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# Summit 300-48 Switch Installation Guide

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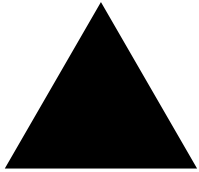
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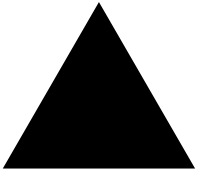


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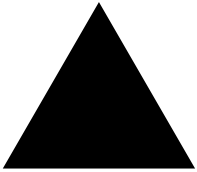


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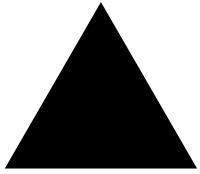
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# Preface

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

## Introduction

This guide provides the required information to install the Summit™ 300-48 switch.

This guide is intended for use by network administrators who are 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
- Internet Protocol (IP) concepts
- Simple Network Management Protocol (SNMP)



### NOTE




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*If the information in the release notes shipped with your switch differs from the information in this guide, follow the release notes.*

## Conventions

Table 1 and Table 2 list conventions that are 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 indicates command syntax, or represents information as it appears on the screen.
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 are 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 <i>italicized type</i>	Italics emphasize a point or denote new terms at the place where they are defined in the text.

## Related Publications

The publications related to this one are:

- *Summit 300-48 Switch Software User Guide*
- *ExtremeWare Release Notes*
- *Summit 300-48 Switch Release Notes*

Documentation for Extreme Networks products is available on the World Wide Web at the following location:

- <http://www.extremenetworks.com/>



# Summit 300-48 Switch Overview

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This chapter describes the features and functionality of the Summit 300-48 switch. It contains the following sections:

- Summary of Features on page 11
- Summit 300-48 Switch Front View on page 12
- Summit 300-48 Switch Rear View on page 14
- Port Connections on page 15
- Port Connections on page 15
- Full-Duplex on page 15
- Mini-GBIC Type and Hardware/Software Support on page 15

## Summary of Features

The Summit 300-48 supports the following features:

- Unified Access support
- 2U high chassis
- 4 Gigabit Ethernet uplinks, fiber/UTP redundant
- Supports up to 48 10/100 Ethernet ports
- Modular expansion slot supports various port configurations
- Serial management port
- Redundant hot swappable power supply

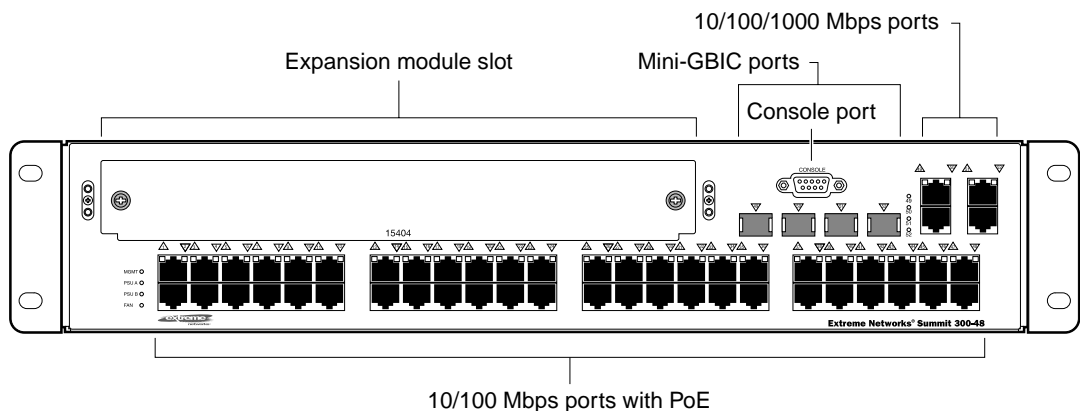
## Unified Access

The Summit 300-48 supports the Unified Access architecture, enabling wired and wireless applications across a completely integrated enterprise infrastructure. With the Altitude product line, the Summit 300-48 supports 802.11 WLAN connectivity. Provisioning of Unified Access is completely controlled by the Summit 300-48.

# Summit 300-48 Switch Front View

Figure 1 shows the Summit 300-48 switch front view.

**Figure 1:** Summit 300-48 switch front view



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The Summit 300-48 switch has 48 autosensing 10/100 Ethernet ports using RJ-45 connectors and provides four unpopulated Extreme mini-GBIC ports.

## Console Port

Use the console port (9-pin, “D” type connector) for connecting a terminal and carrying out local management.



### NOTE

See “Mini-GBIC Type and Hardware/Software Support” on page 15 for information about supported mini-GBIC types and distances.



### NOTE

See “Port Connections” on page 15 for more details.

## Summit 300-48 Switch LEDs

Table 3 describes the light emitting diode (LED) behavior on the Summit 300-48 switch.

**Table 3:** Summit 300-48 Switch LED Behavior

<b>Unit Status LED (MGMT LED)</b>		
	<b>Color</b>	<b>Indicates</b>
	Blinking Green	The Summit switch is operating normally.
	Solid Amber	The Summit has failed its POST.
	Off	No power.
<b>Power Supply Status LEDs (per power supply)</b>		
	<b>Color</b>	<b>Indicates</b>
	Solid Green	The power supply is operating normally.
	Solid Amber	There is a fault.
	Off	There is no power.
<b>Fan Unit Status LEDs</b>		
	<b>Color</b>	<b>Indicates</b>
	Solid Green	The fan is operating normally.
	Solid Amber	There is a fault.
	Off	There is no power.
<b>Power Supply Status LEDs</b>		
<b>LED</b>	<b>Color</b>	<b>Indicates</b>
OUT	Solid Green	The output voltages are enabled and within specification.
	Off	There is a fault on at least one output voltage or voltages are out of specification.
TEMP	Solid Amber	The fan failed or there is an over temperature condition.
	Off	The fan is operating normally and operating temperature is within limit.
IN	Solid Green	The input voltage is within specification and the input section is working.
	Off	The input voltage is out of range or there is a fault in the input section.
<b>10/100 Mbps Port Status LEDs</b>		
	<b>Color</b>	<b>Indicates</b>
	Green solid	Link is present; port is enabled; non-powered device.
	Green blinking	Link is present; there is activity; non-powered device.
	Amber solid	Link is present; port is enabled; device powered.
	Amber blinking	Link is present; there is activity; device powered.
	Alternating Amber/Green	Port is enabled; powered device; there is a fault.
	Off	Link is not present or the port is disabled.

