Summit Family Hardware Installation Guide

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Preface

This guide provides the instructions and supporting information needed to install the following Extreme Networks® Summit® family switches:

- Summit X150 series switches
- Summit X250e series switches
- Summit X350 series switches
- Summit X430 series switches
- Summit X440 series switches
- Summit X450 series switches
- Summit X450a series switches
- Summit X450e series switches
- Summit X460 series switches
- Summit X460-G2 series switches
- Summit X480 series switches
- Summit X650 series switches
- Summit X670 series switches
- Summit X670-G2 series switches
- Summit X770 series switches

The guide includes information about site preparation, switch functionality, and switch operation.

> **Note**
>
> The various Summit switch series are called the Summit family switches when referred to collectively.

Using Hardware Publications Online

You can access hardware publications at the Extreme Networks website (www.extremenetworks.com/documentation). Publications are provided in HTML, ePub, and PDF formats.

To navigate this guide online, use the table of contents found in the navigation bar on the left. You can also use the **prev | next** links at the top and bottom of the page.

Audience

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)
- Basic equipment installation procedures

See the *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide* for information about configuring Extreme Networks Summit family switches.

> **Note**
>
> If the information in an installation note or release note shipped with your Extreme Networks equipment differs from the information in this guide, follow the installation or release note.

Conventions

The following 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.
Words in italicized type	Italics emphasize a point of information or denote new terms at the place where they are defined in the text. Book titles are printed in italics.

Related Publications

The Extreme Networks ExtremeXOS® switch documentation set includes:

- *ExtremeXOS Concepts Guide*
- *ExtremeXOS Command Reference Guide*
- *ExtremeXOS Release Notes*
- *ExtremeXOS Hardware and Software Compatibility Matrix*
- *BlackDiamond 8800 Series Switches Hardware Installation Guide*
- *BlackDiamond X8 Switch Hardware Installation Guide*
- *BlackDiamond® 20800 Series Switches Hardware Installation Guide (legacy product)*
- *BlackDiamond 10808 Switch Hardware Installation Guide (legacy product)*
- *BlackDiamond 12800 Series Switches Hardware Installation Guide (legacy product)*
- *Summit Family Switches Hardware Installation Guide (this guide)*
- *E4G Series Routers Hardware Installation Guide*
- *Extreme Networks Pluggable Interface Modules Installation Guide*

Hardware and software documentation for Extreme Networks products is available from the Extreme Networks website at: www.extremenetworks.com/services/documentation

You can download software concepts guides and reference guides, hardware installation guides, and other documents.

Under your product warranty or with a current support contract, you can access software release notes and entitled software from the eSupport web pages at: https://esupport.extremenetworks.com/

For instructions on accessing and downloading software and software release notes, see the Technical Assistance User Guide at http://www.extremenetworks.com/services/tac-userguides.aspx:

Note

You must have an active support agreement or a product registered to you in order to receive an eSupport login and access to Extreme Networks software release notes.

To request an eSupport user name and password, select the Request Web Login link on the eSupport home page at: http://esupport.extremenetworks.com/

You can see complete information about all of our services online at: www.extremenetworks.com/solutions/service-solutions.aspx

1 Summit Family Switches

Overview of the Summit Switches
Summit X150 Series Switches
Summit X250e Series Switches
Summit X350 Series Switches
Summit X430 Series Switches
Summit X440 Series Switches
Summit X450, X450a, and X450e Series Switches
Summit X460 Series Switches
Summit X460-G2 Series Switches
Summit X480 Series Switches
Summit X650 Series Switches
Summit X670 Series Switches
Summit X670-G2 Series Switches
Summit X770 Series Switches
Pluggable Interfaces for Summit Family Switches

The Summit family switches are compact enclosures 1.75 inches high (1 U). They provide 8, 24, or 48, or 72 high-density copper or fiber optic ports operating at speeds up to 40 Gbps; many models provide combination copper/fiber uplink ports. PoE connections and options for adding 10-Gbps or 40-Gbps uplink connections are available on some models. Many Summit switches include high-speed stacking interfaces that allow you to connect up to eight Summit switches into a single SummitStack management entity. Summit models are available for AC or DC power connection; all Summit switches make provision for redundant power supplies. Most models have connections for optional external redundant power supplies; the Summit X460 series, X460-G2 series, X480 series, X650 series, X670 series, X670-G2 series, and X770 series switches provide two bays for pluggable power supplies.

Most Summit models are available in versions that are compliant with the Trade Agreements Act (TAA); these versions are identified by a -TAA suffix on the model number. Functionally, the TAA-compliant models are completely equivalent to the matching versions that are not TAA-compliant. In all feature descriptions, references to a specific Summit switch model also apply to the equivalent TAA-compliant model.

The following sections contain general information on the following:

Overview of the Summit Switches

The following tables list the Summit switch series and summarize the features available in each series.

