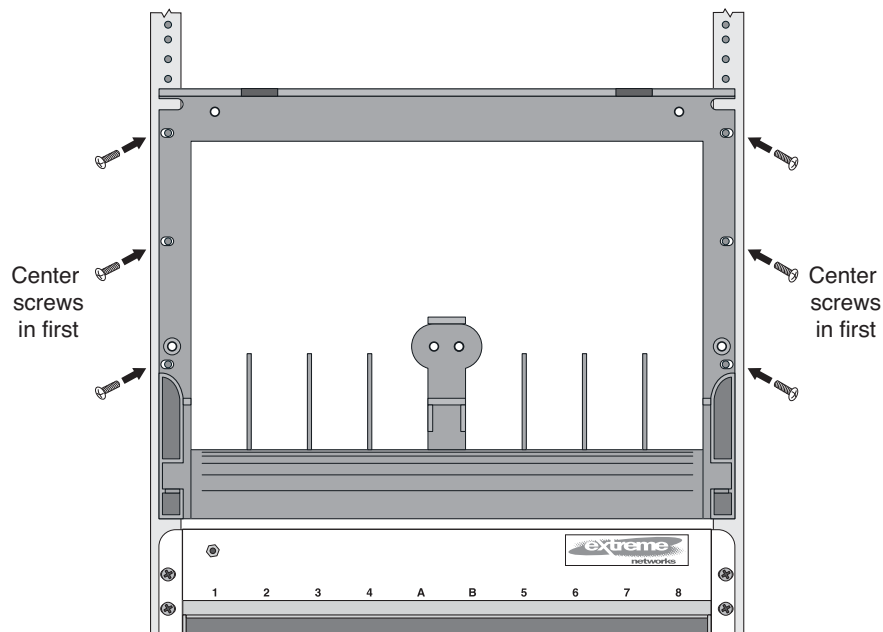
EX_181

- 3 Remove the six screws that secure the cable guides to the mounting base. Save the screws for reattaching the guides later.
- 4 Set the cable manager mounting base against the rack above the installed BlackDiamond 10808 chassis.

Adjust the height of the cable manager base as needed to ensure proper alignment of the screw holes. The distance between the top of the chassis and the cable manager base will be approximately 1/4-inch (6-mm) to 7/8-inch (20-mm).

- 5 Use six rack-mounting screws (not supplied) to mount the base onto the rack, as follows:
 - a On each side, insert the center screw first and partially tighten it (see [Figure 128](#)).
 - b Insert the remaining screws.
 - c Tighten all six screws securely.

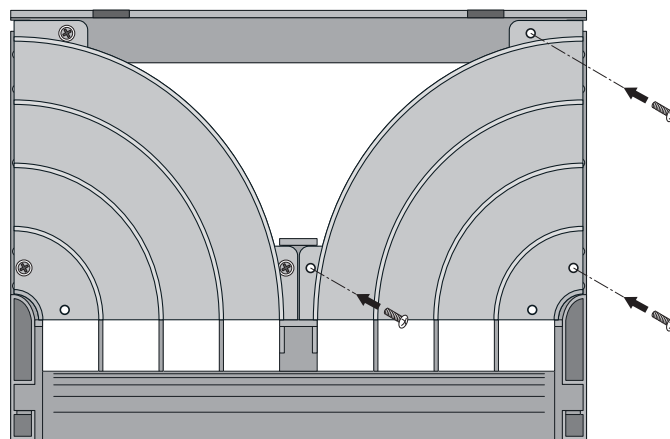
Be sure that the screws do not protrude from the cable manager mounting base and prevent the cable guides from fitting properly over the base.

Figure 128: Attaching the cable manager base to the rack

EX_076A

- 6 Reattach the cable guides to the cable manager mounting base using the screws you removed previously (see [Figure 129](#)).

Do not overtighten the screws.

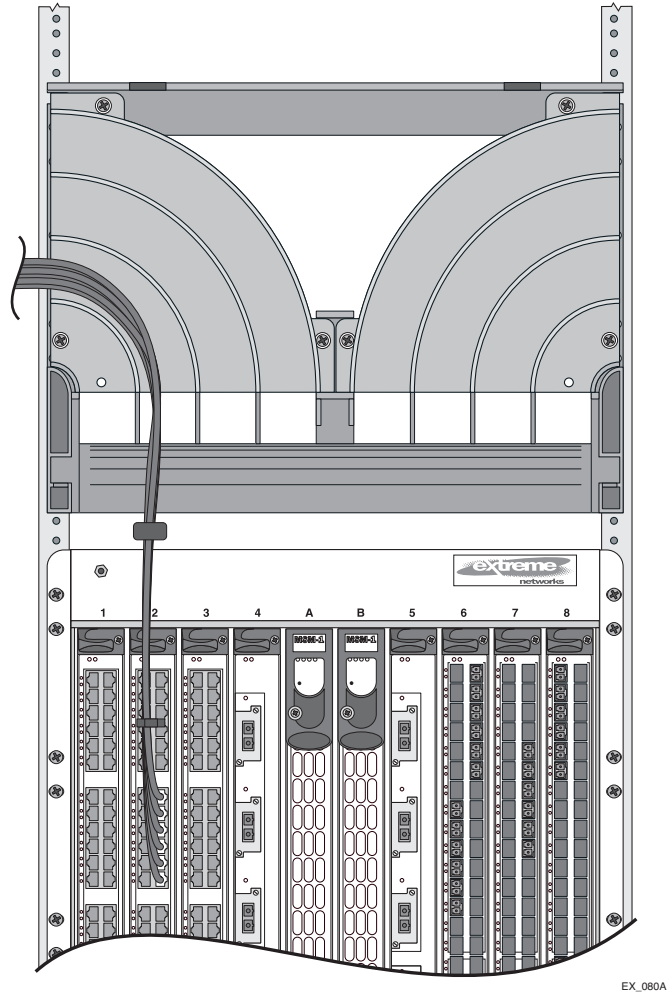
Figure 129: Securing the cable guides to the mounted cable manager base

EX_077

- 7 Route bundled cables through the channels in the cable guides, as shown in [Figure 130](#).

Use the cable holders and cable clips to organize and bundle the cables, as described in [“Using the Cable Holders and Cable Clips”](#) on page 202.

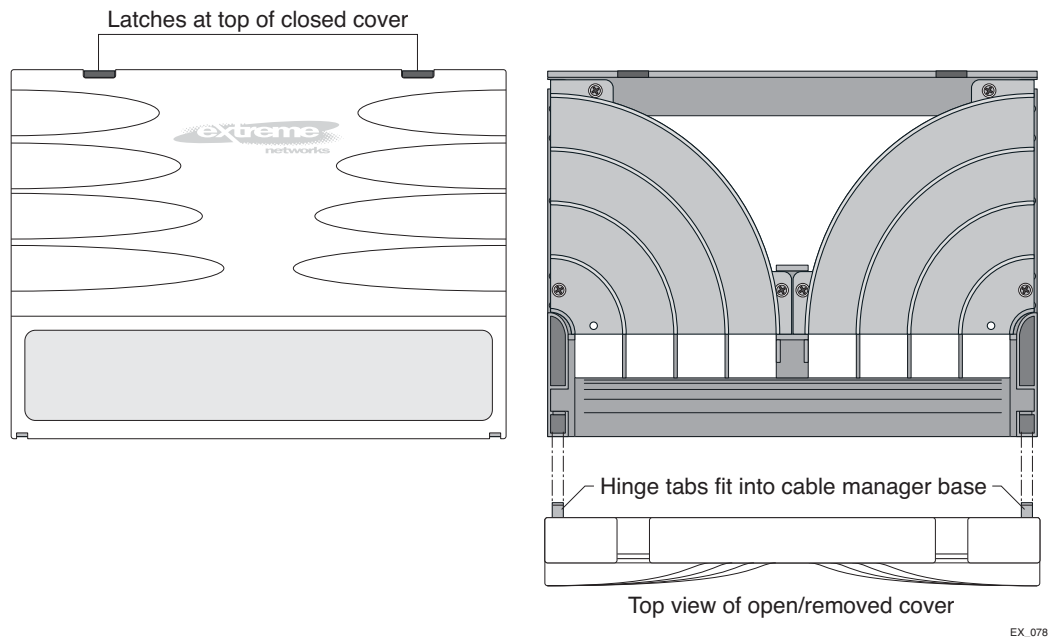
Figure 130: Using the cable manager



EX_080A

- 8 Set the bottom edge of the cover on the hinge tabs of the cable manager base (see [Figure 131](#)). Rotate the cover into place and press firmly at the top until the latches lock.

Figure 131: Cable manager cover plate

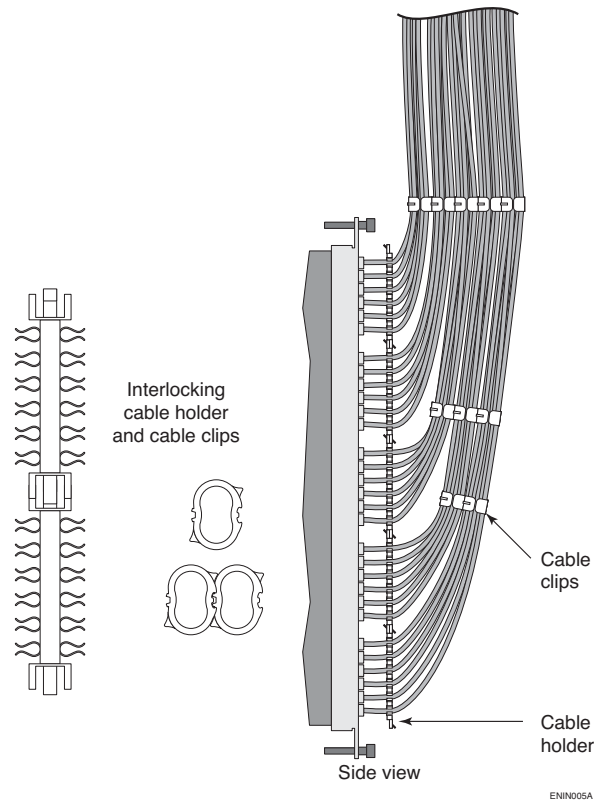


Using the Cable Holders and Cable Clips

When you use the cable holders and the cable clips, Extreme Networks recommends the following:

- Attach the cables to the holders by slipping the cable through the opening.
- Connect the cable holders, if you need more than one. (Refer to [“Connecting Cable Holders” on page 203.](#))
- If you need more than one cable clip for a bundle, connect the clips together before you route the cables through the clips. (Refer to [“Connecting Cable Clips” on page 204.](#))
- To form a cable bundle, thread the cables through the clips.

[Figure 132](#) shows the cable holders and clips being used to manage a group of cables.

Figure 132: BlackDiamond cable holders and clips

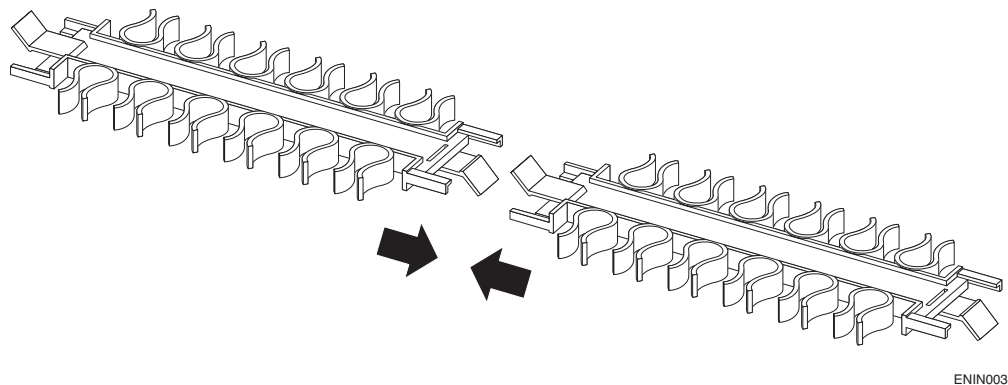
Connecting Cable Holders

Each cable holder holds up to 12 separate cables, with 6 on each side. Connect cable holders end to end as needed to accommodate the number of cables you need to organize.

To connect the cable holders:

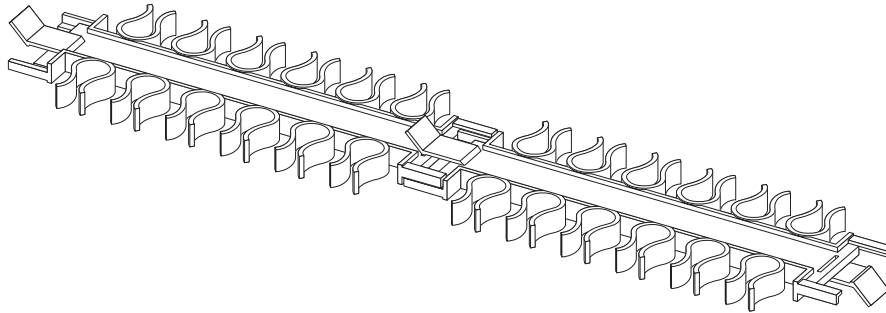
- 1 Hold two cable holders as shown in [Figure 133](#).

Make sure that one locking tab at the joint is on top and the other is on the bottom.

Figure 133: Connecting cable holders

- 2 Slide the ends together and push the cable holders together until you feel them snap into place (see [Figure 134](#)).

Figure 134: Connected cable holders



ENIN004

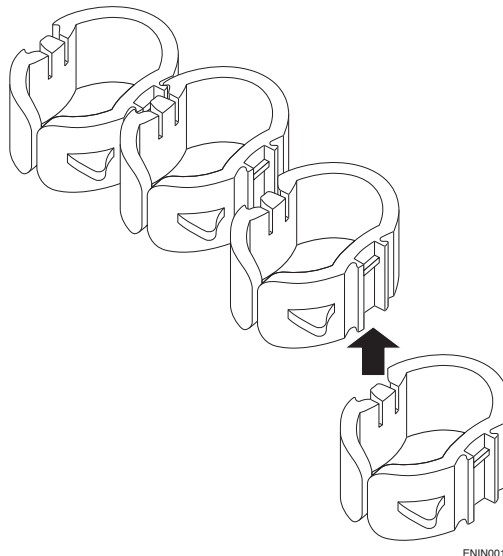
- 3 Connect as many cable holders together as you need to manage your cable bundles.
- 4 To disconnect the holders, grasp one in each hand firmly and carefully pull them apart.

Connecting Cable Clips

To connect the cable clips:

- 1 Hold two clips next to each other with the split sides facing the same way (see [Figure 135](#)).
- 2 Slide the connecting grooves together (see [Figure 135](#)).

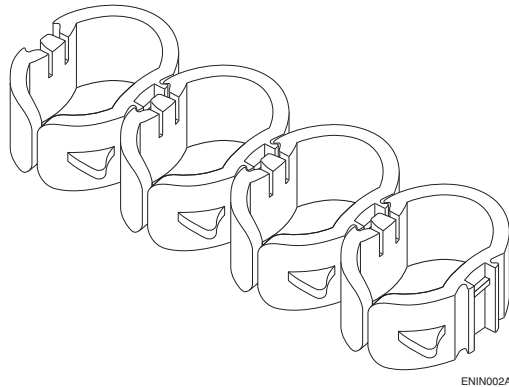
Figure 135: Connecting cable clips



ENIN001A

- 3 Press the clips together until the connectors lock into place (see [Figure 136](#)).

Figure 136: Cable clip chain



- 4 Connect as many cable clips together as you need to manage your cable bundles.
- 5 To disconnect the cable clips, push on the bottom ring while holding the top ring steady.

5

BlackDiamond Maintenance Procedures

14 Replacing the BlackDiamond 12802 PSU/Fan Controller and Fan Tray

This chapter provides important safety information and instructions on how to replace a PSU/fan controller or fan tray in the BlackDiamond 12802 switch.

Each BlackDiamond 12802 switch has one fan tray containing four fans. A PSU/fan controller module in the BlackDiamond 12802 switch collects and reports data from the AC power supply units and the fan tray.

Safety Information

Service to all BlackDiamond equipment should be performed by trained service personnel only. Read all important safety information before installation or removal. See Appendix A for additional information regarding regulatory compliance certifications applicable to a BlackDiamond PSU/fan controller.

Thoroughly review the information about power supplies in [Chapter 6](#) before working with the PSU/fan controller unit.

Pre-installation Requirements

You must have access to the back of the BlackDiamond switch to replace an installed BlackDiamond 12802 fan tray or PSU/fan controller.

Power off the BlackDiamond 12802 switch before you begin to replace the PSU/fan controller.

To replace a BlackDiamond fan tray or PSU/fan controller, you need the following tools and equipment:

- ESD-preventive wrist strap
- #2 Phillips screwdriver
- Replacement BlackDiamond fan tray or PSU/fan controller

Replacing the BlackDiamond 12802 Fan Tray



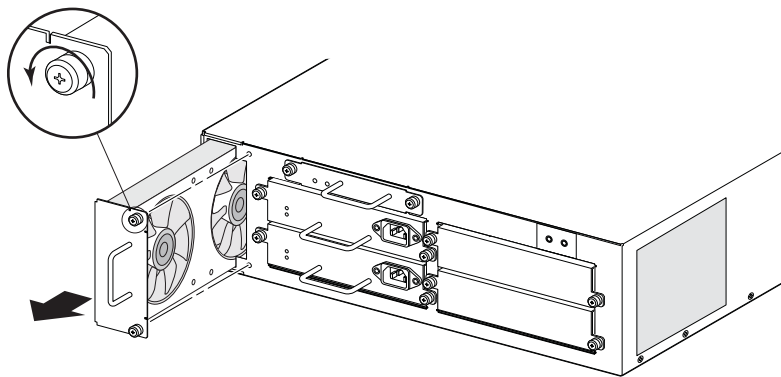
CAUTION

Removing the fan tray for more than a few minutes may result in overheating and possible damage to the system. Thermal sensors shut down power if the internal temperature exceeds 60 °C. Make sure you have the replacement unit before starting this procedure.

To replace the fan tray:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top right corner of the switch.
- 2 Remove the fan tray as follows:
 - a Locate the two captive screws at the top and bottom of the fan tray ([Figure 137](#)).
 - b Using a #2 Phillips screwdriver, turn each captive screw counter-clockwise to loosen the screws (see [Figure 137](#)).

Figure 137: Removing the fan tray from the BlackDiamond 12802 switch



BD_145

- c Use the fan tray handle to pull the fan tray half-way out of the fan tray slot (see [Figure 137](#)). This action disconnects the fan tray from the switch power.

Wait for the fan blades to stop turning before continuing with this procedure.



WARNING!

Be sure that all fan blade motion has ceased before continuing to remove the fan tray.

- d Support the bottom of the fan tray with your free hand as you use the handle to slide the fan tray completely out of the fan tray slot.



CAUTION

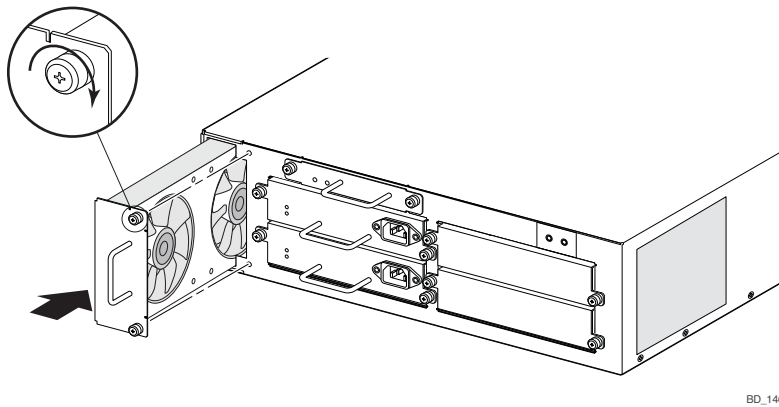
Use both hands to support the weight of the fan tray during removal.

- 3 Install the replacement fan tray as follows:
 - a Support the bottom of the fan tray with your free hand as you lift the fan tray by the handle. Align the fan tray with the fan tray slot on the switch, and then slide the fan tray into place in the switch (see [Figure 138](#)).



CAUTION

Use both hands to support the weight of the fan tray during installation.

Figure 138: Installing the fan tray in the BlackDiamond 12802 switch

BD_146

- b Using a #2 Phillips screwdriver, tighten the captive screws by turning them clockwise (see [Figure 138](#)).

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the switch so that the strap will always be available when you need to handle ESD-sensitive components.

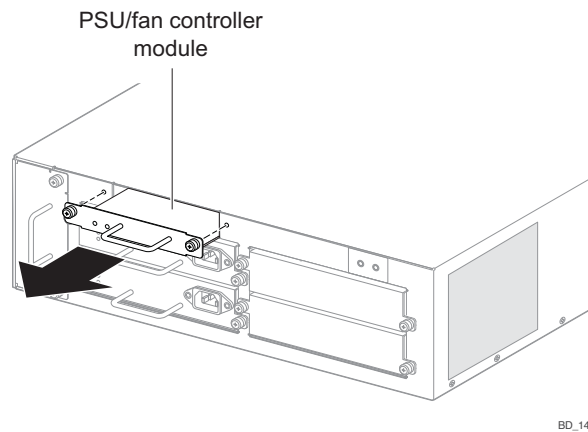
Replacing a BlackDiamond PSU/Fan Controller

**NOTE**

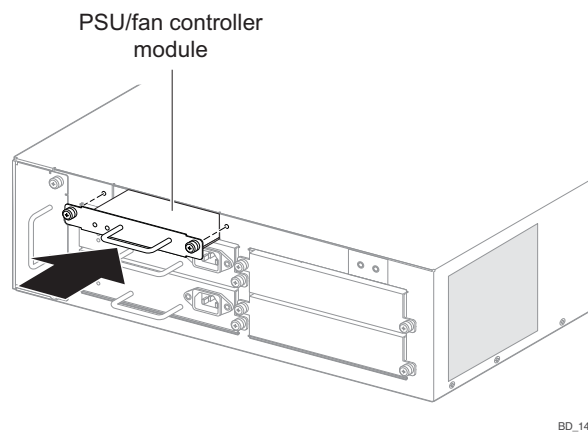
Removing the PSU/fan controller causes the switch to stop operation until the controller is replaced. Be sure to have the replacement controller available before you start the replacement process.

To replace a PSU/fan controller:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the front top-right corner of the switch.
- 2 Power off the switch.
- 3 Remove the installed controller as follows:
 - a Using a #2 Phillips screwdriver, turn the captive retaining screws counter-clockwise to loosen them completely.
 - b Use the handle to pull the controller out of the BlackDiamond 12802 chassis ([Figure 139](#)). Set the controller on an ESD-preventive surface.

Figure 139: Removing a PSU/fan controller

- 4 Install the replacement controller as follows:
 - a Remove the replacement PSU/fan controller from its antistatic packaging.
 - b Insert the replacement controller into the controller slot on the BlackDiamond 12802 chassis (Figure 140).
 - c Align and tighten the captive retaining screws.

Figure 140: Installing a PSU/fan controller

- 5 Power on the switch.

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the switch so that it will always be available when you need to handle ESD-sensitive components.

15

Replacing a BlackDiamond 8800 Series/ BlackDiamond 12804 PSU/Fan Controller

This chapter describes important safety information as well as instructions on how to remove and replace an Extreme Networks BlackDiamond 8800/12804 PSU/fan controller from the following BlackDiamond switches:

- Extreme Networks BlackDiamond 8800 series of switches
- Extreme Networks BlackDiamond 12804 switch

Each of these BlackDiamond switches contains two PSU/fan controllers that collect and report data from the Extreme Networks AC power supply units and the BlackDiamond fan tray.

The BlackDiamond 8800/12804 PSU/fan controllers intervene in the event of power inconsistencies and provide primary/backup redundancy should a BlackDiamond 8800/12804 PSU/fan controller fail.

**NOTE**

The BlackDiamond 8810 uses the same PSU/fan controller as the BlackDiamond 8806 and BlackDiamond 12804, but the BlackDiamond 8810 uses a different fan tray.

This chapter includes the following sections:

- [Pre-Installation Requirements on page 213](#)
- [Removing a BlackDiamond 8800/12804 PSU/Fan Controller on page 213](#)
- [Installing a BlackDiamond 8800/12804 Spare PSU/Fan Controller on page 216](#)

Pre-Installation Requirements

Make sure that you have access to the back of the switch. You will need the following tools and equipment to replace a BlackDiamond 8800/12804 PSU/fan controller:

- ESD-preventive wrist strap
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- BlackDiamond 8800/12804 spare PSU/fan controller

Removing a BlackDiamond 8800/12804 PSU/Fan Controller

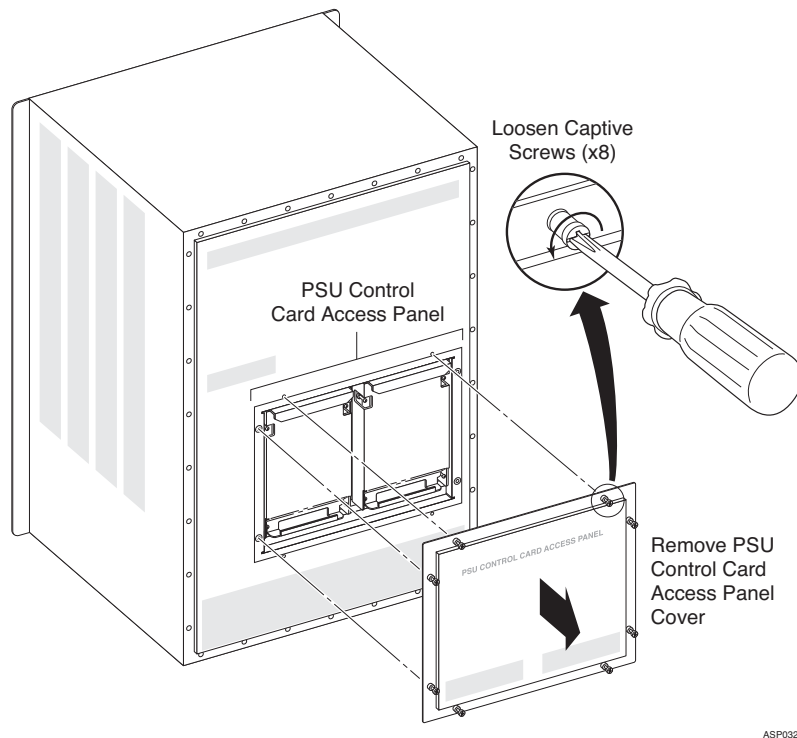
**NOTE**

Beginning with ExtremeXOS version 11.2.1.3, you can hot swap the PSU/fan controller unit. Refer to the ExtremeXOS 12.0 Concepts Guide for complete information about upgrading software.

To remove a BlackDiamond 8800/12804 PSU/fan controller from the BlackDiamond 8800/12804 switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle that is located on the front top-left corner of the switch.
- 2 Locate the eight captive screws on the PSU control card access panel cover located on the back side of the BlackDiamond 8800/12804 switch as shown in [Figure 141](#).

Figure 141: Eight captive screws on the PSU control card access panel cover

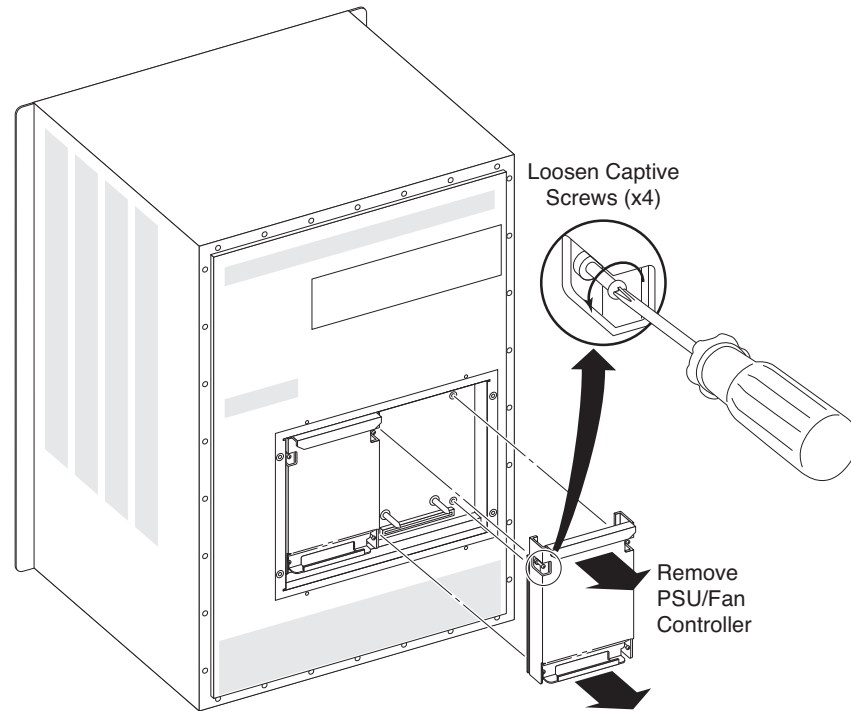


ASP032B

- 3 Turn each captive screw counter-clockwise, using a #2 Phillips screwdriver, to loosen all eight captive screws on the PSU control card access panel cover also shown in [Figure 141](#).
- 4 Pull the cover off of the PSU control card access panel on the switch.

- 5 Locate the four captive screws on the PSU/fan controller behind the access panel as shown in [Figure 142](#). The figure illustrates a BlackDiamond 8810, but the same method also applies to the BlackDiamond 8806 and BlackDiamond 12804.

Figure 142: Four captive screws on the BlackDiamond 8800/12804 PSU/fan controller



ASP033B

- 6 Turn each captive screw counter-clockwise, using a #1 Phillips screwdriver, to loosen all four captive screws on the PSU/fan controller also shown in [Figure 142](#).
- 7 Pull the PSU/fan controller out from the PSU control card access panel on the switch, by pulling equally on the upper and lower handles.

Leave the ESD-preventive wrist strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Installing a BlackDiamond 8800/12804 Spare PSU/Fan Controller



NOTE

Beginning with ExtremeXOS version 11.2.1.3, you can hot swap the PSU/fan controller unit. Refer to the ExtremeXOS 12.0 Concepts Guide for complete information on upgrading software.

To install a replacement BlackDiamond 8800/12804 PSU/fan controller into the BlackDiamond 8800/12804 switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle that is located on the front top-left corner of the switch.
- 2 Align the guide pins in the empty PSU control card access panel with the holes on the BlackDiamond 8800/12804 spare PSU/fan controller.
- 3 Push the BlackDiamond 8800/12804 spare PSU/fan controller into the empty PSU control card access panel until the four captive screws on the spare PSU/fan controller are in alignment.
- 4 Turn each captive screw clockwise, using a #1 Phillips screwdriver, to tighten all four captive screws on the spare PSU/fan controller.
- 5 Align the guide pins on the PSU control card access panel cover with the holes on the PSU control card access panel.
- 6 Push the PSU control card access panel cover over the PSU control card access panel until the eight captive screws on the PSU control card access panel cover are in alignment.
- 7 Turn each captive screw clockwise, using a #2 Phillips screwdriver, to tighten all eight captive screws on the PSU control card access panel cover.

Leave the ESD-preventive wrist strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Replacing a BlackDiamond 12804 or 8800 Series Fan Tray

This chapter describes how to remove and replace a fan tray in the following BlackDiamond switches:

- BlackDiamond 8810 switch
- BlackDiamond 8806 switch
- BlackDiamond 12804 switch

This chapter includes the following sections:

- [Pre-Installation Requirements on page 217](#)
- [Removing the Fan Tray on page 217](#)
- [Installing the BlackDiamond 8810 Spare Fan Tray on page 219](#)

Pre-Installation Requirements

You need the following tools and equipment to remove and replace a fan tray in a BlackDiamond 12804 or 8800 series switch:

- ESD-preventive wrist strap
- #2 Phillips screwdriver
- BlackDiamond spare fan tray



NOTE

To avoid long periods of operation without forced air cooling, make sure you have the replacement fan tray ready before you start the replacement procedure.

Removing the Fan Tray

To remove a fan tray from the BlackDiamond 12804 or 8800 series switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-left corner of the switch chassis.
- 2 Locate the captive screws at the top and bottom of the fan tray.
- 3 Using a #2 Phillips screwdriver, turn each captive screw counter-clockwise to loosen the screws as shown in [Figure 143](#) and [Figure 144](#).

Figure 143: Removing the fan tray from the BlackDiamond 8810 switch

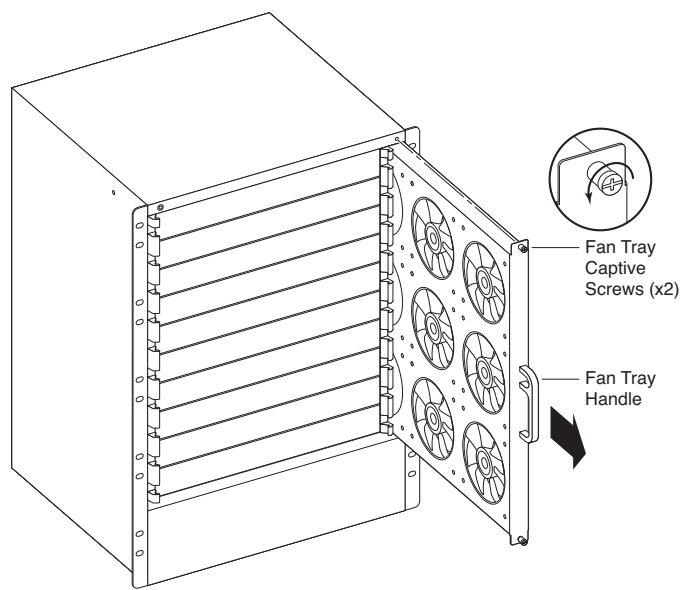
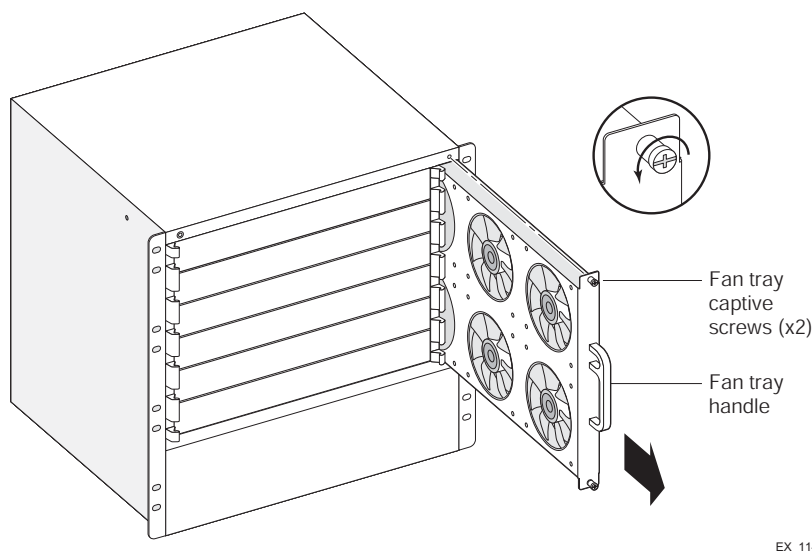


Figure 144: Removing the fan tray from the BlackDiamond 8806/12804 switch



- 4 Use the fan tray handle to pull the fan tray half-way out from the fan tray slot. This action disconnects the fan tray from the switch power.

Wait for the fan blades to stop turning before continuing with this procedure.



WARNING!

Be sure that all fan blade motion has ceased before continuing to remove the fan tray.

- 5 Support the bottom of the fan tray with your free hand as you use the handle to slide the fan tray completely out from the fan tray slot.

**CAUTION**

Be sure that both hands are used to support the weight of the fan tray during removal.

**NOTE**

Leave the ESD-preventive wrist strap permanently connected to the switch so that it is always available when you need to touch ESD-sensitive components.

Installing the BlackDiamond 8810 Spare Fan Tray

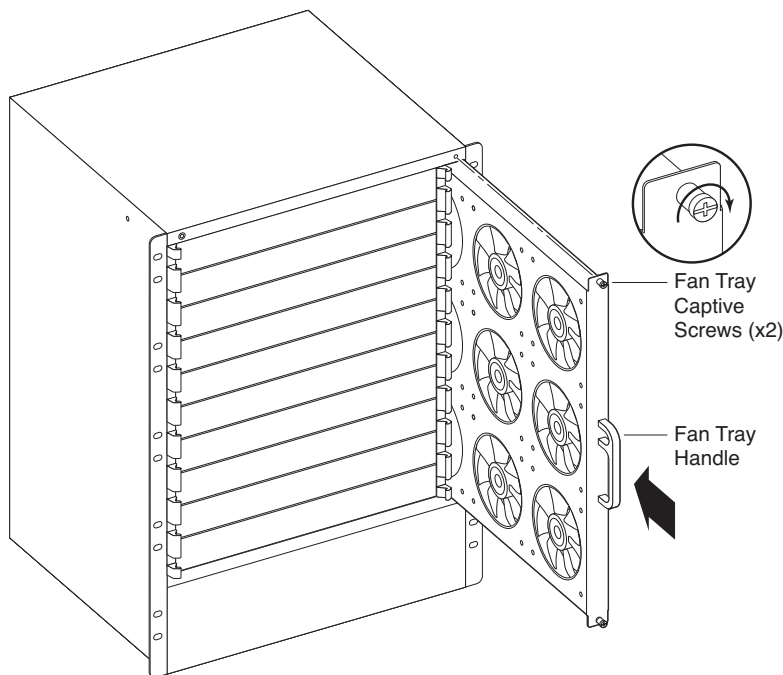
To install a replacement fan tray into the BlackDiamond 8810 switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top left corner of the switch.
- 2 Support the bottom of the fan tray with one hand as you lift the fan tray by the handle using the other hand. Align the spare fan tray with the fan tray slot on the switch, and then slide the fan tray into place in the switch (see [Figure 145](#) and [Figure 146](#)).

**CAUTION**

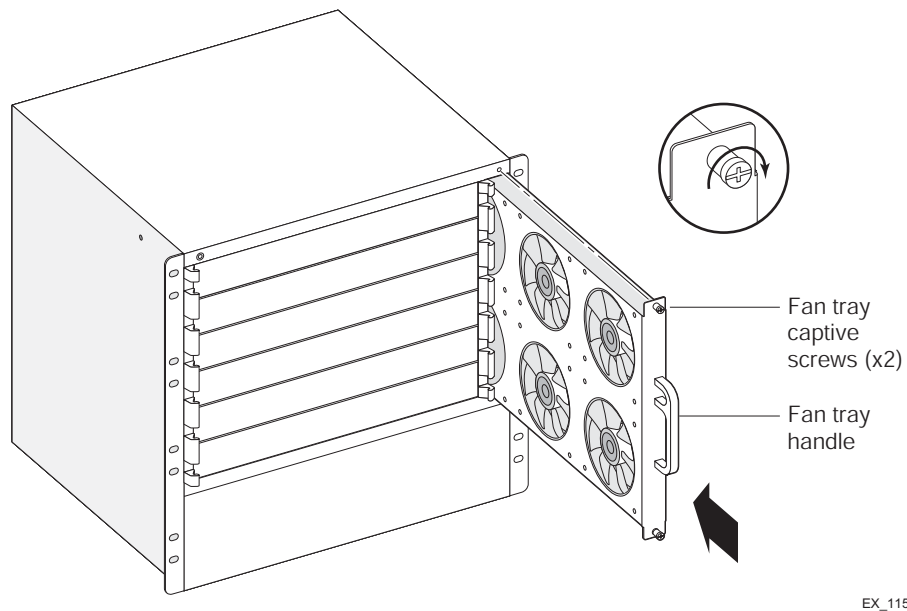
Be sure that both hands are used to support the weight of the fan tray during installation.

Figure 145: Installing the fan tray in the BlackDiamond 8810 switch



ASP030A

Figure 146: Installing the fan tray in the BlackDiamond 8806/12804 switch



- 3 Use a #2 Phillips screwdriver to turn each captive screw clockwise to tighten the screws ([Figure 145](#)).

Leave the ESD-preventive wrist strap permanently connected to the switch so that it is always available when you need to touch ESD-sensitive components.

17 Replacing the BlackDiamond 10808 Switch Fan Tray, Air Filter, and Power Supply Controller

This chapter provides instructions for replacing the following components in the BlackDiamond 12808 switch and includes the following sections:

- [Replacing a BlackDiamond 10808 Switch Fan Tray on page 221](#)
- [Replacing the BlackDiamond 10808 Air Filter on page 223](#)
- [Replacing the BlackDiamond 10808 Power Supply Controller on page 224](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove any BlackDiamond 10808 series component.

Replacing a BlackDiamond 10808 Switch Fan Tray



CAUTION

Do not cover or obstruct the fan ventilation holes at the rear of the unit. Doing so can result in overheating and possible damage to the BlackDiamond 10808 switch. Thermal sensors will shut down the BlackDiamond 10808 switch if the internal temperature exceeds 60 degrees Celsius.

BlackDiamond 10808 fan trays are hot-swappable. You do not need to turn off power to the BlackDiamond 10808 switch to remove a fan tray.

You need the following tools and equipment to replace a fan tray:

- ESD-preventive wrist strap
- # 2 Phillips screwdriver



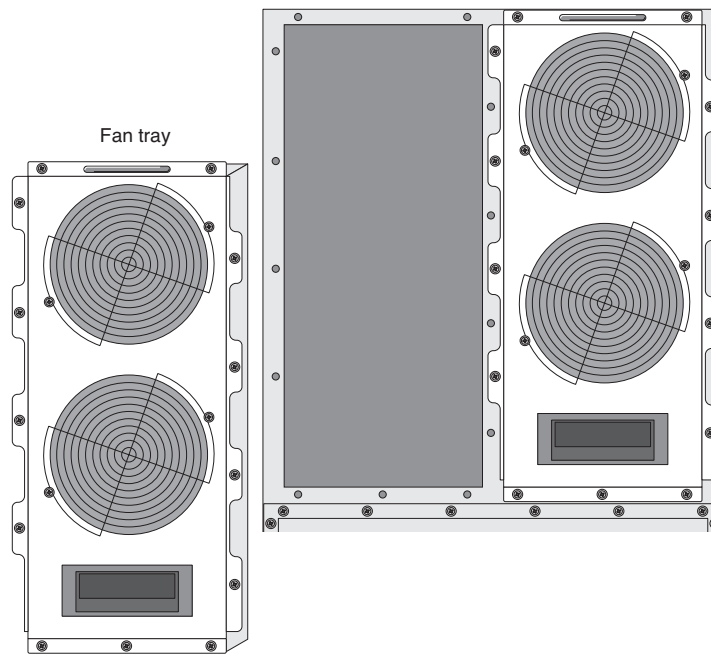
CAUTION

Service to all equipment should be performed by trained and qualified service personnel only. Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must read the safety information provided in [Appendix A](#) of this guide.

Removing the Fan Tray

To remove the fan tray from the BlackDiamond 10808 switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
- 2 Unscrew the two captive screws that secure the fan tray to the chassis
- 3 Use the finger grips to pull the fan tray out of the chassis approximately 1 inch (2.54 cm); this step disconnects the power and causes the fans to stop rotating.

Figure 147: BlackDiamond 10808 series fan tray

EX_012

- 4 Allow the fan blades to stop spinning completely and remove the fan tray from its slot.

**CAUTION**

Keep your hands away from rotating fan blades.

- 5 Place one hand under the fan tray for support and use the other hand to pull the fan tray from its slot.

Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to touch ESD-sensitive components.

Installing the Replacement Fan Tray

To install the fan tray in the BlackDiamond 10808 switch:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top-left corner of the switch front panel.
- 2 Check the connectors on the switch fan tray for dust and packing materials.
- 3 Support the fan tray with one hand under the tray as you guide the fan tray into the slot. Insert the fan tray all the way into the slot.

**NOTE**

If the chassis is powered on, the fan blades will begin turning as soon as the tray makes contact with the backplane.

- 4 Tighten the captive retaining screws to secure the fan tray to the chassis.

Leave the ESD-preventive wrist strap permanently connected to the chassis so that it is always available when you need to handle ESD-sensitive components.

Replacing the BlackDiamond 10808 Air Filter

This section describes how to replace the BlackDiamond 10808 series air filter.

You need the following tools and equipment to install an air filter:

- #2 Phillips screwdriver
- Replacement filter



NOTE

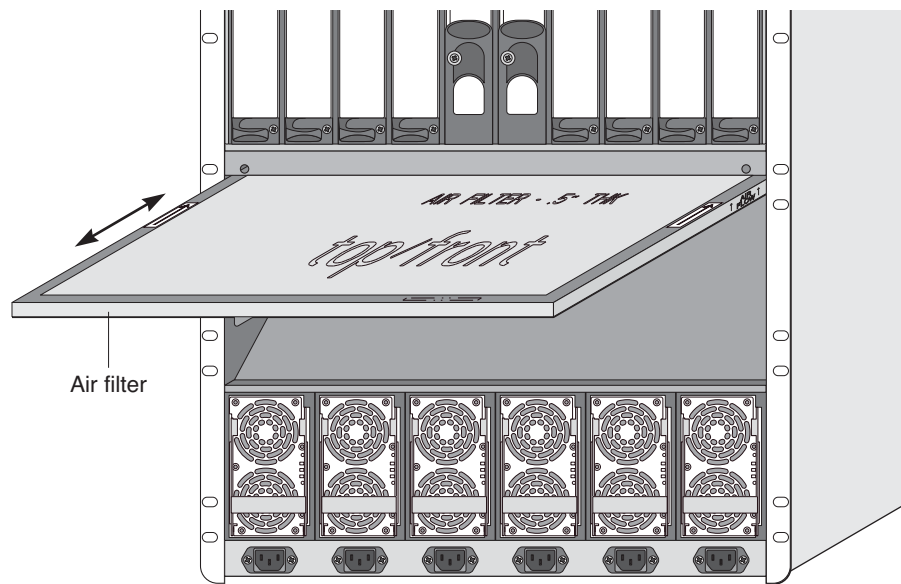
Extreme Networks recommends that you visually inspect the air filter at least once every three months. Replace or clean as necessary.