**Table 3:** Summit 300-48 Switch LED Behavior (continued)**10/100/1000 Mbps Port Status LEDs**

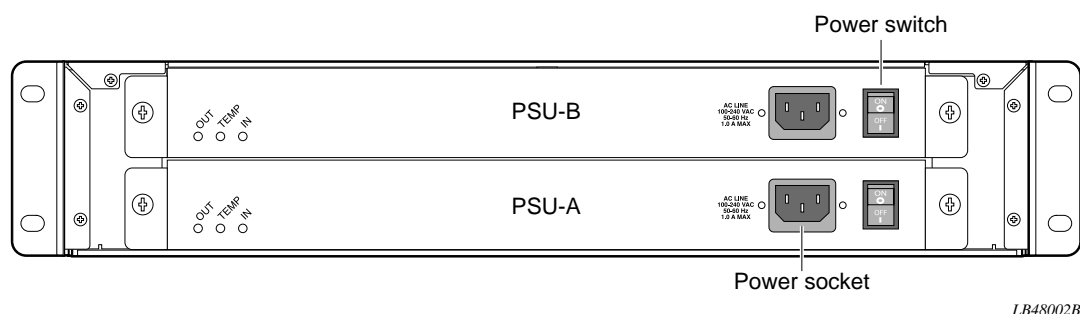
Color	Indicates
Green solid	Link is present; port is enabled; full-duplex operation.
Green blinking	Link is present; there is activity.
Amber blinking	Reserved.
Off	Link is not present or the port is disabled.

**Mini-GBIC Port Status LEDs**

Color	Indicates
Yellow blinking	A non-supported GBIC is installed on this port.
Solid Green	Link is present; port is enabled; full-duplex operation.
Blinking Green	Link is present; there is activity.
Off	Link is not present; port is disabled; mini-GBIC is not installed.

## Summit 300-48 Switch Rear View

Figure 2 shows the rear view of the Summit 300-48 switch.

**Figure 2:** Summit 300-48 switch rear view

## Power Socket

The Summit 300-48 switch automatically adjusts to the supply voltage. The power supply operates down to 90 V.

## Serial Number

Use this serial number for fault-reporting purposes.

## MAC Address

This label shows the unique Ethernet MAC address assigned to this device.



*The Summit 300-48 switch certification and safety label, and the serial number and MAC address labels are located on the bottom of the switch.*

## Port Connections

The Summit 300-48 switch uses a combination of 10BASE-T/100BASE-TX ports using RJ-45 connectors and Small Form Factor Pluggable (SFP) Gigabit Interface Connectors (GBICs), also known as mini-GBICs.

The Summit 300-48 switch provides dual-media support on GigE ports. Ports 49-52 are dual-mode redundant ports. Only one media type (fiber or copper) can be active. The switch will use the first available link. If the current link goes down, the switch will search for an available link. If both links are available at system startup, a fiber link will be used.

## Full-Duplex

The Summit 300-48 switch provides full-duplex support for all ports. Full-duplex allows frames to be transmitted and received simultaneously and, in effect, doubles the bandwidth available on a link. All 10/100 Mbps ports on the Summit 300-48 switch autonegotiate for half- or full-duplex operation.

## Mini-GBIC Type and Hardware/Software Support

The Summit 300-48 switch supports the small form pluggable (SFP) GBIC, also known as the mini-GBIC. The switch identifies the type of mini-GBIC that is installed and verifies that the mini-GBIC is an Extreme Networks-certified mini-GBIC.

### Mini-GBIC Types and Specifications

The two types of mini-GBIC interfaces are:

- 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 802.1z standard

Use only Extreme Networks-certified mini-GBICs, available from Extreme Networks, in the mini-GBIC port in the switch.

Table 4 describes the specifications for the SX mini-GBIC interface.

**Table 4:** SX Mini-GBIC Specifications

Parameter	Minimum	Typical	Maximum
<b>Transceiver</b>			
Optical output power	-9.5 dBm		-4 dBm
Center wavelength	830 nm	850 nm	860 nm
<b>Receiver</b>			
Optical input power sensitivity	-21 dBm		
Optical input power maximum			-4 dBm
Operating wavelength	830 nm		860 nm
<b>General</b>			
Total system budget			11.5 dBm

Total optical system budget for the SX mini-GBIC is 11.5 dBm. Extreme Networks recommends that 3 dBm of the total budget be reserved for losses induced by cable splices/connectors and operating margin. While 8.5 dBm remains available for cable induced attenuation, the 1000BASE-SX standard specifies supported distances of 275 meters over 62.5 micron multimode fiber and 550 meters over 50 micron multimode fiber. There is no minimum attenuation or minimum cable length restriction.

Table 5 describes the specifications for the LX mini-GBIC interface.

**Table 5:** LX Mini-GBIC Specifications

Parameter	Minimum	Typical	Maximum
<b>Transceiver</b>			
Optical output power	-9.5 dBm		-3 dBm
Center wavelength	1275 nm	1310 nm	1355 nm
<b>Receiver</b>			
Optical input power sensitivity	-23 dBm		
Optical input power maximum			-3 dBm
Operating wavelength	1270 nm		1355 nm
<b>General</b>			
Total system budget			13.5 dBm

Total optical system budget for the LX mini-GBIC is 13.5 dBm. Measure cable plant losses with a 1310 nm light source and verify this to be within budget. When calculating the maximum distance attainable using optical cable with a specified loss per kilometer (for example 0.25 dB/km) Extreme Networks recommends that 3 dBm of the total budget be reserved for losses induced by cable splices/connectors and operating margin. Thus, 10.5 dBm remains available for cable induced attenuation. 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.



Table 6 describes the specifications for the ZX mini-GBIC interface.