Table 3: Summit Switch Features—Summit X150, X250e, X350, X430, and X440 Series

Feature	Summit X150 Series	Summit X250e Series	Summit X350 Series	Summit X430 Series	Summit X440 Series
Maximum autonegotiating 10/100BASE-TX ports	26 or 50	26 or 50	—	—	—
Maximum autonegotiating 10/100/1000-BASE-TX ports	2	24 or 48	24 or 48	8 or 24 or 48	8, 24, or 48
Maximum 1-Gbps Ethernet ports (SFP)	2	2	4	4	24
Maximum 10-Gbps Ethernet ports (SFP+)	—	2	2	—	2
SummitStack support	No	Yes	No	No	Yes (except X440-L2-24t and X440-L2-48t)
Total switching capacity	8.8 to 17.6 Gbps	48.8 to 97.6 Gbps	128 to 256 Gbps	Up to 108 Gbps	Up to 136 Gbps
Redundant power	Yes (external)	Yes (external)	Yes (external)	No	Yes (external)
DC power available	No	Yes	Yes	No	Yes
Power over Ethernet (802.3af)	Yes	Yes	No	Yes (Also 802.3at)	Yes (Also 802.3at)

Table 4: Summit Switch Features—Summit X450, X450a, and X450e Series

Feature	Summit X450 Series	Summit X450a Series	Summit X450e Series
Maximum autonegotiating 10/100BASE-TX ports	—	—	—
Maximum autonegotiating 10/100/1000-BASE-TX ports	24 or 48	24 or 48	24 or 48
Maximum 1-Gbps Ethernet ports (SFP)	4	4	4
Maximum 10-Gbps Ethernet ports (XFP, XENPAK, SFP+)	2	2	2

Table 4: Summit Switch Features—Summit X450, X450a, and X450e Series (continued)

Feature	Summit X450 Series	Summit X450a Series	Summit X450e Series
SummitStack support	Yes	Yes	Yes
Total switching capacity	128 to 256 Gbps	128 to 256 Gbps	128 to 256 Gbps
Redundant power	Yes (external)	Yes (external)	Yes (external)
DC power available	No	Yes	No
Power over Ethernet (802.3af)	Yes	Yes	Yes

Table 5: Summit Switch Features—Summit X460, X460-G2, X480, X650, X670, X670-G2, and X770 Series

Feature	Summit X460 Series	Summit X460-G2 Series	Summit X480 Series	Summit X650 Series	Summit X670 Series	Summit X670-G2 Series	Summit X770 Series
Maximum autonegotiating 10/100BASE-TX ports	—	48	—	—	—	—	—
Maximum autonegotiating 10/100/1000-BASE-TX ports	48	—	48	—	—	—	—
Maximum 1-Gbps Ethernet ports (SFP)	24 or 48	24 or 48	24 or 48	4	—	—	—
Maximum 10-Gbps Ethernet ports (XFP, XENPAK, SFP+)	2 (with XGM3-2sf)	4	4 (with VIM2-10G4X)	24 (default) 32 (with VIM1-10G8X)	48	72	—
Maximum 10G BASE-T RJ-45 (100 Mbps/1G/10G tri-speed) ports	—	—	—	—	48	—	—
Maximum 40GBASE-X QSFP+ ports	—	—	—	—	—	4	32
SummitStack support	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Total switching capacity	176 to 224 Gbps	336	224 to 448 Gbps (with VIM2-10G4X)	488 to 680 Gbps	640 Gbps	720 Gbps	1280 Gbps
Redundant power	Yes (hot-swappable)	Yes (hot-swappable)	Yes (hot-swappable)	Yes (hot-swappable)	Yes (hot-swappable)	Yes (hot-swappable)	Yes (hot-swappable)
DC power available	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power over Ethernet (802.3af)	Yes (Also 802.3at)	Yes (Also 802.3at)	No	No	No	No	No

Model numbers for the Summit switches are in the following format:

<Series>-<number of front-panel I/O ports><port type><internal power supply type>

- The number of ports can be 8, 24, 32, 48, or 72.
- The port type can be t (copper), p (copper providing Power of Ethernet), q (QSFP+), or x (fiber).
- For models with integral power supplies, the power supply type can be AC (no designation) or DC.

  Models with pluggable power supplies can accommodate either AC or DC supplies and have no power designation in their model numbers.

The following table lists the available switch models in each series.

Table 6: Switch Models in Each Summit Series

Series	Available Models						
Summit X430	X430-8p		X430-24t X430-24p			X430-48t	
Summit X440	Summit X440-8t	Summit X440-8p	Summit X440-24t X440-24tDC Summit X440-24x Summit X440-L2-24t Summit X440-24t-10G Summit X440-24x-10G	Summit X440-24p Summit X440-24p-10G		Summit X440-48t X440-48tDC Summit X440-L2-48t Summit X440-48t-10G	Summit X440-48p Summit X440-48p-10G
Summit X450			Summit X450-24t*	Summit X450-24x*			
Summit X460			Summit X460-24t	Summit X460-24p	Summit X460-24x	Summit X460-48t	Summit X460-48p	Summit X460-48x
Summit X460-G2			Summit X460-G2-24t-GE4 Summit X460-G2-24t-10GE4	Summit X460-G2-24p-GE4 Summit X460-G2-24p-10GE4	Summit X460-G2-24x-10GE4	Summit X460-G2-48t-GE4 Summit X460-G2-48t-10GE4	Summit X460-G2-48p-GE4 Summit X460-G2-48p-10GE4	Summit X460-G2-48x-10GE4
Summit X480				Summit X480-24x*	Summit X480-48t*		Summit X480-48x*
Summit X670							Summit X670-48x Summit X670V-48x Summit X670V-48t
Summit X670-G2							Summit X670-G2-48x-4q	Summit X4670-G2-72x

Table 6: Switch Models in Each Summit Series (continued)

Series	Available Models
Summit X770	Summit X770-32q
*These Summit switch models are not available in TAA versions.**These Summit switch models do not have separate TAA and non-TAA versions; all Summit X650 series models are TAA-compliant.	