To replace the filter in the BlackDiamond 10808 switch:

- 1 Remove the bezel from the front of the chassis using a #2 Phillips screwdriver.
- 2 Slide the old filter out from the chassis.
- 3 Slide a new filter into the chassis.

Use the directional arrows on the top side of the filter to verify that the filter is facing the correct way, as shown in [Figure 148](#).

Figure 148: BlackDiamond 10808 series air filter



EX_081

Replacing the BlackDiamond 10808 Power Supply Controller

Two power supply controllers installed in the BlackDiamond 10808 switch provide primary/backup redundancy in case one of the controllers fails or is removed. At least one power supply controller must be installed at all times.

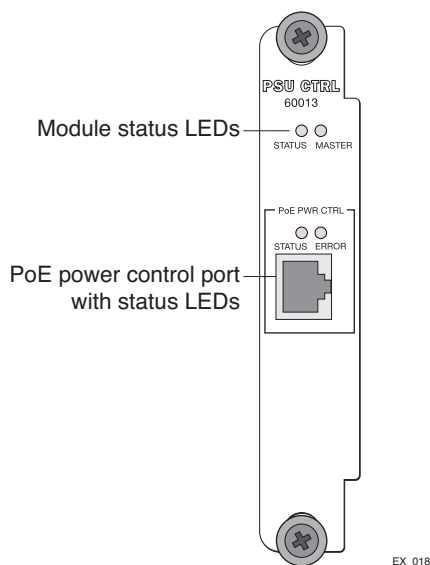


CAUTION

Do not reach into the power supply controller access area when power is on.

Figure 149 shows the front panel of the power supply controller.

Figure 149: Power supply controller front panel



NOTE

The RJ-45 port on the power supply controller is not an Ethernet port and no connection should be made to it.

The front panel of the power supply controller has status LEDs. [Table 26](#) describes the LED behavior on the power supply controller.

Table 26: Power supply controller LEDs

LED	Color	Indicates
STATUS	Amber	Diagnostics in progress.
	Green	Normal operation.
MASTER	Blinking Green	Unit is primary.
	Off	Unit is backup.
PoE PWR CTRL STATUS	Green	Link idle.
	Amber	Link busy.
PoE PWR CTRL ERROR	Off	No errors detected.
	Amber	Errors detected.

Pre-Installation Requirements

You need the following tools and equipment to install or remove the power supply controller:

- ESD-preventive wrist strap
- # 2 Phillips screwdriver
- Power supply controller
- BlackDiamond 10808 switch

Removing a Power Supply Controller



NOTE

The power supply controllers are hot-swappable. You do not need to turn off power to a BlackDiamond 10808 switch to remove and replace a power supply controller.



CAUTION

If you are replacing both power supply controllers, remove and replace the controllers one at a time. After the first controller is removed and replaced, wait for the Status LED to light solid green, indicating normal operation, before you replace the second controller. DO NOT remove both power controllers simultaneously; doing so will cause the entire system to power down.

To replace a power supply controller:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end of the strap to the ground receptacle on the top left corner of the BlackDiamond chassis front panel.
- 2 If a blank faceplate is covering the power supply controller bay, remove it and save it for future use.
- 3 Using a #2 Phillips screwdriver, loosen the captive retaining screws on the power supply controller.
- 4 Remove the power supply controller from the slot.

Installing a Power Supply Controller



NOTE

The power supply controllers are hot-swappable. You do not need to turn off power to a BlackDiamond 10808 switch to install a power supply controller.

To install a power supply controller:

- 1 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the ground receptacle on the top left corner of the BlackDiamond chassis front panel.
- 2 If a blank faceplate is covering the power supply controller bay, remove it and save it for future use.
- 3 Verify that the power supply controller is right side up.
- 4 Slide the power supply controller into the slot, aligning the notch on the top of the slot with the power supply controller.
- 5 Tighten the captive thumbscrews to secure the power supply controller into the slot.

Verifying a Successful Installation

After you supply power to the switch, the switch performs a power-on self test (POST).

During the power-on self test:

- All ports are temporarily disabled.
- The packet LED is off.
- The power LED is on.
- The MGMT LED flashes until the switch successfully passes the POST.

If the switch passes the POST, the MGMT LED blinks at a slow rate (one blink per second). If the switch fails the POST, the MGMT LED shows a solid yellow light.

18 Repacking a BlackDiamond Chassis

This chapter describes how to remove a BlackDiamond chassis from an equipment rack and repack the chassis for shipping back to Extreme Networks. To repack a BlackDiamond chassis, use the original shipping crate or box and packing materials.

This chapter includes the following sections:

- [Safety Information on page 227](#)
- [Repacking the BlackDiamond 8810 Chassis on page 228](#)
- [Repacking the BlackDiamond 8806/12804 Chassis on page 231](#)
- [Repacking the BlackDiamond 12802 Chassis on page 234](#)
- [Repacking the BlackDiamond 10808 Chassis on page 235](#)



NOTE

Read the information in this chapter thoroughly before you attempt to remove a BlackDiamond chassis.

Safety Information



CAUTION

Correct lifting procedures for a BlackDiamond chassis require two or more people.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



NOTE

See [Appendix A, “Safety Information”](#) for additional safety information and [Appendix B, “Technical Specifications”](#) for additional information regarding regulatory compliance certifications.



CAUTION

A BlackDiamond chassis should be empty before being lifted. This will also prevent damage to the system components due to possible system chassis flex when lifting.

Repacking the BlackDiamond 8810 Chassis

To repack the BlackDiamond 8810 chassis:

- 1 Remove all modules and power supplies from the chassis. Follow correct Extreme Networks procedures for removing components.
- 2 Using four mounting screws, attach the helper bracket to the system rack immediately below the chassis.
- 3 Remove the eight mounting screws that secure the chassis to the system rack.
- 4 On each side of the chassis, place one hand in the empty power supply bay and the other hand in the rear slot on the back panel of the chassis (see [Figure 150](#)).

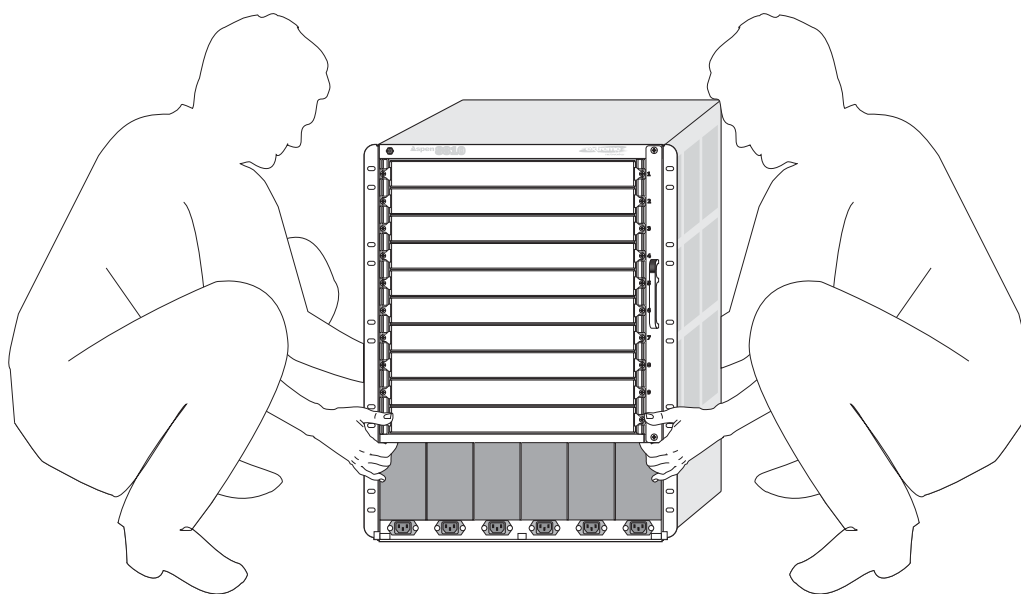


CAUTION

Do not use the fan tray handle to lift or maneuver the BlackDiamond 8810 chassis. This handle is not designed to support the weight of the chassis.

- 5 Slowly guide the chassis out of the system rack using the helper bracket for support.
- 6 Carefully lift the chassis off the helper bracket and lower it onto wood pallet as shown in [Figure 150](#).

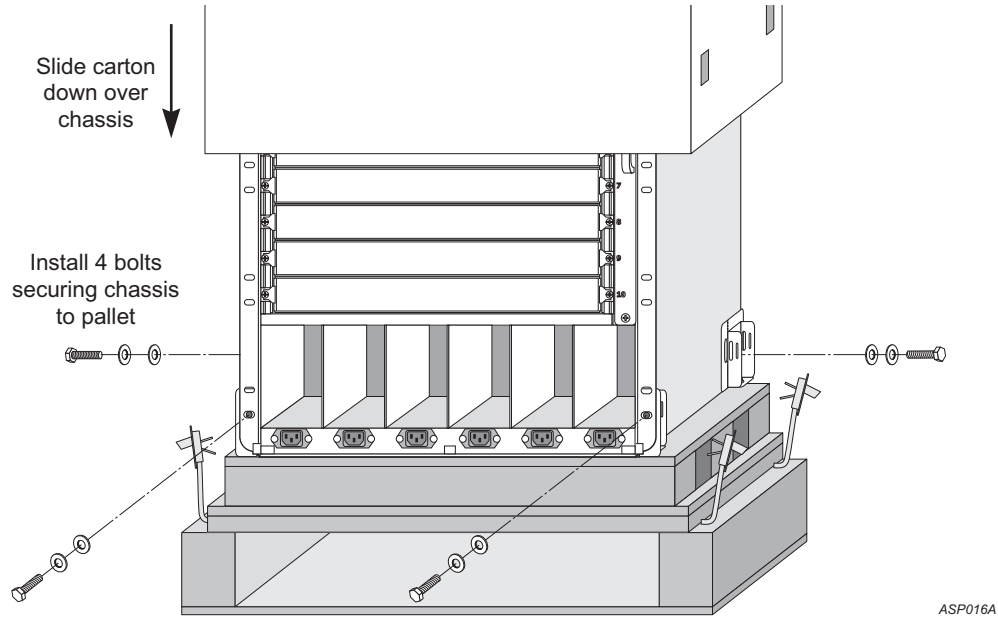
Figure 150: Correct method for lifting the BlackDiamond 8810 chassis



ASP017A

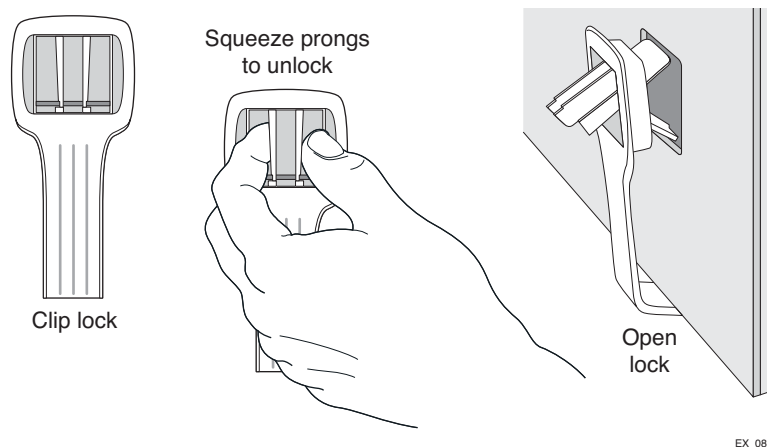
- 7 Attach all four restraining bolts to the four shipping brackets, securing the BlackDiamond 8810 chassis to the shipping pallet (see [Figure 151](#)).

Figure 151: Recrating the BlackDiamond 8810 chassis



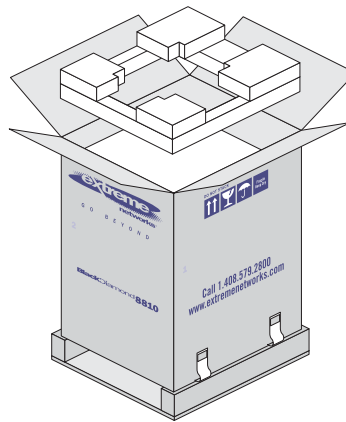
- 8 Slide the BlackDiamond 8810 shipping carton down over the BlackDiamond 8810 chassis.
- 9 Insert the clip locks as shown in [Figure 152](#).
 - a Place your thumb and index finger inside the clip lock touching the prongs.
 - b Squeeze the prongs inward applying equal pressure on each side.
 - c Push the prongs inward until the clip lock is secured to the carton.
 - d Repeat steps 8a through 8c to insert each of the remaining clip locks.

Figure 152: Clip locks located on BlackDiamond 8810 shipping carton



10 Place the packing foam on top of the BlackDiamond 8810 chassis as shown in [Figure 153](#).

Figure 153: Placing packing foam into the BlackDiamond 8810 shipping carton

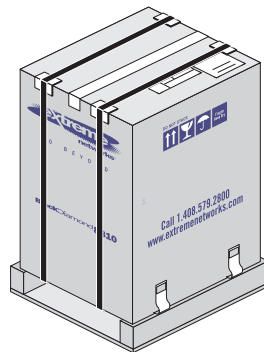


ASP024A

11 Close the top flaps on the shipping carton and seal them with packing tape.

12 Secure the BlackDiamond 8810 shipping carton with nylon straps as shown in [Figure 154](#).

Figure 154: BlackDiamond 8810 shipping carton with nylon straps



ASP026

Repacking the BlackDiamond 8806/12804 Chassis

To repack the BlackDiamond 8806/12804 chassis:

- 1 Remove all modules and power supplies from the BlackDiamond 8806/12804 chassis. Follow correct Extreme Networks procedures for removing components.
- 2 Using four rack mounting screws, attach the 19-inch helper bracket to the system rack immediately below the chassis.
- 3 Remove the eight rack mounting screws that secure the chassis to the system rack.
- 4 On each side of the chassis, place one hand in the empty power supply bay and the other hand in the rear slot on the back panel of the chassis.

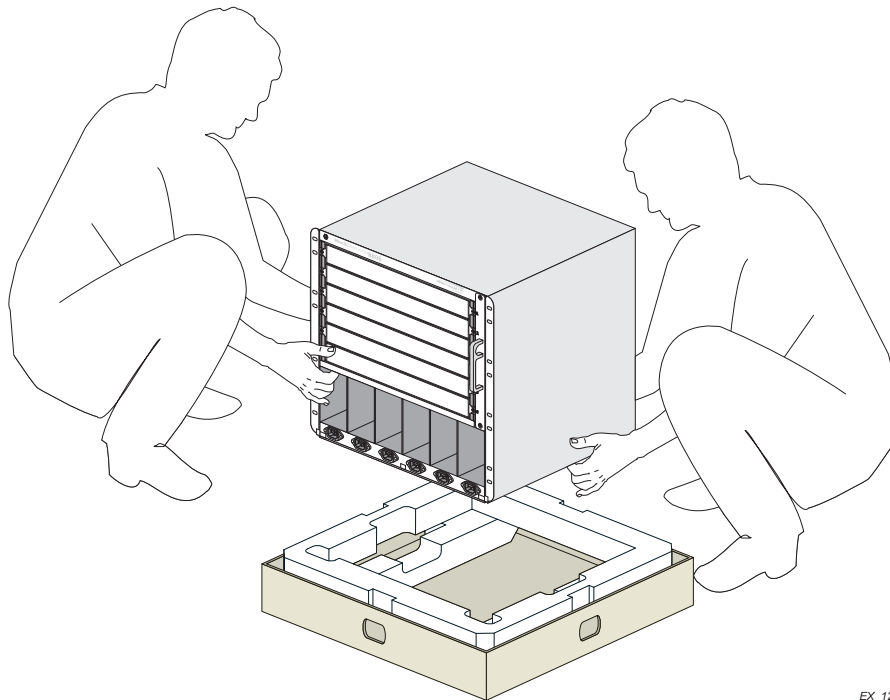


CAUTION

Do not use the fan tray handle to lift or maneuver the BlackDiamond 8806/12804 chassis. This handle is not designed to support the weight of the chassis.

- 5 Slowly guide the chassis out of the system rack using the helper bracket for support.
- 6 Carefully lift the chassis off the helper bracket and lower it onto the foam cushion in the shipping carton base (see [Figure 155](#).)

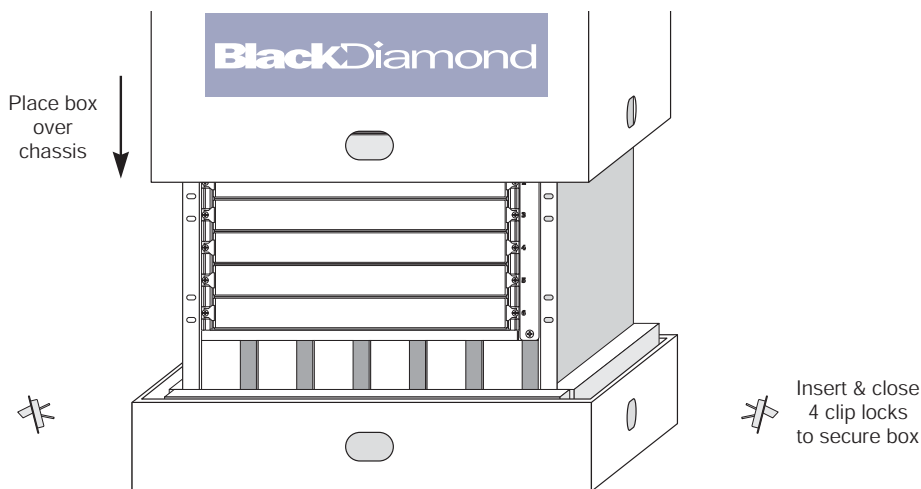
Figure 155: Setting the BlackDiamond 8806/12804 chassis onto the foam cushion



EX_129

- 7 Slide the top of the BlackDiamond shipping carton down and over the BlackDiamond 8806/12804 chassis (see [Figure 156](#)).

Figure 156: Replacing the carton over the BlackDiamond 8806/12804 chassis



EX_121

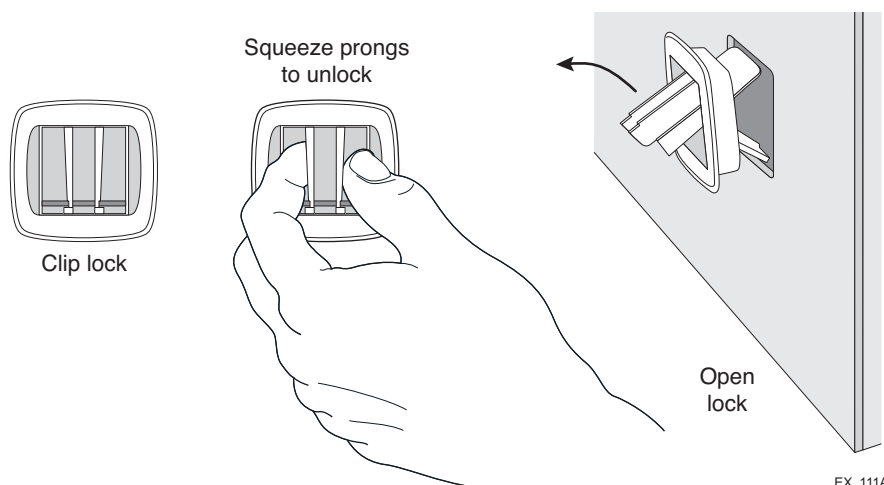
- 8 Insert the clip locks (see [Figure 157](#)).
 - a Place your thumb and index finger inside the clip lock touching the prongs.
 - b Squeeze the prongs inward, applying equal pressure on each side.
 - c Push the prongs inward until the clip lock is secured onto the carton.Repeat steps 8a through 8c to insert each of the remaining clip locks.



CAUTION

Proper installation of the clip locks is critical for safe shipment of the BlackDiamond 8806/12804 chassis. Make sure that the clip locks are secure and accurately installed.

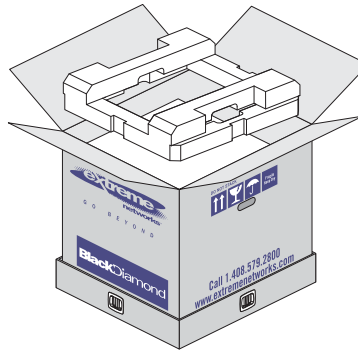
Figure 157: Clip locks on the BlackDiamond 8806/12804 chassis shipping carton



EX_111A

- 9 Place the packing foam material on top of the chassis as shown in [Figure 158](#).

Figure 158: Placing packing foam into the BlackDiamond 8806/12804 chassis shipping carton



EX_110B

- 10 Close the top flaps on the shipping carton and seal them with packing tape.
 11 Secure the shipping carton with nylon straps (see [Figure 159](#)).



NOTE

Nylon straps are optional but are recommended by Extreme Networks for extra security during shipment. The installation of nylon straps requires a crimping tool. If you do not have nylon straps and a crimping tool available to secure the carton, the chassis can be shipped without the straps; however, it is critical that the clip locks be secure before shipment.

Figure 159: Sealed BlackDiamond 8806/12804 chassis shipping carton with nylon straps



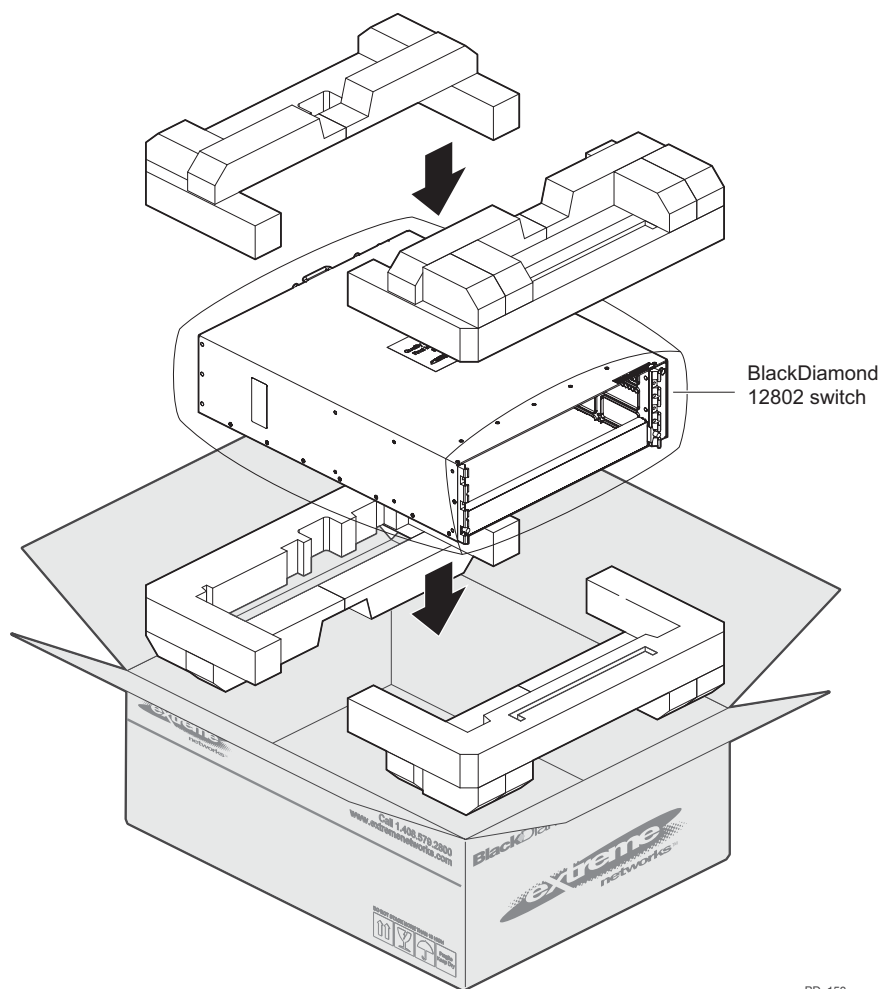
EX_113

Repacking the BlackDiamond 12802 Chassis

To repack the BlackDiamond 12802 chassis for return to Extreme Networks:

- 1 Prepare the shipping box. Remove saved packing materials except the lower foam cushion, which should be in the bottom of the box.
- 2 Remove all modules and power supplies from the chassis. Follow correct Extreme Networks procedures for removing components from the BlackDiamond chassis.
- 3 Remove the chassis from the equipment rack as follows:
 - a Loosen and remove the eight mounting screws holding the chassis to the rack.
 - b Guide the chassis out of the rack and set it on a secure, flat surface.
- 4 Remove the rack-mounting brackets.
- 5 Place the chassis into the shipping bag.
- 6 Carefully set the chassis onto the foam cushion in the bottom of the shipping carton (see [Figure 160](#).)

Figure 160: Packing the BlackDiamond 12802 chassis for shipping



BD_150

- 7 Set the top foam cushion in place over the chassis (see [Figure 160](#)).
- 8 Close the top flaps and seal them securely with packing tape.

Repacking the BlackDiamond 10808 Chassis

To repack the BlackDiamond 10808 chassis for return to Extreme Networks, you must recreate it using the original packaging materials.

**NOTE**

Contact Extreme Networks Customer Support for instructions on returning the chassis.

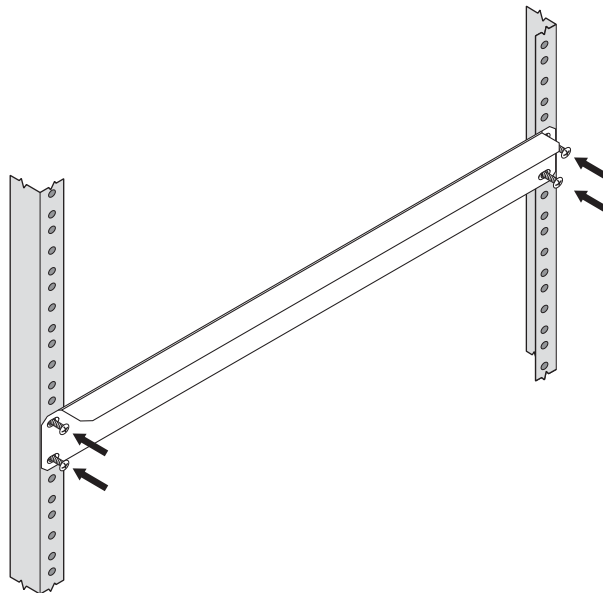
**CAUTION**

The BlackDiamond 10808 chassis weighs more than 100 lb (45 kg). Correct lifting procedures for the chassis require two people.

To recreate the chassis:

- 1 Mount the helper bracket in the rack using four appropriate screws (not provided) (see [Figure 161](#)).

Figure 161: Helper bracket for the BlackDiamond 10800 series chassis

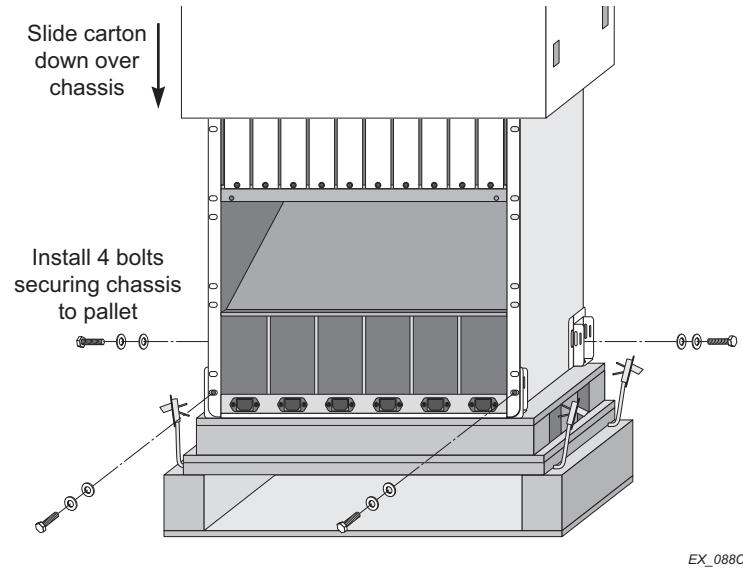


EX_086A

- 2 With one person on each side of the chassis, remove the chassis from the rack and place it onto the pallet.

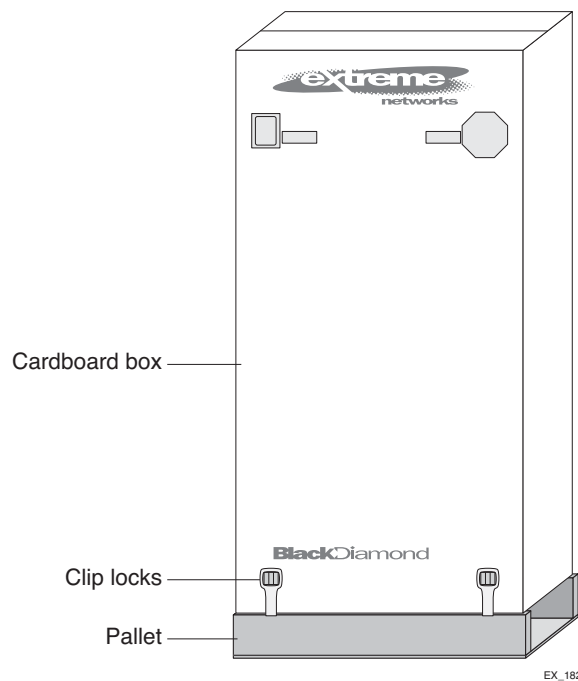
- 3 Attach all four restraining bolts to the four shipping brackets to secure the BlackDiamond 10808 chassis to the shipping pallet (see [Figure 162](#)).
- 4 Slide the carton down over the chassis (see [Figure 162](#)).

Figure 162: Securing the BlackDiamond 10808 series chassis to the shipping pallet



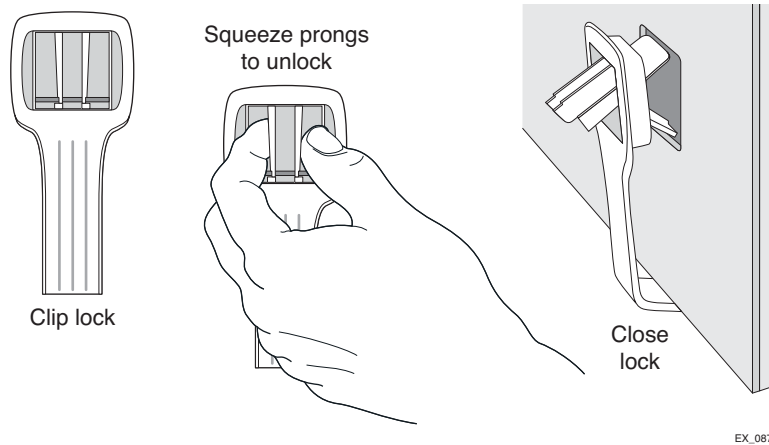
- 5 Engage the four plastic clip locks near the bottom of the shipping carton (see [Figure 163](#)). Two clip locks are located on opposite sides of the carton.

Figure 163: Location of clip locks



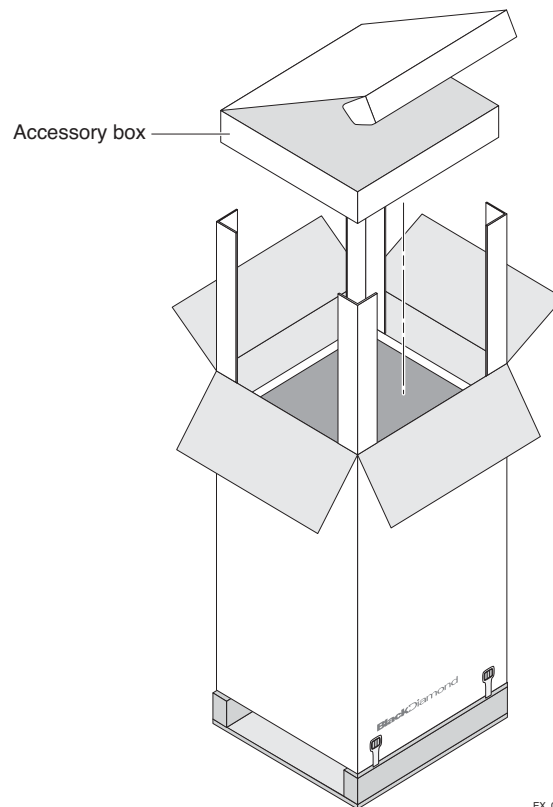
- a Place your thumb and index finger inside the clip lock adjacent to the two vertical prongs (see [Figure 164](#)).
 - b Press the prongs inward, applying equal pressure on each side.
 - c Press the prongs into the carton until the clip clicks into place.
- Repeat steps 5a through 5c to engage each of the remaining three clip locks.

Figure 164: Installing the clip locks



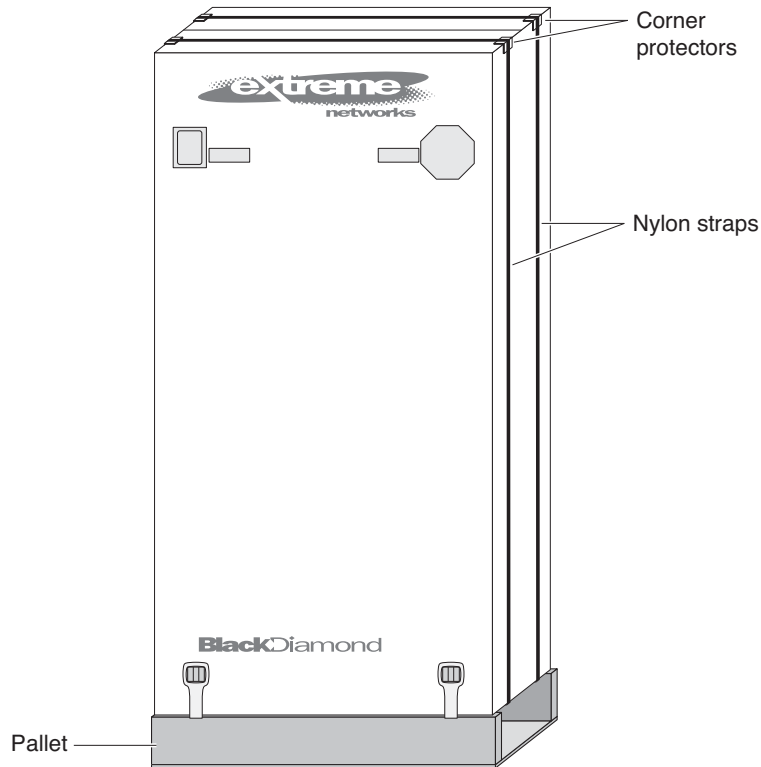
- 6 Insert the four v-boards in the corners of the crate (see [Figure 165](#)).

Figure 165: Inserting the v-boards



- 7 Close the crate flaps and seal them with packing tape.
- 8 Place four plastic corner protectors on top of the shipping crate and secure the crate to the pallet by using two nylon straps as shown in [Figure 166](#).

Figure 166: Nylon strap location



CAUTION

Do not overtighten the nylon straps. Tighten them securely, but not enough to crush the corners of the shipping crate.

6

Summit Family of Switches

19 Summit Family of Switches

This chapter describes the Summit family of switches. The chapter includes the following sections:

- [Overview of the Summit Switches on page 241](#)
- [Summit X250e Series Switches on page 242](#)
- [Summit X250e Series Switch LEDs on page 250](#)
- [Summit X450 Series Switches on page 252](#)
- [Summit X450a Series Switches on page 256](#)
- [Summit X450e Series Switches on page 270](#)
- [Summit X450, X450a, and X450e Series Switch LEDs on page 276](#)

Overview of the Summit Switches

The Summit X250e series switches provide fast Ethernet connectivity both with PoE and without PoE. These compact switches include high-density 10/100BASE-T ports, combination 1-gigabit copper/fiber Ethernet ports, and high-speed stacking ports for combining multiple units into a single SummitStack™ management entity.

The Summit X450 switches include three series of switches. These switches provide high-density 10/100/1000BASE-T ports, combination copper/fiber Ethernet ports, optional pluggable 10-gigabit uplink ports, and high-speed stacking ports for combining multiple units into a single SummitStack management entity.

[Table 27](#) shows the models in each Summit series in the Summit family of switches.

Table 27: Summit switches

Summit X250e Series Switches	Summit X450 Series Switches	Summit X450a Series Switches	Summit X450e Series Switches
Summit X250e-24t	Summit X450-24t	Summit X450a-24t	Summit X450e-24p
Summit X250e-24p	Summit X450-24x	Summit X450a-24tDC	Summit X450e-48p
Summit X250e-48t		Summit X450a-48t	
Summit X250e-48p		Summit X450a-24x	
		Summit X450a-24xDC	

Refer to the following sections for specific hardware details about each series:

- [Summit X250e Series Switches on page 242](#)
- [Summit X450 Series Switches on page 252](#)
- [Summit X450a Series Switches on page 256](#)
- [Summit X450e Series Switches on page 270](#)

**NOTE**

See the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide* for feature-specific information about the Summit switches and for information regarding switch configuration.

**NOTE**

Switch certifications, safety labels, and serial numbers are located on the bottom of each unit.

Summit X250e Series Switches

The Summit X250e series switches include the following switches:

- [Summit X250e-24t Switch](#)
- [Summit X250e-24p Switch](#)
- [Summit X250e-48t Switch](#)
- [Summit X250e-48p Switch](#)

Summit X250e-24t Switch

The Summit X250e-24t switch is a compact unit 1.75 inches high (1 U) that includes the following:

- Twenty-four fixed 10/100BASE-T ports (ports 1–24) that deliver high-density copper connectivity for 2.4 Gbps
- Two combination ports (ports 25–26) that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity

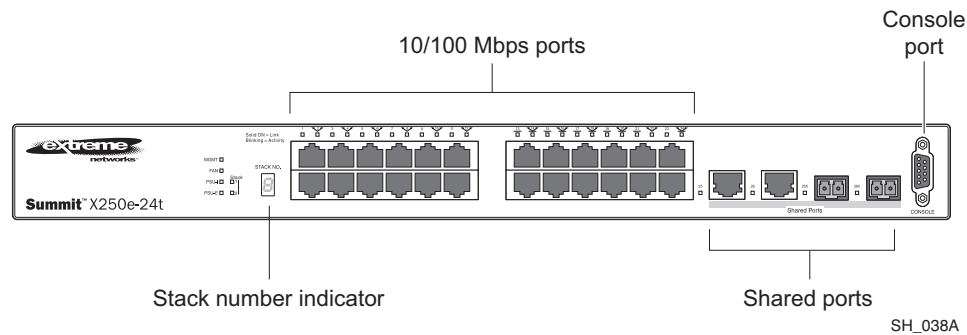
**NOTE**

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-160 External Power Module. When this power supply is used with the Summit X250-24t switch, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X250e-24t Switch Front Panel

[Figure 167](#) shows the front panel of the Summit X250e-24t switch.

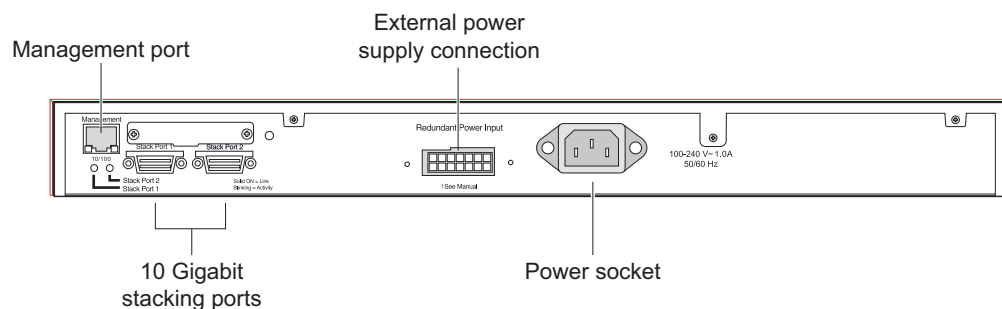
Figure 167: Summit X250e-24t switch front panel

The front panel on the Summit X250e-24t switch includes:

- LEDs—For a description of the LEDs and their operation, see [“Summit X250e Series Switch LEDs” on page 250](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- 10/100BASE-T Ethernet ports—Twenty-four 10/100BASE-T Ethernet ports that deliver high-density copper connectivity.
- Combination ports—Two combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X250e-24t Switch Rear Panel

[Figure 168](#) shows the rear panel of the Summit X250e-24t switch.

Figure 168: Summit X250e-24t switch rear panel

SH_039

The rear panel on the Summit X250e-24t switch includes:

- Management port
 - Used to connect the system to a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from a laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-160 External Power Module \(with EPS-T\)” on page 309](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-500 unit.
- AC power socket
The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X250e-24p Switch

The Summit X250e-24p switch is a compact unit 1.75 inches high (1 U) that includes the following:

- Twenty-four fixed 10/100BASE-T PoE ports (ports 1–24) that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port
- Two combination ports (ports 25–26) that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity



NOTE

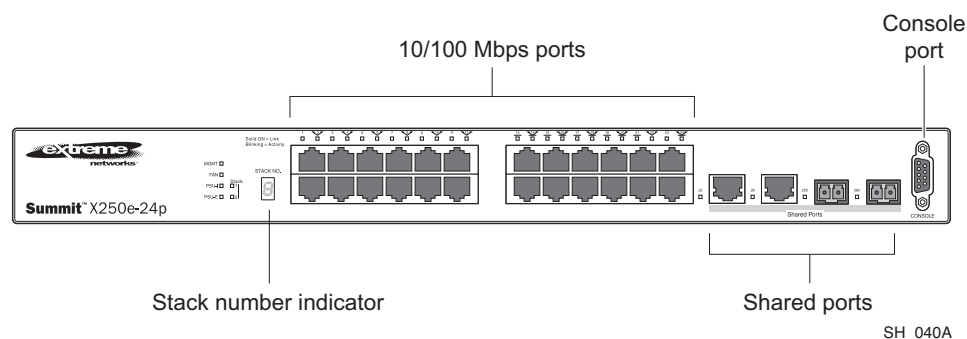
For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-500 External Power Supply (Model No. 10911). When this power supply is used with the Summit X250e-24p switch, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X250e-24p Switch Front Panel

[Figure 169](#) shows the front panel of the Summit X250e-24p switch.

Figure 169: Summit X250e-24p switch front panel



The front panel on the Summit X250e-24p switch includes:

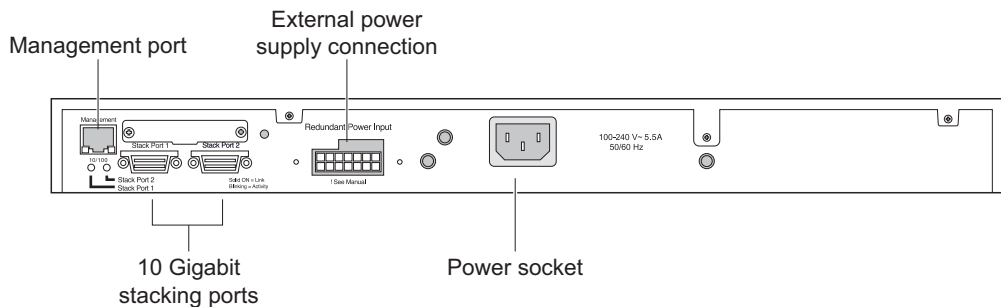
- LEDs—For a description of the LEDs and their operation, see [“Summit X250e Series Switch LEDs” on page 250](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- 10/100BASE-T PoE ports—Twenty-four 10/100BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port

- **Combination ports**—Two combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity.
- **Console port**—Serial port used to connect a terminal and perform local management.

Summit X250e-24p Switch Rear Panel

Figure 170 shows the rear panel of the Summit X250e-24p switch.