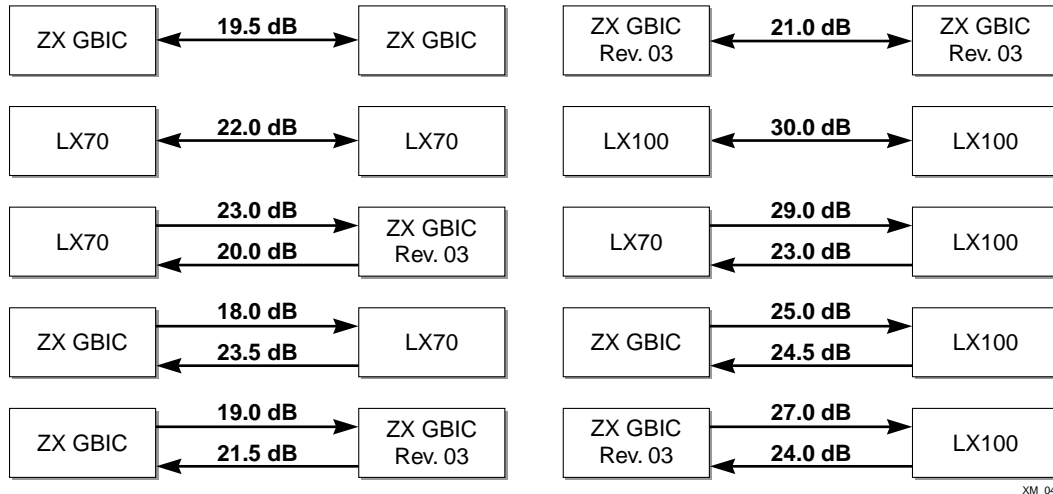
**Table 6:** ZX mini-GBIC Specifications

Parameter	Minimum	Typical	Maximum
<b>Transceiver</b>			
Optical output power	-2 dBm	0 dBm	3 dBm
Center wavelength	1540 nm	1550 nm	1570 nm
<b>Receiver</b>			
Optical input power sensitivity	-23 dBm		
Optical input power maximum			-3 dBm
Operating wavelength	1540 nm	1550 nm	1570 nm

## Long Range GBIC System Budgets

Measure cable plant losses with a 1550 nm light source and verify this to be within budget. When calculating 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, connectors, and operating margin. Figure 3 shows the total optical system budget between long range GBICs.

**Figure 3:** Total optical system budgets for long range GBICs



The ZX mini-GBIC is equivalent to the ZX Rev 03 GBIC.

Table 7 lists the minimum attenuations that are required by each long range GBIC to prevent saturation of the receiver.

**Table 7:** Minimum attenuation requirements

		Receivers				
		GBIC Type	LX70	LX100	ZX (prior to Rev 03)	ZX Rev 03    ZX mini
Transceivers		<b>LX70</b>	9 dB	13 dB	7 dB	7 dB    9 dB
		<b>LX100</b>	8 dB	12 dB	6 dB	6 dB    8 dB
		<b>ZX (prior to Rev 03)</b>	2 dB	6 dB	0 dB	0 dB    2 dB
		<b>ZX Rev 03</b>	5 dB	9 dB	3 dB	3 dB    5 dB
		<b>ZX mini</b>	6 dB	10 dB	4 dB	4 dB    6 dB

The ZX mini-GBIC is equivalent to the ZX Rev 03 GBIC.

# 2

## Site Preparation

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This chapter describes how to prepare your site for installing Extreme Networks equipment. It contains information on environmental and cabling requirements, power requirements, and building and electrical code organizations.

This chapter contains the following sections:

- Planning Your Site on page 20
- Meeting Site Requirements on page 20
- Evaluating and Meeting Cable Requirements on page 26
- Meeting Power Requirements on page 30
- Applicable Industry Standards on page 33

The requirements described in this chapter are intended for the system administrator, network equipment technician, or network manager who is 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!**

*Read the safety information in Appendix A thoroughly before installing your Extreme Networks switch. Failure to follow this safety information can lead to personal injury or damage to the equipment.*

# Planning Your Site

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

## Step 1: Meeting Site Requirements

Your physical installation site must meet several 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

## Step 2: Evaluating and Meeting Cable Requirements

After examining your physical site and ensuring all environment requirements are met, you should 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).

## Step 3: Meeting Power Requirements

To run your equipment safely, you must meet the specific power requirements for the Extreme Networks equipment that you plan to install.



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*Review and follow the safety information before you install your equipment.*

# 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

You need to 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.

Three major building codes are:

- Uniform Building Code—produced by the International Conference of Building Officials (ICBO); 5360 South Workman Mill Road; Whittier, California 90601 USA. [www.icbo.org](http://www.icbo.org)
- BOCA Basic Building Code—produced by the Building Officials and Code Administrators (BOCA) International, Inc.; 4051 West Flossmoor Road; Country Club Hills, Illinois 60478 USA. [www.bocai.org](http://www.bocai.org)
- Standard Building Code (SBC)—produced by the Southern Building Code Congress International, Inc.; 900 Montclair Road; Birmingham, Alabama 35213 USA. [www.sbcci.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 02269 USA. [www.nfpa.org](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. [www.ul.com](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; 2101 L Street N.W.; Washington, D.C. 20037 USA. [www.nema.org](http://www.nema.org)
- Electronics Industry Association (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; 2001 Eye Street N.W.; Washington, D.C. 20006 USA. [www.eia.org](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; 1919 M Street N.W.; Washington, D.C. 20554 USA.

## Wiring Closet Considerations

You should consider the following recommendations for your wiring closet:

- Ensure that your system is easily accessible for installation and service. See “Rack Specifications and Recommendations” on page 24 for specific recommendations.
- Use appropriate AC power for your switch, as described in Table 8.

**Table 8:** AC Power Requirements

Switch Type	Country	Requirements
Summit	North America	13 A service receptacle, NEMA 5-15 for 110/220 VAC power supplies.
Summit	United Kingdom	10 A service receptacle, BS 1363 for 110/220 VAC power supplies.
Summit	International	10 A service receptacle, CEE 7/7 for 110/220 VAC power supplies.
Summit	Australia	10 A service receptacle, AS 3112 for 110/220 VAC power supplies.
Summit	Japan	15 A service receptacle, JIS 8303 for 110/220 VAC power supplies.

- 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 area, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Ensure that each wiring closet has a suitable ground. All distribution racks and equipment installed in the closet should be grounded.
- Ensure 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.