> **Note**
>
> See the *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide* for feature-specific information about the Summit switches and for information regarding switch configuration.

Combination Ports and Failover

Summit family switches provide two, four, or twelve uplink ports implemented as combination ports that pair a copper port using RJ-45 connectors with an optical port using LC connectors.

The copper port operates as an autonegotiating 10/100/1000BASE-T port. The optical port allows Gigabit Ethernet uplink connections through Extreme Networks small form factor pluggable (SFP) interface modules. See the individual switch descriptions for the port numbers of the combination ports on each switch model.

Summit family switches support automatic failover from an active fiber port to a copper backup or from an active copper port to a fiber port. If one of the uplink connections fails, the Summit uplink connection automatically fails over to the second connection. To set up a redundant link on a combination port, connect the active 1000BASE-T and fiber links to both the RJ-45 and SFP interfaces of that port.

Gigabit Ethernet uplink redundancy on the Summit family switches follows these rules:
- With both the SFP and 1000BASE-T interfaces connected on a combination port, only one interface can be activated. The other is inactive.
- If only one interface is connected, the switch activates the connected interface.
- The switch determines whether the port uses the fiber or copper connection based on the order in which the connectors are inserted into the switch. When the switch senses that an SFP and a copper connector are inserted, the switch enables the uplink redundancy feature. For example, if you first connect copper ports 25 and 26 on a Summit X250e-24t switch, and then insert SFPs into ports 25 and 26, the switch assigns the copper ports as active ports and the fiber ports as redundant ports.

Hardware identifies when a link is lost and responds by swapping the primary and redundant ports to maintain stability. After a failover occurs, the switch keeps the current port assignment until another failure occurs or a user changes the assignment using the CLI. For more information about configuring automatic failover on combination ports, see the ExtremeXOS Concepts Guide.

Summit X150 Series Switches

The Summit X150 series switches provide 24 or 48 fixed 10/100BASE-T Ethernet ports that deliver high-density copper connectivity at 2.4 Gbps or 4.8 Gbps.

Models are available with PoE and without PoE. Each Summit X150 series switch has two combination ports that provide 10/100/1000 BASE-T or SFP connectivity for 2 Gbps of copper or fiber connectivity. A serial console port on the front panel allows you to connect a terminal and perform local management. On the back of the switch, an Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations.

The rear panel of the switch provides an AC power input socket and a redundant power connector. The internal power supply operates from 100 VAC to 240 VAC. The switch automatically adjusts to the supply voltage. The redundant power connector allows you to connect the switch to the EPS-160 or EPS-500 external power supply. When a compatible external power supply is used with the Summit X150 series switch, the internal and external power supplies 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 Summit X150e series switches include the following switch models:

* Summit X150-24t Switch
* Summit X150-24t-TAA switch
* Summit X150-24p Switch
* Summit X150-24p-TAA switch
* Summit X150-48t switch
* Summit X150-48t-TAA switch

> **Note**
>
> In the descriptions that follow, references to a Summit X150 series model number also apply to the equivalent TAA-compliant switch version.

Summit X150-24t Switch

The front panel of the Summit X150-24t switch includes:

* Twenty-four fixed autosensing 10/100BASE-T ports (ports 1–24) that provide 2.4 Gbps of high-density copper connectivity
* Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
* LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X150 Series Switch LEDs.
* Serial console port used to connect a terminal and perform local management

10/100 Mbps ports

Console port

Combination ports

Figure 1: Summit X150-24t Switch Front Panel

The rear panel of the Summit X150-24t switch (shown in Figure 2: Summit X150-24t Switch Rear Panel on page 16) includes:

- Ethernet management port with associated LEDs
- Redundant power input connector for optional connection to the EPS-160 External Power Module

  See EPS-160 External Power Module (with EPS-T) for more information. The connecting redundant power supply cable is shipped with the EPS-160 unit.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Management port

External power supply connection

Power socket
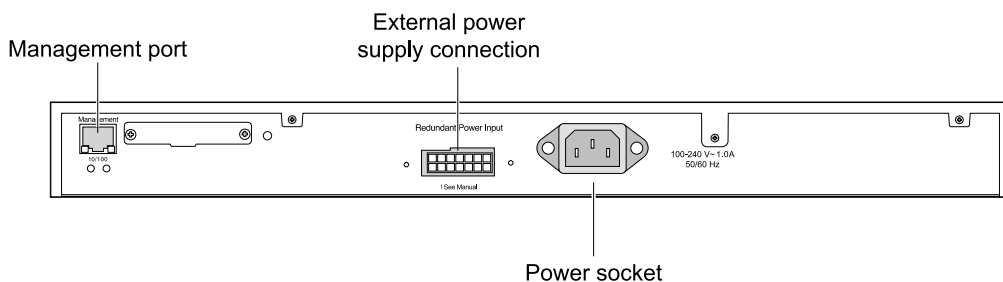
Figure 2: Summit X150-24t Switch Rear Panel

Summit X150-24p Switch

The front panel of the Summit X150-24p switch includes:

- Twenty-four fixed autosensing 10/100BASE-T PoE ports (ports 1–24). In addition to 4 Gbps of high-density copper connectivity, these ports also provide a full 15.4 Watts of PoE per port.
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity.