Figure 170: Summit X250e-24p switch rear panel



SH_041

The rear panel on the Summit X250e-24p switch includes:

- Management port
 - Used to connect the system to a parallel management network for administration.OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
 - Two LEDs for the management port, located in the bottom corners of the port.
 - Two high-performance stacking ports with associated LEDs
 - Redundant power input connector for an optional, redundant EPS-500 Power Supply with full PoE power support (see “[EPS-500 External Power Supply Unit](#)” on page 317 for complete details). The connecting redundant power supply cable is shipped with the EPS-500 unit.
 - AC power socket
- The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X250e-48t Switch

The Summit X250e-48t switch is a compact unit 1.75 inches high (1 U) that includes the following:

- Forty-eight fixed 10/100BASE-T ports (ports 1–48) that deliver high-density copper connectivity for 4.8 Gbps
- Two combination ports (ports 49–50) that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity

**NOTE**

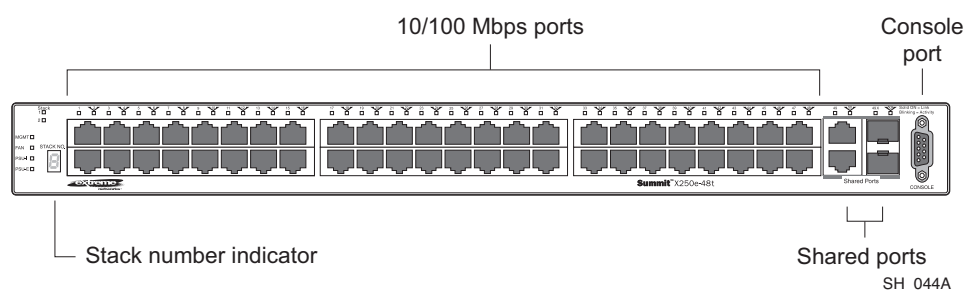
For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-160 External Power Module. When this power supply unit is used with the Summit X250e-48t switch, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X250e-48t Switch Front Panel

[Figure 171](#) shows the front panel of the Summit X250e-48t switch.

Figure 171: Summit X250e-48t switch front panel

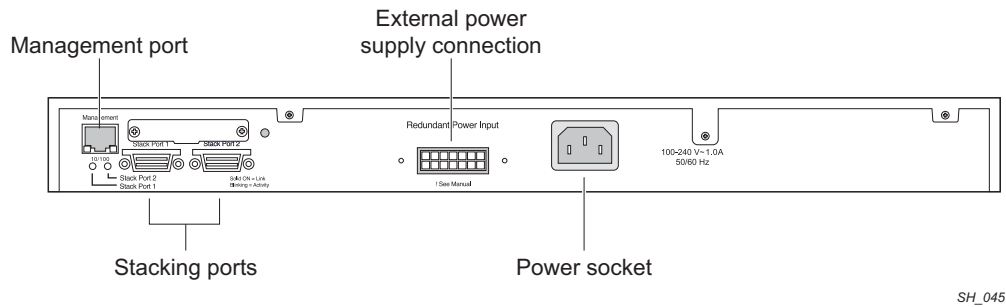


The front panel on the Summit X250e-48t switch includes:

- LEDs—For a description of the LEDs and their operation, see [“Summit X250e Series Switch LEDs” on page 250](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- 10/100BASE-T Ethernet ports—Forty-eight 10/100BASE-T Ethernet ports that deliver high-density copper connectivity.
- Combination ports—Two combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X250e-48t Switch Rear Panel

[Figure 172](#) shows the rear panel of the Summit X250e-48t switch.

Figure 172: Summit X250e-48t switch rear panel

The rear panel on the Summit X250a-48t switch includes:

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for an optional, redundant EPS-500 Power Supply unit. (See [“EPS-160 External Power Module \(with EPS-T\)” on page 309](#) for complete details.) The connecting redundant power supply cable is shipped with the EPS-500 unit.
- AC Power Socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X250e-48p Switch

The Summit X250e-48p switch is a compact unit 1.75 inches high (1 U) that includes the following:

- Forty-eight fixed 10/100BASE-T PoE ports (ports 1–48) that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port when used with the EPS-600LS External Power Module.
- Two combination ports (ports 49–50) that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity



NOTE

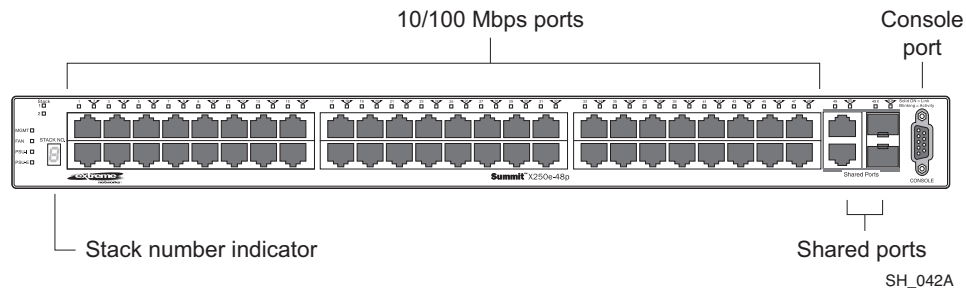
For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with one or more EPS-600LS External Power Modules (Model No. 10913) installed in an EPS-C chassis (Model No. 10912). The PoE capability of the Summit X250e-48p switch varies depending on the number of external power modules in use. For complete details, see [“EPS-600LS External Power Module” on page 328](#).

Summit X250e-48p Switch Front Panel

Figure 173 shows the front panel of the Summit X250e-48p switch.

Figure 173: Summit X250e-48p switch front panel



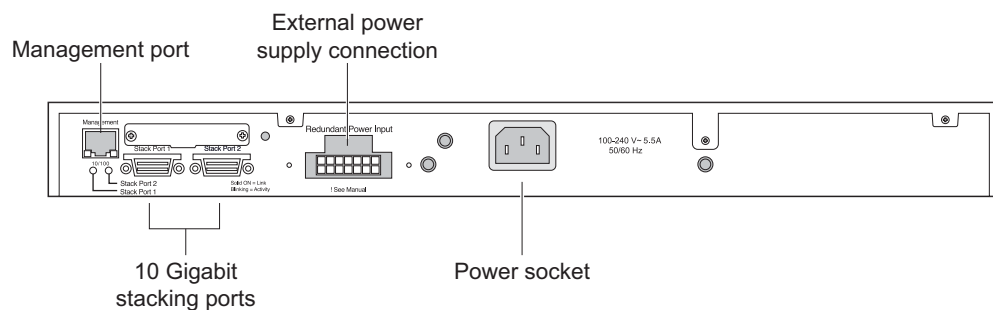
The front panel on the Summit X250e-48p switch includes:

- LEDs—For a description of the LEDs and their operation, see [“Summit X250e Series Switch LEDs” on page 250](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- 10/100BASE-T PoE ports—Forty-eight 10/100BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port
- Combination ports—Two combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 2 Gbps of copper or fiber connectivity.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X250e-48p Switch Rear Panel

Figure 174 shows the rear panel of the Summit X250e-48p switch.

Figure 174: Summit X250e-48p switch rear panel



The rear panel on the Summit X250e-48p switch includes:

- Management port
 - Used to connect the system to a parallel management network for administration.

OR

 - Used to connect an Ethernet cable directly from your laptop to the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to an EPS-C chassis, which can hold up to three EPS-600LS external power modules. The PoE capability of the Summit X250e-48p switch varies depending on the number of external power modules in use. For complete details, see [“EPS-600LS External Power Module” on page 328](#). The connecting redundant power supply cable is shipped with the EPS-C chassis.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X250e-48p Power Supplies

The Summit X250e-48p switch is powered by both an internal power supply and an optional external redundant power supply system.

Internal Power Supply. The internal Summit X250e-48p internal power supply is capable of 370 W of PoE power. It supplies 15.4 W to each port for a 24-port configuration and 7.7 W to each port for a 48-port configuration or any combination of ports where total PoE power does not exceed 370 watts. If the total system demands exceed this power limit, you can specify one of the following:

- Port priorities to identify which ports should be ranked higher when allocating power
- Port disconnect precedence to specify the method of shutting off ports when not enough PoE power is available



NOTE

A full discussion of these concepts can be found in the ExtremeXOS 12.0 Concepts Guide, Power over Ethernet section.

External Power Supplies. The EPS-600LS External Power Module provides optional redundant power for the Summit X250e-48p switch. Through the redundant power input connector on the rear panel, the switch can be powered by one, two, or three external power modules installed in the EPS-C External Power Supply Chassis.

The PoE capability of the Summit X250e-48p varies depending on the number of external power modules in use. [Table 28](#) summarizes the PoE power behavior for the Summit X250e-48p switch based on the number of power supply modules in use.

Table 28: Number of external power modules and corresponding PoE behavior

Internal Power Supply Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External PSU/Chassis Failed/Disconnected
Internal power supply: Power on	370 W of redundant power	740 W of external power only Internal power supply disabled	740 W of external power only with 2:1 redundancy Internal power supply disabled	370 W of internal power only
Internal power supply: Power Failure	370 W of external power only	740 W of external power only	740 W of external power only with 2:1 redundancy	No PoE power

For specifications and installation instructions for the external power module, see [“EPS-600LS External Power Module” on page 328](#).

Summit X250e Series Switch LEDs

Table 29 lists the specific types of LEDs on the Summit X250e switches, along with their associated colors and meanings.

Table 29: LEDs on the Summit X250e series switches

Label or Type	Color/State	Meaning
Chassis LEDs		
MGMT	Blinking green	Power-on self-test (POST) in progress
	Steady green	POST passed. normal operation
	Blinking amber	System is disabled. POST failed or system overheated
	Off	No external power attached
Fan	Steady green	Normal operation
	Blinking amber	Fan failure. Switch will continue to operate unless it overheats.
	Off	No power
Power LEDs		
PSU-I (Internal power supply)	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power
PSU-E (External power supply)	Steady green	Normal operation
	Blinking amber	Failure
	Off	No external power attached

Table 29: LEDs on the Summit X250e series switches (Continued)

Label or Type	Color/State	Meaning
I/O and Uplink Port LEDs		
Port number 1–24 or 1–48	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present.
Port number 25, 26 or 49, 50 (Shared ports)	Steady green	Link OK
	Blinking green	Activity
Additional Port LED Meanings for PoE Switches: Summit X250e-24p & Summit X250e-48p		
All front-panel ports	Steady green	Link OK. port not powered.
	Steady amber	Link OK, port is powered, no traffic
	Blinking green	Link OK, transmitting packets, port not powered.
	Blinking amber	Link OK, transmitting packets, port is powered.
	Slow blinking amber	No link or disabled port, port is powered
	Alternating amber and green	Port has a power fault.
	Off	Port is not powered, has no link, or is disabled.
Stacking Port LEDs		
Stack 1,2 (front panel)	Steady green	Link OK
Stack Port 1, Stack Port 2 (rear panel)	Blinking green	Activity
	Off	No link
Other LEDs		
Management Port (rear panel)	Right LED: Steady green	Link OK
	Left LED: Blinking green	Activity

Summit X450 Series Switches

The Summit X450 series of switches consists of the following switches:

- [Summit X450-24t Switch on page 252](#)
- [Summit X450-24x Switch on page 254](#)

Summit X450-24t Switch

The Summit X450-24t switch is a compact unit 1.75 inches high (1 U) that has the following features:

- 24 auto-sensing ports that include:
 - 20 fixed 10/100/1000 BASE-T ports that deliver high-density copper connectivity for 20 Gbps (ports 5-24)
 - Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 1-4)



NOTE

For information about mini-GBICS, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional: Summit XGM-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules



NOTE

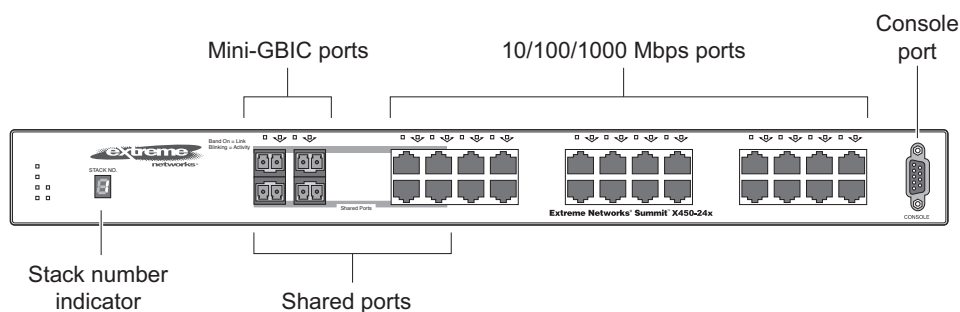
For information about the Summit XGM-2xn option card, see [“Summit XGM-2xn Option Card” on page 295](#).

- Redundant power input connector for use with the EPS-160 External Power Module (Model No. 10907). When this power supply is used with the Summit X450-24t switch, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450-24t Switch Front Panel

[Figure 175](#) shows the front panel of the Summit X450-24t switch.

Figure 175: Summit X450-24t switch front panel



S450_002C

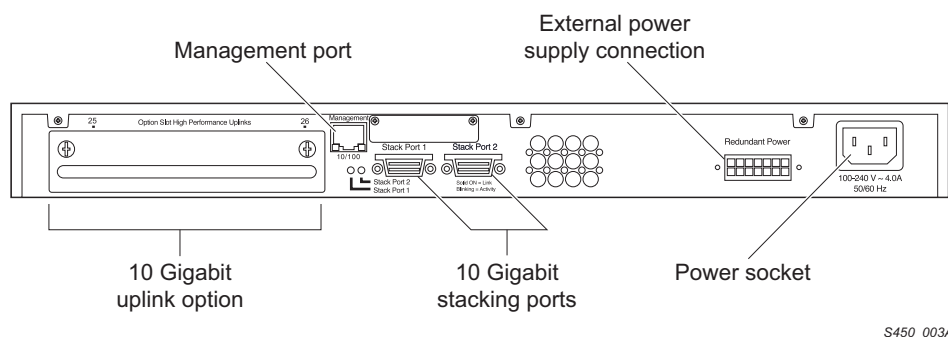
The front panel on the Summit X450-24t switch consists of:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T Ethernet ports—Twenty 10/100/1000 BASE-T Ethernet ports that deliver high-density copper connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450-24t Switch Rear Panel

Figure 176 shows the rear panel of the Summit X450-24t switch.

Figure 176: Summit X450-24t switch rear panel



The rear panel on the Summit X450-24t switch includes:

- Slot for the Summit XGM-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules (see [“Summit XGM-2xn Option Card”](#) on page 295 for complete details)
- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-160 External Power Module \(with EPS-T\)”](#) on page 309 for complete details). The connecting redundant power supply cable is shipped with the EPS-160.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450-24x Switch

The Summit X450-24x switch includes the following:

- 20 fixed mini-GBIC ports that deliver high-density fiber connectivity for 20 Gbps in 1.75-inch (1U) form factor (ports 5-24)



NOTE

For information about mini-GBICS, see [“Mini-GBIC Interfaces” on page 338](#).

- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 1-4)
- Two high-performance stacking ports
- Optional: Summit XGM-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules



NOTE

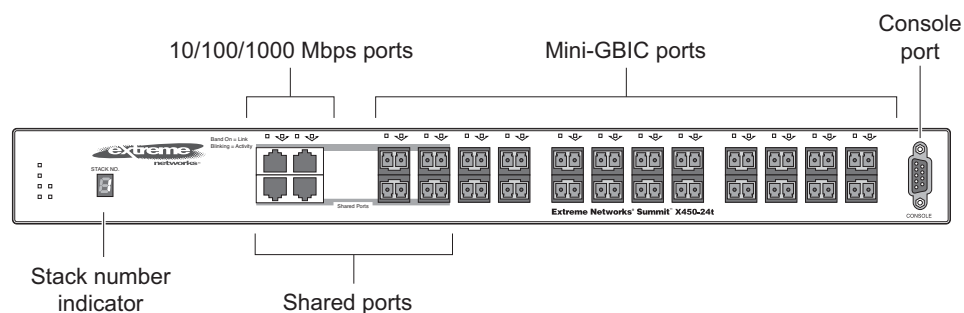
For information regarding the Summit XGM-2xn option card, see [“Summit XGM-2xn Option Card” on page 295](#).

- Optional: EPS-160 External Power Module (Model No. 10907), which is the compatible redundant power supply available for use with the Summit X450-24x. When this switch is used with the EPS-160, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450-24x Switch Front Panel

Figure 177 shows the front panel of the Summit X450-24x switch.

Figure 177: Summit X450-24x switch front panel



S450_001C

The front panel on the Summit X450-24x consists of:

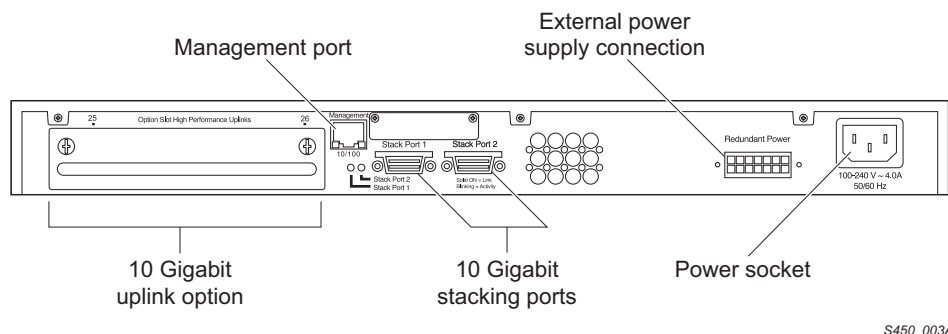
- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs” on page 276](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of fiber or copper connectivity.

- Mini-GBIC ports—20 mini-GBIC ports that deliver high-density fiber connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450-24x Switch Rear Panel

Figure 178 shows the rear panel of the Summit X450-24x switch.

Figure 178: Summit X450-24x switch rear panel



The rear panel on the Summit X450-24x switch includes:

- Slot for the Summit XGM-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules (see [“Summit XGM-2xn Option Card” on page 295](#) for complete details)
- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-160 External Power Module \(with EPS-T\)” on page 309](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-160.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450a Series Switches

The Summit X450a series of switches consists of the following switches:

- [Summit X450a-24t Switch on page 256](#)
- [Summit X450a-24tDC Switch on page 259](#)
- [Summit X450a-24x Switch on page 261](#)
- [Summit X450a-24xDC Switch on page 263](#)
- [Summit X450a-48t Switch on page 265](#)
- [Summit X450a-48tDC Switch on page 267](#)

Summit X450a-24t Switch

The Summit X450a-24t switch includes the following:

- 20 fixed 10/100/1000 BASE-T ports that deliver high-density copper connectivity for 20 Gbps in 1.75-inch (1U) form factor (ports 1-20)
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 21-24)



NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

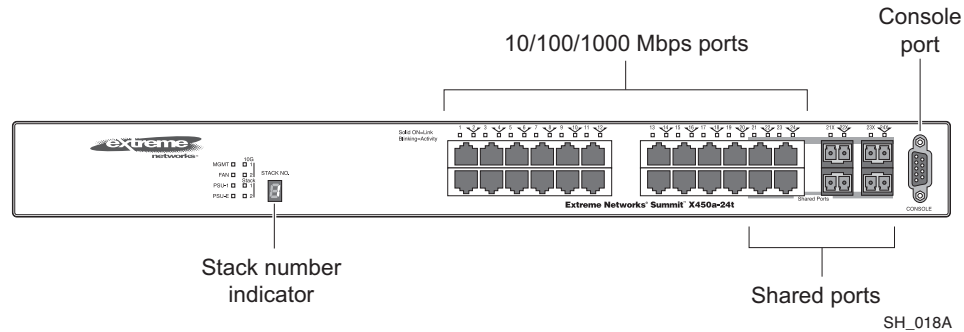
For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-LD External Power Supply Unit (Model No. 45019), which is a redundant power supply for use with the Summit X450a-24t switch. When this switch is used with the EPS-LD, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450a-24t Switch Front Panel

Figure 179 shows the front panel of the Summit X450a-24t switch.

Figure 179: Summit X450a-24t switch front panel



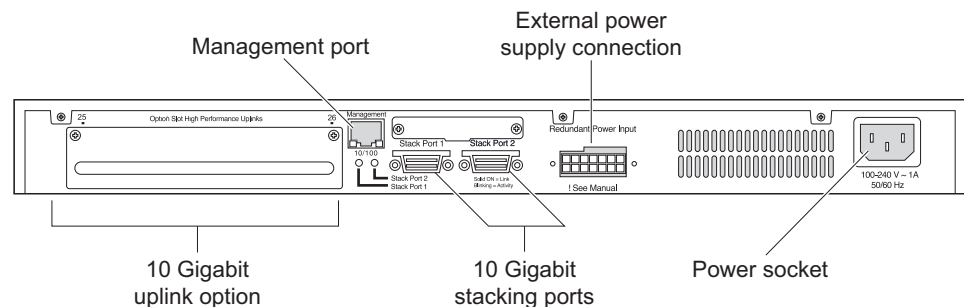
The front panel on the Summit X450a-24t switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T Ethernet ports—Twenty 10/100/1000 BASE-T Ethernet ports that deliver high-density copper connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-24t Switch Rear Panel

Figure 180 shows the rear panel of the Summit X450a-24t switch.

Figure 180: Summit X450a-24t switch rear panel



The rear panel on the Summit X450a-24t switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located at the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-LD External Power Supply Unit” on page 313](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-LD.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450a-24tDC Switch

The Summit X450a-24tDC switch includes the following:

- 20 fixed 10/100/1000 BASE-T ports that deliver high-density copper connectivity for 20 Gbps in 1.75-inch (1U) form factor (ports 1-20)
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 21-24)



NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-150DC External Power Module (Model No. 10909), which is the redundant power supply for use with the Summit X450a-24tDC switch. When this switch is used with the EPS-150DC, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.



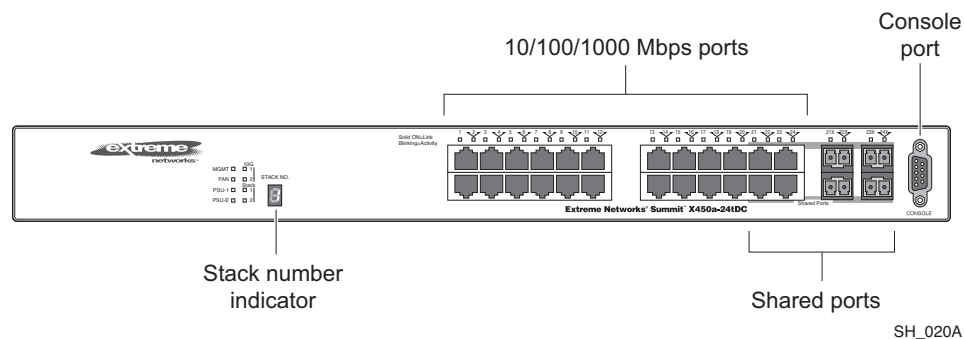
NOTE

For centralized DC power connection, this product is intended to be installed in Restricted Access Locations (Dedicated Equipment Rooms, Equipment Closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Summit X450a-24tDC Switch Front Panel

Figure 181 shows the front panel of the Summit X450a-24tDC switch.

Figure 181: Summit X450a-24tDC switch front panel



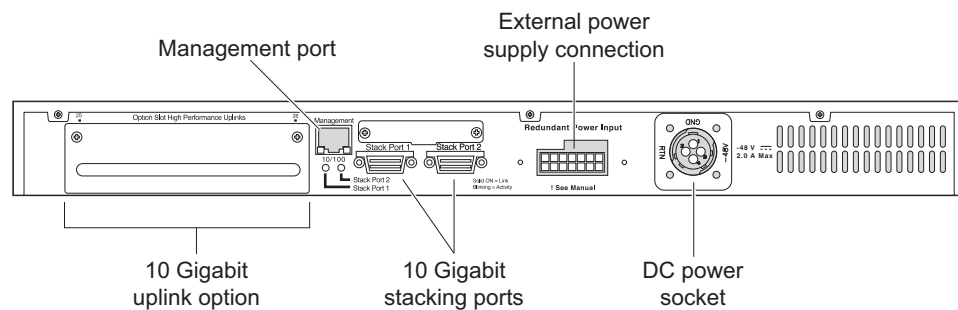
The front panel on the Summit X450a-24tDC switch consists of:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T Ethernet ports—Twenty 10/100/1000 BASE-T Ethernet ports that deliver high-density copper connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-24tDC Switch Rear Panel

Figure 182 shows the rear panel of the Summit X450a-24tDC switch.

Figure 182: Summit X450a-24tDC switch rear panel



SH_026

The rear panel on the Summit X450a-24tDC switch consists of:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card”](#) on page 297 or [“Summit XGM2-2xf Option Card”](#) on page 302.

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located at the bottom corners of the port.
- Two high-performance stacking ports

- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-150DC External Power Module \(with EPS-T2\)”](#) on page 321 for complete details). The connecting redundant power supply cable is shipped with the EPS-150DC.
- DC power socket
The switch automatically adjusts to the supply voltage. The power supply operates from -36 V to -72 Vdc.

Summit X450a-24x Switch

The Summit X450a-24x switch includes the following:

- 20 fixed 1000BASE-X ports that deliver high-density fiber (mini-GBIC) connectivity for 20 Gbps in 1.75-inch (1U) form factor (ports 1-20).
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 21-24).

NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces”](#) on page 338.

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

NOTE

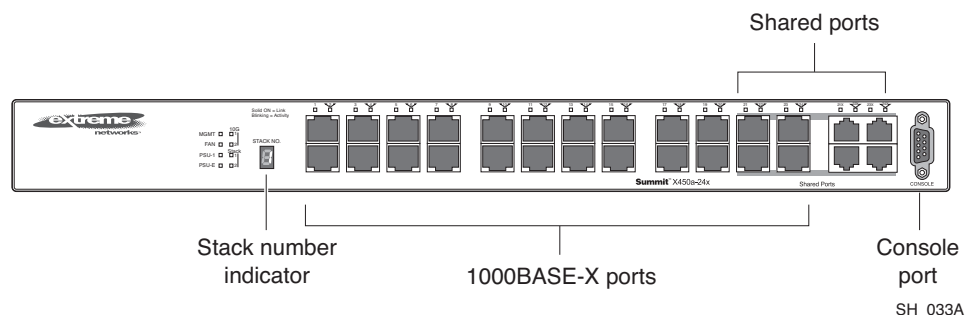
For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card”](#) on page 297 or [“Summit XGM2-2xf Option Card”](#) on page 302.

- Optional: EPS-LD External Power Supply Unit (Model No. 45019), which is the redundant power supply for use with the Summit X450a-24x. When this switch is used with the EPS-LD, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450a-24x Switch Front Panel

[Figure 183](#) shows the front panel of the Summit X450a-24x switch.

Figure 183: Summit X450a-24x switch front panel



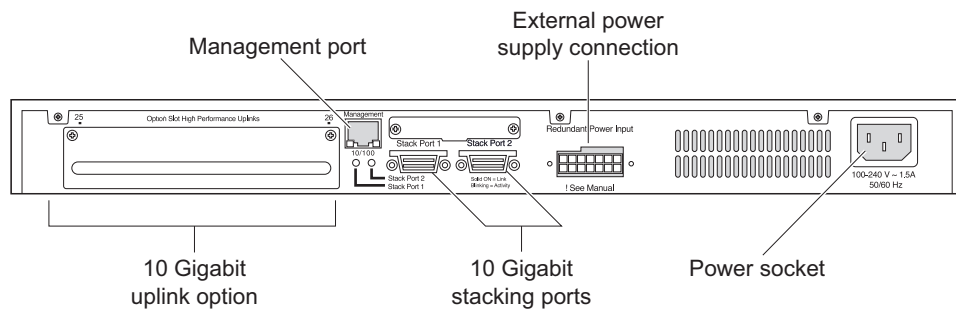
The front panel on the Summit X450a-24x switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of fiber or copper connectivity.
- Mini-GBIC ports—20 mini-GBIC ports that deliver high-density fiber connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-24x Switch Rear Panel

Figure 184 shows the rear panel of the Summit X450a-24x switch.

Figure 184: Summit X450a-24x switch rear panel



SH_031

The rear panel on the Summit X450a-24x switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card”](#) on page 297 or [“Summit XGM2-2xf Option Card”](#) on page 302.

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports

- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-LD External Power Supply Unit” on page 313](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-LD.
- AC power socket
The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450a-24xDC Switch

The Summit X450a-24xDC switch includes the following:

- 20 fixed 1000BASE-X ports that deliver high-density fiber (mini-GBIC) connectivity for 20 Gbps in 1.75-inch (1U) form factor (ports 1-20).
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 21-24).

NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-150DC External Power Module (Model No. 10909), which is the redundant power supply for use with the Summit X450a-24xDC switch. When this switch is used with the EPS-150DC, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

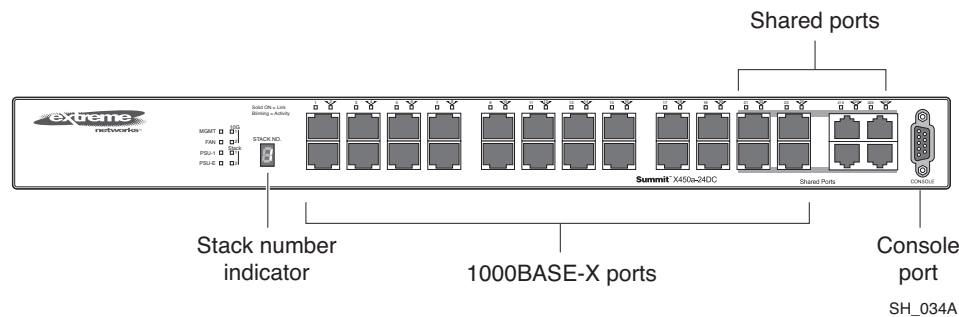
NOTE

For centralized DC power connection, this product is intended to be installed in Restricted Access Locations (Dedicated Equipment Rooms, Equipment Closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Summit X450a-24xDC Switch Front Panel

Figure 185 shows the front panel of the Summit X450a-24xDC switch.

Figure 185: Summit X450a-24xDC switch front panel



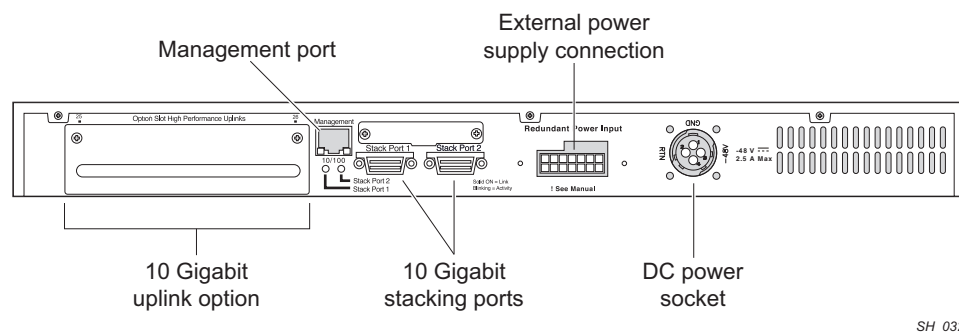
The front panel on the Summit X450a-24xDC switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of fiber or copper connectivity.
- Mini-GBIC ports—20 mini-GBIC ports that deliver high-density fiber connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-24xDC Switch Rear Panel

Figure 186 shows the rear panel of the Summit X450a-24xDC switch.

Figure 186: Summit X450a-24xDC switch rear panel



SH_032

The rear panel on the Summit X450a-24xDC switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-150DC External Power Module \(with EPS-T2\)” on page 321](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-150DC.
- DC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from -36 V to -72 V DC.

Summit X450a-48t Switch

The Summit X450a-48t switch includes the following:

- 44 fixed 10/100/1000 BASE-T ports that deliver high-density copper connectivity for 44 Gbps in 1.75-inch (1U) form factor (ports 1-44)
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 45-48)

**NOTE**

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

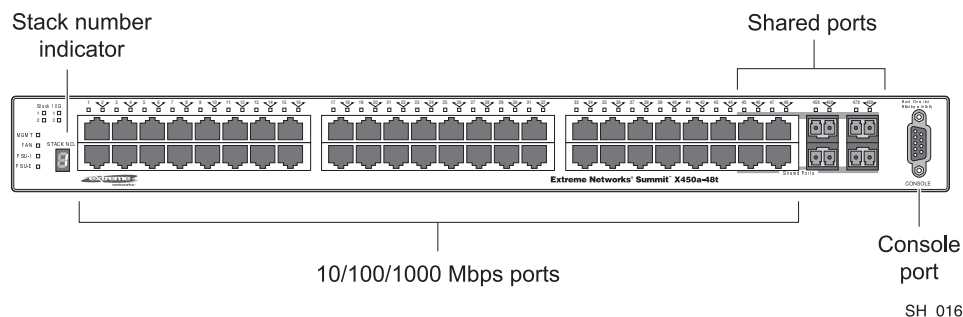
For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-500 External Power Supply Unit (Model No. 10911), which is the redundant power supply for use with the Summit X450a-48t switch. When this switch is used with the EPS-500, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450a-48t Switch Front Panel

Figure 187 shows the front panel of the Summit X450a-48t switch.

Figure 187: Summit X450a-48t switch front panel



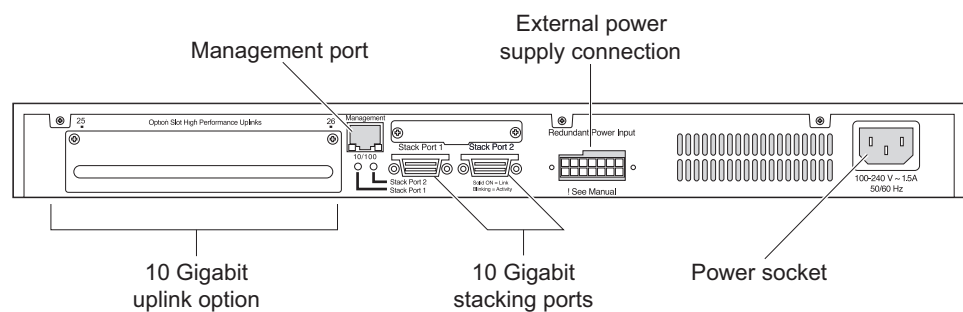
The front panel on the Summit X450a-48t switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T Ethernet ports—Forty-four 10/100/1000 BASE-T Ethernet ports that deliver high-density copper connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-48t Switch Rear Panel

Figure 188 shows the rear panel of the Summit X450a-48t switch.

Figure 188: Summit X450a-48t switch rear panel



SH_029

The rear panel on the Summit X450a-48t switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-500 External Power Supply Unit” on page 317](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-500 power supply.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450a-48tDC Switch

The Summit X450a-48tDC switch includes the following:

- 44 fixed 10/100/1000 BASE-T ports that deliver high-density copper connectivity for 44 Gbps in 1.75-inch (1U) form factor (ports 1-44)
- Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 45-48)

**NOTE**

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-150DC External Power Module (Model No. 10909), which is the redundant power supply for use with the Summit X450a-48tDC switch. When this switch is used with the EPS-150DC, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

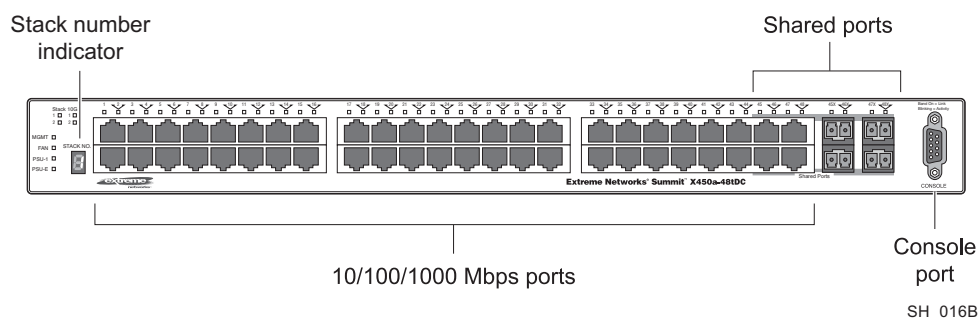
**NOTE**

For centralized DC power connection, this product is intended to be installed in Restricted Access Locations (Dedicated Equipment Rooms, Equipment Closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Summit X450a-48tDC Switch Front Panel

Figure 187 shows the front panel of the Summit X450a-48tDC switch.

Figure 189: Summit X450-48tDC switch front panel



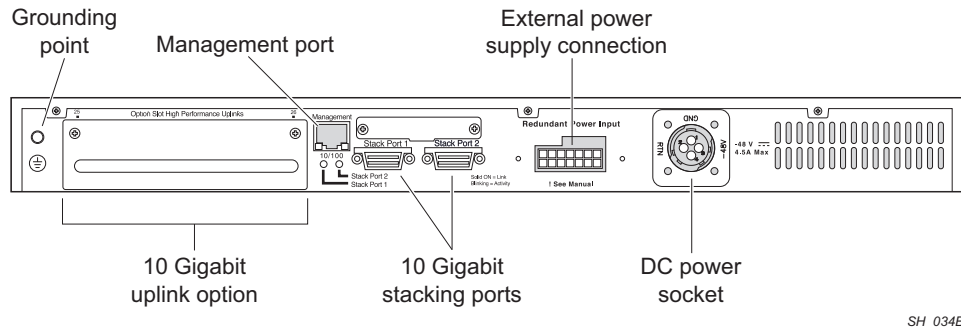
The front panel on the Summit X450a-48tDC switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports —Four combination ports that provide 10/100/1000 BASE-T or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T Ethernet ports—Forty-four 10/100/1000 BASE-T Ethernet ports that deliver high-density copper connectivity in 1.75-inch (1U) form factor.
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450a-48tDC Switch Rear Panel

Figure 188 shows the rear panel of the Summit X450a-48tDC switch.

Figure 190: Summit X450a-48tDC switch rear panel



The rear panel on the Summit X450a-48tDC switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply (see [“EPS-500 External Power Supply Unit” on page 317](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-500.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450e Series Switches

The Summit X450e series of switches consists of the following switches:

- [Summit X450e-24p Switch on page 270](#)
- [Summit X450e-48p Switch on page 272](#)

Summit X450e-24p Switch

The Summit X450e-24p switch includes the following:

- 20 fixed 10/100/1000 BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port (ports 1-20)
- Four combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 21-24)

All 24 ports can provide PoE power.



NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

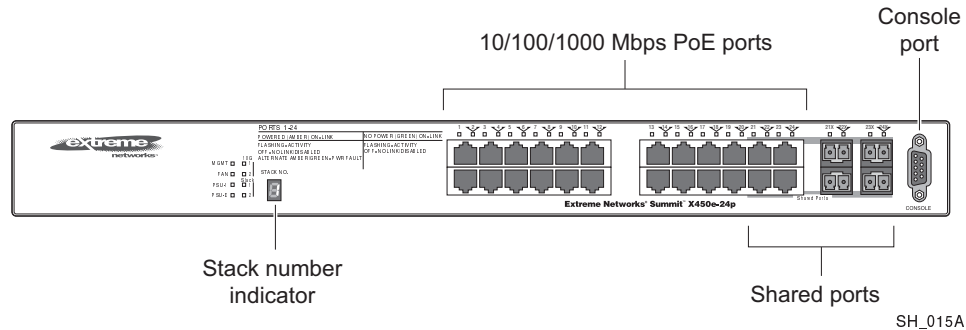
For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-LD External Power Supply Unit (Model No. 45019), which is the redundant power supply for use with the Summit X450e-24p switch. When this switch is used with the EPS-LD, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Summit X450e-24p Switch Front Panel

Figure 191 shows the front panel of the Summit X450e-24p switch.

Figure 191: Summit X450e-24p switch front panel



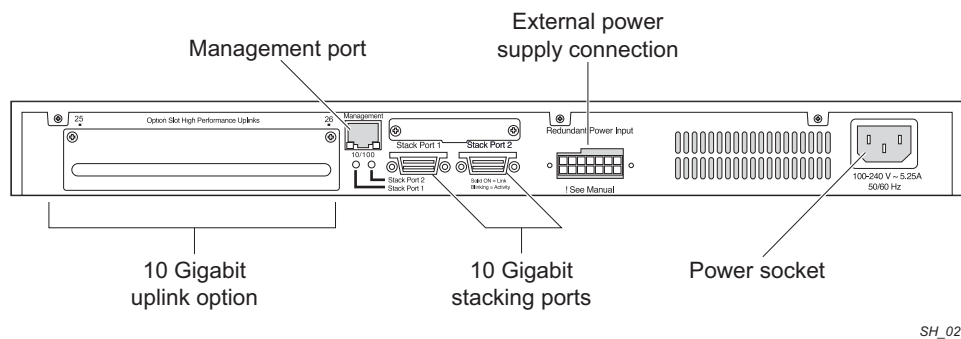
The front panel on the Summit X450e-24p switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs”](#) on page 276.
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T PoE ports—Twenty 10/100/1000 BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450e-24p Switch Rear Panel

Figure 192 shows the rear panel of the Summit X450e-24p switch.

Figure 192: Summit X450e-24p switch rear panel



The rear panel on the Summit X450e-24p switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for an optional, redundant Extreme External Power Supply with full PoE power support (see [“EPS-LD External Power Supply Unit” on page 313](#) for complete details). The connecting redundant power supply cable is shipped with the EPS-LD.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450e-48p Switch

The Summit X450e-48p switch includes the following:

- 44 fixed 10/100/1000 BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port (ports 1-44) when used with the EPS-C/EPS-600LS
- Four combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity (ports 45-48)
- All 48 ports are capable of providing PoE power



NOTE

For information about mini-GBICs, see [“Mini-GBIC Interfaces” on page 338](#).

- Two high-performance stacking ports
- Optional:
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules

**NOTE**

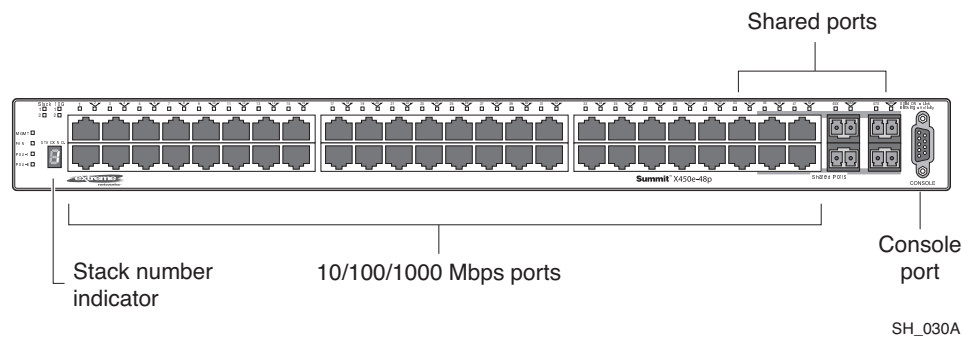
For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Optional: EPS-600LS External Power Module (Model No. 10913), which is the redundant power supply unit for use with the Summit X450e-48p switch. The EPS-600LS is installed in the EPS-C chassis (Model No. 10912). The EPS-C chassis can hold up to three EPS-600LS units. The PoE capability of the Summit X450e-48p switch varies depending on the number of external power modules in use. For complete details, see [“EPS-600LS External Power Module” on page 328](#).

Summit X450e-48p Switch Front Panel

Figure 193 shows the front panel of the Summit X450e-48p switch.

Figure 193: Summit X450e-48p switch front panel



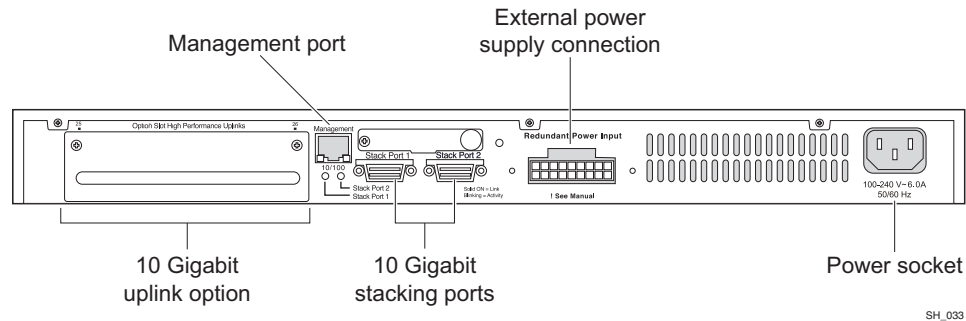
The front panel on the Summit X450e-48p switch includes:

- LEDs—For a description of the LEDs and their behavior, see [“Summit X450, X450a, and X450e Series Switch LEDs” on page 276](#).
- Stack number indicator—Numeric indicator of the position of this switch in a stacked configuration.
- Combination ports—Four combination ports that provide 10/100/1000 BASE-T PoE or mini-GBIC connectivity for 4 Gbps of copper or fiber connectivity.
- 10/100/1000 BASE-T PoE ports—Forty-four 10/100/1000 BASE-T PoE ports that deliver high-density copper connectivity and a full 15.4 Watts of PoE per port
- Console port—Serial port used to connect a terminal and perform local management.

Summit X450e-48p Switch Rear Panel

Figure 194 shows the rear panel of the Summit X450e-48p switch.

Figure 194: Summit X450e-48p switch rear panel



The rear panel on the Summit X450e-48p switch includes:

- Slot for a Summit option card
 - Summit XGM2-2xn option card, which allows you to add up to two 10 Gigabit XENPAK modules
 - OR
 - Summit XGM2-2xf option card, which allows you to add up to two 10 Gigabit XFP modules



NOTE

For information regarding these compatible Summit option cards, see [“Summit XGM2-2xn Option Card” on page 297](#) or [“Summit XGM2-2xf Option Card” on page 302](#).