The following are some general thermal recommendations for your wiring closet:

- Ensure 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 nonbusiness 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**

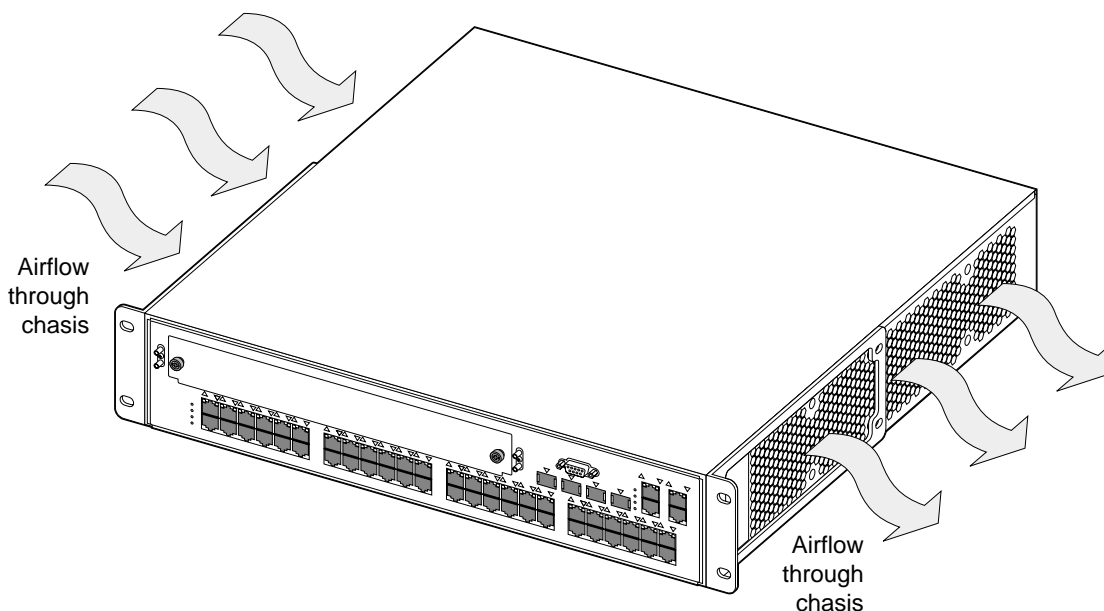
*Like all electrical equipment, product lifetimes degrade with increased temperature. If possible, temperatures should be kept at approximately 78° F (25° C) or lower.*

**Airflow Requirements.** To ensure proper airflow through an Extreme Networks switch, refer to the following recommendations when you are installing your switch:

- The Summit 300-48 switch requires 3 inches (7.62 cm) on both the left and right sides of the switch (5 inches (12.7 cm) recommended) for proper airflow.

The airflow of the Summit 300-48 switch moves from the left side of the switch to the right side of the switch, or from the right side of the switch to the left side of the switch.

**Figure 4:** Airflow through the Summit 300-48 chassis



LB48003

**Humidity.** Operating humidity should be kept between 10 and 95% relative humidity (noncondensing).

### Electrostatic Discharge (ESD)

Your system must be protected from static electricity. Take the following measures to ensure optimum system performance:

- Keep relative humidity at 50 to 70%.
- Remove materials that can cause electrostatic generation (such as synthetic resins) from the wiring closet. Check the appropriateness of floor mats and flooring.

- Connect conductors (metals, etc.) to ground, using dedicated grounding lines.
- Use electrostatically safe equipment and the ESD straps.

## 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 and space 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 (48.26 cm) rack to facilitate easy maintenance and to provide proper ventilation.
- The rack should use the universal mounting rail hole pattern that is identified in IEC Standard 297.
- The mounting holes should be flush with the rails to accommodate the chassis.
- Use a rack made of steel or aluminum.
- 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.

At minimum, follow these guidelines:

- Ground equipment racks to earth ground.
  - CAD weld appropriate wire terminals to building I-beams or earth ground rods.
  - Use #4 copper wire.
  - 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.
  - Properly test the quality of the earth ground.



#### NOTE

*Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding is in place 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.



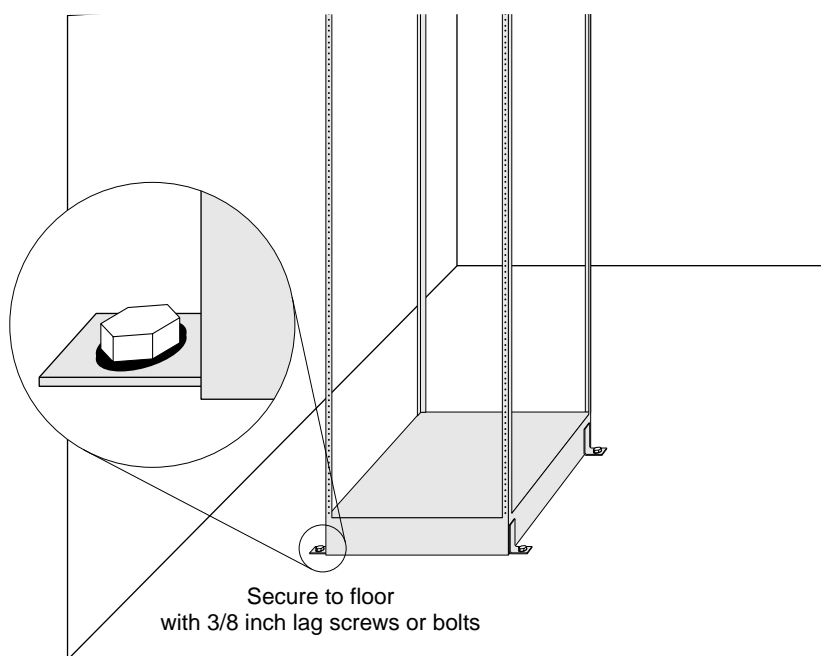
### NOTE

*Install your equipment rack near an easily accessible power outlet. When you need to disconnect the power cable from your switch, remove it first from the power source and then from the switch.*

## 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 5.

**Figure 5:** Properly secured rack



LB48025

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 describes the following topics:

- Cabling Standards
- Cable Labeling and Record Keeping
- Installing Cable
- RJ-45 Connector Jackets
- Radio Frequency Interference

### Cabling Standards

We recommend using the BICSI (Building Industry Consulting Service International) RCDD (Registered Communications Distribution Designer), 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 (5.08-7.62 cm)— to provide proper strain relief.
- Bundle cable using velcro straps to avoid injuring cables.
- If you build your own cable, ensure 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 RF interference.
- 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.