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions.

For a description of the LEDs and their operation, see Summit X150 Series Switch LEDs.
- Serial console port used to connect a terminal and perform local management.
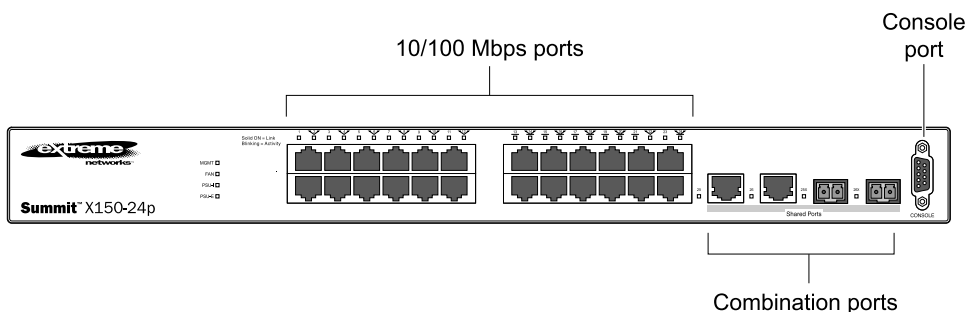
Figure 3: Summit X150-24p Switch Front Panel

The rear panel of the Summit X150-24p switch includes:
- Ethernet management port with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Supply (Model No. 10911) with full PoE power support

  The connecting redundant power supply cable is shipped with the EPS-500 unit. See EPS-500 External Power Supply Unit for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
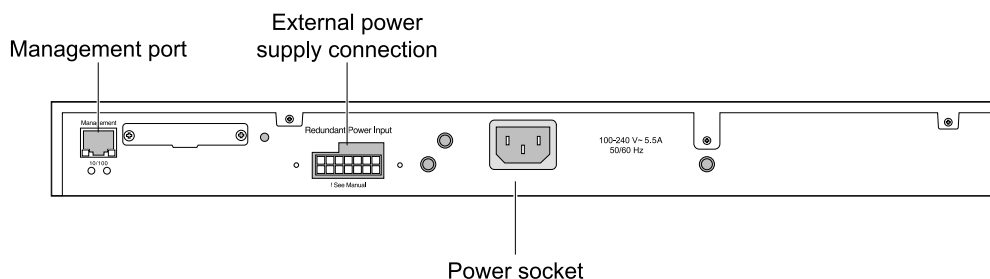
Figure 4: Summit X150-24p Switch Rear Panel

Summit X150-48t Switch

The front panel of the Summit X150-48t switch includes:
- Forty-eight fixed autosensing 10/100BASE-T ports (ports 1–48) that provide 4.8 Gbps of high-density copper connectivity
- Two combination ports (ports 49–50) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X150 Series Switch LEDs.
- Serial console port used to connect a terminal and perform local management

10/100 Mbps ports   Console port

Combination ports

Figure 5: Summit X150-48t Switch Front Panel

The rear panel of the Summit X150-48t switch (Figure 6: Summit X150-48t Switch Rear Panel on page 18) includes:

- Management port with associated LEDs
- Redundant power input connector for optional connection to the EPS-160 External Power Module

  The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Management port   External power supply connection

Power socket
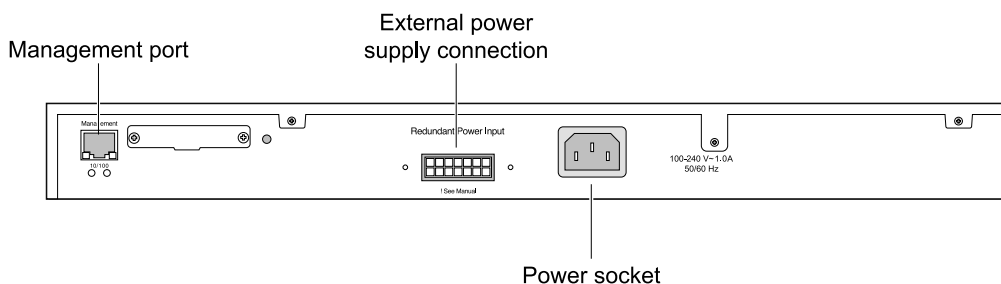
Figure 6: Summit X150-48t Switch Rear Panel

Summit X150 Series Switch LEDs

The following describes the meanings of the LEDs on the Summit X150 switches.