- Management port
 - Used to connect the system into a parallel management network for administration.
 - OR
 - Used to connect an Ethernet cable directly from your laptop into the management port to view and locally manage the switch configurations.
- Two LEDs for the management port, located in the bottom corners of the port.
- Two high-performance stacking ports
- Redundant power input connector for optional connection to an EPS-C chassis, which can hold up to three EPS-600LS external power modules. The PoE capability of the Summit X450e-48p switch varies depending on the number of external power modules in use. For complete details, see [“EPS-600LS External Power Module” on page 328](#). The connecting redundant power supply cable is shipped with the EPS-C chassis.
- AC power socket

The switch automatically adjusts to the supply voltage. The power supply operates from 100 VAC to 240 VAC.

Summit X450e-48p Power Supplies

Internal PSU. The internal Summit X450e-48p PSU is capable of 370 W of PoE power: 15.4 W supplied to each port for a 24 port configuration and 7.7 W supplied to each port for a 48 port configuration or any combination of ports where total PoE power does not exceed 370 watts. If the total system demands exceed this power limit, the user may specify:

- Port priorities to identify which ports should be ranked higher when allocating power
- Port disconnect precedence to specify the method of shutting off ports when not enough PoE power is available



NOTE

A full discussion of these concepts may be found in the ExtremeXOS 12.0 Concepts Guide, Power over Ethernet section.

External PSUs. The Summit X450e-48p switch may be powered by one, two, or three external power modules through the redundant power input connector on the rear of the switch.

The EPS-C (External Power Supply Chassis) is shipped with the redundant power supply cable that connects to the redundant input connector on the rear of the switch. The EPS-C chassis can hold from one to three 600-Watt EPS-600LS (External Power Module) units.

The PoE capability of the Summit X450e-48p switch varies depending on the number of external power modules in use. [Table 30](#) summarizes the PoE power behavior for the Summit X450e-48p switch based on the number of power supply modules in use.

Table 30: Number of external PSUs and corresponding PoE behavior

Internal PSU Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External PSU/Chassis Failed/Disconnected
Internal PSU: Power On	370 W of redundant power	740 W of external power only Internal PSU disabled	740 W of external power only with 2:1 redundancy Internal PSU disabled	370 W of internal power only
Internal PSU: Power Failure	370 W of external power only	740 W of external power only	740 W of external power only with 2:1 redundancy	No PoE power

For complete details, see [“EPS-600LS External Power Module”](#) on page 328.

Summit X450, X450a, and X450e Series Switch LEDs

Table 31 lists the LEDs and their associated colors and meanings.

Table 31: LEDs on the Summit X450, X450a, and X450e switches

Label or Type	Color/State	Meaning
MGMT LED	Green Blinking	Normal operation
	Amber Blinking	POST failed; Diagnostic test in progress
	Off	No external power attached
Fan LED	Green Solid	Normal operation
	Amber Blinking	Failure
	Off	No power
Internal Power Supply LED	Green Solid	Normal operation
	Amber Blinking	Failure
	Off	No power
External Power Supply LED	Green Solid	Normal operation
	Amber Blinking	Failure
	Off	No external power attached
Ethernet Port LED	Green Solid	Link OK
	Green Blinking	Activity
Management Port LED	Green Solid	Link OK
	Green Blinking	Activity
Stacking Port LED	Green Solid	Link OK
	Green Blinking	Activity
SFP 1G Port LED	Green Solid	Link OK
	Green Blinking	Activity
XENPAK 10G Port LED	Green Solid	Link OK
	Green Blinking	Activity
	Off	Link down

Table 31: LEDs on the Summit X450, X450a, and X450e switches (Continued)

Label or Type	Color/State	Meaning
Additional Port LED meanings for PoE switches: Summit X450e-24p & Summit X450e-48p		
All front-panel ports	Solid Amber	Port is powered with link, no traffic
	Blinking Amber	Port is powered with link, traffic
	Slow Blinking Amber	Port is powered, with no link
	Alternating Amber and Green	Port is faulted
	Off	Port is not powered, no link or disabled

This chapter describes the installation process for the Summit family of switches. In addition, it provides information about how to build a SummitStack configuration.

The chapter includes the following topics:

- [Safety Information on page 279](#)
- [Building a SummitStack Configuration on page 280](#)
- [Installing a Summit Family Switch on page 285](#)
- [Installing and Removing Summit X450a Series DC-Powered Switches on page 286](#)
- [Initial Management Access on page 292](#)

**NOTE**

Read the information in this chapter thoroughly before you attempt to install or remove a Summit switch.

Safety Information

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

**NOTE**

See [Appendix A, “Safety Information”](#) for additional safety information and [Appendix B, “Technical Specifications”](#) for additional information regarding regulatory compliance certifications.

**CAUTION**

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

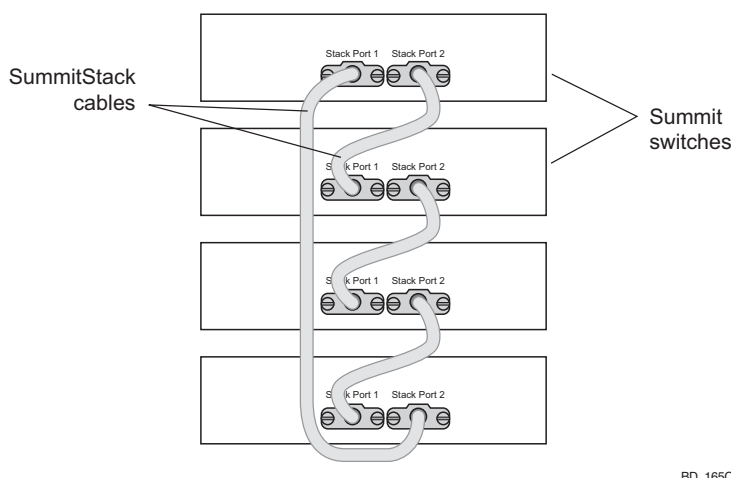
**WARNING!**

*Be sure to connect the chassis ground wire before you connect any power cables.
Be sure to disconnect the ground wire after you disconnect all power cables.*

Building a SummitStack Configuration

If you intend to use the SummitStack feature, read this section before installing the set of Summit family switches that will be included in the SummitStack configuration. A stack consists of a group of up to eight Summit switches that are connected together using stacking cables to form a connected ring, as shown in [Figure 195](#).

Figure 195: Summit switches connected in a SummitStack configuration



BD_165C

The stacking cables are available from Extreme Networks. [Table 32](#) lists the stacking cables available at this time.

Table 32: Available SummitStack stacking cables

Part Number	Description	Length
16106	SummitStack/UniStack cable	0.5 meter (1.6 ft)
16107	SummitStack/UniStack cable	1.5 meters (4.9 ft)
16108	SummitStack/UniStack cable	3 meters (9.8 ft)
16105	SummitStack cable	5 meters (16.4 ft)

Slot Numbers

Each switch (or node) in the stack is assigned a “slot number” during the initial software configuration of the stack. Starting at the switch with the console connection, numbers are assigned in numerical order following the physical path of the connected stacking cables. For example, if you follow the cabling recommendations presented in [“Connecting the Switches to Form the Stack Ring”](#) on page 281 and configure the stack from the console on the switch at the top of the physical stack, the switches will be assigned numbers 1 through 8 from the top down.

Each Summit switch has a seven-segment LED on its front panel, called the stack number indicator. When a stack is operating, the indicator displays the slot number for the switch. (This LED does not light on switches that are not operating in stacking mode.) A quick way to verify that the cable connections match the software configuration is to check the stack number indicator on each switch. If the slot numbers do not line up in the order you arranged the switches, this may indicate that the stacking cable setup differs from what you intended when you configured the software. In this case, reconnect the cables in the correct order and perform the software configuration again.

About Redundancy

When your stack is operational, one switch is the primary (or master) switch that is responsible for running network protocols and managing the stack. To provide recovery in case of a break in the stack connections, you can configure redundancy by designating a backup switch to take over as master if the master switch fails. When you perform the initial software configuration of the stack, the “easy setup” configuration option automatically configures redundancy, with slot 1 as the master and slot 2 as the backup. You can also configure additional switches as “master-capable” to become a stack master in case the initial backup switch fails.

In a stack with multiple master-capable switches, it is possible for more than one switch to try become the stack master if the stack is physically severed. Such a dual-master condition would cause confusion and loss of connectivity in your networks. To resolve a dual-master condition, you must be able to log in to each severed stack segment, either over the management network (using the Ethernet management port on a switch in the segment) or through a direct console port connection to each switch in the segment.

Stack configuration, easy setup, and redundancy are fully described in the *ExtremeXOS 12.0 Concepts Guide*.

Placing Summit Family Switches for Stacked Operation

This section summarizes the recommended best practices for installing Summit switches for a SummitStack configuration. For detailed information about how to configure and manage the stack and how a stack operates, refer to the *ExtremeXOS 12.0 Concepts Guide*.

When you install switches for a SummitStack configuration, follow these recommendations:

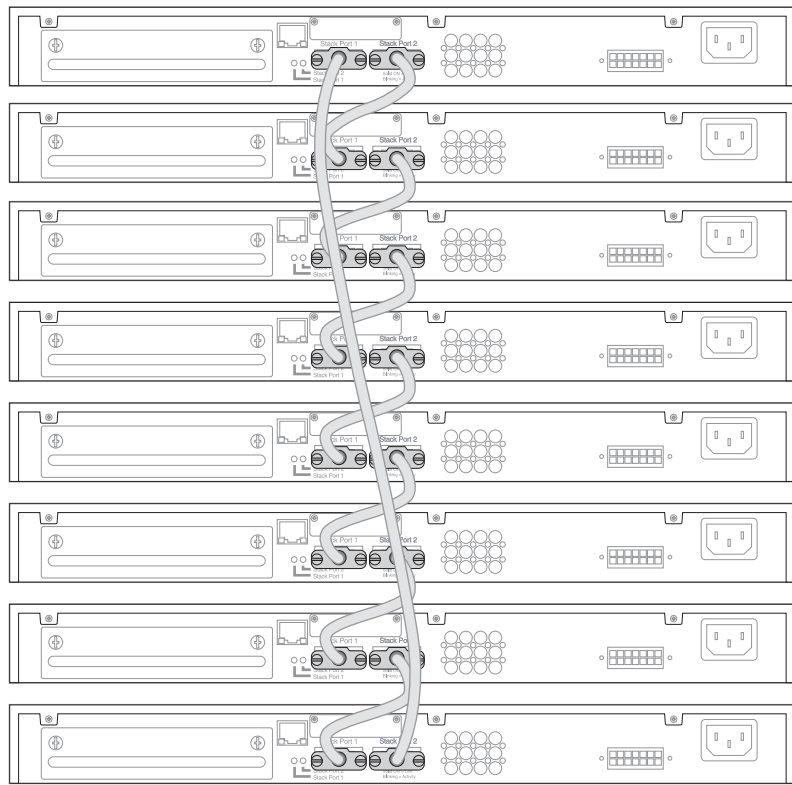
- Use the shortest possible stacking cables to connect the switches in the stack; this reduces the likelihood that the stacking cables might be accidentally damaged or disconnected. Stacking cables are available in lengths from 0.3 meters to 5 meters (see [Table 32](#)).
- When possible, place all switches for the stack in the same rack; this facilitates using shorter stacking cables.
- Because the switches will form a ring, make sure that no two switches in the stack are located more than 5 meters apart.
- For simplicity and ease of connecting the stacking cables, plan to designate the top switch in the physical stack as the stack master. This is the switch through which you will perform the initial stack configuration, using the console port.
- Connect the stacking cables in the order and arrangement shown in [Table 33](#) and [Table 34](#).
- On the stack master switch, connect the Ethernet management port to your management network.
- To provide management access to the stack in case of a failure in the master switch, connect all switches that will participate in redundancy to your management network using the Ethernet management port on each switch.

Connecting the Switches to Form the Stack Ring

After you have installed the individual Summit switches, connect the switches together using the stacking cables. [Table 33](#) and [Table 34](#) list the recommended order for connecting the stacking ports in two sample configurations; [Figure 196](#) and [Figure 197](#) show the cable connections. Although you can connect them in any order, connecting the switches as shown in these examples will produce better predictability and easier software configuration. Connect Stack Port 2 on one switch to Stack Port 1 on the switch with the next higher slot number.

Table 33: Recommended order for stacking connections (8-switch stack)

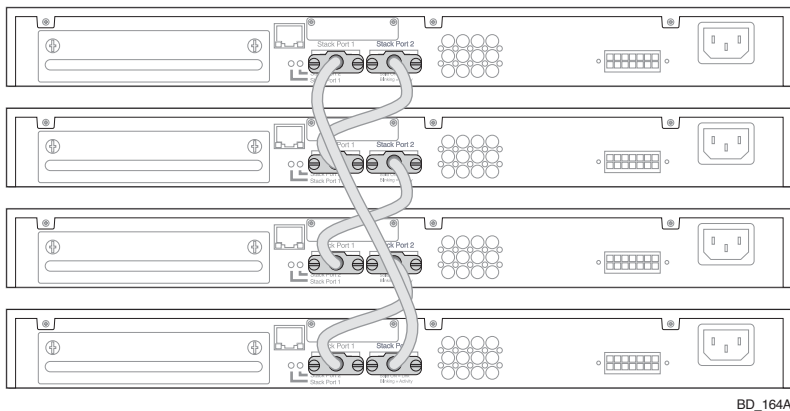
Slot Number	Connect Stack Port 1 on this switch to . . .	Connect Stack Port 2 on this switch to . . .
1	Slot 8 Port 2	Slot 2 Port 1
2	Slot 1 Port 2	Slot 3 Port 1
3	Slot 2 Port 2	Slot 4 Port 1
4	Slot 3 Port 2	Slot 5 Port 1
5	Slot 4 Port 2	Slot 6 Port 1
6	Slot 5 Port 2	Slot 7 Port 1
7	Slot 6 Port 2	Slot 8 Port 1
8	Slot 7 Port 2	Slot 1 Port 1

Figure 196: SummitStack cable connections using eight Summit switches

BD_159B

Table 34: Recommended stacking port connections (4-switch stack)

Slot Number	Connect Stack Port 1 on this switch to . . .	Connect Stack Port 2 on this switch to . . .
1	Slot 4 Port 2	Slot 2 Port 1
2	Slot 1 Port 2	Slot 3 Port 1
3	Slot 2 Port 2	Slot 4 Port 1
4	Slot 3 Port 2	Slot 1 Port 1

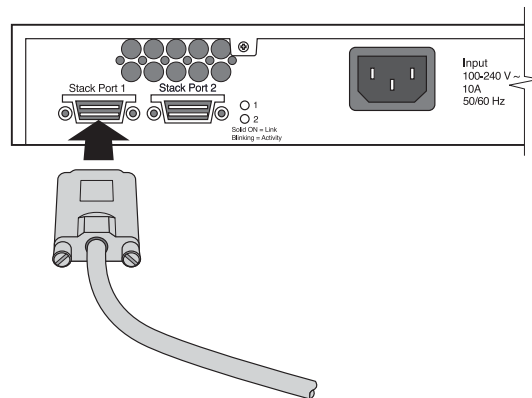
Figure 197: SummitStack cable connections using four Summit switches


Connecting a Stacking Cable to a Stacking Port

To connect a Summit stacking cable:

- 1 Align the cable connector with the stacking port connector on the back of the first switch (Figure 198).
- 2 Firmly press the cable connector into place on the mating stacking port connector.
- 3 Align and tighten the retaining screws on the cable connector.

Repeat steps 1 through 3 to connect the cable to the second switch.

Figure 198: Connecting a Summit stacking cable

ES4K037

**CAUTION**

Avoid making sharp bends in the cable. Sharp bends can stress the cable and cause damage.

Connecting the Console Port

To begin the software configuration for a new stack, you must have at least one console port connected. Connect a console to the console port of the switch that you intend to become the master of the stack. If you are going to configure redundancy, you may wish to connect to the console ports of all switches in the stack that you will configure to be master-capable. If you followed the cabling examples in [Table 33](#) and [Table 34](#), and you use the easy-setup configuration procedure, only slots 1 and 2 will be allowed to become master.

Management Port Cabling

Connect the master, backup, and all other master-capable switches to your management network using the Ethernet management port on the rear panel of each switch. If you choose the default redundancy setup, only slots 1 and 2 are allowed to become master. You may connect all switch management ports in the stack if you choose to do so. There is an alternate IP address configuration that will allow you to directly log into an individual switch in the stack through its management port.

Stacking Port LEDs

Each stacking port has an LED. The LED is solid green if the link is OK, blinking green if traffic is present, and off if there is no signal.

Installing a Summit Family Switch

A Summit family switch can be mounted in a standard 19-inch (48.26 cm) rack or placed free-standing on a tabletop. The installation process includes the following tasks:

- Install the switch in a rack or on a table.
- Ground the switch (DC-powered units only).
- Connect a redundant power supply (if applicable).
- Connect power cables.

If you are installing Summit family switches for use in a SummitStack configuration, read [“Building a SummitStack Configuration” on page 280](#) before you install the switches.

For information about grounding and connecting DC-powered Summit X450 family switches, see [“Installing and Removing Summit X450a Series DC-Powered Switches” on page 286](#).

For information about installing and connecting redundant power supplies, see [Chapter 5, “Summit External Power Supplies \(EPS\).”](#)

Rack-Mounting a Summit Switch

To install the switch in a rack, you will need the following tools and equipment:

- Mounting brackets (provided)
- Eight screws (provided) to secure the mounting brackets to the switch
- Four rack system mounting screws

The screw size will vary based on your organization’s rack system; screws are not provided.

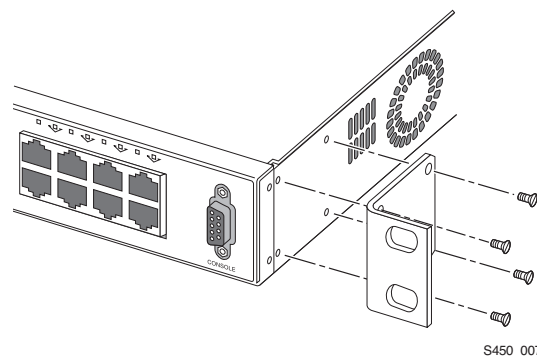
- Screwdriver for securing the switch to your organization’s rack system

The screwdriver size will vary based on the requirements of your organization’s rack system.

To rack-mount a Summit switch:

- 1 Place the switch upright on a secure, flat surface, with the front facing you.
- 2 Locate a mounting bracket over the mounting holes on one side of the unit.
- 3 Insert the screws and fully tighten with a suitable screwdriver, as shown in [Figure 199](#).

Figure 199: Attaching the mounting bracket



- 4 Repeat steps 2 and 3 for the other side of the switch.

- 5 Insert the switch into the 19-inch rack.
 - Take care to load the rack so that it is not top-heavy.
 - Do not cover vents that would restrict airflow. Leave a half-rack space between the units for adequate ventilation.
- 6 Secure the switch with suitable screws (not provided).
- 7 Connect the switch to the redundant power supply (if applicable). For instructions on installing and connecting redundant power supplies, see [Chapter 5, “Summit External Power Supplies \(EPS\).”](#)
- 8 Connect power cables. For information about DC-powered units, see [“Installing and Removing Summit X450a Series DC-Powered Switches” on page 286.](#)

Free-Standing and Desktop Mounting of Multiple Switches

Summit family switches are supplied with four self-adhesive rubber pads. Apply the pads to the underside of each device by placing the pad in the marked area at each corner of the switch, ensuring that all corners aligned. You can safely place up to four Summit family switches on top of one another.

Removing a Summit Switch from a Rack (AC units only)

To remove the Summit switch from a rack:

- 1 Remove power from the switch.

Unplug the power cable(s) from the from the wall outlet(s) first and then from the switch.
- 2 Disconnect the Summit switch from the redundant power supply (if applicable).
- 3 Loosen and remove the four screws holding the switch in place in the system rack.
- 4 Carefully remove the switch from the rack and place it on a secure, flat surface.



NOTE

For information about DC-powered units, see [“Removing a Summit X450a-48tDC Switch from a Rack” on page 291.](#)

Installing and Removing Summit X450a Series DC-Powered Switches

This section provides additional details about installing or removing the Summit X450a-24tDC, Summit X450a-24xDC, and Summit X450a-48tDC switches. Specific safety requirements must be adhered to when you connect or disconnect a DC power source for one of these Summit switches.



NOTE

For centralized DC power connection, these products are intended to be installed in Restricted Access Locations (Dedicated Equipment Rooms, Equipment Closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

**NOTE**

An optional redundant power supply, the EPS-150DC, is available for use with the Summit X450a-24tDC switch, Summit X450a-24xDC switch, and Summit X450a-48tDC switch. When one of these Summit switches is used with the EPS-150DC, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch. Refer to [“EPS-150DC External Power Module \(with EPS-T2\)” on page 321](#) for further details.

Connecting the Internal DC Power Supply to the DC Source Voltage

Before you connect the switch to a power source, complete the physical installation of the switch in the equipment rack, as described in [“Rack-Mounting a Summit Switch” on page 285](#).

If you are installing a Summit X450a-48tDC switch, you must ground the chassis before connecting the switch to the DC source voltage (see [“Grounding the Summit X450a-48tDC Switch”](#) below). If you are not installing a Summit X450a-48tDC switch, go to [“Connecting the DC Wiring Harness to the DC Source Voltage” on page 288](#).

Grounding the Summit X450a-48tDC Switch

Before you connect the power input cable to the Summit X450a-48tDC switch, you must ground the chassis, following the instructions in this section.

Gather the following materials to ground the Summit X450a-48tDC switch:

- Phillips screw with captive lock washer (provided)
- 14 AWG stranded copper wire cable with vinyl-insulated ring terminals attached at each end (provided)
- Phillips screwdriver appropriate to the provided screw
- Additional hardware appropriate to the earth ground connection at your site

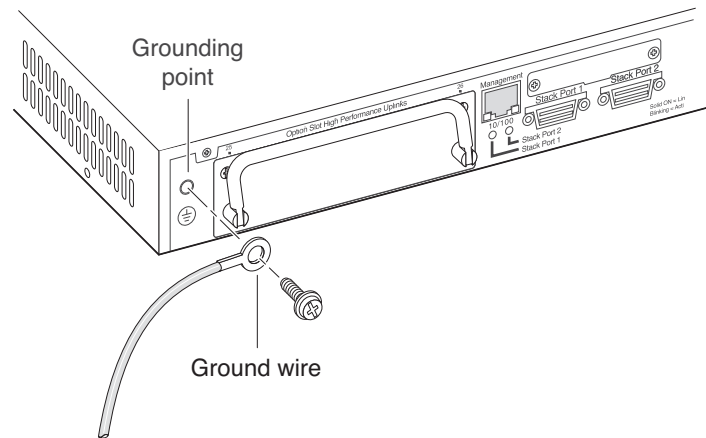
**WARNING!**

Be sure to connect the chassis ground wire before you connect any power cables.

To ground the switch:

- 1 Using the provided Phillips screw, attach the ring terminal to the grounding point on the rear of the chassis (see [Figure 200](#)).

Figure 200: Attaching the ground wire



- 2 Tighten the screw using a Phillips screwdriver.
- 3 Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the DC Wiring Harness to the DC Source Voltage

After the internal DC power supply is installed, it must be connected to a DC power source. A three-wire, 6-foot long DC wiring harness is included with the Summit X450a series DC switch and internal DC power supply. The DC wiring harness *must* be properly connected to the DC source voltage at your facility by a qualified electrician before the connector on the wiring harness can be attached to the DC power supply socket on the switch. [Figure 201](#) shows the wiring harness and connector.



WARNING!

The Summit X450a-24tDC or Summit X450a-24xDC switch and rack must be connected to protective earth ground before installing any switch components.



WARNING!

Wiring the DC input power harness to your facilities DC source voltage must be performed by a qualified, licensed electrician. After the wiring harness is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace and maintain the Summit X450a-24tDC or Summit X450a-24xDC system without further electrician assistance. However, always be sure that the DC circuit is de-energized before connecting or disconnecting the DC power connections at the rear of the switch.



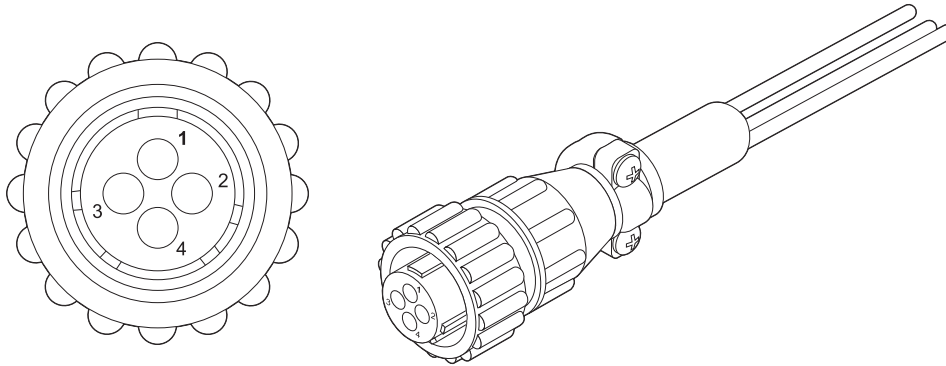
CAUTION

The DC wiring harness must be properly connected to a DC main circuit breaker rated no greater than 20 A.

**CAUTION**

Provide proper connection and strain relief on the DC wiring harness in accordance with all local and national electrical codes.

Figure 201: Three-wire Cable Harness



EWUG005

**NOTE**

Each wire on the harness has been properly marked for proper attachment to the DC power source. Leave these labels on each lead wire for future reference.

Table 35 provides the wire-to-pin connection specifications.

Table 35: Wire-to-Pin Connection Specifications

Pin Number	Wire Color	Circuit Connection
1	Green/Yellow	Chassis Ground
2	Red	Return
3	Black	-48 V
4	unused	

Table 36 lists the technical specifications for the internal DC power supply.

Table 36: Summit X450a family internal DC power supply specifications

Characteristic	Specification
Summit X450a-24tDC Nominal input voltage	-48 V $\overline{\text{DC}}$, 2.0 A
Summit X450a-24xDC Nominal input voltage	-48 V $\overline{\text{DC}}$, 2.5 A
Summit X450a-48tDC Nominal input voltage	-48 V $\overline{\text{DC}}$, 4.5 A
Operational voltage range	-36 to -72 V $\overline{\text{DC}}$
Summit X450a-24tDC Input current	2.0 A at -36 V $\overline{\text{DC}}$, 1.0 A at -72 V $\overline{\text{DC}}$
Summit X450a-24xDC Input current	2.5 A at -36 V $\overline{\text{DC}}$, 1.25 A at -72 V $\overline{\text{DC}}$
Summit X450a-48tDC Input current	6.0 A at -36 V $\overline{\text{DC}}$, 2.0 A at -72 V $\overline{\text{DC}}$
Inrush current	40 A peak maximum
Input wire harness	Extreme PN 250088
Wire size	14 AWG
Connector on cable	TYCO PN 206060-1
Ambient operating conditions	0°C to 40°C
Storage and transportations	-40°C to 70°C

Attaching the DC Wiring Harness to the DC Power Socket on the Switch

After the DC wiring harness is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace, and maintain the Summit X450a-24tDC, Summit X450a-24xDC, or Summit X450a-48tDC system without further electrician assistance.



NOTE

Be sure that the DC circuit is de-energized before you connect the DC wiring harness to the DC power socket.



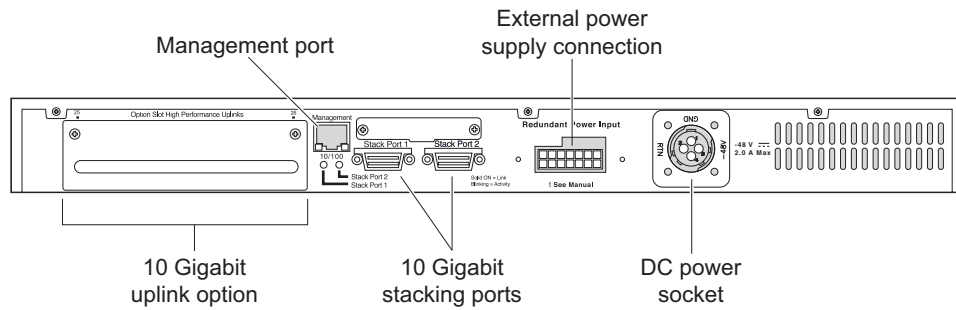
CAUTION

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

To attach the DC wiring harness to the internal DC power supply, perform the following steps:

- 1 Plug the DC wiring harness connector into the DC power supply socket on the rear of the switch (see [Figure 202](#)).

The pins must align properly for the cable to completely connect. Do not force the cable into the socket until the keyway is aligned properly. Refer to [Figure 201](#) for the DC wiring harness connector.

Figure 202: DC power socket on Summit X450a-24tDC switch

SH_026

**NOTE**

Figure 202 shows the rear panel of the Summit X450a-24tDC switch. The rear panel of the Summit X450a-24xDC and Summit X450a-48tDC switches may vary slightly; however, the DC power socket is of the same type and the connection process is the same for all DC-powered switches.

- 2 Tighten the retainer nut on the connector until it is finger-tight.
- 3 Energize the DC circuit.

Removing a Summit X450a-48tDC Switch from a Rack

**WARNING!**

Be sure to disconnect all power cables before you disconnect the chassis ground wire.

**CAUTION**

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

To remove a DC-powered Summit switch from an equipment rack:

- 1 De-energize the DC circuit for all power connections.
- 2 Loosen the retainer nut and unplug the DC power connector from the DC power supply socket on the rear of the switch.
- 3 Disconnect the Summit switch from the redundant power supply (if applicable).
- 4 On a Summit X450a-48tDC switch, loosen and remove the grounding screw from the back of the switch enclosure. Move the ground wire out of the way.
- 5 Loosen and remove the four rack system mount screws holding the switch in place against the system rack.
- 6 Carefully remove the switch from the rack and place it on a secure, flat surface.

**WARNING!**

Removing the DC wiring harness from your facilities DC source voltage requires the performance of a qualified, licensed electrician.

Initial Management Access

For instructions on accessing the switch for initial management setup, see [Chapter 2, “Initial Management Access.”](#)

21 Summit Option Cards

This chapter describes Summit option cards available for use with Summit X450 series, X450a series, and X450e series switches. The chapter includes the following sections

- [Overview on page 293](#)
- [Safety Information on page 294](#)
- [Summit XGM-2xn Option Card on page 295](#)
- [Summit XGM2-2xn Option Card on page 297](#)
- [Installing or Removing XENPAK Modules on page 300](#)
- [Summit XGM2-2xf Option Card on page 302](#)
- [Installing or Removing XFP Modules on page 304](#)



NOTE

Read the information in this chapter thoroughly before attempting to install or remove a Summit option card.

Overview



CAUTION

The Summit option cards (Summit XGM-2xn, Summit XGM2-2xn, and Summit XGM2-2xf) are not hot-swappable. Disconnect power to the switch before installing or removing a Summit option card. After the Summit option card is installed in a compatible switch, compatible optical modules may be hot-swapped into and out of the option card. Use optics approved by Extreme Networks only.

Three types of Summit option cards are available:

- **Summit XGM-2xn option card:** allows you to add up to two 10-gigabit XENPAK optical transceivers to a Summit X450 series switch.
- **Summit XGM2-2xn option card:** allows you to add up to two 10-gigabit XENPAK optical transceivers to a Summit X450a series or X450e series switch.
- **Summit XGM2-2xf option card:** allows you to add up to two 10-gigabit XFP modules to a Summit X450a series or X450e series switch.

Safety Information



WARNING!

XFP and XENPAK modules become very hot after prolonged use. Take care when removing an XFP or XENPAK module from the option card. If the XFP or XENPAK module is too hot to touch, disengage the XFP or XENPAK module and allow it to cool before removing it completely.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

Before installing a Summit option card into your network:

- Read the latest installation and safety information provided in this chapter and the section specific to the optic type you are installing.
- See [Appendix A, "Safety Information,"](#) for additional safety information and [Appendix B, "Technical Specifications,"](#) for additional information regarding regulatory compliance certifications.



WARNING!

When working with laser optic modules, always take the following precautions to prevent exposure to hazardous radiation:

- *Never look at the transmit LED/laser through a magnifying device while it is powered on.*
- *Never look directly at a fiber port on the switch or at the ends of a fiber cable when they are powered on.*
- *Invisible laser radiation can occur when the connectors are open. Avoid direct eye exposure to the beam when optic connections are unplugged.*
- *Never alter, modify, or change an optic device in any way other than suggested in this document.*

XFP and XENPAK Safety Specifications

- Class 1 Laser Product
- EN60825-1+A2:2001 or later, European laser standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 89/336/EEC EMC and 73/23/EEC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products



NOTE

Extreme Networks optics are tested to work in all supported Extreme Networks switches. We recommend that all customers use Extreme Networks optics in their Extreme Networks switches. Extreme Networks assumes no liability for third-party optics. While Extreme Networks does not block third-party optics, we cannot ensure that all third-party optics operate properly in all Extreme Networks switches. The customer assumes all risks associated with using third-party optics in Extreme Networks switches.

Summit XGM-2xn Option Card

The Summit XGM-2xn option card allows you to add up to two 10-gigabit XENPAK modules to the following switches:

- Summit X450-24x switch, running ExtremeXOS 11.2.0 (or later)
- Summit X450-24t switch, running ExtremeXOS 11.2.0 (or later)

The Summit XGM-2xn option card is compatible with the following 10-gigabit XENPAK modules:

- SR XENPAK module, operating in the 850 nm range
- LR XENPAK module, operating in the 1310 nm range
- ER XENPAK module, operating in the 1550 nm range
- ZR XENPAK module, operating in the 1550 nm range
- LX-4 XENPAK module, operating in the 1269-1355 nm range



NOTE

For more information about these XENPAK modules, refer to [“XENPAK Interfaces”](#) on page 354.



NOTE

Standards-based CX-4 XENPAKs are also recognized by ExtremeXOS; contact your CX-4 module vendor to obtain these.

Mixing ZR XENPAKs with Other Types

[Table 37](#) lists the supported combinations of XENPAK types using ZR XENPAKs in a Summit X450 series switch. You can either install one ZR XENPAK and leave one slot empty or install one ZR XENPAK and one SR XENPAK; the Summit X450 series switch does not support any other XENPAK combinations when a ZR XENPAK module is installed. You must put the specified modules in the specified slots, as shown in [Table 37](#), for the switch to discover the ZR XENPAK correctly.

Table 37: Summit X450 ZR XENPAK combinations

Left Slot	Right Slot
ZR XENPAK	Empty
ZR XENPAK	SR XENPAK

Installing the Summit XGM-2xn Option Card



CAUTION

The Summit XGM-2xn option card is not hot-swappable. Disconnect power to the switch before installing or removing the Summit XGM-2xn option card. After the Summit XGM-2xn option card is installed in a compatible switch, XENPAK modules may be hot-swapped into and out of the option card. Use only XENPAK modules approved by Extreme Networks.

You need the following tools and equipment to install a Summit XGM-2xn option card:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver



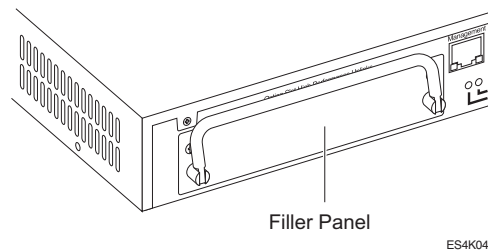
CAUTION

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

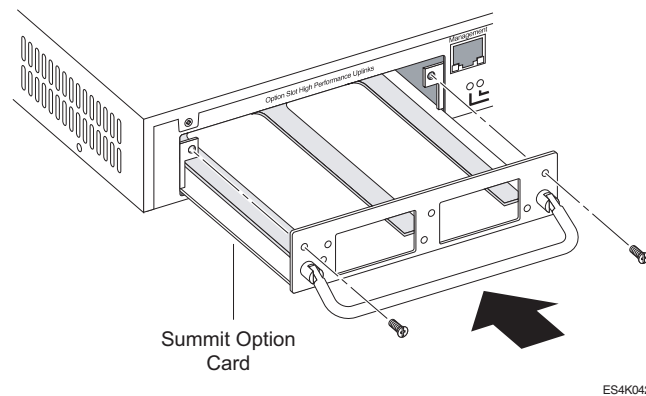
To install the Summit XGM-2xn card:

- 1 Disconnect the AC power and any redundant power supply from the Summit switch.
- 2 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 3 Remove the screws holding the filler panel over the option slot on the back of the switch (Figure 203). Remove the filler panel and set it aside. Save the screws for re-use.

Figure 203: Removing the option slot filler panel



- 4 Align the sheet metal edges on the option card with the card guides in the switch housing. Carefully slide the Summit XGM-2xn option card into the switch housing until the connectors engage and the card is flush with the back panel of the switch (Figure 204).

Figure 204: Installing the Summit XGM-2xn option card

- 5 Using the screws from the cover plate, secure the Summit XGM-2xn option card to the back panel of the switch.
- 6 Refer to [“Installing or Removing XENPAK Modules” on page 300](#) for information on installing or replacing the XENPAK modules in the Summit XGM-2xn option card.

**NOTE**

If you install only one XENPAK module in the Summit XGM-2xn option card, attach the supplied cover plate over the remaining open module slot.

Be sure that the option slot always has either an installed Summit option card or a faceplate over the opening. An open slot could divert air from the switch and cause overheating.

Summit XGM2-2xn Option Card

The Summit XGM2-2xn option card allows you to add up to two 10-gigabit XENPAK modules to the following switches:

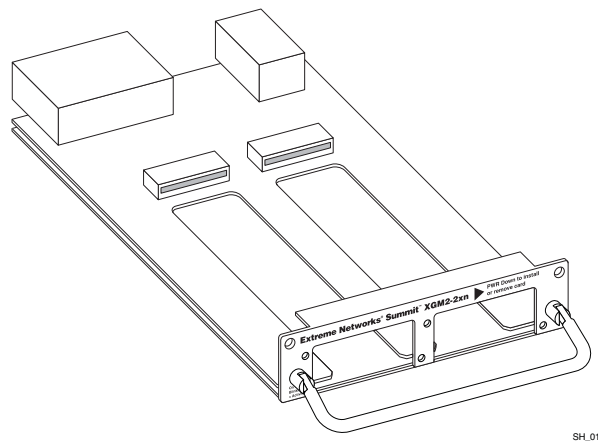
- Summit X450a-24t switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450a-24tDC switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450a-24x switch, running ExtremeXOS 11.6.1 (or later)
- Summit X450a-24xDC switch, running ExtremeXOS 11.6.1 (or later)
- Summit X450a-48t switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450e-24p switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450e-48p switch, running ExtremeXOS 11.6.1 (or later)

The Summit XGM2-2xn option card is compatible with the following 10-gigabit XENPAK modules:

- SR XENPAK module, operating in the 850 nm range
- LR XENPAK module, operating in the 1310 nm range
- ER XENPAK module, operating in the 1550 nm range
- ZR XENPAK module, operating in the 1550 nm range
- LX-4 XENPAK module, operating in the 1269-1355 nm range
- LW XENPAK module, operating in the 1310 nm range

Figure 205 shows the Summit XGM2-2xn option card.

Figure 205: Summit XGM2-2xn option card



NOTE

Refer to “[XENPAK Interfaces](#)” on page 354 for more information about XENPAK modules.

Standards-based CX-4 XENPAKs are also recognized by ExtremeXOS; contact your CX-4 module vendor to obtain these.

Installing the Summit XGM2-2xn Option Card



CAUTION

The Summit XGM2-2xn option card is not hot-swappable. Disconnect power to the switch before installing or removing the Summit XGM2-2xn option card. After the Summit XGM2-2xn option card is installed in a compatible switch, XENPAK modules may be hot-swapped into and out of the option card. Use only XENPAK modules approved by Extreme Networks.



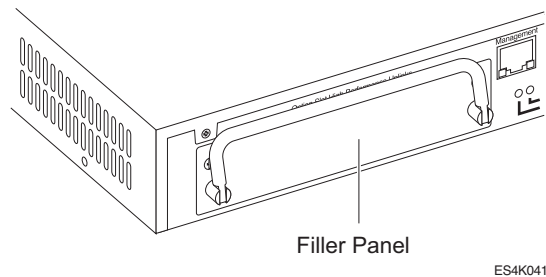
CAUTION

Be sure that the option slot always has either an installed Summit option card or a faceplate over the opening. An open slot could divert air from the switch and cause overheating.

To install the Summit XGM2-2xn option card:

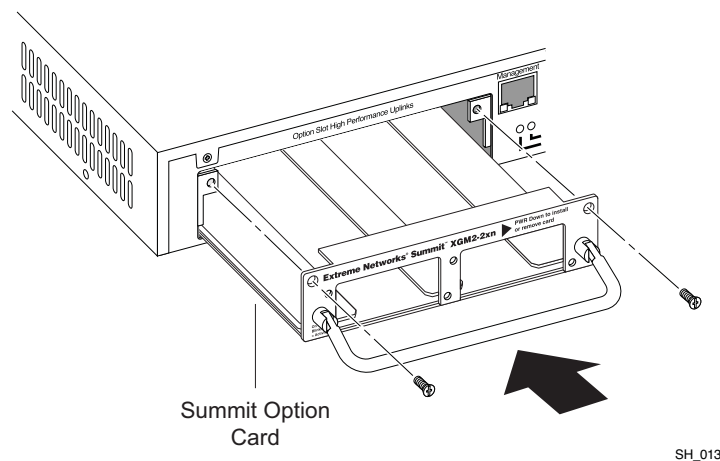
- 1 Disconnect the power from the Summit switch by removing the plug from the wall outlet.
- 2 If a redundant power supply is in use, disconnect the power of the redundant power supply by removing the plug from the wall outlet.
- 3 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 4 Remove the screws holding the filler panel over the option slot on the back of the switch ([Figure 206](#)). Remove the filler panel and set it aside. Save the screws for re-use.

Figure 206: Option slot filler panel



- 5 Align the sheet metal edges on the option card with the card guides in the switch housing. Carefully slide the Summit XGM2-2xn option card into the switch housing until the connectors engage and the option card is flush with the back panel of the switch ([Figure 207](#)).

Figure 207: Installing the Summit XGM2-2xn option card



- 6 Using the screws from the filler panel, secure the Summit XGM2-2xn option card to the back panel of the switch.
- 7 Refer to [“Installing or Removing XENPAK Modules” on page 300](#) for information on installing or replacing the XENPAK modules in the Summit XGM2-2xn option card.



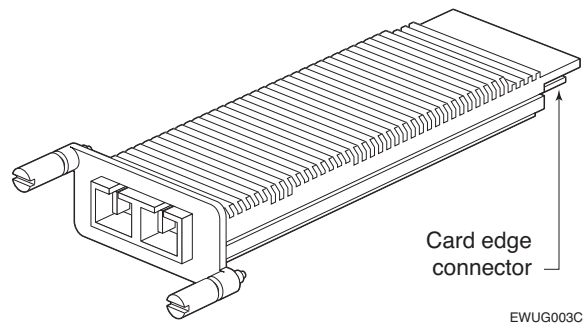
NOTE

If you install only one XENPAK module in the Summit XGM2-2xn option card, attach the supplied cover plate over the remaining open module slot.

Installing or Removing XENPAK Modules

This section describes installing and removing the XENPAK module. All XENPAK modules are installed using this procedure. A typical XENPAK module is shown in [Figure 208](#).

Figure 208: XENPAK module



WARNING!

XENPAK modules contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10 and EN60825-1 A2:2001.



CAUTION

To prevent ESD damage to the XENPAK module, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

Installing a XENPAK Module

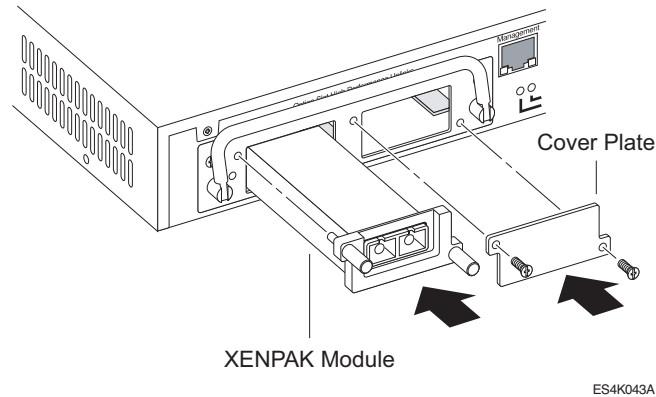


CAUTION

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

To install a XENPAK module:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 2 Remove the XENPAK module from its antistatic container.
- 3 If the module has a protective pad covering the card-edge connector, remove the pad.
- 4 Lift the handle on the Summit XGM-2xn or XGM2-2xn option card to allow the module to be inserted.
- 5 Hold the module by its sides and insert it into one of the slots on the Summit option card ([Figure 209](#)).

Figure 209: Installing a XENPAK module

- 6 Slide the XENPAK module as far into the slot as possible, until you hear it click, indicating that it is firmly attached.
- 7 Secure the XENPAK module to the Summit option card by tightening the captive screws until they are hand-tight.
- 8 Store the antistatic container, dust covers, and card-edge connector protective pad in a clean location in case you need to remove the XENPAK module.
- 9 If only one XENPAK module is installed, attach a supplied cover plate over the other module slot.