### NOTE

*Unshielded twisted pair (UTP) cable can build up ESD charges when being pulled into a new installation. Before installing category 5 UTP cables, discharge ESD from the cable by plugging it into a port on a switch or any network device that is not powered on.*

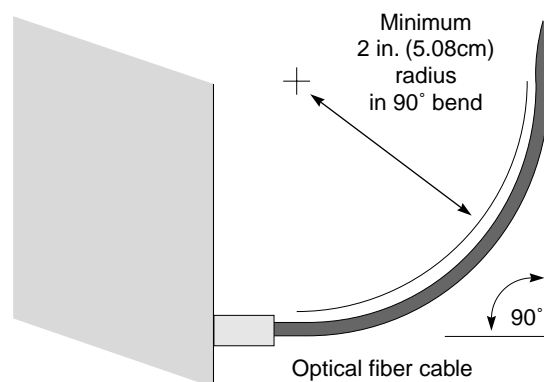
## Fiber Optic Cable

Fiber optic cable must be treated gently 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 9 shows cable media types and maximum distances that support reliable transmission in accordance with international standards except where noted.

**Table 9:** 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
	10/125 µm single-mode fiber*	—	10,000
1000BASE-ZX (1550 nm optical window)	10/125 µm single-mode fiber	—	70,000
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 µm single-mode fiber can use a maximum distance of 10,000 meters.

## RJ-45 Connector Jackets

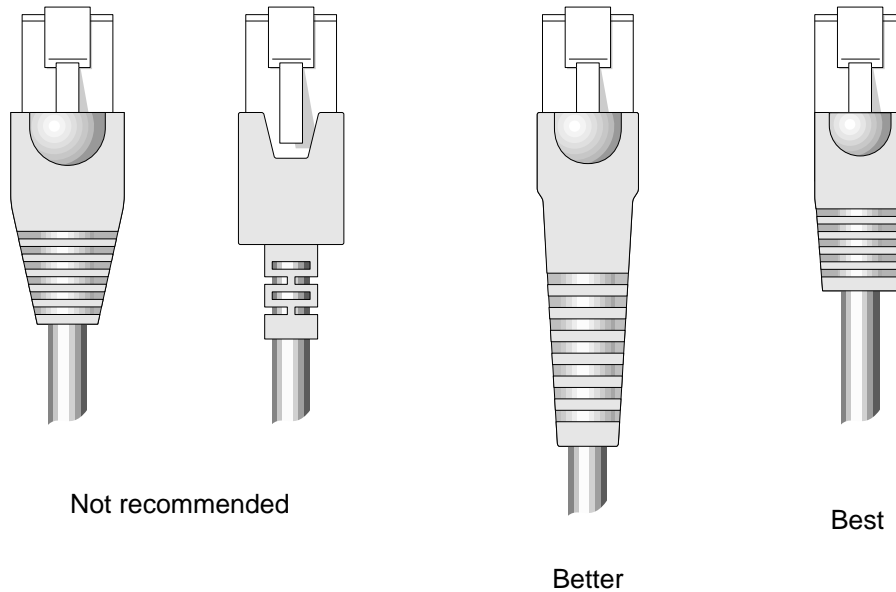
Use RJ-45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

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



## Radio Frequency Interference

If you use unshielded twisted pair (UTP) cabling in an installation, take precautions to avoid radio frequency (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
  - Electrical motors that contain coils
  - Air conditioner units
  - Electrical transformers

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



*Because harmonics can appear on the neutral line of a typical three-phase power circuit, Extreme Networks recommends using a harmonics meter in new installations.*

## 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, follow these steps:

- 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:

- Power Supply Requirements
- AC Power Cable Requirements
- Uninterruptable Power Supply Requirements

For more information about the power specifications of the Extreme Networks family of switches, see Appendix B.

## Power Supply Requirements

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

- Ensure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Ensure that your power supply meets the site power, AC power, or DC power requirements of the network equipment.
- Ensure that DC connections are made by an on-site electrician.



### NOTE

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*For power specifications for Extreme Networks products, see the Extreme Networks website at <http://www.extremenetworks.com>.*

- 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 only affect 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.

## 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 10 have the following additional requirements:

**Table 10:** AC Power Cable Requirements

Country	Requirements
USA and Canada	<ul style="list-style-type: none"> <li>The cable set must be UL-approved and CSA-certified.</li> <li>The minimum specification for the flexible cable is No. 18 AWG (1.5 mm <sup>2</sup>), Type SVT or SJT, 3-conductor.</li> <li>The cable set must have a rated current capacity of at least the amount rated for each specific product.</li> <li>The attachment plug must be an Earth-grounding type with a NEMA 5-15P (10 A, 125 V) configuration.</li> </ul>
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.

## Uninterruptable 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:

- Automatic shutdown of equipment during long power outages.
- Monitoring and logging of 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?



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

## Calculating Amperage Requirements

To determine the size of UPS that you need, use the following procedure:

- 1 To find VA (Volt-Amps), 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 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.



## 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/>.



# 3

## Switch Installation

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This chapter describes the following topics:

- Determining the Switch Location on page 35
- Installing the Switch on page 36
- Connecting Equipment to the Console Port on page 37
- Powering On the Switch on page 39
- Checking the Installation on page 39
- Logging In for the First Time on page 39
- Installing or Replacing a Mini-Gigabit Interface Connector (Mini-GBIC) on page 40



### CAUTION

*Use of controls or adjustments of performance or procedures other than those specified herein can result in hazardous radiation exposure.*

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## Determining the Switch Location

The Summit 300-48 switch is suited for use in an environmentally controlled office, where it can be mounted in a 19-inch rack using the supplied rack mount brackets. Alternatively, the device can be free standing or installed in a equipment room or wiring closet.

All 10/100 Ethernet cables must be terminated within the building that the switch is located. Fiber optic cable may be used if switches are connected between buildings.