LEDs on the Summit X150 Series Switches

Table 7: Front Panel

Label or Type	Color/State	Meaning
MGMT	Blinking green (fast)	Power-on self-test (POST) in progress.
	Steady green	POST passed. System is booting image.
	Blinking green (slow)	Normal operation.
	Blinking amber	Switch diagnostics are running. or 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.
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.
Port number 1 – 24 or 1 – 48	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.
Port number 25, 26 or 49, 50 (Shared ports)	Steady green	Link is OK.
	Blinking green	Activity.
	Off	Link is not present, or port is disabled.

Table 8: Additional Port LED Meanings for PoE Switch: Summit X150-24p

Label or Type	Color/State	Meaning
All front-panel ports	Steady green	Link OK; port is not powered.
	Steady amber	Link is OK; port is powered; no traffic.
	Blinking green	Link is OK and transmitting packets; port is not powered.
	Blinking amber	Link is OK and 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.

Table 9: Rear Panel

Label or Type	Color/State	Meaning
Management Port	Right LED: Steady green	Link is OK.
	Left LED: Blinking green	Activity.
	Both LEDs off	Link is not present.

Summit X250e Series Switches

The Summit X250e series switches provide 24 or 48 Ethernet ports that deliver high-density fast Ethernet connectivity using fixed 10/100/1000BASE-T ports or installable small form pluggable (SFP) optical modules.

Fixed-port models are available either with or without PoE. Each Summit X250e series switch has two combination ports that provide 10/100/1000 BASE-T or SFP connectivity for 2 Gbps of copper or fiber connectivity. A serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations.

On the back of the switch, two high-speed stacking ports allow you to combine multiple units into a single SummitStack management entity. The rear panel also provides an AC or DC power input socket and a redundant power connector. (See specific switch descriptions for more information about the power options.) The switch automatically adjusts to the supply voltage. The redundant power connector allows you to connect the switch to the EPS-160, EPS-500, or EPS-150DC external power supply. When a compatible external power supply is used with the Summit X250e series switch, the internal and external power supplies 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 Summit X250e series switches include the following models:
- Summit X250e-24t Switch
- Summit X250e-24t-TAA switch
- Summit X250e-24tDC Switch
- Summit X250e-24tDC-TAA switch
- Summit X250e-24p Switch
- Summit X250e-24p-TAA switch
- Summit X250e-24x Switch
- Summit X250e-24x-TAA switch
- Summit X250e-24xDC Switch
- Summit X250e-24x-TAA switch
- Summit X250e-48t Switch
- Summit X250e-48t-TAA switch
- Summit X250e-48tDC Switch
- Summit X250e-48tDC-TAA switch

- Summit X250e-48p Switch
- Summit X250e-48p-TAA switch

> **Note**
>
> In the descriptions that follow, references to a Summit X250e series model number also apply to the equivalent TAA-compliant switch version.

Summit X250e-24t Switch

The front panel of the Summit X250e-24t switch includes:

- Twenty-four fixed autosensing 10/100BASE-T ports (ports 1–24) that provide 2.4 Gbps of high-density copper connectivity
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management.

Figure 7: Summit X250e-24t Switch Front Panel

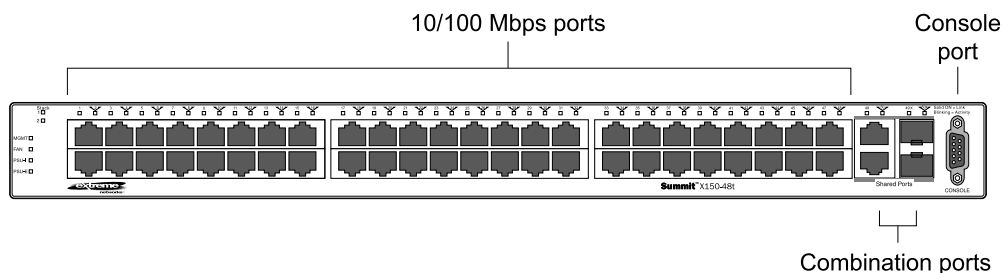The rear panel of the Summit X250e-24t switch (shown in Figure 8: Summit X250e-24t Switch Rear Panel on page 22) includes:

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-160 External Power Module

  The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Management port

External power
supply connection

10 Gigabit
stacking ports

Power socket

Figure 8: Summit X250e-24t Switch Rear Panel

Summit X250e-24tDC Switch

The front panel of the Summit X250e-24tDC switch includes:

- Twenty-four fixed autosensing 10/100BASE-T ports (ports 1–24) that provide 2.4 Gbps of high-density copper connectivity
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

10/100 Mbps ports

Console
port

Stack number indicator

Combination ports

Figure 9: Summit X250e-24tDC Switch Front Panel

The rear panel of the Summit X250e-24tDC switch (shown in Figure 10: Summit X250e-24tDC Switch Rear Panel on page 23) includes:

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-150DC External Power Module (Model No. 10909).

The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-150DC External Power Module (with EPS-T2) for more information.

- DC power input socket

The internal power supply operates from -36 VDC to -72 VDC.