**NOTE**

To ensure that your module is undamaged upon installation, you can correlate factory test data with your installation site test data by consulting the average power reference values shown on the XENPAK module test data sheet (Part No. 121074-00) enclosed with your module.

Remove the dust covers from the module connectors before you connect cables.

Removing a XENPAK Module

**CAUTION**

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

**WARNING!**

Disconnect the fiber optic cable from the XENPAK module before removing the module from the Summit XGM2-2xn option card. Do not stare directly into the beam; it can cause eye damage.

To remove a XENPAK module:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 2 Disconnect the fiber-optic cable from the XENPAK module and install dust covers over the module connectors.

- 3 Loosen the two captive screws until they are completely free from the Summit option card.
- 4 Holding both captive screws, pull the XENPAK module out of the card.

**WARNING!**

XENPAK modules become very hot after prolonged use. Take care when removing a XENPAK from the switch. If the module is too hot to touch, disengage the module and allow it to cool before removing it completely.

- 5 Place the XENPAK module immediately into an antistatic container to protect it from ESD damage and dust.
- 6 If you are not installing another XENPAK module, cover the opening with a cover plate.

Summit XGM2-2xf Option Card

The Summit XGM2-2xf option card allows you to add up to two 10-gigabit XFP modules to the following switches:

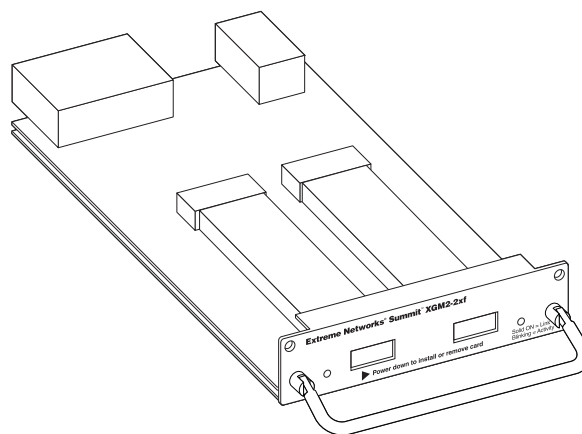
- Summit X450a-24t switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450a-24tDC switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450a-24x switch, running ExtremeXOS 11.6.1 (or later)
- Summit X450a-24xDC switch, running ExtremeXOS 11.6.1 (or later)
- Summit X450a-48t switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450e-24p switch, running ExtremeXOS 11.5.0 (or later)
- Summit X450e-48p switch, running ExtremeXOS 11.6.1 (or later)

The Summit XGM2-2xf option card is compatible with the following 10-gigabit XFP modules:

- LR XFP module
- SR XFP module

Figure 210 shows the Summit XGM2-2xf option card.

Figure 210: Summit XGM2-2xf option card



SH_011

**NOTE**

Refer to “XFP Interfaces” on page 349 for complete details regarding XFP modules.

Installing the Summit XGM2-2xf Option Card

**CAUTION**

The Summit XGM2-2xf option card is not hot-swappable. Disconnect power to the switch before installing or removing the Summit XGM2-2xf option card. After the Summit XGM2-2xf option card is installed in a compatible switch, XFP modules may be hot-swapped into and out of the option card. Use only XFP modules approved by Extreme Networks.

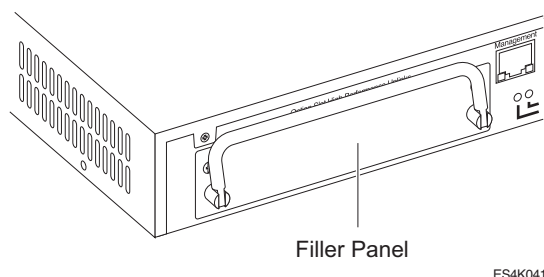
**CAUTION**

Be sure that the option slot always has either an installed Summit option card or a faceplate over the opening. An open slot could divert air from the switch and cause overheating.

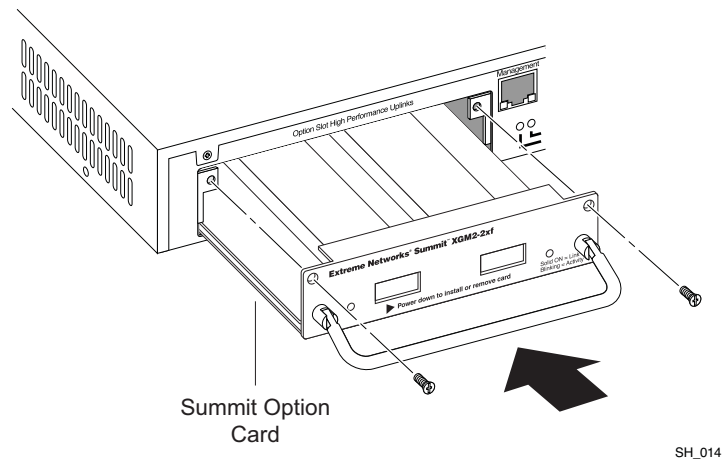
To install the Summit XGM2-2xf option card:

- 1 Disconnect the power from the Summit switch by removing the plug from the wall outlet.
- 2 If a redundant power supply is in use, disconnect the power of the redundant power supply by removing the plug from the wall outlet.
- 3 Attach the ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 4 Remove the screws holding the filler panel over the option slot on the back of the switch (Figure 211). Remove the filler panel and set it aside. Save the screws for re-use.

Figure 211: Removing the option slot filler panel



- 5 Align the sheet metal edges on the option card with the card guides in the switch housing. Carefully slide the Summit XGM2-2xf option card into the switch housing until the connectors engage and the option card is flush with the back panel of the switch (Figure 212).

Figure 212: Installing the Summit XGM2-2xf option card

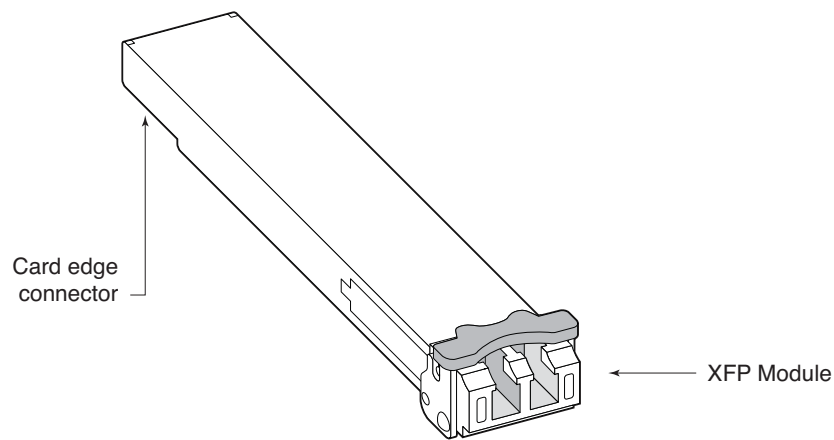
- 6 Using the screws from the filler panel, secure the Summit XGM2-2xf option card to the back panel of the switch.
- 7 Refer to [“Installing or Removing XFP Modules” on page 304](#) for information on installing or replacing the XFP modules in the Summit XGM2-2xf option card.

**NOTE**

If you install only one XFP module in the Summit XGM2-2xf option card, attach the supplied cover plate over the remaining open module slot.

Installing or Removing XFP Modules

This section describes installing and removing an XFP module. You can install or remove an XFP module from your Extreme Networks switch without powering off the system. [Figure 213](#) shows a typical XFP module.

Figure 213: XFP module

SH_022

**WARNING!**

XFP modules contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10 and EN60825-1 A2:2001.

Installing an XFP Module

**WARNING!**

Disconnect the fiber optic cable from the XFP module before removing the module from the Summit XGM2-2xf option card. Do not stare directly into the beam; it can cause eye damage.

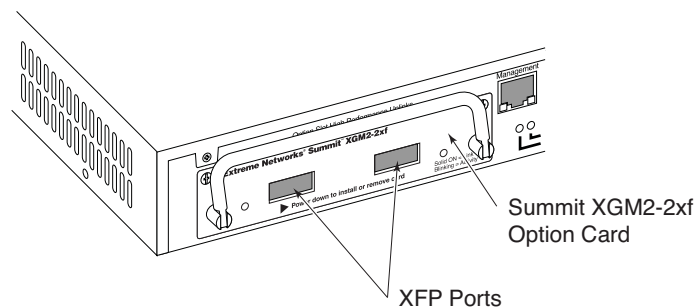
**CAUTION**

To prevent ESD damage to the XFP module, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

To install an XFP module:

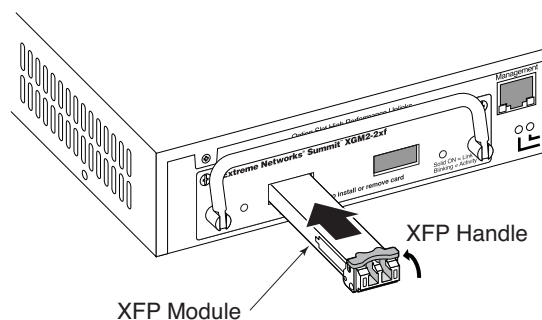
- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 2 Remove the XFP module from its antistatic container and remove the dust covers from the module optical connectors.
If your module has a protective pad covering the card-edge connector, remove it. Store the antistatic container, dust covers, and card-edge connector protective pad in a clean location from which they can be easily retrieved if you need to uninstall the module.
- 3 Remove any rubber dust covers from the port where you are installing the XFP module.
- 4 Move the handle on the Summit XGM2-2xf option card into an upright position to access the XFP ports (see [Figure 214](#)).

Figure 214: Accessing the XFP ports

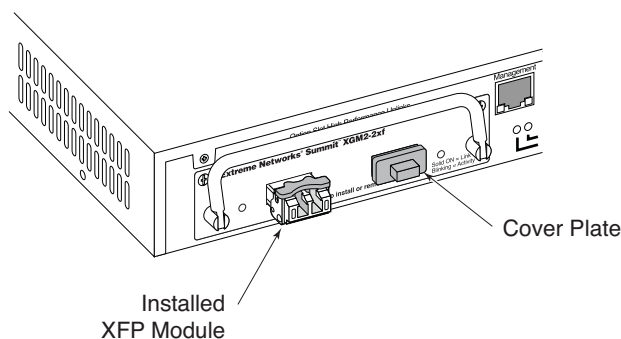


SH_023

- 5 Holding the module by its sides, partially insert the XFP module into one of the Summit XGM2-2xf option card XFP ports (see [Figure 215](#)).
- 6 Push the XFP handle (bail latch) upward until it clicks into place (see [Figure 215](#)).
- 7 Slide the XFP module as far into the slot as possible, until you hear it click, indicating that it is firmly attached (see [Figure 215](#) and [Figure 216](#)).

Figure 215: Installing an XFP module

SH_024

Figure 216: Installed XFP Module

SH_025

**NOTE**

If you are installing only one XFP module, always cover the unoccupied port with a rubber dust cover, which is shipped with the option card (see [Figure 216](#)).

**NOTE**

To ensure that your XFP module is undamaged upon installation, you can correlate factory test data with your installation site test data by consulting the average power reference values shown on the XFP module test data sheet (Part No. 121074-00) enclosed with your module.

Removing an XFP Module

To remove an XFP module:

- 1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to the equipment rack.
- 2 Release the handle (bail latch) on the XFP module.
- 3 Carefully pull the XFP module out of the port.
- 4 Place the dust covers back into the XFP module connectors.
- 5 Place the XFP module immediately into an antistatic container to protect it from ESD damage and dust.

This chapter describes external power supplies available for use with the Summit family of switches.

- [Overview on page 307](#)
- [Safety on page 308](#)
- [EPS-160 External Power Module \(with EPS-T\) on page 309](#)
- [EPS-LD External Power Supply Unit on page 313](#)
- [EPS-500 External Power Supply Unit on page 317](#)
- [EPS-150DC External Power Module \(with EPS-T2\) on page 321](#)
- [EPS-600LS External Power Module on page 328](#)



NOTE

Read the information in this chapter thoroughly before you attempt to install or remove an External Power Supply. This manual focuses on products supported by ExtremeXOS only. The compatible switches called out in each section in this chapter run ExtremeXOS software. For a list of compatible switches running ExtremeWare, refer to the Consolidated “i” and “e” Hardware Installation Guide.

Overview

Summit X450 family and X250e series switches are shipped with an internal power supply, which supplies all of the power needed for most switch operation. An optional redundant power supply can be added to protect against a power supply failure and to provide increased support for PoE operation on applicable switches.

Refer to [Table 38](#) for a compatibility chart of Summit X450 family switches and external power supplies.

Table 38: Summit switch and EPS compatibility

Switch Model	Compatible EPS	Model Number
Summit X450 Series Switches		
Summit X450-24t	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X450-24x	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X450a Series Switches		
Summit X450a-24t	EPS-LD External Power Supply Unit	45019
Summit X450a-24tDC	EPS-150DC External Power Module with EPS-T2	EPS-150DC: 10909 EPS-T2: 10910
Summit X450a-24x	EPS-LD External Power Supply Unit	45019
Summit X450a-24xDC	EPS-150DC External Power Module with EPS-T2	EPS-150DC: 10909 EPS-T2: 10910
Summit X450a-48t	EPS-500 External Power Supply Unit	10911

Table 38: Summit switch and EPS compatibility (Continued)

Switch Model	Compatible EPS	Model Number
Summit X450e Series Switches		
Summit X450e-24p	EPS-LD External Power Supply Unit	45019
Summit X450e-48p	EPS-600LS External Power Module with EPS C Chassis	EPS-600LS: 10913 EPS-C: 10912
Summit X250e Series Switches		
Summit X250e-24t	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X250e-24p	EPS-500 External Power Supply Unit	10911
Summit X250e-48t	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X250e-48p	EPS-600LS External Power Module with EPS C chassis	EPS-600LS: 10913 EPS-C: 10912

Safety

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



NOTE

See [Appendix A, “Safety Information”](#) for additional safety information and [Appendix B, “Technical Specifications”](#) for additional information regarding regulatory compliance certifications.



CAUTION

Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

EPS-160 External Power Module (with EPS-T)

The Extreme Networks EPS-160 External Power Module can be added as a redundant power supply to the Summit X450-24t, X450-24x, X250e-24t, or X250e-48t switch. The entire EPS system consists of a tray (EPS-T) that holds one or two EPS-160 power supplies. Each EPS-160 power supply provides one-to-one redundancy to an attached switch.

The EPS-160 power supply is installed in an EPS-T rack-mountable chassis. The EPS-T chassis can be ordered with one or two EPS-160 power supplies already installed. You can also order an additional power supply from your Extreme Networks reseller.



NOTE

Each individual EPS-160 power supply is shipped with an AC cord for use in North America and a special redundant power supply cord.

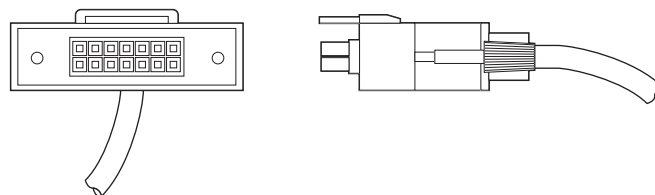
Table 39 shows the wire-to-pin connections for the connector on the rear panel of the EPS-160 power supply.

Table 39: Pinouts for the redundant power supply connector

Pin Number	Wire Label
1	NC
2	GND
3	GND
4	GND
5	GND
6	+12 V
7	+12 V
8	RS+
9	GND
10	INT_PG
11	EXT_CON
12	EXT_PG
13	+5 V
14	+12 V

Figure 217 shows the redundant power cord connector.

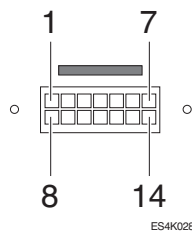
Figure 217: Redundant power cord connector



ES4K027

Figure 218 shows the pin number assignments for the power supply cord connector.

Figure 218: Redundant power connector pin numbers



Installing an EPS-160 External Power Module

You need the following tools and equipment to install an EPS-160 power module:

- Electrostatic discharge (ESD)-preventive wrist strap
- # 1 Phillips screwdriver
- An EPS-T

The EPS-T can be mounted in a rack or placed free-standing on a tabletop.



WARNING!

The EPS must only be installed or removed by trained service personnel in accordance with the installation instructions. Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must read the safety information provided in [Appendix A](#) of this guide. Not following these precautions can result in equipment damage or shock.

Rack Mounting the EPS-T

You need the following tools and equipment to rack-mount the EPS-T:

- # 1 Phillips screwdriver
- Rack mount kit

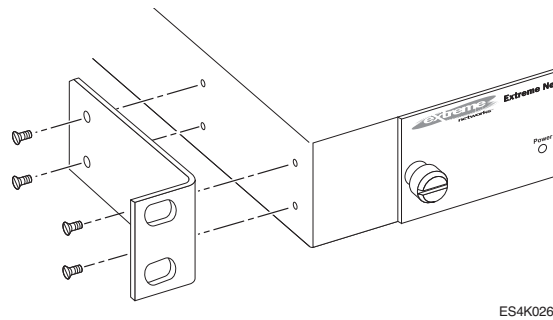


CAUTION

Do not use the rack mount brackets to suspend the EPS-T from under a table or desk, or to attach the EPS-T to a wall.

To rack mount the EPS-T:

- 1 Place the EPS-T upright on a hard flat surface, with the front facing you.
- 2 Remove the mounting bracket kit (including screws) from the packaging.
- 3 Locate a mounting bracket over the mounting holes on one side of the unit.
- 4 Insert the screws and fully tighten with a screwdriver, as shown in [Figure 219](#).

Figure 219: Fitting the mounting bracket

ES4K026

- 5 Repeat steps 3 and 4 for the other side of the EPS-T.
- 6 Mount the EPS-T into a 19-inch rack.

Installing an EPS-160 into an EPS-T

To install an EPS-160 power supply into the EPS-T:

- 1 Remove the EPS-160 power supply from the packing material.
- 2 Remove the cover plate from the empty slot on the EPS-T.
- 3 Insert the EPS-160 power supply into the front of the EPS-T.
- 4 Tighten the provided thumbscrews to secure the power supply to the tray.
- 5 Connect the EPS-160 power supply to the Summit switch by following the procedure in [“Connecting the EPS-160” on page 311](#).

Connecting the EPS-160



CAUTION

Do not attach the AC power cord to the EPS-160 power supply until the EPS-160 is properly grounded and until after the redundant power supply cord is connected.

You need the following tools and equipment to install an EPS-160 power supply:

- Electrostatic discharge (ESD)-preventive wrist strap
- # 1 Phillips screwdriver



CAUTION

The EPS-160 power supply and the rack must all be connected to protective earth ground before attaching to another switch.

To connect the EPS-160 power supply to your switch:

- 1 Connect the keyed-end of the redundant power supply cord to the EPS-160 power supply (see [Figure 220](#)).

The key is a plastic tab on the cord connector housing that fits into the chassis to ensure correct alignment of the connector.

- 2 Connect the other end of each EPS-160 power supply cord to the Extreme switch (see [Figure 220](#)). This connector end can only be inserted into the switch with the end marked TOP facing up.

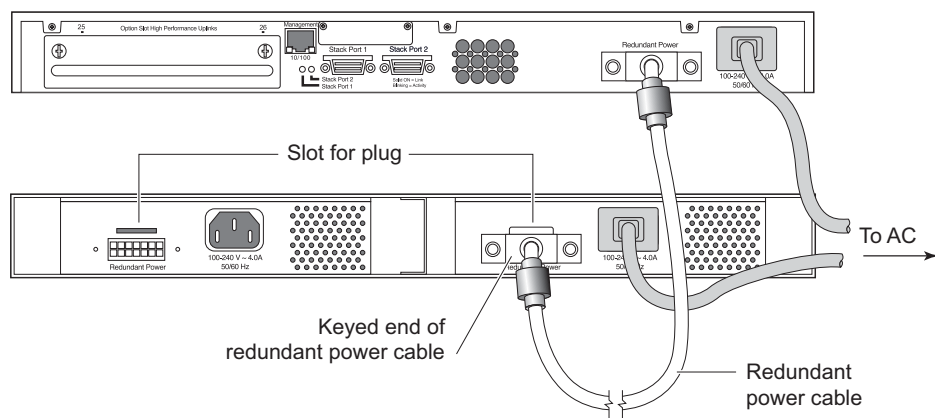
**NOTE**

If your switch shipped with a metal cover plate over the redundant power input connector, remove the cover.

**WARNING!**

The redundant power input connector on the rear of the switch contains high energy and is a burn hazard. Use care when connecting the redundant power supply cord to the rear of the switch.

Figure 220: Redundant power connections



S450_008

- 3 Using the supplied cord, connect the AC cord to the AC supply for each unit.

**NOTE**

For countries other than the USA, you might require a different AC cord that is not supplied. Contact your sales representative for the appropriate cord type and for information regarding the voltage and current requirements of the power supply.

**NOTE**

Consider all of the equipment that is connected to the power supply circuit to ensure that the circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions. The switch and its redundant power source should not be plugged into the same circuit breaker.

The PSU-E LED on the front of the EPS-160 should be solid green to indicate that it is ready.

Removing an EPS-160 from an EPS-T

To remove an EPS-160 power supply from an EPS-T:

- 1 Disconnect the AC power by removing the plug from the wall.
- 2 Disconnect the AC power cord from the EPS-160 power supply.
- 3 Remove the redundant power cord from the EPS-160 supply.

- 4 Loosen the thumbscrews on the front of the tray and slide the EPS-160 power supply out of the EPS-T.

EPS-LD External Power Supply Unit

The Extreme Networks EPS-LD External Power Supply Unit can be added as a redundant power supply to the Summit X450a-24t or Summit X450e-24p switch. When attached to the Summit X450e-24p, the EPS-LD provides 465 W total power with 375 W dedicated for PoE applications.

Installing an EPS-LD

The external power supply box contains the following items:

- One EPS-LD unit
- Mounting hardware, including screws
- One AC power cord (for use in North America)
- One redundant power cord (1 meter long) for connecting the power supply to the switch



NOTE

If you are using the EPS-LD outside North America, the input power cord must have an IEC320-C14 connector and the appropriate power input plug for the country in which you are operating. The cord must be 10 feet or less and at least 16-gauge copper wire.

The EPS-LD unit can be mounted in a rack or placed free-standing on a tabletop. You can mount the EPS-LD facing either the front or the back of the rack. For this reason, each unit has two sets of mounting holes, two on each end. Mount the EPS-LD so that the unit's output connectors are on the same side as the external connector on the connecting switch.



CAUTION

Do not use the rack-mount brackets to suspend the EPS-LD from under a table or desk, or to attach the unit to a wall.

Rack-mounting the EPS-LD



NOTE

When installing an EPS-LD in a rack, make sure air vents are not restricted. Allow for elevated ambient operating temperatures when the EPS-LD is installed adjacent to other equipment. Be sure you mount the equipment in the rack so that the load is evenly distributed.

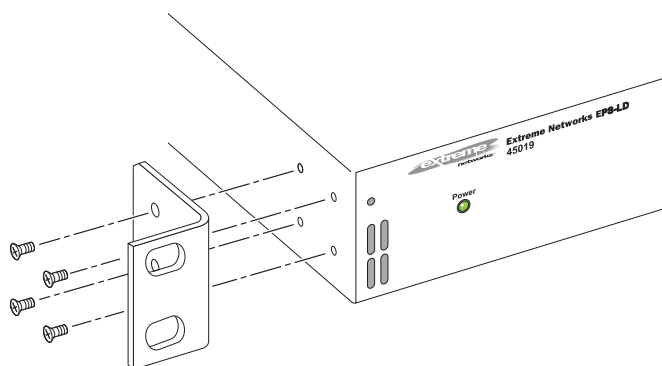
To install the EPS-LD, you need the following tools and materials:

- Electrostatic strap
- #1 Phillips screwdriver

To rack mount each EPS-LD unit:

- 1 Place the EPS-LD unit upright on a hard flat surface, with the side you want to face to the front of the switch toward you.
- 2 Remove the mounting bracket kit (including screws) from the packaging.
- 3 Locate a mounting bracket over the mounting holes on one side of the unit.
- 4 Insert the screws as shown in [Figure 221](#), and fully tighten the screws with a #1 Phillips screwdriver.

Figure 221: Fitting the mounting bracket



XM_054

- 5 Repeat steps 3 and 4 for the other side of the EPS-LD unit.
- 6 Insert the EPS-LD unit into a 19-inch rack.



NOTE

Mount the EPS-LD so that the output connectors are on the same side as the external connector on the connecting switch. If you mount the EPS-LD with the connectors facing in the opposite direction as the Extreme switch connector, leave at least 1 U between the switch and the EPS-LD through which to slide the power cords. Do not route the power cords around the equipment rack.

- 7 Insert the screws into the rack and the mounting bracket on both sides of the unit and fully tighten with a suitable screwdriver.

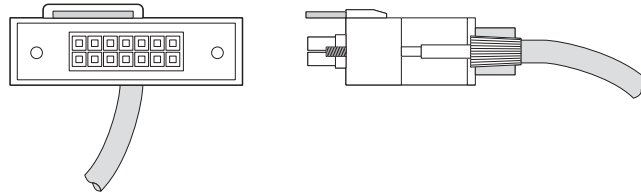
Connecting the EPS-LD to the Switch



CAUTION

Do not attach the AC power cord to the EPS-LD unit until the unit is properly grounded at the electrical outlet and the redundant power supply cord is connected.

One end of the EPS-LD cord has a keyed connector to ensure correct alignment of the connector ([Figure 222](#)). The key is a plastic tab on the cord connector housing that fits into the EPS-LD unit.

Figure 222: EPS-LD cord with key

XM_055

To connect the EPS-LD cord:

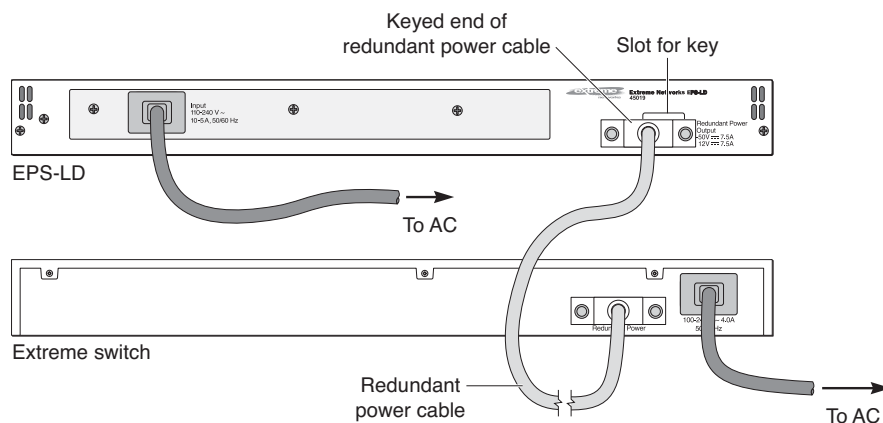
- 1 Connect the keyed end of the EPS-LD cord to the power supply unit.
See [Figure 223](#) to locate the connectors on the EPS-LD unit and on the switch.
 - 2 Align and tighten the captive retaining screws on the connector.
 - 3 Connect the other end of the EPS-LD cord to the Extreme switch.
- The connector fits in only one direction.

**NOTE**

If your switch shipped with a metal cover plate over the redundant power input connector, remove the cover.

**WARNING!**

The redundant power input connector on the rear of the switch contains high energy and is a burn hazard. Use care when connecting the redundant power supply cord to the rear of the switch.

Figure 223: Connecting an EPS-LD unit to a switch

XM_056

Connecting the EPS-LD to Power

Make sure the EPS-LD is connected to the switch before you connect the AC power.



CAUTION

The EPS-LD unit does not have a switch for turning the unit on and off. You disconnect power to the EPS-LD unit by removing the plug from the electrical outlet. Make sure that this connection is easily accessible to you.



NOTE

Consider all of the equipment that is connected to the power supply circuit to ensure that the circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions. The switch and its redundant power source should not be plugged into the same circuit breaker.

To connect the EPS-LD to power:

- 1 Connect the AC input power cord to the AC connector on the EPS-LD unit.
- 2 Connect the other end of the AC cord to the electrical outlet.

Make sure the electrical outlet is properly grounded.

The Power LED on the front of the EPS-LD unit turns solid green to indicate that it is ready. [Table 40](#) shows the possible LED status for the power supply.

Table 40: LED status for EPS-LD Power LED

Power LED	Indicates
Green, solid	The external power supply is operating normally.
Off	The external power supply is not connected.

Removing an EPS-LD

To remove an EPS-LD unit:

- 1 Disconnect the AC power by removing the plug from the wall.
- 2 Disconnect the AC power cord from the EPS-LD unit.
- 3 Disconnect the cord between the Extreme switch and the EPS-LD unit.
- 4 Remove the screws from the EPS-LD mounting brackets.
- 5 Slide the EPS-LD unit out of the rack.

EPS-500 External Power Supply Unit

The Extreme Networks EPS-500 (External Power Supply Unit 10911) provides additional power to compatible Power over Ethernet (PoE) switches and other Extreme switches. The EPS-500 power supply provides up to 500 W of total power and up to 375 W of power dedicated to PoE applications.

**NOTE**

The EPS-500 power supply is currently available for use with the Summit X450a-48t and X250e-24p switches. When this power supply is used one of these Summit switches, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

The EPS-500 unit is shipped with the following items in the box:

- One EPS-500 unit
- Mounting hardware, including screws
- One input AC power cord (for use in North America)
- One output EPS-500 redundant power cord (for connecting to Summit switches)

**NOTE**

Refer to [Appendix A, "Safety Information"](#) for additional information regarding proper power cord selection.

**NOTE**

If you are using the EPS-500 outside of North America, the input power cord must utilize an IEC320-C13 input connector and the appropriate power input plug for the country in which you are operating the unit. The input power cord must be at least 18 AWG copper wire and it must be less than 10 feet (3 m) long.

**NOTE**

Each individual EPS-500 power supply is shipped with an AC cord for use in North America and a special redundant power supply cord.

Installing and Removing an EPS-500

The EPS-500 unit can be mounted in a rack or placed free-standing on a tabletop.

Rack-mounting an EPS-500 unit

You can mount the EPS-500 facing either the front or the back of the rack. For this reason, each unit has two sets of mounting holes on each side. Extreme Networks recommends that you mount the EPS-500 unit so that the power output connectors of the EPS-500 unit are on the same side as the external connector on the connecting switch.



CAUTION

When installing an EPS-500 in a rack system, make sure that the air vents are not restricted. Allow for elevated ambient operating temperatures when the unit is installed adjacent to other equipment. To avoid hazardous conditions due to uneven mechanical loading, make sure that the equipment is mounted properly in the rack system.



CAUTION

Do not use the rack-mount brackets to suspend the EPS-500 from under a table or desk, or to attach the unit to a wall.

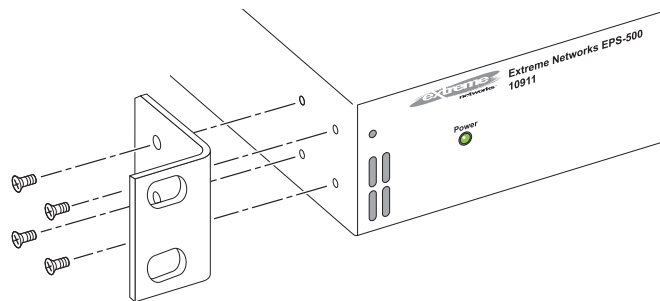
To install the EPS-500, you need the following tools and materials:

- ESD-preventive wrist strap
- #1 Phillips screwdriver

To rack mount each EPS-500 unit:

- 1 Place the EPS-500 unit upright on a hard flat surface, with the side you want to face to the front of the switch toward you.
- 2 Remove the mounting bracket kit from the packaging.
- 3 Place a mounting bracket over the mounting holes on one side of the unit.
- 4 Insert the provided screws (see [Figure 224](#)) and fully tighten the screws using a #1 Phillips screwdriver.

Figure 224: Attaching a mounting bracket



XM_073

- 5 Repeat steps 2 through 4 on the opposite side of the EPS-500 unit.
- 6 Slide the EPS-500 unit into a 19-inch rack.

**NOTE**

Extreme Networks recommends that you mount the EPS-500 so that the output connectors are on the same side as the external connector on the connecting switch. If you mount the EPS-500 with the connectors facing in the opposite direction as the Extreme switch connector, leave at least 1 u between the switch and the EPS-500 through which to slide the power cords. Do not route the power cords around the equipment rack.

- 7 On each side of the unit, insert rack mounting screws through the rack and the mounting bracket and secure the unit to the rack by fully tightening the screws.

Connecting the EPS-500

**CAUTION**

Do not attach the AC power cord to the EPS-500 unit until the unit is properly grounded at the electrical outlet and the redundant power cord is connected.

- 1 Connect the keyed end of the EPS-500 redundant power cord to the power supply unit. The key is a plastic tab on the connector housing that fits into the EPS-500 unit to ensure correct alignment of the connector.
See [Figure 225](#) for details on the connector key, and see [Figure 226](#) to locate the connectors on the EPS-500 unit and on the switch.
- 2 Connect the other end of the redundant power cord to the Extreme switch.
The connector fits the slot in only one direction.

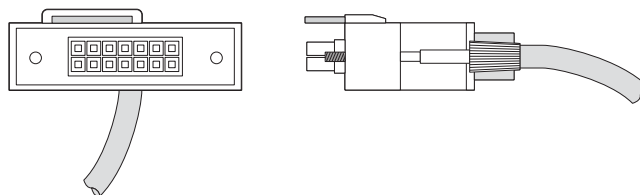
**NOTE**

If your switch was shipped with a metal cover plate over the redundant power input connector, remove the cover.

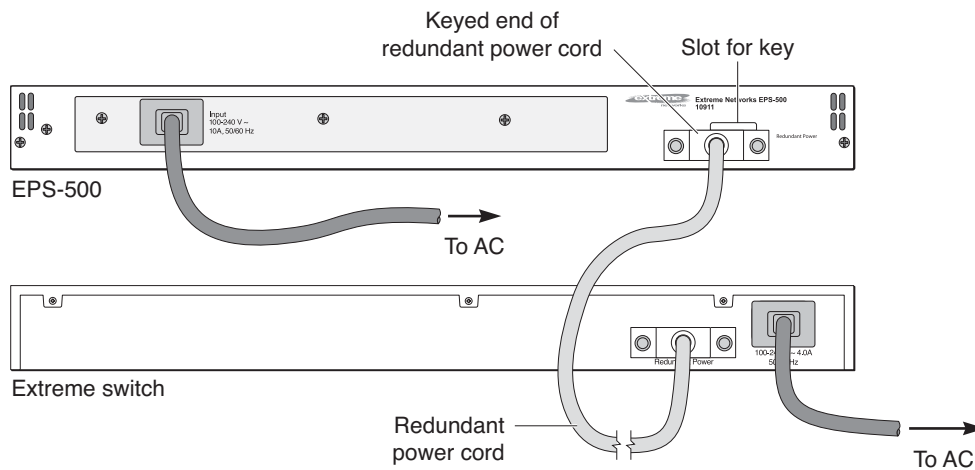
**WARNING!**

The redundant power input connector on the rear of the switch contains high energy and is a burn hazard. Use care when connecting the redundant power supply cord to the rear of the switch.

Figure 225: EPS-500 redundant power cord with connector key



XM_055

Figure 226: Connecting an EPS-500 unit to a switch

XM_074

- 3 Connect the AC input power cord to the AC connector on the EPS-500 unit.

**CAUTION**

The EPS-500 unit does not have a switch for turning the unit on and off. Disconnect power to the EPS-500 unit by removing the plug from the electrical outlet. Be sure that this connection is easily accessible to you.

- 4 Connect the other end of the AC power cord to the electrical outlet.
Be sure that the electrical outlet is properly grounded.

**NOTE**

Consider all of the equipment that is connected to the power supply circuit to ensure that the circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions. The switch and its redundant power source should not be plugged into the same circuit breaker.

The Power LED on the front of the EPS-500 unit turns solid green to indicate that it is ready. [Table 41](#) shows the possible LED status for the power supply.

Table 41: LED status for EPS-500 Power LED

Power LED	Indicates
Green, solid	The external power supply is operating normally.
Off	The external power supply is not connected.

Removing an EPS-500 unit

To remove an EPS-500 unit:

- 1 Disconnect the AC power by removing the plug from the wall.
- 2 Disconnect the AC power cord from the EPS-500 unit.
- 3 Remove the redundant power cord that connects to the Extreme switch from the EPS-500 unit.
- 4 Remove the mounting screws securing the EPS-500 unit to the rack system.
- 5 Slide the EPS-500 unit out of the rack.

EPS-150DC External Power Module (with EPS-T2)

This section describes the installation process for the Extreme Networks EPS-150DC (External Power Module 10909) and specific safety requirements that must be adhered to when connecting an EPS-150DC to a DC power source and to an Extreme Networks switch.

The EPS-150DC is a modular power supply for use in the External Power System Tray (EPS-T2). It allows you to add a redundant power supply to compatible Extreme switches to protect against a power supply failure. The EPS-T2 is a tray that holds one or two EPS-150DC power supplies. Each EPS-150DC provides one-to-one redundancy to an attached Extreme switch. The EPS-150DC installs into an EPS-T2 rack-mountable chassis.



NOTE

The EPS-150DC is available for use with the Summit X450a-24tDC, Summit X450a-24xDC, or Summit X450a-48tDC switch. When the one of these Summit switches is used with the EPS-150DC, the power supplies (internal and redundant) are fully fault tolerant and load-sharing. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

The EPS-150DC unit is shipped with the following items in the box:

- One EPS-150DC unit
- Mounting hardware, including screws
- One DC wiring harness
- One EPS-150DC redundant power cord (for connecting to Summit switches)



NOTE

For centralized DC power connection, this product is intended to be installed in restricted access locations (dedicated equipment rooms, equipment closets, or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Installing an EPS-T2

This section describes the installation process for the Extreme Networks EPS-T2 (External Power Supply Tray 10910). The EPS-T2 is a tray that holds one or two compatible external power supplies.

Pre-Installation Requirements

You need the following tools and equipment to rack mount the EPS-T2:

- # 1 Phillips screwdriver
- Rack mount kit

Rack Mounting the EPS-T2



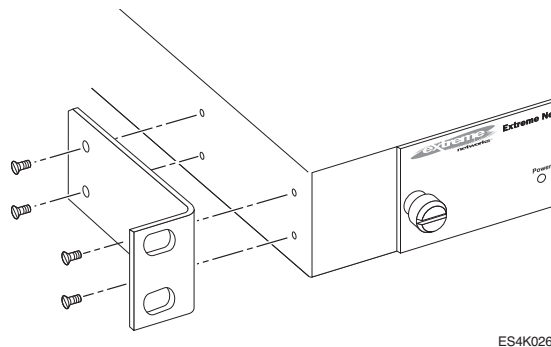
CAUTION

Do not use the rack mount brackets to suspend the EPS-T2 from under a table top or desk, or to attach the EPS-T2 to a wall.

To rack mount the EPS-T2:

- 1 Place the EPS-T2 upright on a hard flat surface, with the front facing you.
- 2 Remove the mounting bracket kit (including screws) from the packaging.
- 3 Locate a mounting bracket over the mounting holes on one side of the unit.
- 4 Insert the screws and fully tighten with a screwdriver, as shown in [Figure 227](#).

Figure 227: Fitting the mounting bracket



- 5 Repeat steps 3 and 4 for the other side of the EPS-T2.
- 6 Slide the EPS-T2 into a 19-inch rack and secure it using appropriate rack-mount screws.

Installing an EPS-150DC



NOTE

Install the EPS-T2 before you begin installing the EPS-150DC.



WARNING!

Always be sure that the DC circuit is de-energized before connecting or disconnecting the DC wiring harness at the DC power socket on the rear of the EPS-150DC unit, and before connecting or disconnecting the redundant power cord between the switch and the EPS-150DC unit.

Installing an EPS-150DC unit includes the following tasks:

- [Connecting the DC Wiring Harness to the DC Source Voltage on page 323.](#)
This task must be performed by a licensed, qualified electrician.
- [Installing an EPS-150DC Unit into an EPS-T2 on page 324](#)
- [Connecting the DC Wiring Harness to the DC Power Socket on the EPS-150DC on page 325](#)
- [Connecting the EPS-150DC to a Switch on page 325](#)

Perform these four tasks in the order they are described.

Connecting the DC Wiring Harness to the DC Source Voltage

The EPS-150DC must be connected to a DC power source. A three-wire, 6-foot long DC wiring harness is included with the EPS-150DC. The DC wiring harness *must* be properly connected to the DC source voltage at your facility by a qualified electrician before the connector on the wiring harness can be attached to the DC power supply socket on the rear of the unit. This section provides information about connector pinouts, and [Appendix B, “Technical Specifications”](#) provides DC power specifications to be used in connecting the wiring harness to the DC source voltage.



WARNING!

Wiring the EPS-150DC DC wiring harness to your facilities DC source voltage must be performed by a qualified, licensed electrician. After the wiring harness is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace and maintain the EPS-150DC without further electrician assistance. However, always be sure that the DC circuit is de-energized before connecting or disconnecting the DC power connection at the rear of the EPS-150DC unit.



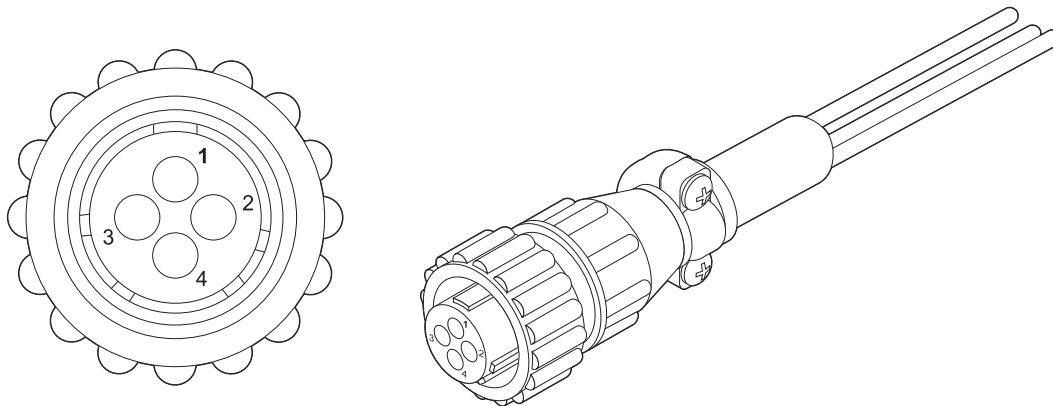
CAUTION

The DC wiring harness must be properly connected to a DC main circuit breaker or fuse rated no greater than 20 A.



CAUTION

Provide proper connection and strain relief on the DC wiring harness in accordance with all local and national electrical codes.

Figure 228: Three-wire Cable Harness

EWUG005

**NOTE**

Each wire on the harness has been properly marked for proper attachment to the DC power source. Leave these labels on each lead wire for future reference.

Table 42 provides the wire-to-pin connection specifications.

Table 42: Wire-to-pin connection specifications

Pin Number	Wire Color	Circuit Connection
1	Green/yellow	Chassis ground
2	Red	Return
3	Black	-48 V
4	unused	

Installing an EPS-150DC Unit into an EPS-T2**WARNING!**

The EPS-150DC unit and rack must be connected to protective earth ground.

To install an individual EPS-150DC into an EPS-T2:

- 1 Remove the EPS-150DC from the packing material.
- 2 Insert the EPS-150DC into the front of the EPS-T2.
- 3 Tighten the provided thumbscrews to secure the power supply to the tray.

Connecting the DC Wiring Harness to the DC Power Socket on the EPS-150DC

After the DC wiring harness is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace, and maintain the EPS-150DC unit without further electrician assistance.



WARNING!

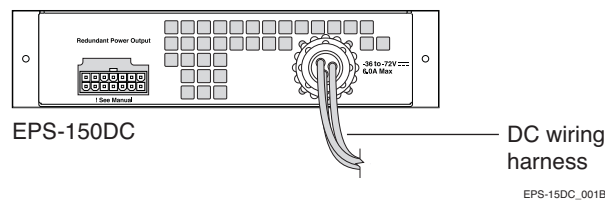
Always be sure that the DC circuit is de-energized before connecting the DC wiring harness to the DC power socket.

To connect the DC wiring harness to the EPS-150DC unit:

- 1 Plug the DC cable connector into the DC power supply socket on the rear of the EPS-150DC unit.

The pins must align properly for the cable to completely connect. Do not force the cable into the socket until the keyway is aligned properly. Refer to [Figure 228](#) for the DC wiring harness connector and to [Figure 229](#) for the DC power socket location on the rear of the EPS-150DC unit.

Figure 229: Connecting the input cable to the EPS-150DC unit



- 2 Tighten the retainer nut on the connector until it is finger tight.

Connecting the EPS-150DC to a Switch

If you are connecting the EPS-150DC unit to a Summit X450a-48tDC switch, you must ground the switch before connecting power. For instructions on grounding the switch, see [“Grounding the Summit X450a-48tDC Switch”](#) on page 287.