When deciding where to install the switch, ensure that:

- The switch is accessible and cables can be connected easily.
- Water or moisture cannot enter the case of the unit.
- Air-flow around the unit and through the vents in the side of the case is not restricted. You should provide a minimum of 75 mm (3 inches) clearance.
- No objects are placed on top of the unit.
- Units are not stacked more than four high if the switch is free-standing.

## Following Safety Information

Before installing or removing any components of the switch, or before carrying out any maintenance procedures, read the safety information provided in Appendix A of this guide.

## Installing the Switch

The Summit 300-48 switch can be mounted in a rack, or placed free-standing on a tabletop.

### Rack Mounting



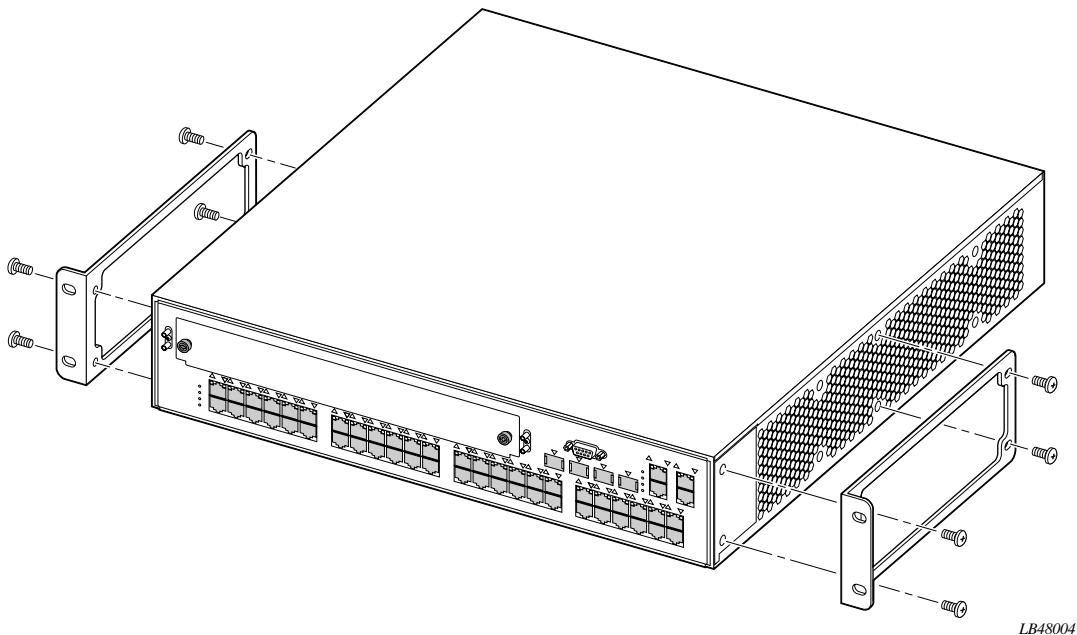
#### CAUTION

*Do not use the rack mount kits to suspend the switch from under a table or desk, or to attach the switch to a wall.*

To rack mount the Summit 300-48 switch:

- 1 Place the switch upright on a hard flat surface, with the front facing you.
- 2 Remove the existing screws from the sides of the case (retain the screws for Step 4).
- 3 Locate a mounting bracket over the mounting holes on one side of the unit.
- 4 Insert the screws and fully tighten with a suitable screwdriver, as shown in Figure 8.

**Figure 8:** Fitting the mounting bracket



- 5 Repeat steps 2 - 4 for the other side of the switch.
- 6 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.
- 7 Secure the switch with suitable screws (not provided).
- 8 Connect the switch to the redundant power supply (if applicable).
- 9 Connect cables.

## Free-Standing

The Summit 300-48 switch is supplied with four self-adhesive rubber pads. Apply the pads to the underside of the device by sticking a pad in the marked area at each corner of the switch.

## Stacking the Switch and Other Devices

You can place up to four Summit switches on top of one another.



### NOTE

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*This relates only to physically placing the devices on top of one another.*

Apply the pads to the underside of the device by sticking a pad at each corner of the switch. Place the devices on top of one another, ensuring that the corners align.

## Connecting Equipment to the Console Port

Connection to the console port is used for direct local management. The switch console port settings are set as follows:

- **Baud rate** — 9600
- **Data bits** — 8
- **Stop bit** — 1
- **Parity** — None
- **Flow control** — None



### NOTE

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*If you set the switch console port flow control to XON/XOFF rather than None, you will be unable to access the switch. Do not set the switch console port flow control to XON/XOFF.*

The terminal connected to the console port on the switch must be configured with the same settings. This procedure is described in the documentation supplied with the terminal.

Appropriate cables are available from your local supplier. To make your own cables, pinouts for a DB-9 male console connector are described in Table 11.

Table 11: Console Connector Pinouts

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 9 shows the pin-outs for a 9-pin to RS-232 25-pin null-modem cable.

Figure 9: Null-modem cable pin-outs

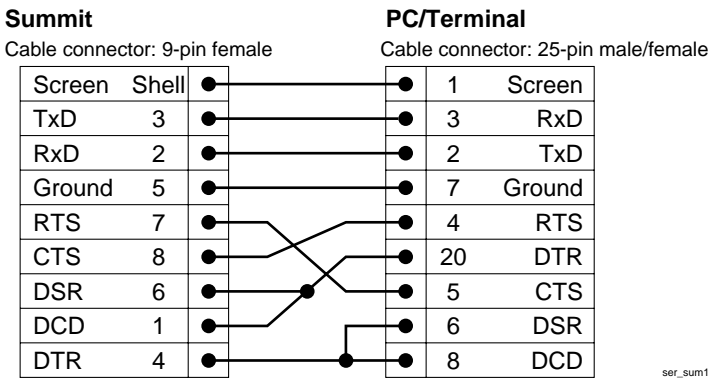
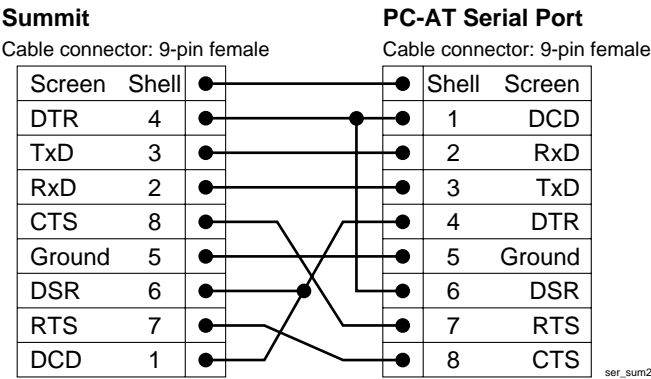


Figure 10 shows the pin-outs for a 9-pin to 9-pin PC-AT null-modem serial cable.