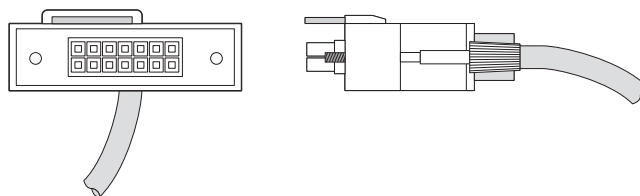


WARNING!

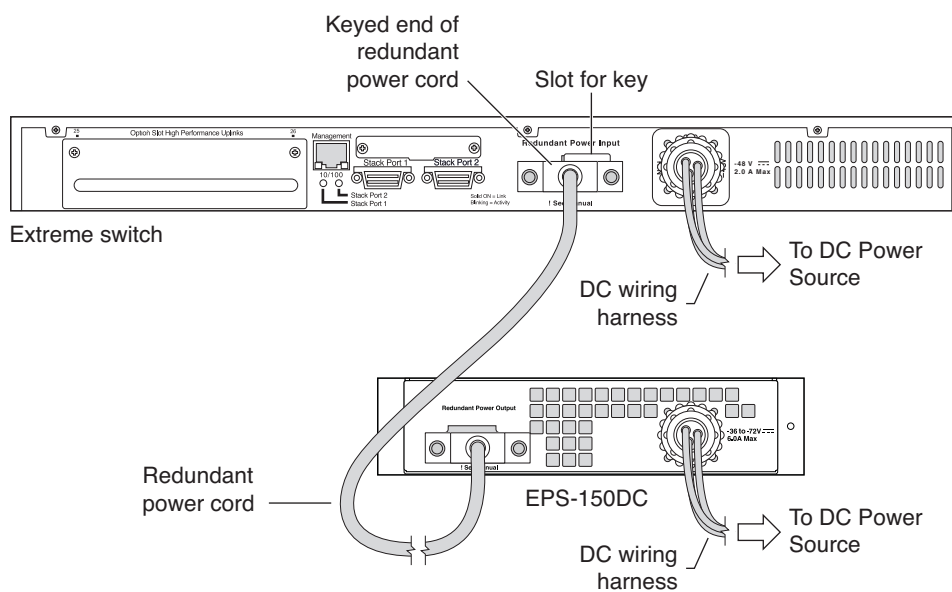
Always be sure that the DC circuit is de-energized before connecting the EPS-150DC to the switch.

To connect the EPS-150DC to a switch:

- 1 Connect the keyed end of the EPS-150DC redundant power cord to the power supply unit. The key is a plastic tab on the connector housing that fits into the EPS-150DC unit to ensure correct alignment of the connector.
See [Figure 230](#) for details on the connector key, and see [Figure 231](#) to locate the connectors on the EPS-150DC unit and on the switch.
- 2 Connect the other end of the redundant power cord to the Extreme switch.
The connector fits the slot in only one direction.

Figure 230: EPS-150DC redundant power cord with connector key

XM_055

Figure 231: Connecting an EPS-150DC unit to a switch

EPS-150DC_002A

3 Energize the DC circuit.



NOTE

Consider all of the equipment that is connected to the power supply circuit to ensure that the circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions.

The Power LED on the front of the EPS-150DC unit turns solid green to indicate that it is ready. [Table 41](#) shows the possible LED status for the power supply.

Table 43: LED status for EPS-150DC Power LED

Power LED	Indicates
Green, solid	The external power module is operating normally.
Off	The external power module is not connected.

Removing an EPS-150DC

**WARNING!**

Always be sure that the DC circuit is de-energized before disconnecting any cables and attempting to remove an EPS-150DC unit.

**WARNING!**

Removing the DC wiring harness from your facilities DC source voltage requires the performance of a qualified, licensed electrician.

To disconnect and remove an EPS-150DC unit:

- 1 Attach the ESD strap to your wrist and connect the metal end to the ground receptacle on the top-right corner of the switch front panel.
- 2 De-energize the DC circuit.
- 3 Remove power from the switch by unplugging the DC connector from the DC power supply socket on the rear of the EPS-150DC unit.
- 4 Disconnect the switch from the EPS-150DC unit by disconnecting the redundant power cord between the two units.
- 5 Loosen the thumbscrews on the front of the EPS-T2 and slide the EPS-150DC out of the EPS-T2.

**WARNING!**

Removing the DC wiring harness from your facilities DC source voltage requires the performance of a qualified, licensed electrician.

EPS-600LS External Power Module

The EPS-600LS External Power Module (Model No. 10913) is the redundant power supply unit for use with the Summit X450e-48p or Summit X250e-48p switch. The EPS-600LS power module is installed in the EPS-C chassis (Model No. 10912). The EPS-C chassis can hold up to three EPS-600LS units.



NOTE

Each individual EPS-600LS power supply is shipped with an AC cord for use in North America, and each EPS-C chassis is shipped with a special redundant power supply cord.

Power Supply Overview

The Summit X450e-48p or Summit X250e-48p switch may be powered by one, two, or three external power modules using the redundant power input connector on the rear of the switch. The cable for making this connection is shipped with the EPS-C chassis). The EPS-C chassis can hold one, two, or three EPS-600LS units.

The PoE capability of the Summit X450e-48p or X250e-48p varies depending on the number of external power modules in use. [Table 44](#) summarizes the PoE power behavior for the Summit X450e-48p or X250e-48p switch based on the number of power modules in use.

Table 44: External power modules and corresponding PoE behavior

Internal PSU Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External PSU/Chassis Failed/Disconnected
Internal PSU: Power On	370 W of redundant power	740 W of external power only Internal PSU disabled	740 W of external power only with 2 + 1 redundancy Internal PSU disabled	370 W of internal power only
Internal PSU: Power Failure	370 W of external power only	740 W of external power only	740 W of external power only with 2 + 1 redundancy	No PoE power

Single 600-LS Module Configuration: Redundant PoE Power

A single EPS-600LS power module provides redundant PoE power capability with the same 370 watt capacity as the internal PSU. The internal Summit X450e-48p or X250e-48p PSU is capable of 370 W of PoE power: 15.4 W supplied to each port for a 24-port configuration and 7.7 W supplied to each port for a 48-port configuration.

- If the internal PSU fails, the external power module will provide power to PoE devices at the same power levels as the internal PSU without any power interruptions.
- If the EPS-600LS power module fails or is removed, the internal PSU continues to provide PoE power without any power interruptions.

Dual 600-LS Module Configuration: Full Power

Two EPS-600LS power modules provide full power at 740 W, which is 15.4 W of PoE power to all 48 ports. In this full power configuration, the internal PSU is disabled, and therefore redundant power is not available.

Triple 600-LS Module Configuration: Full Redundant Power

Three EPS-600LS power modules provide the full 740 W of power for 15.4 W of PoE power to all 48 ports. In addition, this configuration provides 2:1 redundancy. Should one of the EPS-600LS power modules fail, the third power module continues to provide uninterrupted full PoE power. The internal power supply is disabled in this configuration.

Internal-to-External PSU Transfer

This section describes the conditions that would cause the Summit X450e-48p or X250e-48p switch to draw power from the external power unit.

Internal PSU failure with single EPS-600LS module. When an EPS-C with a single EPS-600LS is connected to the Summit X450e-48p or X250e-48p switch and the internal PSU fails, power is drawn from the EPS-600LS without power interruption to the PoE connected devices.

Two or Three EPS-600LS modules. When the Summit X450e-48p or X250e-48p switch detects that an EPS-C is connected and providing stable power from two or three EPS-600LS power modules, the PoE power budget is automatically recalculated to enable 740 W of PoE power. The internal PSU is disabled to prevent damage from excessive current demands beyond the internal PSU's capabilities.

External to Internal PSU Transfer

This section describes the conditions where power from an external power module either fails or is disconnected.

Active Internal PSU with single 600-LS module failure. When an EPS-C configured with a single EPS-600LS module is connected to the Summit X450e-48p or X250e-48p switch and the EPS-600LS fails or is disconnected, power is drawn from the internal PSU without power interruption to the PoE connected devices.

Inactive Internal PSU with a dual EPS-600LS configuration and module failure. The following paragraphs describe the PoE behavior when an EPS-C configured with two EPS-600LS modules is connected to the Summit X450e-48p or X250e-48p switch and one or both EPS-600LS modules fail or are disconnected.

It is possible for one external power module to fail while the second power module continues to function. If one EPS-600LS fails, the PoE power budget is automatically reduced to 370 W for the Summit X450e-48p or X250e-48p switch. PoE port power management occurs as described in the *ExtremeXOS 12.0 Concepts Guide*, Power over Ethernet section. With only a single operating power module, the remaining EPS-600LS behaves as a redundant power module. The internal PSU is returned to an active state to provide redundant capability.

If both external power modules fail or are disconnected, PoE power is interrupted while transferring PoE power back to the internal PSU. The internal PSU is then limited to 370 W of PoE power. The PoE

power budget is automatically adjusted accordingly. Power management will occur as described in the *ExtremeXOS 12.0 Concepts Guide*, Power over Ethernet section.

Disconnecting the EPS-C/EPS-600LS. To manually disconnect an EPS-C or to remove the EPS-600LS modules, the recommended practice is to disconnect each of the EPS-600LS modules one at a time, pausing two seconds between each EPS-600LS disconnect.

This enables a graceful power transition from the external PSUs to the internal PSU.

Example: Two active EPS-600LS modules in an EPS-C

- a Unplug one EPS-600LS unit from its power source.
PoE power is automatically reduced to 370 watts and the internal PSU is enabled providing redundant 370 watt PoE power.
- b Wait at least two seconds before disconnecting the remaining EPS-600LS unit.
- c Unplug the second EPS-600LS unit from its power source.
The internal PSU is already enabled and provides uninterrupted 370 watts of PoE power.



NOTE

After an EPS-600LS unit is disconnected from its power source, it may be removed from the EPS-C. See “Removing an EPS-600LS” on page 334 for complete disconnect and removal details.

- d Disconnect the EPS-C from the switch.

Installing an EPS-C Chassis

This section describes the installation process for the Extreme Networks EPS-C (External Power Supply Chassis 10912). The EPS-C chassis holds one, two, or three compatible EPS-600LS units (External Power Module 10913). The EPS-C is intended for use only with Summit X450e-48p or X250e-48p switches.

Pre-Installation Requirements

You need the following tools and equipment to rack mount the EPS-C:

- # 1 Phillips screwdriver
- Rack mount kit

Rack-Mounting the EPS-C



CAUTION

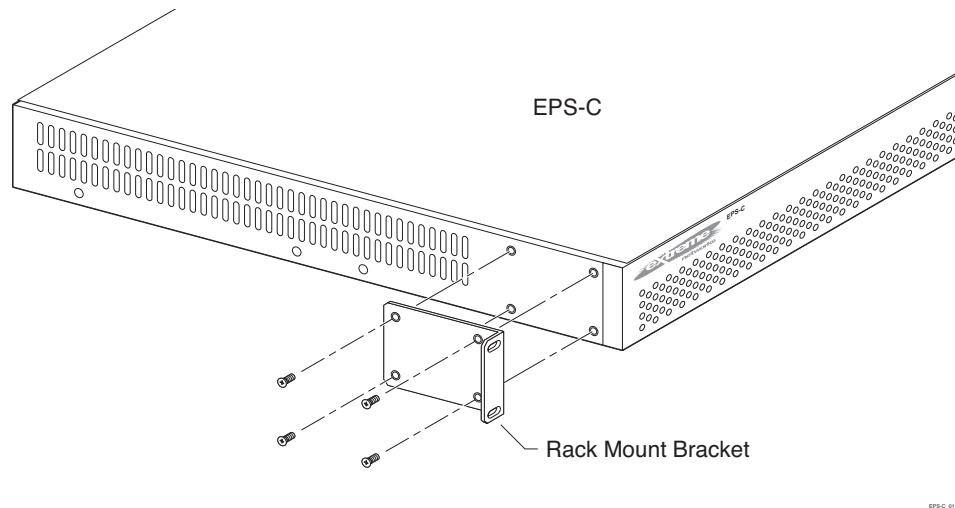
Do not use the rack mount brackets to suspend the EPS-C from under a table top or desk, or to attach the EPS-C unit to a wall.

To rack-mount the EPS-C:

- 1 Place the EPS-C upright on a hard flat surface.
- 2 Remove the mounting bracket kit (including screws) from the packaging.
- 3 Locate a rack mount bracket over the mounting holes on one side of the unit.

- 4 Insert the screws and fully tighten with a screwdriver (see [Figure 232](#)).

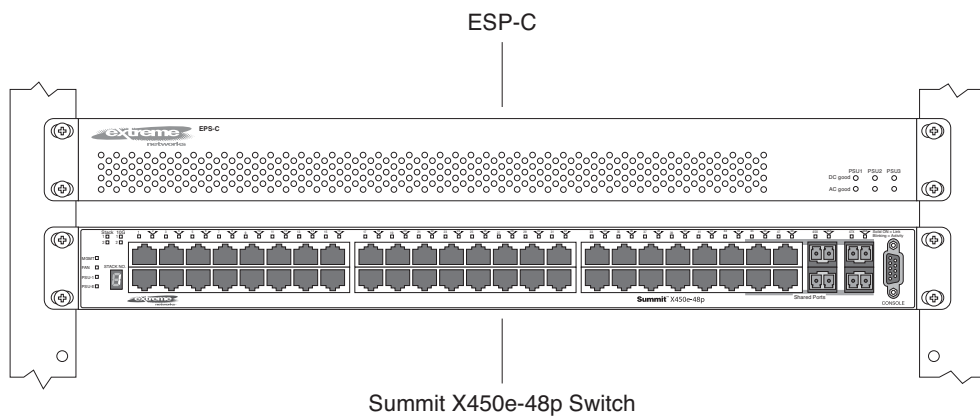
Figure 232: Attaching the mounting bracket



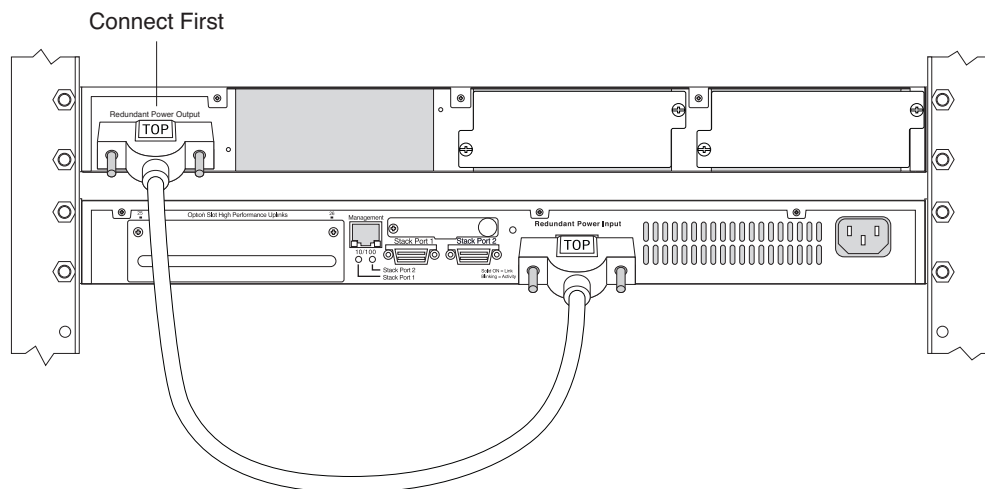
- 5 Repeat steps 3 and 4 for the other side of the EPS-C.
- 6 Mount the EPS-C into a 19-inch rack.

The EPS-C is intended for use with a Summit X450e-48p or X250e-48p switch only. You can install the EPS-C above or below the Summit switch (see [Figure 233](#)).

Figure 233: Installing the EPS-C into a Rack System



- 7 Connect the keyed-end of the redundant power cord to the EPS-C (see [Figure 234](#)). Verify that the side of the connector marked TOP is facing up. The key is a plastic tab on the cable connector housing that fits into the chassis to ensure correct alignment of the connector.
- 8 Connect the other end of the redundant power cord to the Summit X450e-48p or X250e-48p switch (see [Figure 234](#)). Be sure that the side of the connector marked TOP is facing up.

Figure 234: Installing the Redundant Power Cord

EPS-C_03A

Installing an EPS-600LS

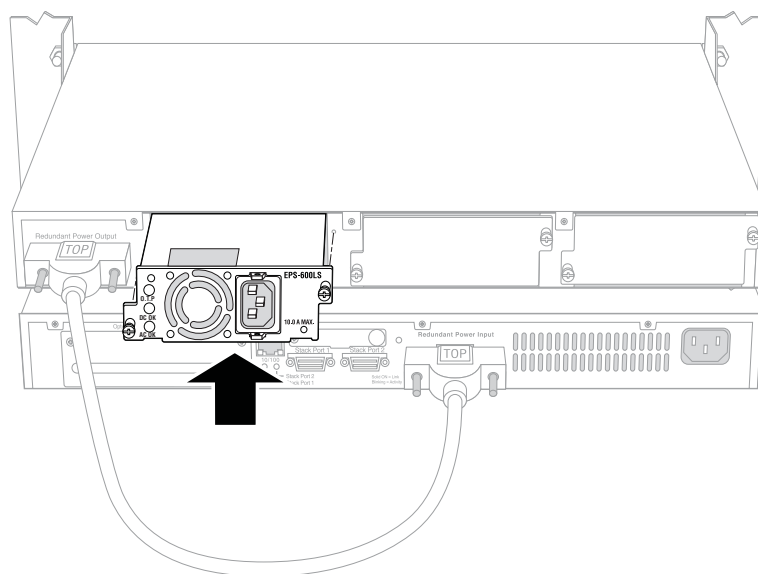
To install an EPS-600LS unit into an EPS-C:

- 1 Slide the EPS-600LS into an empty slot in the EPS-C (see [Figure 235](#)).



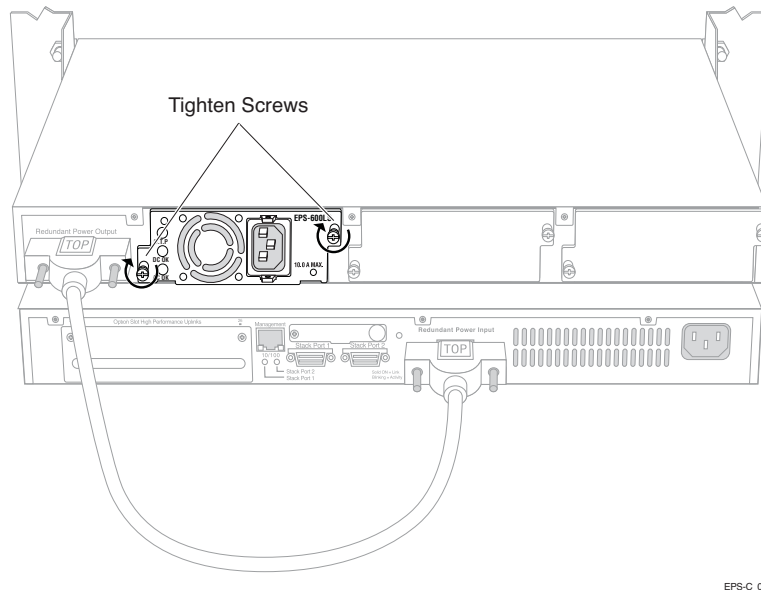
CAUTION

Be sure that empty slots in the EPS-C chassis are always covered by a cover plate when not in use. The EPS-C is shipped with slots 2 and 3 covered and with slot 1 open. Extreme Networks recommends that you populate slot 1 with an EPS-600LS unit first, but this is not required. You can install EPS-600LS units into any of the slots in the EPS-C. The installation sequence does not affect the performance of the power supply units, but empty slots must be covered at all times.

Figure 235: Installing the EPS-600LS unit in the EPS-C chassis

- 2 Slide the unit completely into the chassis until the front of the EPS-600LS is flush with the surface of the EPS-C (see [Figure 236](#)).
- 3 Tighten the two captive screws on the EPS-600LS unit into the EPS-C (see [Figure 236](#)). This secures the unit in place.

Figure 236: Securing the EPS-600LS to the EPS-C chassis



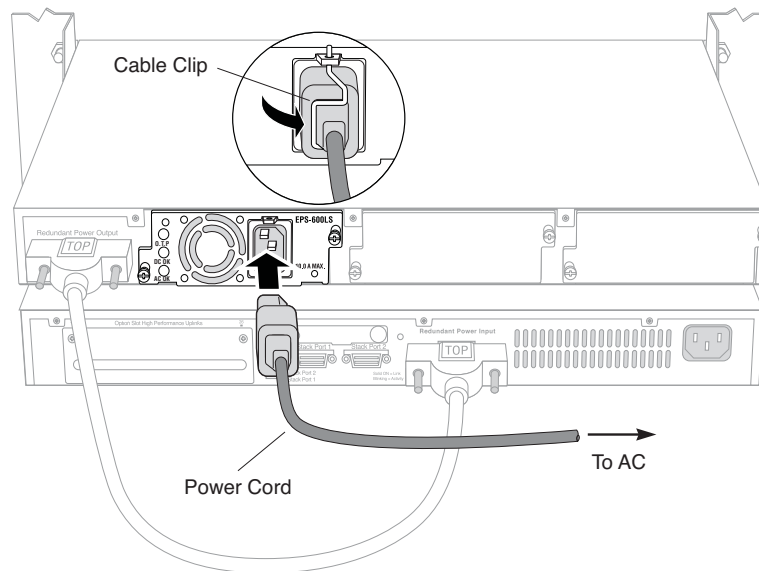
EPS-C_05A

- 4 Connect the AC power cord to the AC connector on the EPS-600LS unit (see [Figure 237](#)).
- 5 Use the cable clip on the EPS-600LS unit to hold the AC power cord in place (see [Figure 237](#)).



CAUTION

The EPS-600LS unit does not have a switch for turning the unit on and off. Disconnect power to the EPS-600LS unit by removing the plug from the electrical outlet. Make sure that this connection is easily accessible to you.

Figure 237: Installing the Redundant Power Cord

EPS-C_06A

- 6 Connect the other end of the AC power cord into the electrical outlet (see [Figure 237](#)).
Be sure that the electrical outlet is properly grounded.

**NOTE**

Consider all of the equipment that is connected to the power supply circuit to ensure that the circuit is not overloaded. Use proper overcurrent protection, such as a circuit breaker, to prevent overcurrent conditions. The switch and each redundant power supply source in the power supply chassis should be plugged into separate branch circuits to provide redundancy.

- 7 Repeat steps 1 through 6 for each EPS-600LS unit (maximum three units per EPS-C).

Removing an EPS-600LS

To remove an EPS-600LS unit:

- 1 Disconnect the AC power by removing the plug from the wall.
- 2 Release the cable clip securing the AC power cord to the EPS-600LS unit.
- 3 Disconnect the AC power cord from the EPS-600LS unit.
- 4 Loosen the captive screws on the EPS-600LS unit securing it to the EPS-C.
- 5 Slide the EPS-600LS unit out of the EPS-C.

7

Optics

23 Extreme Networks Optics

This chapter provides important safety information, specifications, and installation instructions for the pluggable optical devices used in Extreme Networks equipment.

This chapter includes the following topics:

- [Safety on page 337](#)
- [Mini-GBIC Interfaces on page 338](#)
- [XFP Interfaces on page 349](#)
- [XENPAK Interfaces on page 354](#)

Safety

The following safety warnings apply to all optical devices used in Extreme equipment, including but not limited to SC GBICs (GBICs), SFP GBICs (mini-GBICs), XENPAKs, and XFP laser optic modules, that are removable or directly installed in an I/O module or a chassis system.



WARNING!

Laser optic modules become very hot after prolonged use. Take care when removing a laser optic module from the chassis or option card. If the laser optic module is too hot to touch, disengage the laser optic module and allow it to cool before removing it completely.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



WARNING!

When working with laser optic modules, always take the following precautions to prevent exposure to hazardous radiation:

- *Never look at the transmit LED/laser through a magnifying device while it is powered on.*
- *Never look directly at a fiber port on the switch or at the ends of a fiber cable when they are powered on.*
- *Invisible laser radiation can occur when the connectors are open. Avoid direct eye exposure to the beam when optical connections are unplugged.*
- *Never alter, modify, or change an optical device in any way other than suggested in this document.*



NOTE

Extreme Networks optics are tested to work in all supported Extreme Networks switches. We recommend that all customers use Extreme Networks optics in their Extreme Networks switches. Extreme Networks assumes no liability for third-party optics. While Extreme Networks does not block third-party optics, we cannot ensure that all third-party optics operate properly in all Extreme Networks switches. The customer assumes all risks associated with using third-party optics in Extreme Networks switches.

GBIC, Mini-GBIC, XENPAK, and XFP Regulatory Compliance

Extreme Networks optics meet the following regulatory standards:

- Class 1 Laser Product
- EN60825-1+A2:2001 or later, European laser standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 89/336/EEC EMC and 73/23/EEC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products

Mini-GBIC Interfaces

The BlackDiamond 8800 series switches, the BlackDiamond 10808 switch, the BlackDiamond 12800 series switches, the Summit X450 family of switches, and the Summit X250e series switches support the small form pluggable (SFP) Gigabit interface converter (GBIC), also known as the mini-GBIC. The types of switches and the modules identify the compatible type of mini-GBIC.

Mini-GBIC Types and Specifications

The types of mini-GBIC interfaces are as follows:

- SX mini-GBIC, which conforms to the 1000BASE-SX standard
- LX mini-GBIC, which conforms to the 1000BASE-LX standard
- ZX mini-GBIC, a long-haul mini-GBIC that supports links up to 80 km long
- 1000BX mini-GBIC, which conforms to the IEEE 802.3ah 1000BASE-BX10 standard
 - 1000BASE-BX-D, 1490 nm TX/1310 nm RX wavelength
 - 1000BASE-BX-U, 1310 nm TX/1490 nm RX wavelength
- 100FX mini-GBIC, which conforms to the 100FX-MMF standard
- Dual-speed 100FX/1000LX mini-GBIC:
 - 100FX, which conforms to the 100BASE-LX standard
 - 1000LX, which conforms to the 1000BASE-LX standard
- LX100 mini-GBIC, a long-haul mini-GBIC that supports links up to 100 km long

Use only Extreme Networks-certified mini-GBICs, available from Extreme Networks, in the mini-GBIC port on the switch or module.

SX mini-GBIC

The SX mini-GBIC requires the software versions listed in [Table 45](#).

Table 45: SX mini-GBIC software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.0.0 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1.9 or later
BlackDiamond 12804	ExtremeXOS 11.4.1 or later
BlackDiamond 12802	ExtremeXOS 12.0
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.1 or later
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later
Summit X250e series	ExtremeXOS 12.0

Table 46 lists the specifications for the SX mini-GBIC interface.

Table 46: SX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transmitter			
Average launch power	-9.5 dBm		-4 dBm
Center wavelength	830 nm	850 nm	860 nm
Receiver			
Receive sensitivity			-17 dBm
Average receive power (max)			0 dBm
Operating wavelength	770 nm		860 nm
Link			
Link power budget			7.5 dB

Extreme Networks recommends that 3 dB of the total budget be reserved for losses induced by cable splices or connectors and operating margin. There is no minimum attenuation or minimum cable length restriction.

LX mini-GBIC

The LX mini-GBIC requires the software versions listed in Table 47.

Table 47: LX mini-GBIC software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.0.0 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1.9 or later
BlackDiamond 12804	ExtremeXOS 11.4.1 or later
BlackDiamond 12802	ExtremeXOS 12.0

Table 47: LX mini-GBIC software requirements (Continued)

Switch Model	Required Software
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.1 or later
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later
Summit X250e series	ExtremeXOS 12.0

Table 48 lists the specifications for the LX mini-GBIC interface.

Table 48: LX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transmitter			
Average launch power	-11 dBm		-3 dBm
Center wavelength	1270 nm	1310 nm	1355 nm
Receiver			
Receive sensitivity			-19 dBm
Average receive power (max)			-3 dBm
Operating wavelength	1270 nm		1355 nm
Link			
Link power budget			8 dB

Measure cable plant losses with a 1310 nm light source and verify this to be within budget. When you calculate the maximum distance attainable using optical cable with a specified loss per kilometer (for example 0.25 dB/km), Extreme Networks recommends that 3 dB of the total budget be reserved for losses induced by cable splices or connectors, and operating margin. There is no minimum system budget or minimum cable length restriction because the maximum receive power is the same as the maximum transmit power. There is no minimum attenuation or minimum cable length restriction.

ZX mini-GBIC

The ZX mini-GBIC requires the software versions listed in [Table 49](#)

Table 49: ZX mini-GBIC software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.0.0 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1.9 or later
BlackDiamond 12804	ExtremeXOS 11.4.1 or later
BlackDiamond 12802	ExtremeXOS 12.0
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.1 or later
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later
Summit X250e series	ExtremeXOS 12.0

[Table 50](#) lists the specifications for the ZX mini-GBIC interface.

Table 50: ZX mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transmitter			
Average launch power	-2 dBm	0 dBm	3 dBm
Center wavelength	1540 nm	1550 nm	1570 nm
Receiver			
Receive sensitivity	-23 dBm		
Average receive power (max)			-3 dBm
Operating wavelength	1540 nm	1550 nm	1570 nm

Measure cable plant losses with a 1550 nm light source and verify this to be within budget. When you calculate the maximum distance attainable using optical cable with a specified loss per kilometer (for example, 0.25 dB/km), Extreme Networks recommends that you reserve 3 dB of the total budget for losses induced by cable splices or connectors and operating margin. A minimum system budget or attenuation is required to prevent saturation of the receiver.

Dual-speed 100FX/1000LX mini-GBIC

The dual-speed 100FX/1000LX mini-GBIC requires the software versions listed in [Table 51](#). BlackDiamond and Summit models that are not listed do not support the dual-speed 100FX/1000LX mini-GBIC.

Table 51: 100FX/1000LX mini-GBIC software requirements (compatible models listed only)

Switch Model	Required Software	Port Support (Summit Switches Only)
BlackDiamond Switches		
BlackDiamond 8800 series	ExtremeXOS 11.3.1 or later	
BlackDiamond 12804	ExtremeXOS 11.6.1 or later	
BlackDiamond 12802	ExtremeXOS 12.0.1 or later	
Summit X450 Series Switches		
Summit X450-24x	ExtremeXOS 11.3.1 or later	Supported on fiber ports 5 through 24. Not supported on combination ports 1 through 4.
Summit X450a Series Switches		
Summit X450a-24x	ExtremeXOS 11.6.1 or later	Supported on fiber ports 1 through 20. Not supported on combination ports 21 through 24.
Summit X450a-24xDC	ExtremeXOS 11.6.1 or later	Supported on fiber ports 1 through 20. Not supported on combination ports 21 through 24.
Summit X250e Series Switches		
Summit X250e-24t	ExtremeXOS 12.0 or later	Supported on fiber combination ports 25x and 26x.
Summit X250e-24p	ExtremeXOS 12.0 or later	Supported on fiber combination ports 25x and 26x
Summit X250e-48t	ExtremeXOS 12.0 or later	Supported on fiber combination ports 49x and 50x
Summit X250e-48p	ExtremeXOS 12.0 or later	Supported on fiber combination ports 49x and 50x

[Table 52](#) lists the specifications for the dual-speed 100FX/1000LX mini-GBIC interface.

Table 52: Dual-speed 100FX/1000LX mini-GBIC specifications

Parameter	100FX	1000LX
Connector type	LC	LC
Average launch power range with 9 μ m SMF	-8 dBm to -15 dBm	-3 dBm to -11 dBm
Receiver power range with 9 μ m SMF	-8 dBm to -25 dBm	-3 dBm to -19 dBm
Optical link budget with 9 μ m SMF	10 dB	8dB
Center wavelength range	1270 to 1355	1270 to 1355
Mean time between failure	1,993,381 hrs	1,993,381 hrs
Distance range over each optical fiber type (see note below table)		
62.5/125 μ m MMF	2 to 2000 m	2 to 550 m
50/125 μ m MMF	2 to 2000 m	2 to 550 m
10/125 μ m SMF	2 to 10,000 m	2 to 5,000 m

**NOTE**

The 100FX/1000LX mini-GBIC complies with the 100FX-SMF standard. To use the 100FX/1000LX mini-GBIC in 100FX-MMF operation, a minimum attenuation of 6 dB is required. After the mini-GBIC is installed, connect a 6-dB attenuator to the transmitter side (Tx) of the mini-GBIC. Next, connect the attenuator to the single-mode end of a mode conditioning patch cord. The mode conditioning patch cord transitions the mini-GBIC from SMF to MMF operation.

When in SMF operation, 100FX-SMF or 1000LX, measure cable plant losses with a 1310 nm light source and verify this to be within budget. When you calculate the maximum distance attainable using optical cable with a specified loss per kilometer (for example 0.25 dB/km), Extreme Networks recommends that 3 dB of the total budget be reserved for losses induced by cable splices or connectors and operating margin.

**NOTE**

The 100FX/1000LX mini-GBIC detects link status based only on the presence of light in the receive cable. Therefore, if a single strand is broken, the link partner on the other port will not detect link down.

100FX mini-GBIC

The 100FX mini-GBIC requires the software versions listed in [Table 53](#) and [Table 54](#). BlackDiamond and Summit models that are not listed do not support the 100FX mini-GBIC.

Table 53: 100FX mini-GBIC software support in BlackDiamond 8800 series modules (compatible modules listed only)

BlackDiamond 8800 series module	Required Software
G24x	ExtremeXOS 11.4.3 or later for 11.4 stream ExtremeXOS 11.5.2 or later ExtremeXOS 11.6.1 or later
MSM-G8x	ExtremeXOS 11.4.3 or later for 11.4 stream ExtremeXOS 11.5.2 or later ExtremeXOS 11.6.1 or later
G48Xa	ExtremeXOS 11.6.1 or later

Table 54: 100FX mini-GBIC software support in Summit switches (compatible modules listed only)

Summit Switch Model	Required ExtremeXOS Version	Port Support
Summit X450 Series Switches		
Summit X450-24x	ExtremeXOS 11.4.3 or later for 11.4 stream ExtremeXOS 11.5.2 or later ExtremeXOS 11.6.1 or later	Supported on fiber ports 5 through 24. Not supported on combination ports 1 through 4.
Summit X450a Series Switches		
Summit X450a-24x	ExtremeXOS 11.6.1 or later	Supported on fiber ports 1 through 20. Not supported on combination ports 21 through 24.
Summit X450a-24xDC	ExtremeXOS 11.6.1 or later	Supported on fiber ports 1 through 20. Not supported on combination ports 21 through 24.
Summit X250e Series Switches		
Summit X250e-24t	ExtremeXOS 12.0 or later	Supported on fiber combination ports 25x and 26x.
Summit X250e-24p	ExtremeXOS 12.0 or later	Supported on fiber combination ports 25x and 26x.
Summit X250e-48t	ExtremeXOS 12.0 or later	Supported on fiber combination ports 49x and 50x
Summit X250e-48p	ExtremeXOS 12.0 or later	Supported on fiber combination ports 49x and 50x

Table 55 lists the specifications for the 100FX mini-GBIC interface.

Table 55: 100FX mini-GBIC specifications

Parameter	Minimum	Maximum
Transmitter		
Average launch power	-20 dBm	-14 dBm
Center wavelength	1270 nm	1380 nm
Receiver		
Receive sensitivity	-31 dBm	
Average receive power (max)		-14 dBm
Distance range over each fiber type		
62.5/125 µm MMF	2 m	2000 m
50/125 µm MMF	2 m	2000 m

1000BX mini-GBIC

The 1000BX mini-GBIC requires the software versions listed in [Table 56](#)

Table 56: 1000BX mini-GBIC software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.6.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.4.1 or later
BlackDiamond 12804	ExtremeXOS 11.6.1 or later
BlackDiamond 12802	ExtremeXOS 12.0
Summit Switches	
Summit X450 series	ExtremeXOS 11.4.1 or later
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later
Summit X250e series	ExtremeXOS 12.0

[Table 57](#) lists specifications for the 1000BX mini-GBIC.

Table 57: 1000BX mini-GBIC specifications

Parameter	Minimum	Maximum
Transmitter		
Average launch power	-9 dBm	-3 dBm
Center wavelength (1000BASE-BX10-D)	1260 nm	1360 nm
Center wavelength (1000BASE-BX10-U)	1480 nm	1500 nm
Receiver		
Receive sensitivity		-19 dBm
Average receive power (max)		-3 dBm
Link		
Link power budget		8 dB



NOTE

The 1000BX mini-GBIC consists of two SFP optical devices, the 1000BASE-BX-U mini-GBIC and the 1000BASE-BX-D mini-GBIC, which must be used as a pair to allow for a single fiber bidirectional connection.

LX100 mini-GBIC

The LX100 mini-GBIC requires the software versions listed in [Table 58](#).

Table 58: LX100 mini-GBIC software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 12.0 or later
BlackDiamond 8800 series	ExtremeXOS 12.0 or later
BlackDiamond 12804	ExtremeXOS 12.0 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.4.1 or later
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X250e series	ExtremeXOS 12.0 or later

[Table 59](#) lists specifications for the LX100 mini-GBIC.

Table 59: LX100 mini-GBIC specifications

Parameter	Minimum	Typical	Maximum
Transmitter			
Average launch power	1 dBm	3 dBm	5 dBm
Center wavelength	1540 nm	1550 nm	1570 nm
Receiver			
Receive sensitivity			-29 dBm
Average receive power			-9 dBm
Operating wavelength	1540 nm	1550 nm	1570 nm

Preparing to Install or Replace a Mini-GBIC

Complete the following tasks before inserting the mini-GBIC:

- 1 Inspect and clean the fiber tips, coupler, and connectors.
- 2 Prepare and clean an external attenuator, if needed.

When handling fiber cables, take the following precautions to prevent damage to the cables:

- Do not stretch the fiber.
- Make sure the bend radius of the fiber is not less than 2 inches (5.08 cm).

Extreme Networks recommends the following guidelines when installing or replacing mini-GBICs on an active network:

- Use the same type of mini-GBIC at each end of the link, except for the 1000BX mini-GBIC. The 1000BX mini-GBIC consists of two SFP optical devices, the 1000BASE-BX-U SFP and the 1000BASE-BX-D SFP, which must be used as a pair to allow for a single fiber bidirectional connection.
- Connect one end of the link to the Tx port. Without an attenuator, measure the total loss from the Tx port to the other site of the link. The total loss must not exceed the total optical system budget.

Installing and Removing a Mini-GBIC

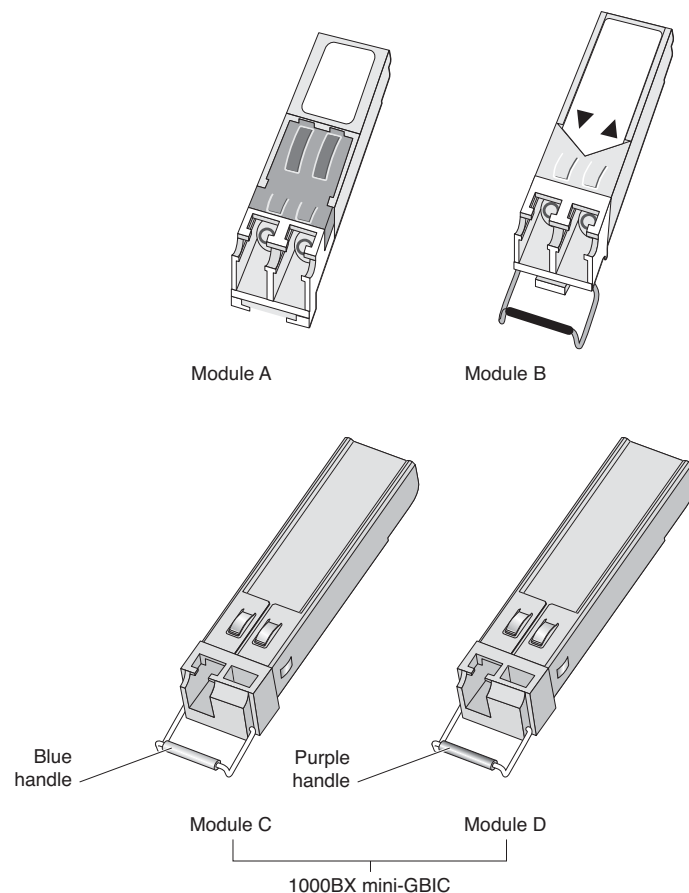
You can add or remove mini-GBICs from your switch without powering off the system. [Figure 238](#) shows the types of mini-GBIC modules and connectors.



NOTE

The 1000BX mini-GBIC consists of two SFP optical devices, the 1000BASE-BX-U SFP (Module C) and the 1000BASE-BX-D SFP (Module D), which must be used as a pair to allow for a single fiber bidirectional connection. See [Figure 238](#).

Figure 238: Mini-GBIC modules and connectors



SH_019

**WARNING!**

Mini-GBICs contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10 and EN60825-1 A2:2001.

**WARNING!**

To prevent ESD damage to a mini-GBIC, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

To insert a mini-GBIC:

- 1 Holding the mini-GBIC by its sides, insert the mini-GBIC into the port on the switch.
- 2 Slide the mini-GBIC into the port, until you hear it click. If the mini-GBIC has a handle, push up on the handle to secure the mini-GBIC.

**NOTE**

Remove the LC fiber-optic connector from the mini-GBIC before removing the mini-GBIC from the port.

To remove a mini-GBIC:

- 1 Disconnect the optical cable from the mini-GBIC.
- 2 Unlatch the mini-GBIC in one of the following ways:
 - On a mini-GBIC similar to Module A in [Figure 238](#), press and hold the black plastic tab at the bottom of the connector.
 - On a mini-GBIC similar to Module B, Module C, or Module D in [Figure 238](#), rotate the front handle down.
- 3 Pull the mini-GBIC out of the port on the switch.

Connecting Fiber Cables

Before you connect fiber cables to the dual-speed 100FX/1000LX mini-GBIC or the LX100 mini-GBIC, note the following information about these mini-GBICs.

100FX/1000LX Mini-GBIC. The 100FX/1000LX mini-GBIC complies with the 100FX-SMF standard. In order to use the 100FX/1000LX mini-GBIC in 100FX-MMF operation, a minimum attenuation of 6 dB is required. After the mini-GBIC is installed, connect a 6-dB attenuator to the transmitter side (Tx) of the mini-GBIC. Then connect the attenuator to the single-mode end of a mode conditioning patch cord. The mode conditioning patch cord transitions the mini-GBIC from SMF to MMF operation.

LX100 Mini-GBIC. To prevent permanent damage to the LX100 mini-GBIC, always check the optical input power of the receiver before you insert the fiber cable. The maximum optical input power is -9 dBm. If you use an optical loopback for diagnostics, the loopback requires a minimum of 12 dB optical attenuation. The recommended attenuation range is 12 to 20 dB.

XFP Interfaces

XFP modules are used in the Summit X450a and X450e series switches, as well as the BlackDiamond 10G4Xa I/O module for the BlackDiamond 8800 series switches. XFP modules are 10-gigabit modules that convert serial electrical signals to external serial optical or electrical signals. XFP modules can be inserted into or removed from an Extreme Networks switch or I/O module without powering off the system. All Extreme Networks XFP modules comply with IEEE 802.3ae standards and with the latest XFP multi-source agreement (MSA).

Extreme Networks switches and modules support the following types of XFP interfaces:

- LR XFP module
- SR XFP module

LR XFP Module

The LR XFP module supports single-mode fiber (SMF) and has LC duplex connectors.

The LR XFP module requires the software versions listed in [Table 60](#).

Table 60: LR XFP module software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 8800 series	ExtremeXOS 11.6.1.9 or later
Summit Switches	
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later

[Table 61](#) lists the specifications for the LR XFP module.

Table 61: LR XFP module specifications

Parameter	10GBASE-LR	Units
Signal speed (nominal)	10.3125	GBd
Transmitter		
Center wavelength (range)	1260 to 1355	nm
Average launch power (max)	0.5	dBm
Average launch power (min)	-8.2	dBm
Receiver		
Average receiver power (min)	-14.4	dBm
Average receiver power (max)	0.5	dBm
Center wavelength (range)	1260 to 1355	nm
Link Budget		
Operating distance	10	Km

SR XFP Module

The SR XFP module requires the software versions listed in [Table 62](#).

Table 62: SR XFP module software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 8800 series	ExtremeXOS 11.6.1.9 or later
Summit Switches	
Summit X450a series	ExtremeXOS 11.5.1 or later
Summit X450e series	ExtremeXOS 11.5.1 or later

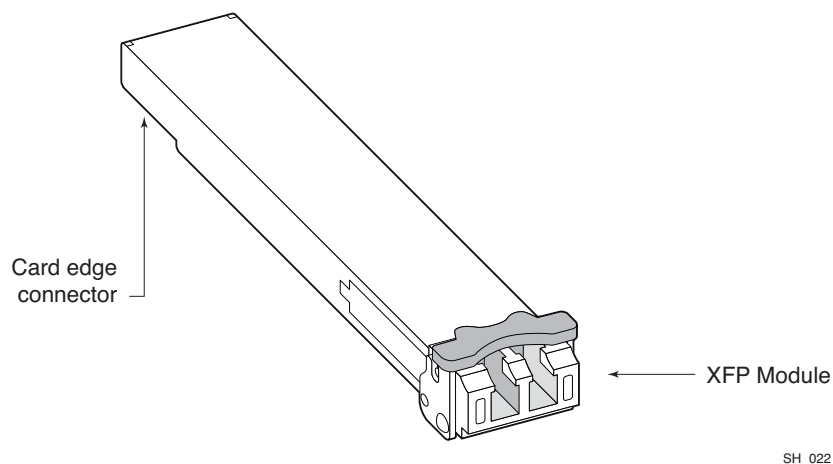
[Table 63](#) lists specifications for the SR XFP module.

Table 63: SR XFP module specifications

Parameter	Minimum	Maximum
Average launch power	-7.3 dBm	-1.3 dBm
Channel insertion loss:		
62.5 μ m (160/200 MHz*km)		1.6 dB
62.5 μ m (200 MHz*km)		1.6 dB
50 μ m (400 MHz*km)		1.7 dB
50 μ m (500 MHz*km)		1.8 dB
50 μ m (2000 MHz*km)		2.6 dB
Wavelength range	840 nm	860 nm
Operating distance range (depends on type and modal bandwidth)		
62.5 μ m MMF (160 MHz*km)		26 m
62.5 μ m MMF (200 MHz*km)		33 m
50 μ m MMF (400 MHz*km)		66 m
50 μ m MMF (500 MHz*km)		82 m
50 μ m MMF (2000 MHz*km)		300 m
Maximum receiver sensitivity in OMA		-11.1 dBm

Installing an XFP Module

This section describes how to install and remove an XFP module ([Figure 239](#)). You can install or remove an XFP module from your Extreme Networks switch without powering off the system.

Figure 239: XFP module**WARNING!**

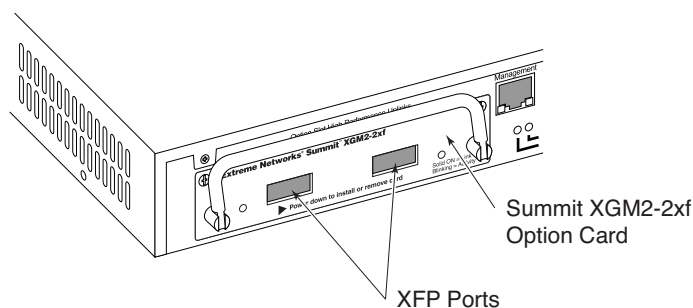
XFP modules contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10 and EN60825-1 A2:2001.

**WARNING!**

To prevent ESD damage to the XFP module, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

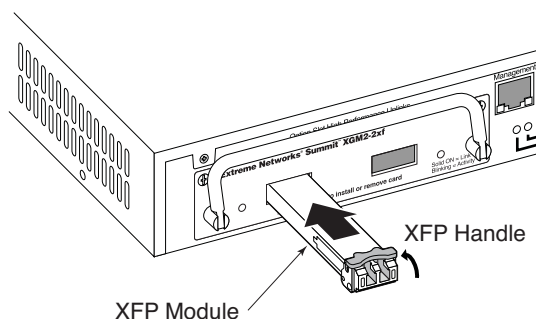
To install an XFP module:

- 1 Remove the XFP module from its antistatic container and remove the dust covers from the module optical connectors.
If your module has a protective pad covering the card-edge connector, remove it. Store the antistatic container, dust covers, and card-edge connector protective pad in a clean location from which they can be easily retrieved if you need to uninstall the module.
- 2 Remove any rubber dust covers from the port on the module into which you are installing the XFP module.
- 3 On the Summit XGM2-2xf option card, move the handle to an upright position to access the XFP ports (see [Figure 240](#)).

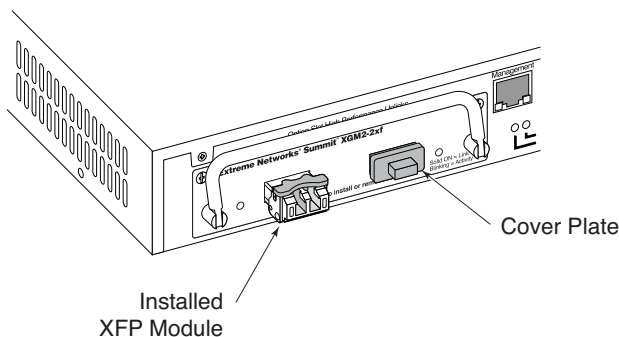
Figure 240: Accessing the XFP ports

SH_023

- 4 Holding the module by its sides, partially insert the XFP module into one of the ports on the Summit XGM2-2xf option card or the 10G4Xa module (see [Figure 241](#)).
- 5 Push the XFP handle (bail latch) upward until it clicks into place (see [Figure 241](#)).
- 6 Slide the XFP module as far back into the slot as possible, until you hear it click, indicating that it is firmly attached (see [Figure 241](#) and [Figure 242](#)).

Figure 241: Installing an XFP module

SH_024

Figure 242: Installed XFP Module

SH_025

**NOTE**

If you are installing only one XFP module, make sure that all unoccupied ports are covered with a rubber dust cover, which is shipped with the option card (see [Figure 242](#)).

**NOTE**

To ensure that your XFP module is undamaged upon installation, you can correlate factory test data with your installation site test data by consulting the average power reference values shown on the XFP module test data sheet (Part No. 121080-00) enclosed with the module.

Removing an XFP Module

This section describes how to remove an XFP module. You can remove an XFP module from your Extreme Networks switch or I/O module without powering off the system. The XFP module is shown in [Figure 239 on page 351](#).

To remove an XFP module:

- 1 Release the handle (bail latch) on the XFP module.
- 2 Carefully pull the XFP module out of the port.
- 3 Place the dust covers back into the XFP module connectors.
- 4 Place the XFP module immediately into an antistatic container to protect it from ESD damage and dust.

XENPAK Interfaces

The BlackDiamond 8800 series of switches, the BlackDiamond 10808 switch, the BlackDiamond 12800 series of switches, and the Summit family of switches support several types of XENPAK modules. All of these modules conform to the 10 Gigabit Ethernet standard defined by the IEEE 802.3ae as applicable



CAUTION

XENPAK modules contain Class 1 laser devices. Invisible laser radiation can occur when the connectors are open. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10, 1040.11 and EN60825-1 A2:2001.

Extreme Networks switches and modules support the following types of XENPAK interfaces:

- SR XENPAK
- LR XENPAK
- ER XENPAK
- ZR XENPAK
- LX4 XENPAK
- LW XENPAK



NOTE

CX4 XENPAKs are also supported by Extreme Networks devices; contact your vendor to obtain these.



NOTE

Use only Extreme Networks-approved XENPAK modules in all Extreme Networks devices.

SR XENPAK

The SR XENPAK supports multimode fiber (MMF) and has SC connectors.

The SR XENPAK requires the software versions listed in [Table 64](#).

Table 64: SR XENPAK software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.1.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1 or later
BlackDiamond 12804	ExtremeXOS 11.4 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.0 or later
Summit X450a series	ExtremeXOS 11.2.0 or later
Summit X450e series	ExtremeXOS 11.2.0 or later

Table 65 lists specifications for the SR XENPAK module

Table 65: SR XENPAK module specifications

Parameter	Minimum	Maximum
Average launch power	-7.3 dBm	-1.3 dBm
Channel insertion loss:		
62.5 μ m (160/200 MHz*km)		1.6 dB
62.5 μ m (200 MHz*km)		1.6 dB
50 μ m (400 MHz*km)		1.7 dB
50 μ m (500 MHz*km)		1.8 dB
50 μ m (2000 MHz*km)		2.6 dB
Wavelength range	840 nm	860 nm
Operating distance range (depends on type and modal bandwidth)		
62.5 μ m MMF (160 MHz*km)		26 m
62.5 μ m MMF (200 MHz*km)		33 m
50 μ m MMF (400 MHz*km)		66 m
50 μ m MMF (500 MHz*km)		82 m
50 μ m MMF (2000 MHz*km)		300 m
Maximum receiver sensitivity in OMA		-11.1 dBm



NOTE

The launch power (measured using the average power method used by power meters) is measured at the factory. The average launch power minimum value is provided as a reference, not a pass/fail criterion.

LR XENPAK

The LR XENPAK supports single-mode fiber (SMF) and has SC connectors.

The LR XENPAK requires the software versions listed in Table 66.

Table 66: LR XENPAK software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.1.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1 or later
BlackDiamond 12804	ExtremeXOS 11.4 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.0 or later
Summit X450a series	ExtremeXOS 11.2.0 or later
Summit X450e series	ExtremeXOS 11.2.0 or later

Table 67 lists specifications for the LR XENPAK module.

Table 67: LR XENPAK module specifications

Parameter	Minimum	Maximum
Average launch power	-7.3 dBm	0.5 dBm
Optical link budget		6.2 dB
Wavelength range	1260 nm	1355 nm
Distance range	2 m	10 km
Maximum receiver sensitivity in OMA		-12.6 dBm



NOTE

The launch power (measured using the average power method used by power meters) is measured at the factory. The average launch power minimum value is provided as a reference, not a pass/fail criterion.

ER XENPAK

The ER XENPAK supports SMF and has SC connectors.

The ER XENPAK requires the software versions listed in Table 68.

Table 68: ER XENPAK software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.1.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.1.1 or later
BlackDiamond 12804	ExtremeXOS 11.4 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.2.0 or later
Summit X450a series	ExtremeXOS 11.2.0 or later
Summit X450e series	ExtremeXOS 11.2.0 or later

Table 69 lists specifications for the ER XENPAK module.

Table 69: ER XENPAK module specifications

Parameter	Minimum	Maximum
Average launch power	-4.7 dBm	4.0 dBm
Optical link budget		10.9 dB
Wavelength range	1530 nm	1565 nm
Distance range: 5 dBm attenuation	2 m	40 km
Maximum receiver sensitivity in OMA		-14.1 dBm

**NOTE**

The launch power (measured using the average power method used by power meters) is measured at the factory. The average launch power minimum value is provided as a reference, not a pass/fail criterion.

ZR XENPAK

The ZR XENPAK supports SMF and has SC connectors.

The ZR XENPAK requires the software versions listed in [Table 70](#).

Table 70: ZR XENPAK software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.3.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.3.1 or later
BlackDiamond 12804	ExtremeXOS 11.4 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.3.1 or later
Summit X450a series	ExtremeXOS 11.3.1 or later
Summit X450e series	ExtremeXOS 11.3.1 or later

[Table 71](#) lists specifications for the ZR XENPAK module

Table 71: ZR XENPAK module specifications

Parameter	Minimum	Maximum
Transmitter		
Optical output power	0 dBm	4 dBm
Center wavelength	1530 nm	1565 nm
Receiver		
Optical input power	-22 dBm	-7 dBm
Operating wavelength	1530 nm	1565 nm
General		
Optical link loss	11 dB	22 dB
Optical dispersion	0 ps/nm	1600 ps/nm
Distance		80 km

**WARNING!**

To prevent permanent damage to the ZR XENPAK and other equipment: always check the optical input power of the receiver before inserting the fiber. The maximum optical input power for the receiver is -7 dBm. If you use optical loopback for diagnostics purposes, the loopback requires a minimum of 10 dB optical attenuation. The recommended attenuation range is 10 dB to 15 dB.

LX4 XENPAK

The LX4 XENPAK supports multimode fiber (MMF) in intra-building connections and single-mode fiber (SMF) for interbuilding connections. The LX4 XENPAK has SC connectors.

The LX4 XENPAK requires the software versions listed in [Table 72](#).

Table 72: LX4 XENPAK software requirements

Switch Model	Required Software
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.3.1 or later
BlackDiamond 8800 series	ExtremeXOS 11.3.1 or later
BlackDiamond 12804	ExtremeXOS 11.4 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450 series	ExtremeXOS 11.3.1 or later
Summit X450a series	ExtremeXOS 11.3.1 or later
Summit X450e series	ExtremeXOS 11.3.1 or later

[Table 73](#) lists specifications for the LX4 XENPAK module.

Table 73: LX4 XENPAK module specifications

Parameter	Minimum	Maximum
Transmitter		
Average launch power, 4 lanes		+ 5.5 dBm
Average launch power, per lane		- 0.5 dBm
Optical modulation amplitude (OMA), per lane:		
SMF	- 6.25 dBm	- 1.25 dBm
MMF	- 6.75 dBm	- 1.25 dBm
Receiver		
Average receive power, 4 lanes		+ 5.5 dBm
Average receive power, per lane		- 0.5 dBm
Receive sensitivity (OMA), per lane		- 14.45 dBm
Optical link budget		
Wavelength range	1269.0 nm 1293.5 nm 1318.0 nm 1342.5 nm	1282.4 nm 1306.9 nm 1331.4 nm 1355.9 nm
Distance range:		
SMF		10 km
MMF		300 m

LW XENPAK

To recognize the LW XENPAK module, your Extreme Networks switch must have the minimum software release listed in [Table 74](#).

Table 74: LW XENPAK software support requirements

Switch Model	Required Software Release
BlackDiamond Switches	
BlackDiamond 10808	ExtremeXOS 11.4.1 or later
BlackDiamond 12804	ExtremeXOS 11.4.1 or later
BlackDiamond 12802	ExtremeXOS 12.0 or later
Summit Switches	
Summit X450a	ExtremeXOS 11.5.0 or later
Summit X450e	ExtremeXOS 11.5.0 or later



NOTE

BlackDiamond 10808 switches and BlackDiamond 12804 switches running builds earlier than ExtremeXOS 11.4.2.3 do not support jumbo-size frame for the LW XENPAK. These switches support standard-size frame only for the LW XENPAK.

BlackDiamond 10808 switches and BlackDiamond 12804 switches running the latest version of ExtremeXOS 11.4 support jumbo-size frame for the LW XENPAK with a 5% decrease in performance, allowing for 95% of the maximum WAN PHY traffic.

ExtremeXOS 11.5.0 or later supports the LW XENPAK at full functionality with 100% performance in the Summit X450a and X450e series switches.

[Table 75](#) lists specifications for the LW XENPAK module.

Table 75: LW XENPAK module specifications

Parameter	Measurement
Transmitter Characteristics	
Signaling speed (nominal)	9.95328 GBd
Signaling speed variation from nominal (max)	+/-20 ppm
Center wavelength (range)	1260 to 1355 nm
Average launch power (max)	0.5 dBm
Average launch power (min)	-8.2 dBm
Receiver Characteristics	
Center wavelength (range)	1260 to 1600 nm
Average receive power (max)	0.5 dBm
Average receive power (min)	-14.4 dBm
Receive sensitivity (max) in OMA	0.055 (-12.6) uW/dBm
Link Power Budget	
Operation distance	10 Km

**CAUTION**

The maximum input power (average receive power) should be less than 0.5 dBm.

Transmitter Clock Locking Mode

The LW XENPAK module provides an interface connection between a 10-gigabit Ethernet and a 10-gigabit SONET/SDH network from a 10-gigabit Ethernet equipment port.

The default transmitter clock locking mode of the LW XENPAK module is set to line timing mode. When in line timing mode, the LW XENPAK module transmitter clock is locked to the receiver-recovered clock. When the LW XENPAK is connected to the SONET/SDH network on the other side of optical cable, the LW XENPAK transmitter clock synchronizes with the SONET/SDH clock source, which helps reduce the pointer adjustment between the SONET/SDH network and the LW XENPAK.

To prevent a clock reference loop, be sure that only one end of a link is using line timing mode and to use internal timing when testing with an optical loopback cable.

Installing and Removing a XENPAK Module



WARNING!

XENPAK modules become very hot after prolonged use. Take care when removing a XENPAK module from the chassis or option card. If the XENPAK module is too hot to touch, disengage the XENPAK module and allow it to cool before removing it completely.

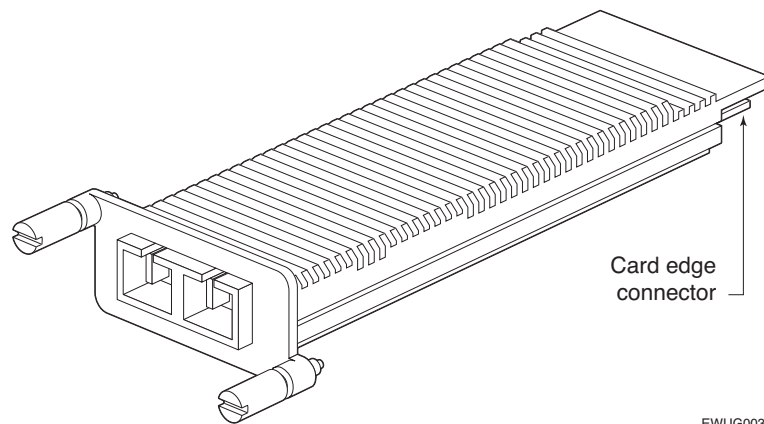
This section describes installing and removing the XENPAK module ([Figure 243](#)). You can install or remove the XENPAK module from your Extreme Networks switch without powering off the system.



NOTE

On a Summit X450 series, X450a series, or X450e series switch, the XENPAK module is inserted into an optional module card. Although the module card is not hot-swappable, you can hot swap the XENPAK into and out of the module card on the Summit. See [Chapter 4](#) for information about the optional module card for XENPAKs on a Summit X450 series, X450a series, or X450e series switch.

Figure 243: XENPAK module



WARNING!

XENPAK modules contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam. This device is compliant with FCC 21 CFR 1040.10 and EN60825-1 A2:2001.



CAUTION

To prevent ESD damage to the XENPAK module, always use an appropriately grounded ESD-preventive wrist strap when installing or removing the module. Handle the module by its sides only. Never touch the card-edge connectors at the insertion end of the module.

To install a XENPAK module:

- 1 Remove the XENPAK module from its antistatic container and remove the dust covers from the module optical connectors.
If your module has a protective pad covering the card-edge connector, remove it. Store the antistatic container, dust covers, and card-edge connector protective pad in a clean location from which they can be easily retrieved if you need to uninstall the module.
- 2 Remove any dust covers from the port on the module into which you are installing the XENPAK module.
- 3 Holding the module by its sides, insert the XENPAK module into the slot on the I/O module or Summit option card.
- 4 Slide the XENPAK module as far back into the slot as possible, until you hear it click, indicating that it is firmly attached.
- 5 Secure the XENPAK module to the I/O module or option card by turning the two captive screws clockwise until the screws are hand-tight.



NOTE

To ensure that your XENPAK module is undamaged upon installation, you can correlate factory test data with your installation site test data by consulting the average power reference values shown on the XENPAK module test data sheet (Part No. 121074-00) enclosed with your module.

To remove a XENPAK module:

- 1 Disconnect the optical cable from the XENPAK module.



WARNING!

XENPAK modules contain Class 1 lasers. Invisible laser radiation can occur when laser connections are unplugged. Do not stare into the beam.

- 2 Loosen the two captive screws until they are completely free from the I/O module faceplate or the Summit option card. (The captive screws remain attached to the XENPAK module.)
- 3 Gripping both captive screws, carefully pull the XENPAK module out of the slot.
- 4 Place the dust covers back into the XENPAK module connectors.
- 5 Place the XENPAK module immediately into an antistatic container to protect it from ESD damage and dust.

8

Initial Management Access

This chapter describes:

- [Connecting Equipment to the Console Port on page 365](#)
- [Logging In for the First Time on page 367](#)

Connecting Equipment to the Console Port

Connection to the console port is used for direct local management. The console port settings are:

- Baud rate—9600
- Data bits—8
- Stop bit—1
- Parity—None
- Flow control—XON/XOFF

The terminal or PC with terminal-emulation software that you connect to an Extreme Networks switch must be configured with these settings. This procedure is described in the documentation supplied with the terminal.

Appropriate cables are available from your local supplier, or you can make your own. To ensure the electromagnetic compatibility of the unit, use only shielded serial cables. [Table 76](#) describes the pinouts for a DB-9 console plug connector.

Table 76: Pinouts for the DB-9 console connector

Function	Pin Number	Direction
DCD (data carrier detect)	1	In
RXD (receive data)	2	In
TXD (transmit data)	3	Out
DTR (data terminal ready)	4	Out
GND (ground)	5	-
DSR (data set ready)	6	In
RTS (request to send)	7	Out
CTS (clear to send)	8	In

Figure 244 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

Figure 244: Null-modem cable pinouts

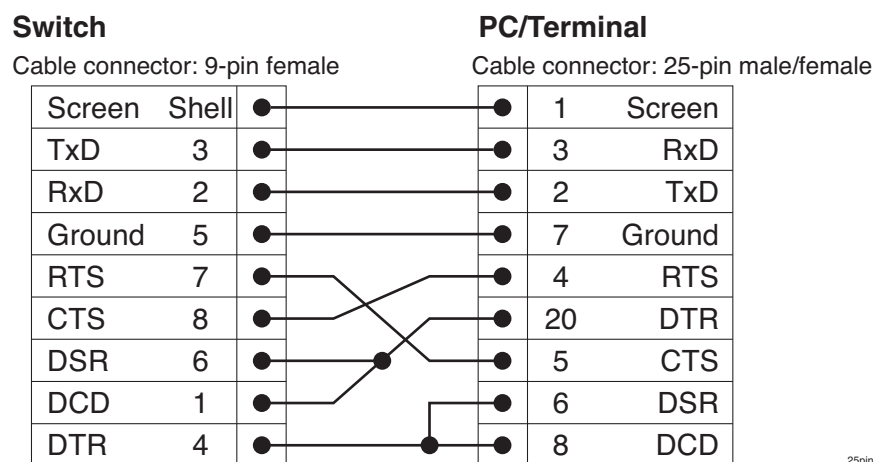
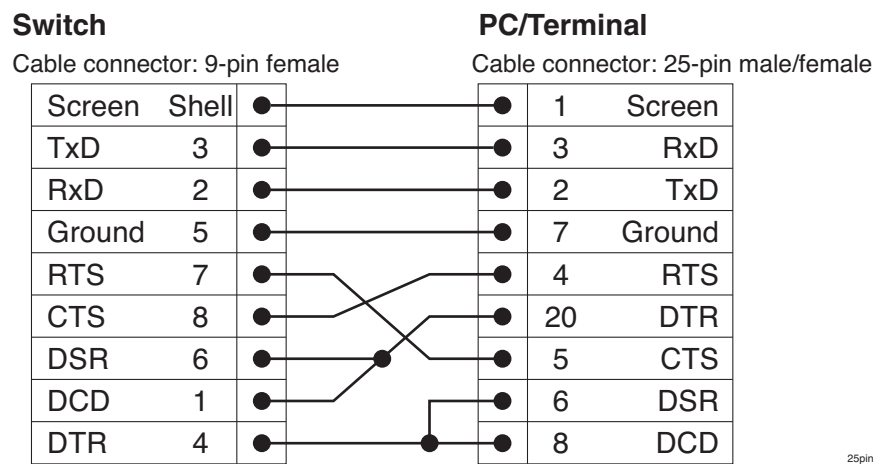


Figure 245 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.

Figure 245: PC-AT serial null-modem cable pinouts



Logging In for the First Time

After your switch has completed all power on self-tests, it is operational. You can log in and configure an IP address for the default VLAN (named *default*).



NOTE

In the case of chassis products, such as the BlackDiamond family of switches, the management port on the MSM is part of the management VLAN by default. Refer to “Management Ports” on page 44 for further details.

To manually configure the IP settings:

- 1 Connect a terminal or PC with terminal-emulation software to the MSM on the BlackDiamond switch or to the console port on the Summit switch.
- 2 At your terminal, press [Return] one or more times until you see the login prompt.
- 3 At the login prompt, enter the default user name *admin* to log on with administrator privileges. For example:

```
login: admin
```

Administrator capabilities allow you to access all switch functions.

- 4 The system will ask a series of questions about the default management settings, which allow all forms of management access for convenience in setting the initial configuration. Answer each question based on the level of security needed for the particular management access type.



NOTE

For more information about logging in to the switch and configuring switch management access, see the ExtremeXOS 12.0 Concepts Guide.

- 5 At the password prompt, press [Return].

The default user name *admin* has no password assigned to it. When you have successfully logged on to the system, the command line prompt displays the system name (for example, BlackDiamond10808>) in its prompt.



NOTE

For more information about how to assign a specific system name, see the ExtremeXOS 12.0 Concepts Guide.

- 6 Assign an IP address and subnetwork mask for VLAN *default* by typing:

```
configure vlan default ipaddress 123.45.67.8 255.255.255.0
```

Your changes take effect immediately.

- 7 Save your configuration changes so that they will be in effect after the next system reboot by typing:

```
save
```

The configuration is saved to the configuration database of the MSM modules in the switch.



NOTE

For more information about saving configuration changes, see the ExtremeXOS 12.0 Concepts Guide.

- 8 When you are finished with these tasks, log out of the switch by typing:

```
logout
```


**WARNING!**

Read the following safety information thoroughly before installing Extreme Networks products. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

Considerations Before Installing

**WARNING!**

Consider the following items before installing equipment.

Be sure that the following conditions are met:

- The system is designed to operate in a typical Telco environmental controlled environment. Choose a site that has the following characteristics:
 - Temperature and humidity controlled indoor area where maximum ambient room temperature shall not exceed 40°C (104°F)
 - Clean and free from airborne materials that can conduct electricity.
 - Well-ventilated and away from sources of heat including direct sunlight.
 - Away from sources of vibration or physical shock.
 - Isolated from strong electromagnetic fields produced by electrical devices.
 - Secured, enclosed, and restricted access, ensuring that only trained and qualified service personnel have access to the equipment.
- In regions that are susceptible to electrical storms, we recommend that you plug your system into a surge suppressor.
- Install equipment into the lower half of the rack first to avoid making the rack top heavy.
- Establish at least 3 inches clearance on all sides for effective ventilation. Do not obstruct the air intake vent on the front, side, or rear ventilation grills. Locate the system away from heat sources.
- Make sure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Make sure that your power supplies meet the site power or AC power requirements of the all network equipment.

Installing Power Supply Units

For the ratings and power requirements of each power supply unit, see [Appendix B, “Technical Specifications”](#) or the data sheet for the power supply at <http://www.extremenetworks.com>.



WARNING!

Be sure that the following requirements are satisfied when installing all Extreme Networks power supplies.

Make sure to satisfy the following requirements:

- Plug power supplies only into properly grounded electrical outlets to help prevent electrical shock and comply with international safety standards.
- Use only power cords that are certified for use within the country of use. Do not attempt to modify AC power cords.
- The wall outlet must be installed near the equipment and be easily accessible for quick disconnect.
- Make sure the voltage and frequency of your power outlet match the equipment's system's electrical ratings. The building and/or power source must provide overload protection.
- Use a surge suppressor, line conditioner, or uninterruptible power supply to protect the system from momentary increases or decreases in electrical power.
- For hot-swappable power supplies, do not slam the PSU into the bay.
- If multiple power supplies are used in a switch, connect each power supply to a different, independent power source. If a single power source fails, it will affect only that power supply to which it is connected. If all the power supplies on a single switch are connected to the same power source, the entire switch is vulnerable to a power failure.



WARNING!

Extreme Networks 325 W DC PSUs do not have switches for turning the unit on and off. Make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cord at the DC power socket on the Extreme Networks 325 W DC PSU.

Wiring the 325 W DC PSU DC power cord to your facility DC source voltage must be performed by a qualified, licensed electrician.

Extreme Networks 325 W AC PSUs do not have switches for turning the unit on and off. Remove the wall plug from the electrical outlet to disconnect the power to an Extreme Networks 325 W AC PSU. Make sure that this connection is easily accessible.

Do not connect the power supply into an electrical outlet when the power supply is outside the chassis; doing so would expose a hazardous energy and poses a potential shock and fire hazard.

Do not put your hand into an open power supply bay when a power supply is not present. Empty power supply bays require a cover plate at all times.

Maintenance Safety

Take the following precautions:

- Use only original accessories and/or components approved for use with this system. Failure to observe these instructions may damage the equipment or even violate required safety and EMC regulations.
- The chassis cover should only be removed by Extreme Networks personnel. There are no customer serviceable components in this system. Repairs to the system must be performed by an Extreme Networks factory service technician.
- The power on button for the system may not turn off all system power. To remove power from the system, you must unplug all power cords from wall outlets. The power cord is the disconnect device to the main power source.
- Disconnect all power before removing the back panel of any Extreme Networks switch, unless otherwise instructed by a product specific maintenance procedure.
- Disconnect all power cords before working near power supplies, unless otherwise instructed by a maintenance procedure.
- When handling modules, optic devices, power supplies, or other modular accessories put on the electrostatic discharge (ESD) preventive wrist strap to reduce the risk of electronic damage to the equipment. Leave the ESD-preventive wrist strap permanently attached to the chassis so that it is always available when you need to handle ESD-sensitive components.
- Install all cables in a manner that avoids strain. Use tie wraps or other strain relief devices.
- Replace power cord immediately if it shows any signs of damage.

General Safety Precautions

Follow these guidelines:

- Do not attempt to lift objects that you think are too heavy for you.
- When installing in rack, caution should be taken to load heavier devices in lowest portions of rack to avoid a top heavy hazard.
- For Summit desktop switches, do not place a monitor or other objects on top of the equipment. The chassis cover is not designed to support weight.
- Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.
- Protecting ESD: To protect ESDs always wear a wristband before carrying out any work on PC boards and modules. Transport PC boards only in electrostatic packaging. Always place PC boards on a grounded surface before working on them.
- Laying cables: Lay cables so as to prevent any risk of these cables being damaged or causing accidents, such as tripping.

LAN Systems



WARNING!

This equipment is intended for intra-building. Intra-building connections are defined as cable runs that are located in the same building as the unit.

This equipment can be connected between buildings if one of the following requirements are met:

- Cable runs between buildings are less than 140 feet long.
- Cable runs between buildings are directly buried.
- Cable runs between buildings are in an underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

PoE Devices

When connecting power over Ethernet (PoE) devices to a PoE switch, all connections between the PoE device and the switch must remain inside the same building and use a low-voltage power distribution system per IEEE 802.3af.

Uninterruptible Power Supply Requirements

An uninterruptible power supply (UPS) is a device that sits between a power supply (such as a wall outlet) and a device (such as a switch) to prevent outages, sags, surges, and bad harmonics from adversely affecting the performance of the device.

UPS Features

A UPS traditionally can perform the following functions:

- Absorb relatively small power surges.
- Smooth out noisy power sources.
- Continue to provide power to equipment during line sags.
- Provide power for some time after a blackout has occurred.

In addition, some UPS or UPS plus software combinations provide the following functions:

- Automatically shut down equipment during long power outages.
- Monitor and log power supply status.
- Display the voltage (current draw) of the equipment.
- Restart equipment after a long power outage.
- Display the voltage currently on the line.
- Provide alarms on certain error conditions.
- Provide short circuit protection.

Calculating Amperage Requirements

To determine the size of UPS that you need:

- 1 Locate the voltage and amperage requirements for each piece of equipment. These numbers are usually located on a sticker on the back or bottom of your equipment. Then multiply the numbers together to get the Volt-Amps (VA):

$$VA = \text{Volts} \times \text{Amperes}$$
- 2 Add the VA from each piece of equipment together to find the total VA requirement.
 To determine the minimum amperage requirements for your UPS, we recommend that you add 30% to the total.

UPS Transition Time

Transition time is the time that is necessary for the UPS to transfer from utility power to full-load battery power. For Extreme Networks products, a transition time of less than 20 milliseconds is required for optimum performance.

Power Supply Cords Selection

Extreme Networks provides power input cords shipped in the product box for use in the US and Canada. Power supply cords for use outside of the United States and Canada are typically provided separately by third-party distribution centers. Contact the Extreme Networks TAC for questions regarding the proper selection of a power input cord for your specific switch.

The following are power cord requirements for use on Extreme switches:

Summit Family of Switches:

- Wire: 18 AWG (.823mm²) minimum, 3-conductor flexible cable, Type SVT, SJT, HAR or equivalent, no longer than 15ft
- Wall plug: Suitable for use in country of installation & approved by local regulatory authority
- Device connector: IEC320-C13, rated at 10 A, 250 VAC
- Power cord assembly: Must be rated at 10A, 250V by in-country regulatory authority

Black Diamond SSI AC PSU Model 60020:

- Wire: 16 AWG (1.31 mm²) minimum, 3-conductor flexible cable, Type SVT, SJT, HAR or equivalent, no longer than 10ft
- Wall plug: Suitable for use in country of installation & approved by local regulatory authority
- Device connector: IEC320-C13, 90 degree angle, rated at 15 A, 250 VAC
- Power cord assembly: Must be rated at 10A by in-country regulatory authority

Black Diamond SSI DC PSU, Model 60021:

- Wire: UL LISTED Type TC (Tray Cable), three conductor, 8 AWG, jacketed, and marked (UL) TC, 90C min

**NOTE**

Tray Cable is a UL US only requirement. Outside United States standard 8 AWG (8.35mm²), 90C wire is acceptable.

- Wall plug: N/A, 3-conductor wires have been stripped and are ready for connection to DC power source mains
- Device Connector: Molex Shell Connector PN 42816-0312; Molex Pin Connectors PN 42815-0032
- Assembly Rating: 75VDC, 30A, (Do not disconnect under load)

**WARNING!**

When using multiple power supplies, make sure that each power supply is attached to independent circuits breakers. See PS installation instructions of PS for proper sizing of circuit breaker.

Make sure that the source outlet is properly grounded according to the country's local electrical requirements before plugging the AC supply power cord into a PSU.

For specific product input power requirements refer to the data sheet of the product or modular PSU at <http://www.extremenetworks.com> or to Appendix B of this guide.

The following countries have specific safety instructions concerning power connectors:

- Argentina: The supply plug must comply with Argentinean standards.
- Australia: Use AS 3112 for 110/220 VAC power supplies.
- Denmark: The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
- International: Use CEE 7/7 for 110/220 VAC power supplies.
- Japan:
 - Use JIS 8303 for 110/220 VAC power supplies.
 - The power cord provided with the power supply, switch, or chassis is for use only with that specific product from Extreme Networks; it is not for use with any other product from Extreme Networks or any other vendors' equipment.
- North America: The cord set must be cULus listed or cCSAus listed.
- Switzerland: The supply plug must comply with SEV/ASE 1011.
- United Kingdom: Use BS 1363 for 110/220 VAC power supplies.

**NOTE**

This equipment is not intended to be directly powered by power distribution systems where phase-phase voltages exceed 240V AC (2P+PE), such as those used in Norway, France, and other countries. For these applications it is recommended that a transformer be used to step down the voltage to < 240V AC from phase-phase, or that you make a connection to a (P+N+PE) power distribution where voltages do not exceed 240V AC.

All installations should confirm that the product is reliably grounded according to the country's local electrical codes.

**NOTE**

Building codes vary worldwide; therefore, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation & country.

Battery Replacement and Disposal

Batteries included with Extreme products are encapsulated and must be replaced by qualified Extreme Service personnel only. Contact your Extreme Service personnel for product replacement. Do not attempt to replace the battery. If these instructions are disregarded and replacement of these batteries is attempted, the following guidelines must be followed to avoid danger of explosion:

- 1 Replace with same or equivalent battery type as recommended by the battery manufacturer.
- 2 Dispose of battery in accordance with the battery manufacturer's recommendation.

Fiber Optic Ports—Optical Safety

The following safety warnings apply to all optical devices used in Extreme Networks equipment, including but not limited to SC GBICs (GBICs), SFP GBICs (mini-GBICs), XENPAKs, and XFP laser optic modules, that are removable or directly installed in an I/O module or chassis system.



WARNING!

Laser optic modules become very hot after prolonged use. Take care when removing a laser optic module from the chassis or option card. If the laser optic module is too hot to touch, disengage the laser optic module and allow it to cool before removing it completely.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.



WARNING!

When working with laser optic modules, the following precautions must be followed or hazardous radiation exposure may occur:

- *Never look at the transmit LED/laser through a magnifying device while it is powered on.*
- *Never look directly at a fiber port on the switch or at the ends of a fiber cable when they are powered on.*
- *Invisible laser radiation can occur when the connectors are open. Avoid direct eye exposure to the beam when optical connections are unplugged.*
- *Never alter, modify, or change an optical device in any way other than suggested in this document.*

GBIC, Mini-GBIC, XENPAK, and XFP Regulatory Compliance

- Class 1 Laser Product
- EN60825-1+A2:2001 or later, European laser standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 89/336/EEC EMC and 73/23/EEC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products



NOTE

Extreme Networks optics are tested to work in all supported Extreme Networks switches. We recommend that all customers use Extreme Networks optics in their Extreme Networks switches. Extreme Networks assumes no liability for third-party optics. While Extreme Networks does not block third-party optics, we cannot ensure that all third-party party optics operate properly in all Extreme Networks switches. The customer assumes all risks associated with using third-party optics in Extreme Networks switches.

Sicherheitshinweise



WARNUNG!

Vor der Installation der Produkte von Extreme Networks sind die nachfolgenden Sicherheitshinweise aufmerksam zu lesen. Die Nichtbeachtung dieser Sicherheitshinweise kann zu Verletzungen oder Schäden an der Ausrüstung führen.

Installation, Wartung und Ausbau eines Switch, einer Grundplatte oder einer seiner Komponenten dürfen nur von geschultem und qualifiziertem Servicepersonal durchgeführt werden! Geschulte und qualifizierte Servicetechniker verfügen über die erforderliche technische Ausbildung und Erfahrung, um mögliche Gefahren bei der Durchführung von Servicearbeiten zu erkennen und Maßnahmen zur Minimierung der Gefahr für sich bzw. andere zu treffen.

Hinweise zur Installation



WARNUNG!

Beachten Sie vor der Installation der Ausrüstung folgende Punkte.

Stellen Sie sicher, dass die nachfolgend aufgeführten Bedingungen erfüllt sind:

- Das System ist für den Einsatz in einer typischen Umgebung gemäß Telco-Vorgaben vorgesehen. Wählen Sie einen Aufstellort mit den folgenden Eigenschaften:
 - Innenbereich mit Temperatur- und Feuchtigkeitsregelung, wobei die maximale Raumtemperatur 40°C (104°F) nicht überschreiten darf.
 - Sauber und frei von elektrisch aufladbaren Teilchen in der Luft.
 - Ausreichende Belüftung und Abstand zu Wärmequellen, einschließlich direktem Sonnenlicht
 - Ausreichender Abstand zu Quellen, die Erschütterungen oder Schläge/Stöße hervorrufen können
 - Isolierung von starken elektromagnetischen Feldern, wie sie durch Elektrogeräte erzeugt werden
 - Sicherer, abgeschlossener Arbeitsbereich mit beschränktem Zugang, sodass nur geschultes und qualifiziertes Servicepersonal Zugriff auf das Gerät hat
 - In für elektrische Stürme anfälligen Gebieten wird empfohlen, das System an einen Spannungsstoßunterdrücker anzuschließen.
 - Die Ausrüstung im unteren Teil des Gestells installieren, um zu vermeiden, dass der obere Teil des Gestells zu schwer wird.
 - Auf allen Seiten für mindestens 7,5 cm (3") Abstand sorgen, um eine ausreichende Belüftung zu gewährleisten. Die Lufteinlassöffnung an den vorderen, seitlichen und hinteren Entlüftungsgittern nicht blockieren. Das System nicht in der Nähe von Wärmequellen aufstellen.
- Sicherstellen, dass die Ausrüstung in einem Bereich aufgestellt wird, der den Spezifikationen für Leistungsaufnahme und Wärmeabstrahlung der Komponenten entspricht.
- Sicherstellen, dass Ihre Netzteile die Anforderungen an die Strom- oder Wechselstromversorgung vor Ort für alle Netzwerkgeräte erfüllen.

- Bei den Extreme-Produkten handelt es sich um digitale Geräte der Klasse A gemäß Teil 15 der FCC-Richtlinien und anderen internationalen Richtlinien. Der Gerätebetrieb unterliegt den folgenden Voraussetzungen: (1) Das Gerät kann schädliche Interferenzen verursachen, und (2) das Gerät muss jede empfangene Interferenz zulassen, einschließlich einer Interferenz, die einen unerwünschten Betrieb verursachen kann.

Installation von Netzteilen



WARNUNG!

Bei der Installation sämtlicher Netzteile von Extreme Networks muss sichergestellt werden, dass die nachfolgend aufgeführten Anforderungen erfüllt sind. Angaben zu Nennleistung und Leistungsbedarf finden sich in den Installationsanweisungen für das jeweilige Netzteil (Power Supply Unit, PSU).

Folgende Anforderungen müssen unbedingt erfüllt sein:

- Wenn der mit Wechsel- oder Gleichstrom betriebene Switch von Extreme Networks mit einem externen grünen/gelben Erdungskabel ausgestattet ist, dann muss zunächst dieses Erdungskabel zwischen der Grundplatte und einem geeigneten Erdungspunkt angeschlossen werden, bevor andere Verbindungen zum Gerät hergestellt werden; dies gilt auch für den Anschluss an das Wechsel- bzw. Gleichstromnetz. Beim Ausbau des Geräts aus dem Gestell muss das Erdungskabel als letztes getrennt werden.
- Netzteile nur an vorschriftsmäßig geerdete Steckdosen anschließen, um die Gefahr elektrischer Schläge zu vermeiden und die Konformität mit internationalen Sicherheitsnormen zu gewährleisten.
- Nur Stromkabel verwenden, die für den Einsatz in dem jeweiligen Land zugelassen sind. Wechselstromkabel dürfen nicht manipuliert werden.
- Die Wandsteckdose muss in der Nähe der Anlage installiert und leicht zugänglich sein, um eine schnelle Trennung vom Netz zu ermöglichen.
- Spannung und Frequenz der Steckdose müssen den elektrischen Nenndaten des Systems entsprechen. Das Gebäude bzw. die Stromquelle muss mit einem Überlastschutz ausgestattet sein.
- Einen Spannungsstoßunterdrücker, einen Netzfilter oder eine unterbrechungsfreie Stromversorgung verwenden, um das System vor einer vorübergehenden Zu- oder Abnahme der elektrischen Leistung zu schützen.
- Bei laufendem Betrieb austauschbare Netzteile: Das Netzteil vorsichtig, nicht mit Kraft in das Aufnahmefach einsetzen.
- Bei Einsatz mehrerer Netzteile in einem Switch sind die Netzteile jeweils an unterschiedliche, unabhängige Stromquellen anzuschließen. Auf diese Weise ist bei einem Ausfall einer einzelnen Stromquelle nur das daran angeschlossene Netzteil betroffen. Wenn alle Netzteile eines einzelnen Switch an dieselbe Stromquelle angeschlossen sind, ist der gesamte Switch für einen Ausfall der Stromversorgung anfällig.

Leistungsspezifikationen für Netzteile von Extreme Networks finden sich in Anhang B dieses Dokuments oder im Netzteil-Datenblatt unter <http://www.extremenetworks.com>.



WARNUNG!

Die 325 W DC-Netzteile von Extreme Networks sind nicht mit Ein-/Ausschaltern ausgestattet. Vor dem Einstecken des Gleichstromkabels in den Gleichstromanschluss des 325 W DC-Netzteils von Extreme Networks sowie vor dem Abziehen des Kabels sicherstellen, dass der Gleichstromkreis abgeschaltet ist.

Das Gleichstromkabel des 325 W DC-Netzteils muss von einem qualifizierten, zugelassenen Elektriker an die Gleichspannungsquelle in Ihrem Gebäude angeschlossen werden.

Extreme Networks 325 W AC Netzteile haben keinen An- Aus Schalter. Die Stromzufuhr zu einem Extreme Networks 325 W AC Netzteil wird durch das Ziehen des Netzkabels unterbrochen. Es ist sicherzustellen, dass diese Verbindung leicht zugänglich ist.

Das Netzteil nicht ausserhalb von dem Gehäuse an das Netz anschliessen, da hierdurch gefährliche Spannungen zugänglich werden sowie die Gefahr von einem elektrischem Schlag und/ oder Feuergefahr besteht.

Nicht die Hand in den Netzteilsschacht einführen, wenn das Netzteil entfernt ist. Leere Netzteilsschächte müssen immer mit einer Abdeckplatte bedeckt sein.

Wartungssicherheit

Folgende Vorsichtsmaßnahmen müssen getroffen werden:

- Nur für den Einsatz mit diesem System zugelassene Originalzubehöriteile bzw. -komponenten verwenden. Die Nichtbeachtung dieser Anweisungen kann zu Schäden an der Ausrüstung oder sogar zu einem Verstoß gegen die erforderlichen Sicherheitsbestimmungen und EMV-Vorschriften führen.
- Die Abdeckung der Grundplatte darf nur durch Personal von Extreme Networks entfernt werden. Das System enthält keine vom Kunden zu wartenden Komponenten. Reparaturen am System sind von einem Werkstechniker von Extreme Networks durchzuführen.
- Der An-/Aus-Schalter des Systems darf nicht die gesamte Stromversorgung zum System unterbrechen. Zur Unterbrechung der Wechselstromversorgung zum System müssen alle Stromkabel aus den Wandsteckdosen gezogen werden. Das Stromkabel dient zur Trennung von der Netzstromversorgung.
- Vor dem Entfernen der Rückwand eines Extreme Networks-Switch muss die gesamte Stromzufuhr unterbrochen werden.
- Vor der Aufnahme von Arbeiten in der Nähe von Stromquellen alle Stromkabel abziehen, sofern nicht im Rahmen eines Wartungsverfahrens anders vorgegeben.
- Beim Umgang mit Modulen, optischen Geräten, Netzteilen oder anderen modularen Zubehöriteilen das ESD-Schutzarmband anlegen, um das Risiko einer Beschädigung der Geräte durch elektrostatische Entladungen zu verringern. Das Armband zum Schutz elektrostatisch gefährdeter Bauteile (ESB) grundsätzlich an der Grundplatte befestigt lassen, damit es beim Umgang mit diesen Bauteilen immer zur Hand ist.
- Alle Kabel so verlegen, dass übermäßige Belastungen vermieden werden. Kabelbinder oder Zugentlastungsklemmen verwenden.
- Ein Stromkabel bei Anzeichen von Beschädigungen unverzüglich austauschen.