Figure 10: PC-AT serial null-modem cable pin-outs



## Powering On the Switch

Connect the AC power cable to the switch and then to the wall outlet. Turn the on/off switch on the back of the Summit 300-48 switch to the on position.

## Checking the Installation

After turning on power to the Summit 300-48 switch, the device performs a Power On Self-Test (POST).

During the POST, all ports are temporarily disabled, the port LED is off, and the MGMT LED flashes. 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 (1 blink per second). If the switch fails the POST, the MGMT LED shows a solid amber light.



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*For more information on the LEDs, see Chapter 1.*

## Logging In for the First Time

After the Summit 300-48 switch completes the POST, it is operational. Once operational, you can log in to the switch and configure an IP address for the default VLAN (named *default*).

To manually configure the IP settings:

- 1 Connect a terminal or workstation running terminal-emulation software to the console port.
- 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.



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*For more information on switch security, see the Summit 300-48 Software User Guide.*

- 4 At the password prompt, press [Return].

The default name, *admin*, has no password assigned. When you have successfully logged on to the switch, the command-line prompt displays the name of the switch (for example, *Summit 300-48*) in its prompt.

- 5 Assign an IP address and subnetwork mask for VLAN *default* by typing

```
config vlan default ipaddress 123.45.67.8 255.255.255.0
```

Your changes take effect immediately.

- 6 Save your configuration changes so that they will be in effect after the next switch reboot, by typing `save`.

**NOTE**

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*For more information on saving configuration changes, see the Summit 300-48 Software User Guide.*

- 7 When you are finished, logout of the switch by typing

```
logout
```

**NOTE**

---

*After two incorrect login attempts, the Summit 300-48 switch locks you out of the login facility. You must wait a few minutes before attempting to log in again.*

## Installing or Replacing a Mini-Gigabit Interface Connector (Mini-GBIC)

This section describes the safety precautions and preparation steps that you must perform before inserting and securing a mini-GBIC.

### Safety Information

Before you begin the process of installing or replacing a mini-GBIC, read the safety information in this section.

**CAUTION**

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*Mini-GBICs can emit invisible laser radiation. Avoid direct eye exposure to beam.*

Mini-GBICs are a class 1 laser device. Use only Extreme-approved devices.

Remove the LC fiber-optic connector from the mini-GBIC prior to removing the mini-GBIC from the switch.

### Preparing to Install or Replace a Mini-GBIC

To ensure proper installation, complete the following tasks before inserting the mini-GBIC:

- Disable the port that is needed to install or replace the mini-GBIC.
- Inspect and clean the fiber tips, coupler, and connectors.
- Prepare and clean an external attenuator, if needed.



- Do not stretch the fiber.
- Make sure the bend radius of the fiber is not less than 2 inches.

In addition to the previously described tasks, Extreme Networks recommends the following when installing or replacing mini-GBICs on an active network:

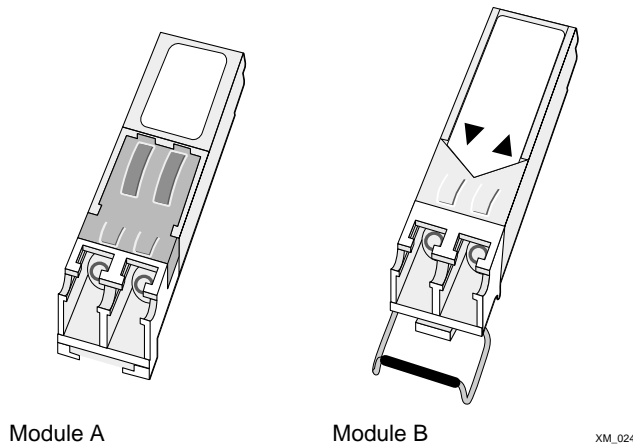
- Use the same type of mini-GBIC at each end of the link.
- Connect one end of the link to the Tx port. Without an attenuator, measure the total loss from the Tx port to the other side of the link.

After you complete these described tasks, you are ready to install or replace a mini-GBIC.

## Installing and Removing a Mini-GBIC

You can add and remove mini-GBICs from your Summit 300-48 switch without powering off the system. Figure 11 shows the two types of mini-GBIC connectors.

**Figure 11:** Mini-GBIC modules



Mini-GBICs are a Class 1 laser device. Use only Extreme-approved devices.



### NOTE

*Remove the LC fiber-optic connector from the mini-GBIC prior to removing the mini-GBIC from the switch.*



### CAUTION

*Mini-GBICs can emit invisible laser radiation. Avoid direct eye exposure to beam.*

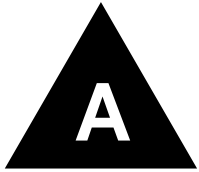
If you see an amber blinking mini-GBIC port status LED after you install a mini-GBIC into the Summit 300-48 switch, this means the mini-GBIC is not certified by Extreme Networks. To correct this problem, you install an Extreme Networks-certified mini-GBIC, available from Extreme Networks, into the port on the switch.

To remove the mini-GBIC connector labeled “Module A,” gently squeeze the sides to release it, and pull the mini-GBIC out of the slot.

To remove the mini-GBIC connector labeled “Module B,” lift down on the front handle and pull the mini-GBIC out of the slot.

To insert a mini-GBIC connector:

- 1** Holding the mini-GBIC by its sides, insert the mini-GBIC into the port on the switch. Mini-GBICs can be installed in ports 25 and 26 on the Summit 300-48 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.



# Safety Information



## WARNING!

*Read the following safety information thoroughly before installing your Extreme Networks switch. Failure to follow this safety information can lead to personal injury or damage to the equipment.*

Installation, maintenance, removal of parts, and removal of the unit and components must be done by qualified service personnel only.