Allgemeine Sicherheitsvorkehrungen

Folgende Richtlinien sind unbedingt zu befolgen:

- Keine Gegenstände heben, die möglicherweise zu schwer sind.
- Bei einer Installation in einem Gestell darauf achten, dass schwere Geräte unten im Gestell eingebaut werden, um Gefahren durch Umkippen zu vermeiden.
- Bei Summit Desktop-Switches keinen Monitor oder andere Gegenstände auf die Anlage stellen. Die Abdeckung der Grundplatte ist nicht darauf ausgelegt, Gewicht zu tragen.

- Nur Werkzeuge und Ausrüstung verwenden, die sich in einwandfreiem Zustand befinden. Keine Ausrüstung verwenden, die sichtbare Beschädigungen aufweist.
- Schutz ESD-gefährdeter Bauteile: Zum Schutz ESD-gefährdeter Bauteile grundsätzlich vor der Aufnahme von Arbeiten an Leiterplatten oder Modulen ein Armband anlegen. Leiterplatten nur in antistatischer Verpackung transportieren. Vor der Aufnahme von Arbeiten an Leiterplatten diese immer auf einer geerdeten Fläche ablegen.
- Verlegen von Kabeln: Kabel so verlegen, dass keine Schäden entstehen oder Unfälle, z. B. durch Stolpern, verursacht werden können.

Auswahl der Stromkabel

Je nachdem, welchen Switch Sie erworben haben, werden die Wechselstromnetzteile von Extreme Networks entweder nur mit einem 110-VAC-Kabel oder mit einem 110-VAC-Kabel und einem 208/220-VAC-Kabel geliefert. Die von Extreme Networks gelieferten Stromkabel sind nur für den Einsatz in den Vereinigten Staaten und Kanada ausgelegt und zugelassen. Stromkabel für den Einsatz außerhalb der Vereinigten Staaten und Kanada werden normalerweise von einem Drittanbieter geliefert und müssen die folgenden Anforderungen erfüllen:

- Die Stromkabel müssen offiziell für das Land zugelassen sein, in dem sie verwendet werden sollen.
- Die Stromkabel müssen mit einem für das Einsatzland zugelassenen Wandsteckkontakt mit der geeigneten Nennleistung ausgerüstet sein.
- Die Konfiguration der Steckvorrichtung (die Steckverbindung zur Einheit, nicht zur Wandsteckdose) muss für eine Gerätesteckdose gemäß EN60320/IEC320-C14 ausgeführt sein.
- Die Länge der Stromkabel muss weniger als 5 m (15 Fuß) betragen.
- Die Mindestspezifikation für das flexible Kabel lautet:
 - Nr. 18 AWG (0,823 mm²) für Einheiten mit einem Bemessungsstrom von weniger als 10 A, oder
 - Nr. 18 AWG (0,823 mm²) bis 2 m Länge für Einheiten mit einem Bemessungsstrom von 10 A oder höher, oder
 - Nr. 16 AWG (1,0 mm²) bis 5 m Länge für Einheiten mit einem Bemessungsstrom von 10 A oder höher
- Bei allen Kabeln muss es sich um 3-adrige Kupferleiter vom Typ SVT oder SJT, HAR oder einen äquivalenten Typ handeln.

Verwenden Sie immer ein Wechselstromkabel, das den Vorschriften Ihres Landes entspricht. Erkundigen Sie sich über die örtlichen Vorschriften für Elektroinstallationen und fragen Sie bei den zuständigen Aufsichtsbehörden nach den Anforderungen an Stromkabel. Nähere Angaben zu den Leistungsspezifikationen von Netzteilen finden sich unter <http://www.extremenetworks.com> oder in Anhang B dieses Dokuments.



WARNUNG!

Vor dem Anschließen des Wechselstromkabels an ein Netzteil muss sichergestellt werden, dass die Steckdose vorschriftsgemäß geerdet ist.

Für die unten aufgeführten Länder gelten zusätzlich folgende Anforderungen:

- Argentinien: Der Netzstecker muss den argentinischen Standards entsprechen.
- Australien: Versorgungsteckdose, 15 A Minimum, AS 3112 für 110/220-VAC-Netzteile

- Dänemark: Der Netzstecker muss die in Abschnitt 107-2-D1 der Norm DK2-1a oder DK2-5a aufgeführten Bestimmungen erfüllen.
- Japan:
 - Versorgungssteckdose, 15 A, JIS 8303 für 110/220-VAC-Netzteile.
 - Das mit dem Netzteil, dem Switch oder der Grundplatte gelieferte Verbindungskabel ist nur für den Einsatz mit dem spezifischen Produkt von Extreme Networks vorgesehen und darf nicht mit anderen Geräten von Extreme Networks oder anderen Anbietern verwendet werden.
- Nordamerika: Versorgungssteckdose, 15 A, NEMA 5-15 für 110-VAC-Netzteile und NEMA L6-15P für 208/220-VAC-Netzteile
- Schweiz: Der Netzstecker muss der Richtlinie SEV/ASE 1011 entsprechen.
- Großbritannien: Versorgungssteckdose, 15 A, BS 1363 für 110/220-VAC-Netzteile
- International: Versorgungssteckdose, 15 A, CEE 7/7 für 110/220-VAC-Netzteile
- Nur Frankreich und Peru:
Diese Einheit kann nicht über IT+-Netzteile mit Strom versorgt werden. Wenn Ihre Netzteile vom Typ IT sind, muss dieses Gerät mit 230 V (2P+T) unter Verwendung eines Trenntrafos mit einem Verhältnis von 1:1 versorgt werden. Der zweite Anschlusspunkt muss als neutral definiert und direkt an die Erde angeschlossen werden.

Hinweis: Die Bauvorschriften sind weltweit verschieden; Extreme Networks empfiehlt daher ausdrücklich, einen Elektroinstallateur zu beauftragen, um die sachgemäße Geräteerdung und Stromverteilung für Ihre spezifische Installation sicherzustellen.

Austauschen und Entsorgen von Batterien

Im Umgang mit Batterien sind folgende Hinweise zu beachten:

- Austauschen der Lithium-Batterie: Die in diesem Gerät enthaltenen Batterien können nicht vom Anwender ausgetauscht werden. Wenden Sie sich für einen Austausch des kompletten Gerätes bitte an die Servicemitarbeiter von Extreme. Sollte der Versuch eines Austausches unternommen werden, sind zur Vermeidung einer Explosionsgefahr folgende Richtlinien zu beachten:
 - a Die Batterie nur durch eine identische oder eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen.
 - b Die Batterie gemäß den Empfehlungen des Herstellers entsorgen.

Lichtleiteranschlüsse: Optische Sicherheit



WARNUNG!

Beim Umgang mit Lichtleitermodulen sind folgende Vorsichtsmaßnahmen zu beachten:

- Niemals durch ein Vergrößerungsgerät auf die übertragende LED/den Laser schauen, wenn diese(r) eingeschaltet ist.
- Niemals direkt auf einen Lichtleiteranschluss am Switch oder auf die Enden eines Faserkabels schauen, wenn diese eingeschaltet sind.
- Bei offenen Anschlüssen kann es zu unsichtbarer Laserstrahlung kommen. Direkter Augenkontakt mit dem Strahl ist zu vermeiden.
- Ein optisches Gerät niemals auf andere Weise verändern oder modifizieren als in diesem Dokument angegeben.

Einhaltung behördlicher Vorschriften durch GBIC, Mini-GBIC, XENPAK und XFP

- Laserprodukt der Klasse 1
- EN60825-1+A2:2001 oder jünger, Europäische Richtlinie für Lasersysteme
- Anwendung der CE-Kennzeichnung gemäß der Richtlinien 89/336/EWG EMV und 73/23/EWG für Niederspannungsgeräte

B Technical Specifications

This appendix includes the following technical specifications:

- [BlackDiamond 10808 Switch on page 385](#)
- [BlackDiamond 8810 Switch on page 388](#)
- [BlackDiamond 8806/12804 Switch on page 390](#)
- [Power supply specifications for BlackDiamond switches on page 395](#)
- [Summit Family of Switches on page 398](#)
- [Summit External Power Supplies on page 411](#)



NOTE

The power supply specifications for the BlackDiamond family of switches are consolidated into one table: [Table 81](#).

BlackDiamond 10808 Switch

Table 77: BlackDiamond 10808 switch technical specifications

Physical Dimensions

BlackDiamond 10808 chassis	Height: 38.5 inches (98 cm) Width: 17.3 inches (44 cm) Depth: 21.0 inches (53.3 cm)

Weight

BlackDiamond 10808 chassis (empty)	105 lb (47.7 kg)
BlackDiamond 10808 chassis (fully loaded)	242 lb (110 kg)
Power supply	7 lb (3.2 kg)
BlackDiamond 10808 MSM	10.7 lb (4.9 kg)
BlackDiamond 10808 I/O module	9.25 lb (4.2 kg)

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive

Table 77: BlackDiamond 10808 switch technical specifications (Continued)

International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)
EMI/EMC Standards	
North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive
International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	
	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	
Note: These standards are module-specific and may not apply to every module in the series.	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX, 100BASE-FX IEEE 802.3z 1000BASE-X IEEE 802.3ab 1000BASE-T IEEE 802.3ac VLAN Tag IEEE 802.3ad Link Aggregation IEEE 802.3ae 10GBASE-X IEEE 802.3aef Power over Ethernet
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5 G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g), 11 ms, 60 shocks Operational sine vibration: 5 to 100 to 5 Hz @ 0.2 g, 0 to peak, 0.1 Oct./min. Operational random vibration: 3 to 500 Hz @ 1.5 g rms

Table 77: BlackDiamond 10808 switch technical specifications (Continued)

Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 10% to 93% relative humidity, non-condensing Packaged shock (half sine): <50 kg 180 m/s² (10 g), 6 ms, 600 shocks, modules >50 kg 100 m/s² (6 g), 11 ms, 600 shocks, chassis Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides & corners @ 39.5" <22 lb (10 kg) modules @ 11.8" <110 lb (50 kg) chassis

Acoustic Sound (BlackDiamond 10808 Switch with AC Power Supplies)

Sound power in accordance with EN 300 753 (10-1997)	Sound power Low: 71 dBA per ISO 7779 Normal: 80 dBA per ISO 7779 High: 85 dBA per ISO 7779 Declared sound power Low: 7.4 belsA per ISO 7779 & ISO 9296 Normal: 8.2 belsA per ISO 7779 & ISO 9296 High: 8.8 belsA per ISO 7779 & ISO 9296
Sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure Low: 65 dBA front side @ 0.6m Normal: 75 dBA rear side @ 0.6m High: 81 dBA rear side @ 0.6m

BlackDiamond 8810 Switch

Table 78: BlackDiamond 8810 switch technical specifications

Physical Dimensions

BlackDiamond 8810 chassis	Height: 24.47 inches (62.2 cm) Width: 17.51 inches (44.5 cm) Depth: 18.23 inches (46.3 cm)

Weight

BlackDiamond 8810 chassis (empty)	79 lb (35.8 kg)
BlackDiamond 8810 chassis (fully loaded)	196 lb (88.9 kg)
Power supply	7 lb (3.2 kg)
BlackDiamond 8810 fan tray	6.75 lb (3.06 kg)
BlackDiamond 8810 PSU/fan controller	1.75 lb (.79 kg)

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1(Australia /New Zealand)

EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive
International EMC Certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C

Table 78: BlackDiamond 8810 switch technical specifications (Continued)

Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX, 100BASE-FX IEEE 802.3z 1000BASE-X IEEE 802.3ab 1000BASE-T IEEE 802.3ac VLAN Tag IEEE 802.3ad Link Aggregation IEEE 802.3ae 10GBASE-X IEEE 802.3aef Power over Ethernet
Note: These standards are module-specific and may not apply to every module in the series.	
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g), 11 ms, 60 shocks Operational sine vibration: 5 to 100 to 5 Hz @ 0.2 g, 0 to peak, 0.1 oct./min. Operational random vibration: 3 to 500 Hz @ 1.5g rms
Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 10% to 93% relative humidity, non-condensing Packaged shock (half sine): <50 kg 180 m/s ² (10 g), 6 ms, 600 shocks, modules >50 kg 100 m/s ² (6 g), 11 ms, 600 shocks, chassis Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides & corners @ 39.5" <22 lb (10 kg) modules @ 11.8" <110 lb (50 kg) chassis
Acoustic Sound (BlackDiamond 8810 Switch with AC Power Supplies)	
Sound power in accordance with EN 300 753 (10-1997)	Sound power Normal: 70 dBA per ISO 7779 High: 75 dBA per ISO 7779 Declared sound power Normal: 7.2 belsA per ISO 7779 & ISO 9296 High: 7.7 belsA per ISO 7779 & ISO 9296
Sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure Normal: 64 dBA front side @ 0.6m High: 67 dBA rear side @ 0.6m

BlackDiamond 8806/12804 Switch

Table 79: BlackDiamond 8806 and BlackDiamond 12804 switch technical specifications

Physical Dimensions

BlackDiamond 8806 chassis	Height: 17.47 inches (44.4 cm)
BlackDiamond 12804 chassis	Width: 17.51 inches (44.5 cm)
	Depth: 18.12 inches (46.0 cm)

Weight

BlackDiamond 8806 chassis (empty)	63.75 lb (29.0 kg)
BlackDiamond 12804 chassis (empty)	
BlackDiamond 8806 chassis (fully loaded)	153 lb (69.5 kg)
BlackDiamond 12804 chassis (fully loaded)	
BlackDiamond 8806/12804 power supply	7 lb (3.2 kg)
BlackDiamond 8806 fan tray	4.75 lb (2.2 kg)
BlackDiamond 12804 fan tray	
BlackDiamond 8806 PSU/Fan Controller	1.75 lb (.79 kg)
BlackDiamond 12804 PSU/Fan Controller	

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)

EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive

Table 79: BlackDiamond 8806 and BlackDiamond 12804 switch technical specifications (Continued)

International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX, 100BASE-FX IEEE 802.3z 1000BASE-X IEEE 802.3ab 1000BASE-T IEEE 802.3ac VLAN Tag IEEE 802.3ad Link Aggregation IEEE 802.3ae 10GBASE-X IEEE 802.3aef Power over Ethernet
Note: These standards are module-specific and may not apply to every module in the series.	
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operating altitude 0 to 3000 meters (0 to 9,850 ft) Operational shock: 30 m/s ² (3 g), 11 ms, 60 shocks Operational random vibration: 5 to 500 Hz @ 1.5g rms
Storage & Transportation Conditions (Packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 10% to 93% relative humidity, non-condensing Packaged shock (half sine): <50 kg 180 m/s ² (10 g), 6 ms, 600 shocks, modules >50 kg 100 m/s ² (6 g), 11 ms, 600 shocks, chassis Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz Packaged sinusoidal vibration: 5 to 62 Hz, 5 mm/s velocity, 62 to 200 Hz, 0.2 g Tilt: 22.5 degrees and return to position 14 drops minimum on sides & corners @ 39.4" <20 lb (9 kg) modules @ 19.7" <80 lb (36 kg) chassis

Table 79: BlackDiamond 8806 and BlackDiamond 12804 switch technical specifications (Continued)**Acoustic Sound** (BlackDiamond 8806/12804 switch with AC Power Supplies)

Sound power in accordance with EN 300 753 (10-1997)	Sound power
	Normal: 70 dBA per ISO 7779 High: 73 dBA per ISO 7779
	Declared sound power
	Normal: 7.2 belsA per ISO 7779 & ISO 9296 High: 7.6 belsA per ISO 7779 & ISO 9296
Sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure
	Normal: 64 dBA front side @ 0.6m High: 66 dBA left side @ 0.6m

BlackDiamond 12802 Switch

Table 80: BlackDiamond 12802 switch technical specifications

Physical Dimensions

BlackDiamond 12802 chassis	Height: 5.25 inches (13.3 cm) Width: 17.25 inches (43.8 cm) Depth: 21.25 inches (54.0 cm)

Weight

BlackDiamond 12802 chassis (empty)	29.25 lb (13.3 kg)
BlackDiamond 12802 chassis (fully loaded)	63 lb (28.6 kg)
BlackDiamond 12802 power supply	3.0 lb (1.4 kg)
BlackDiamond 12802 fan tray	3.25 lb (1.5 kg)
BlackDiamond 12802 PSU/Fan Controller	0.5 lb (0.2 kg)

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)

EM/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive
International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C

Table 80: BlackDiamond 12802 switch technical specifications (Continued)

Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX, 100BASE-FX IEEE 802.3z 1000BASE-X IEEE 802.3ab 1000BASE-T IEEE 802.3ac VLAN Tag IEEE 802.3ad Link Aggregation IEEE 802.3ae 10GBASE-X IEEE 802.3aef Power over Ethernet
Note: These standards are module-specific and may not apply to every module in the series.	
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise
Operating conditions	Operating temperature range 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operating altitude 0 to 3000 meters (0 to 9,850 ft) Operational shock: 30 m/s ² (3 g), 11 ms, 60 shocks Operational random vibration: 5 to 500 Hz @ 1.5g rms
Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 10% to 93% relative humidity, non-condensing Packaged shock (half sine): <50 kg 180 m/s ² (10 g), 6 ms, 600 shocks, modules >50 kg 100 m/s ² (6 g), 11 ms, 600 shocks, chassis Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3dB/oct. from 20 to 200 Hz Packaged sinusoidal vibration: 5 to 62 Hz, 5 mm/s velocity, 62 to 200 Hz, 0.2 G Tilt: 22.5 degrees and return to position 14 drops minimum on sides & corners @ 39.4" <20 lb (9 kg) modules @ 19.7" <80 lb (36 kg) chassis

Power Supplies for the BlackDiamond Family of Switches

This section lists specifications for the power supplies that are installed in the following BlackDiamond switches:

- BlackDiamond 8800 series switches
- BlackDiamond 10808 switch
- BlackDiamond 12804 switch
- BlackDiamond 12802 switch

Table 81: Power supply specifications for BlackDiamond switches

AC SSI PS Model #60020/PS2336 (700/1200 W AC PSU)s	For the BlackDiamond 8800 series switches, BlackDiamond 10808 switch, and BlackDiamond 12804 switch
Typical configuration	3 power supplies
Full configuration	6 power supplies
Input	Nominal input: 100 to 240 V~, 60/50 Hz, 10 A max AC voltage input range: 90 to 264 V~ Maximum input amperages: 7 A @ 200 V~ (high-line) 10 A @ 90 V~ (low-line) AC line frequency: 47 to 63 Hz PS input socket: IEC 320 C14 Minimum wire size: 16 AWG (1.31mm ²) copper stranded
Output	DC output: 48 V  , 24 A/12 V  , 4 A (high-line) 48 V  , 13.5 A/12 V  , 4 A (low-line) DC output power (W): 700 to 1200 W
Power supply cord selection	Refer to “Power Supply Cords Selection” on page 375 .
AC power supply input socket	IEC 320 C14
Minimum wire size	16 AWG (1.0mm ²) copper stranded (pre-approved cord set for county of use)
Operating conditions	Operating temperature: 0° C to 40° C Storage temperature: -40° C to 70° C Operating humidity: 10% to 90% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g)
AC PS Model #41050 (600/900 W AC PSU)	For the BlackDiamond 8806 switch
Typical configuration	3 power supplies
Full configuration	6 power supplies
Input	Nominal input voltage: 100 to 240 V~, 60/50 Hz, 8 A max Voltage input range/frequency range: 90 to 264 V~ AC line frequency: 47 to 63 Hz Maximum input amperages: 5 A @ 200 V~ (high-line) 8 A @ 90 V~ (low-line) Input socket: IEC 320 C14 Minimum wire size: 16 AWG (1.31mm ²) copper stranded (pre-approved cord set for country of use)

Table 81: Power supply specifications for BlackDiamond switches (Continued)

Output	DC output: 48V $\overline{\text{DC}}$, 18A/12V $\overline{\text{DC}}$, 4A (high line) 48V $\overline{\text{DC}}$, 11.5A/12V $\overline{\text{DC}}$, 4A (low line) DC output power (W): 600 to 900 W
Power supply cord selection	Refer to “Power Supply Cords Selection” on page 375 .
Operating conditions	Operating temperature: 0° C to 40° C (32° F to 104° F) Storage temperature: -40° C to 70° C Operating humidity: 10% to 90% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g)
DC SSI PS Model #60021 (1200 W DC PSU)	For the BlackDiamond 8800 series switches, BlackDiamond 10808 switch, and BlackDiamond 12804 switch
Typical configuration	3 power supplies
Full configuration	6 power supplies
Input	Nominal input voltage: -48 V $\overline{\text{DC}}$ Voltage input range: -40.5 V $\overline{\text{DC}}$ to -72 V $\overline{\text{DC}}$ Input currents: -40 V $\overline{\text{DC}}$ @ 35 A -48 V $\overline{\text{DC}}$ @ 30 A -60 V $\overline{\text{DC}}$ @ 23 A Maximum in-rush current: Not more than 80 A for 5 ms Input circuit protection: 50 A Wire harness provided by Extreme Networks with each power supply. Extreme Part# 4340-00028 Wire type: 8 AWG (10 mm ²) listed tray cable, copper-stranded rated @ 90 C minimum Connector: Molex connector PN 42816-0312 Connector pins: Molex connector pins PN 42815-0032
Output	DC output: 48 V $\overline{\text{DC}}$, 24 A / 12 V $\overline{\text{DC}}$, 4 A DC output power (W): 1200 W
Operating conditions	Operating temperature: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 90% relative humidity, non-condensing Operating altitude: 0 m to 3,000 m (0 ft to 9,850 ft) Operational shock*: 30 m/s ² (3 g), 60 shocks Operational office vibration*: 5 to 100-5 Hz @ 2/10 G, 0 to peak, 1 oct/min Operational random vibration*: 3 to 500 Hz @ 1.5 G rms * Worst case operational condition; not for continuous operation under this condition
AC PS Model #65021 (325 W AC Power Supply)	For the BlackDiamond 12802 switch
Minimum configuration	2 power supplies
Full configuration	4 power supplies
Input	Nominal input ratings: 100 to 240 V~, 60/50 Hz, 4 A max Operational voltage range: 90 to 264 V~ Maximum input amperages: 3.5 A @ 115 V~ (low-line) 1.75 A @ 230 V~ (high-line) AC line frequency: 47 to 63 Hz AC power supply input socket: IEC 320 C14 Minimum wire size: 18 AWG (0.82mm ²) copper stranded (pre-approved cord set for county of use)

Table 81: Power supply specifications for BlackDiamond switches (Continued)

Output	DC Output: 48 V $\overline{\text{m}}$, 6 A/12 V $\overline{\text{m}}$ 2.5 A/7 VSB 0.75 A Output power (W): 325 W
Operating conditions	Operating temperature: 0° C to 40° C Storage temperature: -40° C to 70° C Operating humidity: 10% to 90% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g)
DC PS Model #65022 (325 W DC PSU)	
Minimum configuration	For the BlackDiamond 12802 switch 2 power supplies
Full configuration	4 power supplies
Input	Nominal input voltage: -48 V~, -60 V~, 15 A maximum Operational voltage range: -40 V to -72 V~ Maximum input amperages: 10 A @ -40 V~ (low-line) 8 A @ -48 V~ 7 A @ -60 V~ (high-line) Maximum in-rush current: 8 A Input circuit protection: 15 A Wire harness provided by Extreme Networks with each power supply. Extreme part number 4340-00028 Minimum wire size: 14 AWG (1.3 mm ²) copper stranded (pre-approved cord set for county of use) Connector: Molex connector PN 42816-0312 Connector pins: Molex connector pins PN 42815-0032
Output	DC Output: 48 V $\overline{\text{m}}$, 6 A/ 12 V $\overline{\text{m}}$ 2.5 A/7 VSB 0.75 A Output power (W): 325 W
Operating conditions	Operating temperature: 0° C to 40° C Storage temperature: -40° C to 70° C Operating humidity: 10% to 90% relative humidity, non-condensing Operational shock: 30 m/s ² (3 g)

Summit Family of Switches

This section includes specifications for the following Summit switch series:

- Summit X250e series switches ([Table 82](#))
- Summit X450 series switches ([Table 83](#))
- Summit X450a series switches ([Table 84](#))
- Summit X450e series switches ([Table 85](#))

Summit X250e Series Switches

The Summit X250e series includes the following switches:

- Summit X250e-24t switch
- Summit X250e-24p switch
- Summit X250e-48t switch
- Summit X250e-48p switch

Table 82: Summit X250e series switch technical specifications

Physical Dimensions

Summit X250e-24t switch	Height: 1.73 inches (4.4 cm)
Summit X250e-24p switch	Width: 17.35 inches (44.1 cm)
	Depth: 12.13 inches (30.8 cm)
Summit X250e-48t switch	Height: 1.73 inches (4.4 cm)
Summit X250e-48p switch	Width: 17.35 inches (44.1 cm)
	Depth: 15.28 inches (38.8 cm)

Weight

Summit X250e-24t switch	12.01 lb (5.46 kg)
Summit X250e-24p switch	14.9 lb (6.8 kg)
Summit X250e-48t switch	15.1 lb (6.9 kg)
Summit X250e-48p switch	17.0 lb (7.7 kg)

Packaged Dimensions

Summit X250e-24t switch	Height: 12.6 inches (32 cm)
Summit X250e-24p switch	Width: 23.6 inches (60 cm)
	Depth: 18.5 inches (47 cm)
Summit X250e-48t switch	Height: 12.2 inches (31 cm)
Summit X250e-48p switch	Width: 22.8 inches (58 cm)
	Depth: 22 inches (56 cm)

Packaged Weight

Summit X250e-24t switch	13.2 lb (6.0 kg)
Summit X250e-24p switch	14.9 lb (6.8 kg)
Summit X250e-48t switch	15.1 lb (6.9 kg)
Summit X250e-48p switch	17.0 lb (7.7 kg)

Table 82: Summit X250e series switch technical specifications (Continued)**Summit X250e-24t Power & Acoustic Sound**

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 1.0 A
Input current	1.0 A @ 115 V~ (low-line) 0.5 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Inrush current	30 A @ 115 V, 60 A @ 230 V
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82mm ²) copper stranded
Efficiency	83%
Heat dissipation (DVT)	36
Power consumption (DVT)	36
Acoustic noise (in dBA per ISO 7779)	45 (high fan speed) 37 (low fan speed)

Summit X250e-24p Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 5.25 A
Input current	4.25 A @ 115 V~ (low-line) 2.0 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Inrush current	30 A @ 115 V, 60 A @ 230 V
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82mm ²) copper stranded
Efficiency	81%
Heat dissipation (DVT)	100
Power consumption (DVT)	500
Acoustic noise (in dBA per ISO 7779)	44 (high fan speed) 39 (low fan speed)

Summit X250e-48t Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 1.0 A
Input current	1.45 A @ 115 V~ (low-line) 0.65 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Inrush current	30 A @ 115 V, 60 A @ 230 V
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.

Table 82: Summit X250e series switch technical specifications (Continued)

Power supply cord gauge	18 AWG (0.82mm ²) copper stranded
Efficiency	83%
Heat dissipation (DVT)	51
Power consumption (DVT)	51
Acoustic noise (in dBA per ISO 7779)	47 (high fan speed) 37 (low fan speed)

Summit X250e-48p Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 5.5 A
Input current	5.25 A @ 115 V~ (low-line) 2.5 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Inrush current	30 A @ 115 V, 60 A @ 230 V
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82 mm ²) copper stranded
Efficiency	78%
Heat dissipation (DVT)	130
Power consumption (DVT)	520
Acoustic noise (in dBA per ISO 7779)	46 (high fan speed) 39 (low fan speed)

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)

EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive

Table 82: Summit X250e series switch technical specifications (Continued)

International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV L-L, 2kV L-G, Level 3, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	IEEE 802.3ab 1000BASE-T
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 95% relative humidity, non-condensing Operating altitude: 0 to 3,000 meters (9,850 feet) Operational shock (half sine): 30 m/s ² (3 g), 11 ms, 60 shocks Operational random vibration: 3 to 500 Hz @ 1.5g rms
Storage & transportation conditions (packaged)	Storage temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 60% to 95% relative humidity, non-condensing Packaged shock (half sine): 180 m/s ² (18 g), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz @ velocity 5 mm/s, 62 to 500 Hz @ 0.2 G Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides & corners @ 42" (<15 kg box)

Summit X450 Series Switches

The Summit X450 series includes the following switches:

- Summit X450-24t switch
- Summit X450-24x switch

Table 83: Summit X450 series switch technical specifications

Physical Dimensions

Summit X450-24t switch	Height: 1.73 inches (4.4 cm)
Summit X450-24x switch	Width: 17.35 inches (44.1 cm)
	Depth: 16.38 inches (41.6 cm)

Weight

Summit X450-24t switch	14 lb (6.35 kg)
Summit X450-24x switch	13.8 lb (6.26 kg)

Power

Summit switch	Auto-ranging 100 V to 240 V AC, 50/60 Hz
Min voltage/associated current	1.5 A at 100 V
Max voltage/associated current	1 A at 240 V AC
Line frequency	50 to 60 Hz
Heat dissipation, Watts/BTU	160 W/546 BTU/hr
Power supply cord selection	Refer to “Power Supply Cords Selection” on page 375.

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)

EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive

Table 83: Summit X450 series switch technical specifications (Continued)

International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range 0 °C to 40 °C (32 °F to 104 °F) Operating humidity: 10% to 95% relative humidity, non-condensing Operational shock (half sine): 30 m/s ² (3g), 11ms, 18 shocks Operational random vibration: 3 to 500 Hz @ 1.5 g rms
Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 10% to 95% relative humidity, non-condensing Packaged shock (half sine): 100 m/s ² (6 g), 6 ms, 600 shocks Packaged random vibration: 5 to 200 Hz @ 1.0 ASD (1m ² /s ²), w/-3 dB/octave 14 drops minimum on sides & corners @ 36" (<15 kg box)
Acoustic Sound (Summit X450-24t/SummitX450-24x)	
Sound power in accordance with EN 300 753 (10-1997)	Sound power: 61 dBA per ISO 7779 Declared sound power: 6.3 belsA per ISO 7779 & ISO 9296
Sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure: 49 dBA rear @ 0.6m

Summit X450a Series Switches

The Summit X450a series includes the following switches:

- Summit X450a-24t switch
- Summit X450a-24tDC switch
- Summit X450a-24x switch
- Summit X450a-24xDC switch
- Summit X450a-48t switch

Table 84: Summit X450a series switch technical specifications

Physical Dimensions

Summit X450a-24t switch	Height: 1.73 inches (4.4 cm)
Summit X450a-24tDC switch	Width: 17.35 inches (44.1 cm)
Summit X450a-24x switch	Depth: 15.30 inches (38.9 cm)
Summit X450a-24xDC switch	
Summit X450a-48t switch	Height: 1.73 inches (4.4 cm)
Summit X450a-48tDC switch	Width: 17.35 inches (44.1 cm)
	Depth: 17 inches (43.2 cm)

Weight

Summit X450a-24t switch	13.75 lb (6.24 kg)
Summit X450a-24tDC switch	12.25 lb (5.57 kg)
Summit X450a-24x switch	13 lb (5.9 kg)
Summit X450a-24xDC switch	12.50 lb (5.67 kg)
Summit X450a-48t switch	15.75 lb (7.14 kg)
Summit X450a-48tDC switch	14.25 lb (6.50 kg)

Packaged Dimensions

Summit X450a-24t switch	Height: 5.9 inches (15 cm)
Summit X450a-24tDC switch	Width: 22.4 inches (57 cm)
Summit X450a-24x switch	Depth: 21.7 inches (55 cm)
Summit X450a-24xDC switch	
Summit X450a-48t switch	
Summit X450a-48tDC switch	

Packaged Weight

Summit X450a-24t switch	18.7 lb (8.5 kg)
Summit X450a-24tDC switch	16.8 lb (7.7 kg)
Summit X450a-24x switch	18.7 lb (8.5 kg)
Summit X450a-24xDC switch	16.8 lb (7.7 kg)
Summit X450a-48t switch	20.4 lb (9.3 kg)
Summit X450a-48tDC switch	17.75 lb (8.0 kg)

Summit X450a-24t Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 1.0 A
Input current	1.0 A @ 115 V~ (low-line) 0.5 A @ 230 V~ (high-line)

Table 84: Summit X450a series switch technical specifications (Continued)

Line frequency range	47 to 63 Hz
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82 mm ²) copper stranded
Heat dissipation, Watts/BTU	100 W/341.2 BTU/hr
Power consumption, Watts/BTU	100 W/341.2 BTU/hr
Sound power in accordance with EN 300 753 (10-1997)	Sound power: 62 dBA per ISO 7779 Declared sound power: 6.4 belsA per ISO 7779 & ISO 9296
Bystander sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure: 54 dBA right side @ 0.6m

Summit X450a-24tDC Power

Operational voltage range	–36 to –72 V 
Nominal input ratings	–48 V  , 2.0 A
Nominal input current	2.0 A @ –36 V  (low-line) 1.0 A @ –72 V  (high-line)
Power supply cord type	DC
Power supply input socket	TYCO PN 206061-1
Power cord input plug	TYCO PN 206060-1
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	14 AWG
Heat dissipation, Watts/BTU	108 W/368.5 BTU/hr
Power consumption, Watts/BTU	108 W/368.5 BTU/hr

Summit X450a-48t Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 1.5 A
Nominal input current	1.45 A @ 115 V~ (low-line) 0.65 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82 mm ²) copper stranded
Heat dissipation, Watts/BTU	150 W/511.8 BTU/hr
Power consumption, Watts/BTU	150 W/511.8 BTU/hr
Sound power in accordance with EN 300 753 (10-1997)	Sound power: 62 dBA per ISO 7779 Declared sound power: 6.4 belsA per ISO 7779 & ISO 9296
Bystander sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure: 54 dBA right side @ 0.6 m

Table 84: Summit X450a series switch technical specifications (Continued)**Summit X450a-48tDC Power & Acoustic Sound**

Nominal input voltage	–48 V $\overline{\text{DC}}$
Operational voltage range	–36 to –72 V $\overline{\text{DC}}$
Input current	4.5 A maximum at full load –48 V input with 75% efficiency
Inrush current	40 A peak maximum
Input wire harness	Extreme part number 250088
Wire size	14 AWG
Connector on cable	TYCO PN 206060-1

Summit X450a-24x Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 1.0 A
Nominal input current	1.0 A @ 115 V~ (low-line) 0.5 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375 .
Power supply cord gauge	18 AWG (0.82 mm ²) copper stranded
Heat dissipation, Watts/BTU	98 W/334.4 BTU/hr
Power consumption, Watts/BTU	98 W/334.4 BTU/hr

Summit X450a-24xDC Power

Operational voltage range	–36 to –72 V $\overline{\text{DC}}$
Nominal input ratings	–48 V $\overline{\text{DC}}$, 2.5 A
Input current	2.5 A @ –36 V $\overline{\text{DC}}$ (low-line) 1.25 A @ –72 V $\overline{\text{DC}}$ (high-line)
Power supply cord type	DC
Power supply input socket	TYCO PN 206061-1
Power cord input plug	TYCO PN 206060-1
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375 .
Power supply cord gauge	14 AWG
Heat dissipation, Watts/BTU	98 W/334.4 BTU/hr
Power consumption, Watts/BTU	98 W/334.4 BTU/hr

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZS 60950-1 (Australia /New Zealand)

Table 84: Summit X450a series switch technical specifications (Continued)**EMI/EMC Standards**

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive
International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV L-L, 2kV L-G, Level 3, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)

Telecom Standards

ETSI EN 300 386:2001 (EMC Telecommunications)
ETSI EN 300 019 (Environmental for Telecommunications)

IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T

Environmental Standards

Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operating altitude: 0 to 3,000 meters (9,850 feet) Operational shock (half sine): 30 m/s ² (3 g), 11 ms, 60 shocks Operational random vibration: 3 to 500 Hz @ 1.5 g rms
Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 60% to 95% relative humidity, non-condensing Packaged shock (half sine): 180 m/s ² (18 g), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz @ velocity 5 mm/s, 62 to 500 Hz @ 0.2 G Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides & corners @ 42" (<15 kg box)

Summit X450e Series Switches

The Summit X450e series includes the following switches:

- Summit X450e-24p switch
- Summit X450e-48p switch

Table 85: Summit X450e series switch technical specifications

Physical Dimensions

Summit X450e-24p switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.30 inches (38.9 cm)
Summit X450e-48p switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 17 inches (43.2 cm)

Weight

Summit X450e-24p switch	14 lb (6.35 kg)
Summit X450e-48p switch	16.25 lb (7.4 kg)

Packaged Dimensions

Summit X450e-24p switch	Height: 5.9 inches (15 cm)
Summit X450e-48p switch	Width: 22.4 inches (57 cm) Depth: 21.7 inches (55 cm)

Packaged Weight

Summit X450e-24p switch	18.9 lb (8.6 kg)
Summit X450e-48p switch	21 lb (9.6 kg)

Summit X450e-24p Power & Acoustic Sound

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 5.25 A
Input current	4.25 A @ 115 V~ (low-line) 2.0 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power Supply Cord Gauge	18 AWG (0.82mm ²) copper stranded
Heat dissipation, Watts/BTU	120 W/409.5 BTU/hr
Power consumption, Watts/BTU	500 W/1706.1 BTU/hr

Table 85: Summit X450e series switch technical specifications (Continued)**Summit X450e-48p Power & Acoustic Sound**

Operational voltage range	85 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 6 A
Nominal input current	5.25 A @ 115 V~ (low-line) 2.5 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	18 AWG (0.82mm ²) copper stranded
Heat dissipation, Watts/BTU	180 W/614.2 BTU/hr
Power consumption, Watts/BTU	603 W/2057.5 BTU/hr

Safety Standards

North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)● IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001+A11 EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 Country Deviations AS/NZX 60950-1 (Australia /New Zealand)

EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	EN 55022:1998 Class A EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2,3 (Harmonics & Flicker) ETSI EN 300 386:2001 (EMC Telecommunications) 89/336/EEC EMC Directive
International EMC certifications	CISPR 22:1997 Class A (International Emissions) CISPR 24:1997 Class A (International Immunity) IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A IEC/EN 61000-4-5 Surge, 2kV L-L, 2kV L-G, Level 3, Criteria A IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) AS/NZS 3548 ACA (Australia Emissions) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, EMC Approval (North Korea)

Table 85: Summit X450e series switch technical specifications (Continued)

Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards	IEEE 802.3ab 1000BASE-T
Environmental Standards	
Environmental	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F) Operating humidity: 10% to 93% relative humidity, non-condensing Operating altitude: 0 to 3,000 meters (9,850 feet) Operational shock (half sine): 30 m/s ² (3 g), 11 ms, 60 shocks Operational random vibration: 3 to 500 Hz @ 1.5 g rms
Storage & transportation conditions (packaged)	Transportation temperature: -40° C to 70° C (-40° F to 158° F) Storage and transportation humidity: 60% to 95% relative humidity, non-condensing Packaged shock (half sine): 180 m/s ² (18 g), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz @ velocity 5 mm/s, 62 to 500 Hz @ 0.2 G Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides & corners @ 42"(<15kg box)

Summit External Power Supplies

Table 86: Summit external power supplies

EPS-LD External Power Supply	For use with the Summit X450a-24t and X450e-24p switches
Operational voltage range	90 to 264 V~
Nominal input ratings	100 to 240 V~, 50/60 Hz, 10 A
Line frequency range	47 to 63 Hz
Input Current	10 A at 115 V ~, 5 A at 230 V ~
Maximum inrush current	30 A at 115 V ~, 60 A at 230 V ~
Output	-50 V $\equiv$, 7.5 A max, 375 Watts 12 V $\equiv$, 7.5 A max, 90 Watts
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Maximum continuous DC output shall not exceed 465 Watts.	
EPS-160 External Power Module	For use with the Summit X450-24t, X450-24x, X250e-24t, and X250e-48t switches
Operational voltage range	90 to 264 V~
Nominal input ratings	100 to 250 V, 4 to 2 A, 47 to 63 Hz
Line frequency range	47 to 63 Hz
Input current	2 A at 100 V 1 A at 240 V
Line frequency	50 to 60 Hz
Heat dissipation, Watts/BTU	160 W / 546 BTU/hr
AC power supply input socket	IEC 320 C14
Minimum wire size	16 AWG (1.0mm ²) copper stranded
Output	12 V $\equiv$, 11 A 5 V $\equiv$, 1.5 A
Power Supply Cord Selection	Refer to “Power Supply Cords Selection” on page 375.
Maximum Inrush Current	30 A at 100 V~, 50 A at 50 V~
EPS-500 External Power Supply	For use with the Summit X450a-48t and X250e-24p switches
Operational voltage range	90 to 264 V~
Nominal input ratings	100 to 240 V~, 50 to 60 Hz, 10 A
Nominal input current	5.75 A @ 115 V~ (low-line) 2.80 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Output	-50 V $\equiv$, 7.5 A max, 375 Watts 12 V $\equiv$, 10.5 A max, 126 Watts Maximum continuous DC output shall not exceed 500 Watts.
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.

Table 86: Summit external power supplies (Continued)

Power supply cord gauge	18 AWG (0.82mm ² ; less than 2 m) or 16 AWG (1.3mm ²) copper stranded
Heat dissipation	125 W
Power consumption	625 W
Operating conditions	Temperature: 0° C to 40° C (32° F to 104° F) Humidity: 10% to 93% relative humidity, non-condensing Altitude: 0 to 3,000 meters (9,850 feet) Shock (half sine): 30 m/s ² (3 g), 11 ms, 60 shocks Random vibrations: 3 to 500 Hz @ 1.5 g rms
Maximum in-rush current	30 A @ 115 V/60 Hz, maximum load
Efficiency	80% with 60% to 100% load
EPS-600LS External Power Module Model 10913	For use with the Summit X450e-48p and X250e-48p switches Must be installed in the EPS-C chassis (Model 10912)
Operational voltage range	85 to 264 V~
Nominal input ratings	100-250 V~, 50-60 Hz, 10 A
Nominal input current	7 A @ 115 V~ (low-line) 3.5 A @ 230 V~ (high-line)
Line frequency range	47 to 63 Hz
Output power	600 W
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375 .
Minimum wire size	18 AWG (0.82mm ² ; less than 2 m) or 16 AWG (1.3mm ²) copper stranded
Heat dissipation	132 W
Power consumption	732 W
Operating conditions	Temperature: 0° C to 40° C (32° F to 104° F) Humidity: 10% to 93% relative humidity, non-condensing Altitude: 0 to 3000 meters (9,850 ft) Shock: 10 ms, 3 axis (half sine) Vibration: 5 to 200 to 5 Hz, 5 to 32 Hz, 0.021DA, 32-2000 Hz (swept sine)
Storage and transportation conditions	Temperature: -40° C to 70° C (-40° F to 158° F) Humidity: 60% to 95% relative humidity, non-condensing Packaged shock: 180 m/s ² (18g), 6 ms, 600 shocks (half sine) Packaged sine vibration: 5 to 62 Hz @ velocity 5 mm/s, 62 to 500 Hz @ 0.2 G Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz Shock: 14 drops min on sides & corners @ 42" (<15 kg box)
Maximum in-rush current	17 A @115 V/60 Hz, maximum load
Efficiency	85% nominal

Output Ratings for EPS-C chassis with 1, 2, or 3 installed EPS-600LS units

One EPS-600-LS unit	582 W output: -48 V/9 A (432 W), 12 V/12.5 A
Two EPS-600-LS units	1116 W output: -48 V/18 A (864 W), 12 V/21 A
Three EPS-600-LS units	1260 W output: -48 V/21 A (1008 W), 12 V/21 A

Table 86: Summit external power supplies (Continued)

EPS-150DC External Power Module	For use with the Summit X450a-24tDC and Summit X450a-24xDC switches
Operational voltage range	–36 to –72 V 
Nominal input ratings	–36 to –72 V  , 6 A
Input current	5.5 A @ –36 V  (low-line) 2.6 A @ –72 V  (high-line)
Line frequency range	47 to 63 Hz
Power supply cord type	DC
Power supply input socket	TYCO PN 206061-1
Power cord input plug	TYCO PN 206060-1
Power cord wall plug	Refer to “Power Supply Cords Selection” on page 375.
Power supply cord gauge	14 AWG
Heat dissipation	64 W
Power consumption	214 W
Ambient operating temperature	0° C to 40° C
Storage and transportation temperature	–40° C to 70° C
Input wire harness	Extreme part number 250088-00

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