Service personnel are people having appropriate technical training and experience 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.

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



## NOTE

*For more information about the Summit 300-48 temperature and humidity ranges, see Appendix B.*

## Power

The Summit 300-48 switch has two power inputs on the switch.

- The unit must be grounded. Do not connect the power supply unit to an AC outlet without a ground connection.
- The unit must be connected to a grounded outlet to comply with European safety standards.
- The socket outlet must be near the unit and easily accessible. You can only remove power from the unit by disconnecting all power cords from the outlet.
- This unit operates under Safety Extra Low Voltage (SELV) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN60320/IEC320 appliance inlet.
- *France and Peru only*  
This unit cannot be powered from IT<sup>†</sup> supplies. If your supplies are of IT type, this unit must be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labeled Neutral, connected directly to ground.

## Power Cord

The power cord must be approved for the country where it is used:

- USA and Canada
  - The cord set must be UL-listed and CSA-certified.
  - The minimum specification for the flexible cord is No. 18 AWG (1.5 mm<sup>2</sup>), Type SVT or SJT, 3-conductor.
  - The cord set must have a rated current capacity of at least the amount rated for each specific product.
  - The AC attachment plug must be an Earth-grounding type with a NEMA 5-15P (10 A, 125 V) configuration.
- 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.

## Connections

**Fiber Optic ports - Optical Safety.** Never look at the transmit LED/laser through a magnifying device while it is powered on. Never look directly at the fiber port or fiber cable ends when they are powered on.

This is a Class 1 laser device.



*Use only for data communications applications that require optical fiber. Use only with the appropriate connector. When not in use, replace dust cover. Using this module in ways other than those described in this manual can result in intense heat that can cause fire, property damage, or personal injury.*

# Lithium Battery

The lithium battery is not user-replaceable.



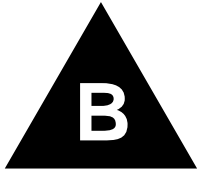
## **WARNING!**

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*Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.*

- Disposal requirements vary by country and by state.
- Lithium batteries are not listed by the Environmental Protection Agency (EPA) as a hazardous waste. Therefore, they can typically be disposed of as normal waste.
- If you are disposing of large quantities, contact a local waste-management service.
- No hazardous compounds are used within the battery module.
- The weight of the lithium contained in each coin cell is approximately 0.035 grams.
- Two types of batteries are used interchangeably:
  - CR chemistry uses manganese dioxide as the cathode material.
  - BR chemistry uses poly-carbonmonofluoride as the cathode material.





# Technical Specifications

<b>Physical Dimensions</b>	<b>Summit 300-48</b> Height: 3.5 inches (8.89 cm) Width: 17.25 inches (43.815 cm) Depth: 18.25 inches (46.355 cm) Weight (with one power supply unit): 14 lbs (6.35kg)
<b>Safety</b>	
Agency Certifications	UL60950 3rd Edition, Listed Device CSA 22.2#60950-00 NOM/NYCE (Mexico Safety) European Safety of ITE <ul style="list-style-type: none"><li>• EN60950:2000+All Available Country Deviations</li><li>• 73/23/EEC Low Voltage Directive</li></ul> International Safety of ITE <ul style="list-style-type: none"><li>• CB Scheme IEC 60950:1999+All Country Deviations</li><li>• AS/NZX 3260 (Australia /New Zealand)</li><li>• GOST (Russia)</li></ul> Laser Safety for North America & European Union <ul style="list-style-type: none"><li>• FCC 21 CFR Subpart J (US Safety of Laser Products)</li><li>• CDRH Letter of Approval (US FDA Approval)</li><li>• EN60825-1:1994+A11:1996+A2 (European Safety of Lasers Products)</li></ul>

<b>Electromagnetic Compatibility</b>	FCC CFR 47 part 15 Class A ICES-003 Class A European EMC standards for ITE <ul style="list-style-type: none"> <li>• EN 55022:1998 Class A</li> <li>• EN 55024:1998 Class A</li> </ul> includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 <ul style="list-style-type: none"> <li>• EN 61000-3-2,3 (Harmonics &amp; Flicker)</li> <li>• ETSI EN 300 386:2001 (EMC Telecommunications)</li> <li>• 89/336/EEC EMC Directive</li> </ul> International EMC Certifications <ul style="list-style-type: none"> <li>• ISPR 22:1997 Class A</li> <li>• CISPR 24:1997 Class A</li> <li>• VCCI Class A (Japan)</li> <li>• AS/NZS 3548 (Australia)</li> <li>• CNS 13438:1997 Class A (BSMI-Taiwan)</li> <li>• MIC Mark (Korea)</li> </ul>
<b>Heat Dissipation</b>	185 W maximum (631 BTU/hr maximum)
<b>Power Supply</b>	AC Line Frequency 50 Hz to 60 Hz Input Voltage Options 90 VAC to 264 VAC, auto-ranging Current Rating 100-240 VAC 3.0/6.0 A max.
<b>Switch Power-Off</b>	Temperature power-off 149° F to 167° F (65° C to 75° C)
<b>Environmental Requirements</b>	Operating Temperature 0° to 40° C (32° to 104° F) Storage Temperature -10° to 70° C (14° to 158° F) Operating Humidity 10% to 95% relative humidity, non-condensing Standards <ul style="list-style-type: none"> <li>EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage</li> <li>EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation</li> <li>EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational</li> <li>EN/ETSI 300 753 (1997-10) - Acoustic Noise</li> <li>ASTM D5276 Drop Packaged</li> <li>ASTM D3580 Random Vibration Packaged 1.5G</li> </ul>

#### Certification Marks



CE (European Community)



TUV/GS (German Notified Body)



TUV/S (Argentina)



GOST (Russian Federation)





ACN 090 029 066

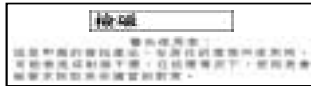
C-Tick (Australian Communication Authority)



Underwriters Laboratories (USA and Canada)



MIC (South Korea)

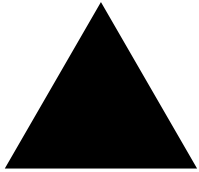


BSMI, Republic of Taiwan



NOM (Mexican Official Normalization, Electronic Certification and Normalization)





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