- Grounding lug

Figure 10: Summit X250e-24tDC Switch Rear Panel

Summit X250e-24p Switch

The front panel of the Summit X250e-24p switch includes:

- Twenty-four fixed autosensing 10/100BASE-T PoE ports (ports 1–24). In addition to 2.4 Gbps of high-density copper connectivity, these ports also provide a full 15.4 Watts of PoE per port.
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

For more information about combination ports, see Combination Ports and Failover.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 11: Summit X250e-24p Switch Front Panel

The rear panel of the Summit X250e-24p switch (shown in Figure 12: Summit X250e-24p Switch Rear Panel on page 24) includes:

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-500 External Power Supply (Model No. 10911) with full PoE power support

  The connecting redundant power supply cable is shipped with the EPS-500 unit. See EPS-500 External Power Supply Unit for more information.

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
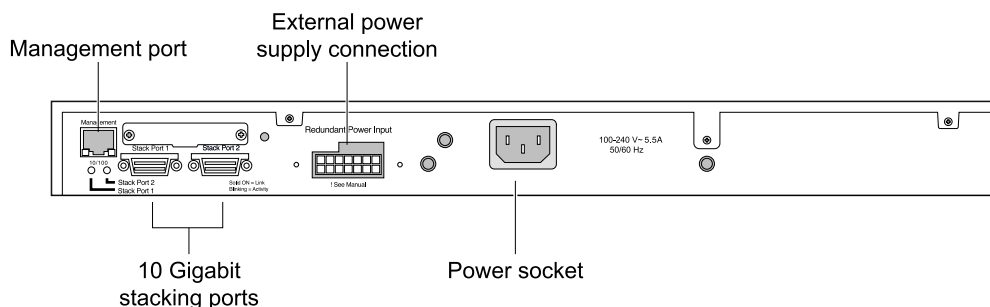
Figure 12: Summit X250e-24p Switch Rear Panel

Summit X250e-24x Switch

The front panel of the Summit X250e-24x switch includes:

- Twenty-four 100BASE-FX ports (ports 1–24) that provide 2.4 Gbps of high-density fiber connectivity
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 13: Summit X250e-24x Switch Front Panel

The rear panel of the Summit X250e-24x switch (shown in Figure 14: Summit X250e-24x Switch Rear Panel on page 25) includes:

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-160 External Power Module

  The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 14: Summit X250e-24x Switch Rear Panel

Summit X250e-24xDC Switch

The front panel of the Summit X250e-24xDC switch includes:

- Twenty-four 100BASE-FX ports (ports 1–24) that provide 2.4 Gbps of high-density fiber connectivity
- Two combination ports (ports 25–26) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity
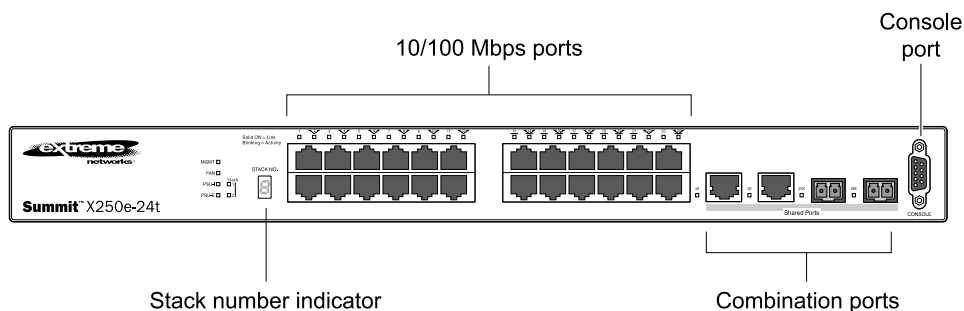
  For more information about combination ports, see Combination Ports and Failover.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

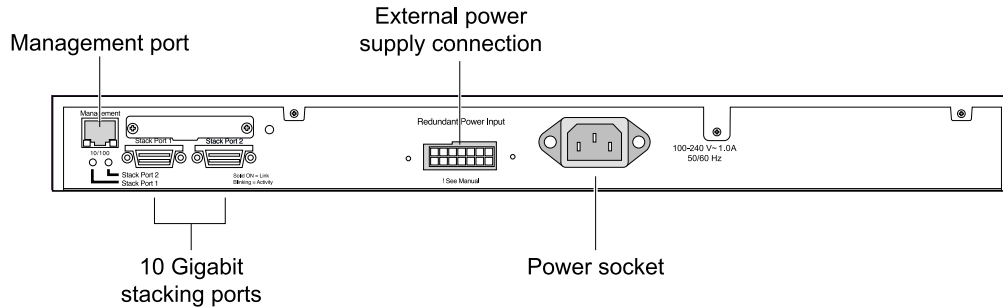**Figure 15: Summit X250e-24xDC Switch Front Panel**

The rear panel of the Summit X250e-24xDC switch (Figure 16: Summit X250e-24xDC Switch Rear Panel on page 27) includes:

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-150DC External Power Module (Model No. 10909)

  The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-150DC External Power Module (with EPS-T2) for more information.
- DC power input socket

  The internal power supply operates from -36 VDC to -72 VDC.
- Grounding lug

> **Note**
>
> For centralized DC power connection, this product is intended to be installed in a restricted access location (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Management port

External power
supply connection

10 Gigabit
stacking ports

DC power
socket

Grounding
lug

Figure 16: Summit X250e-24xDC Switch Rear Panel

Summit X250e-48t Switch

The front panel of the Summit X250e-48t switch includes:

- Forty-eight fixed autosensing 10/100BASE-T ports (ports 1–48) that provide 4.8 Gbps of high-density copper connectivity
- Two combination ports (ports 49–50) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity
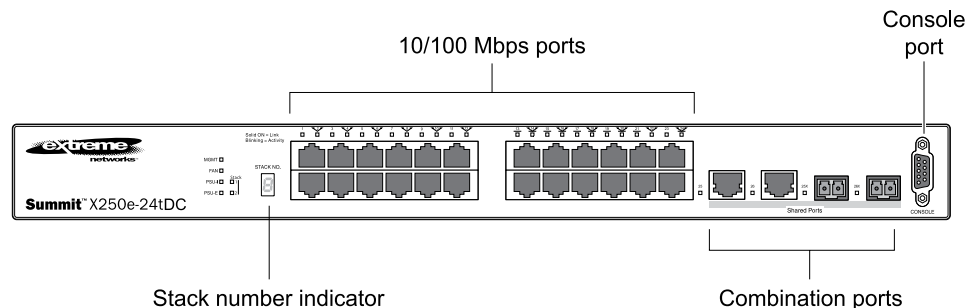
    For more information about combination ports, see Combination Ports and Failover.

    For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

    For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

10/100 Mbps ports

Console
port

Stack number indicator

Combination ports

Figure 17: Summit X250e-48t Switch Front Panel

The rear panel of the Summit X250e-48t switch () includes:

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-160 External Power Module

The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.

- AC power input socket

The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 18: Summit X250e-48t Switch Rear Panel

Summit X250e-48tDC Switch

The front panel of the Summit X250e-48tDC switch includes:

- Forty-eight fixed autosensing 10/100BASE-T ports (ports 1–48) that provide 4.8 Gbps of high-density copper connectivity
- Two combination ports (ports 49–50) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 19: Summit X250e-48tDC Switch Front Panel

The rear panel of the Summit X250e-48tDC switch (shown in Figure 20: Summit X250e-48tDC Switch Rear Panel on page 29) includes:

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for use with the EPS-150DC External Power Module (Model No. 10909).

  The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-150DC External Power Module (with EPS-T2) for more information.
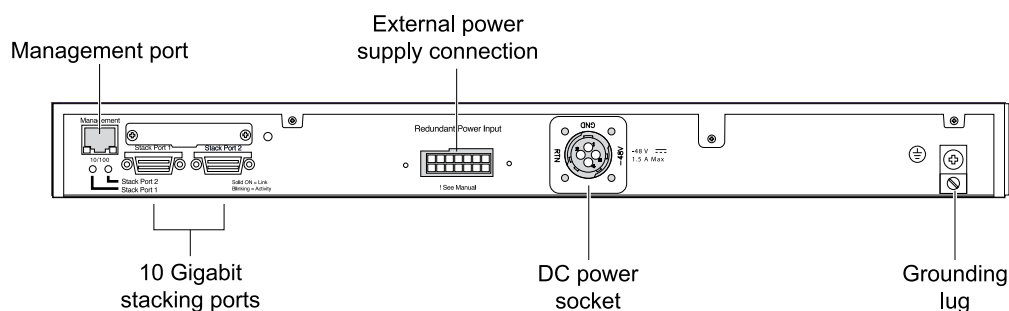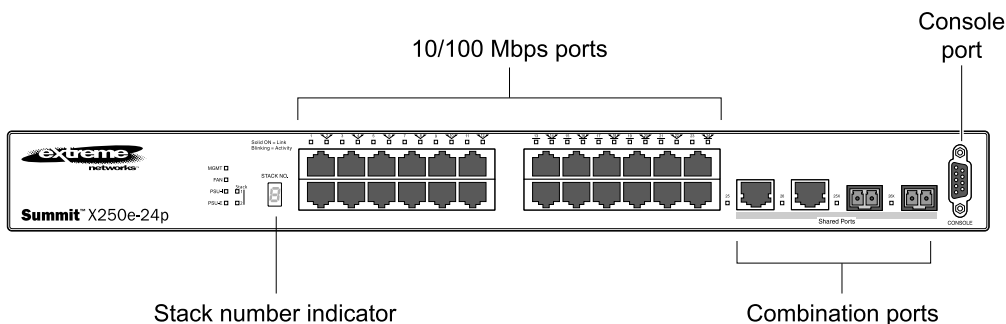- DC power input socket

  The internal power supply operates from -36 VDC to -72 VDC.
- Grounding lug

> **Note**
>
> For centralized DC power connection, this product is intended to be installed in a restricted access location (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Figure 20: Summit X250e-48tDC Switch Rear Panel

Summit X250e-48p Switch

The front panel of the Summit X250e-48p switch includes:

- Forty-eight fixed autosensing 10/100BASE-T PoE ports (ports 1–48). In addition to 4.8 Gbps of high-density copper connectivity, these ports provide a full 15.4 Watts of PoE per port when used with the EPS-600LS External Power Module.
- Two combination ports (ports 49–50) using RJ-45 connectors and SFPs to provide 2 Gbps of copper or fiber connectivity
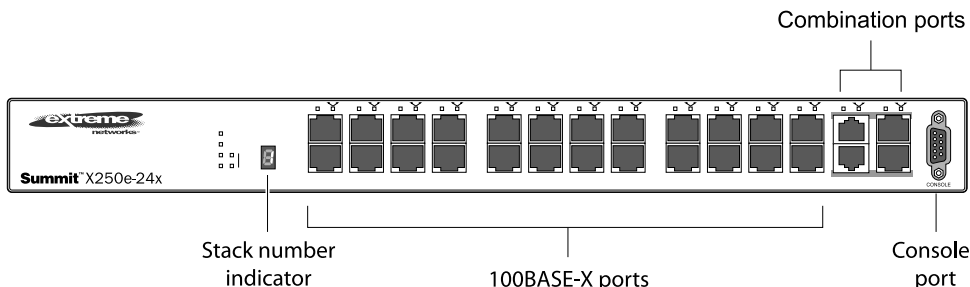
  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X250e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

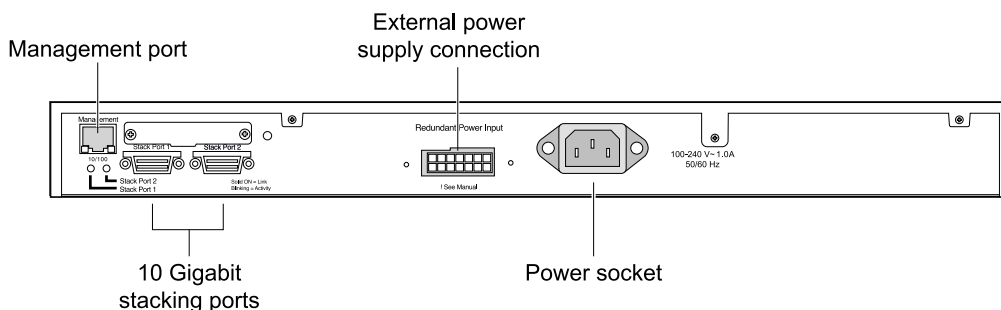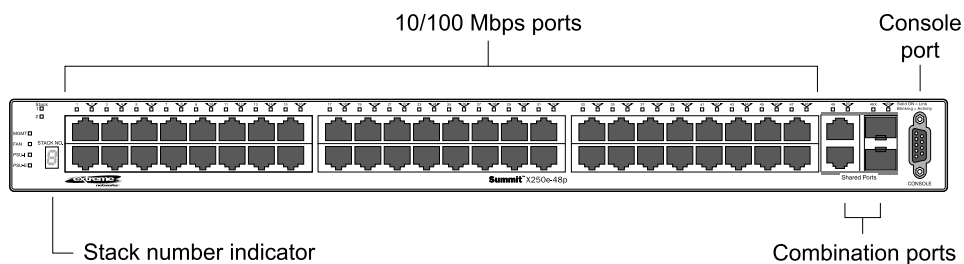**Figure 21: Summit X250e-48p Switch Front Panel**

The rear panel of the Summit X250e-48p switch (shown in Figure 22: Summit X250e-48p Switch Rear Panel on page 30) includes:

- Ethernet management port with associated LEDs
- 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 connecting redundant power supply cable is shipped with the EPS-C chassis. The PoE capability of the Summit X250e-48p switch varies depending on the number of external power modules in use. For more information, see EPS-600LS External Power Module.

- AC power input socket

    The internal AC power supply operates from 100 VAC to 240 VAC.
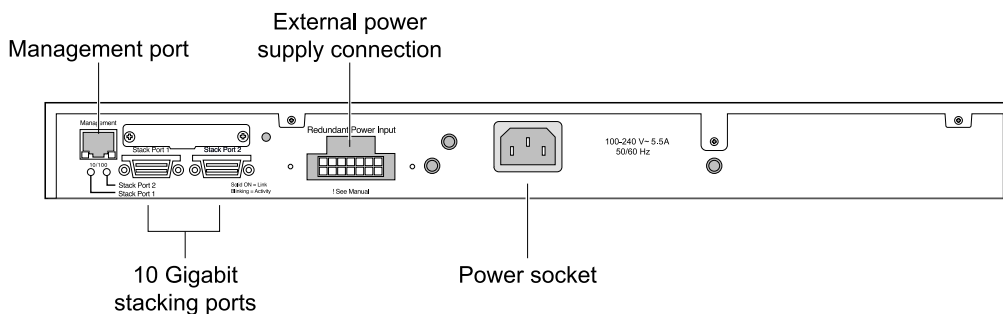
Figure 22: Summit X250e-48p Switch Rear Panel

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 Summit X250e-48p internal power supply can provide 370 W of PoE power, as follows:

- In a 24-port configuration, it provides 15.4 W to each port.

- In a 48-port configuration or any combination of ports where total PoE power does not exceed 370 watts, it provides 7.7 W to each port.

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**
>
> For a detailed discussion of these concepts, see the Power over Ethernet section in the ExtremeXOS Concepts Guide.

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. The following table summarizes the PoE power behavior for the Summit X250e-48p switch based on the number of power supply modules in use.

Internal Power Supply Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External Power Supply/ 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.

Summit X250e Series Switch LEDs

The following describes the meanings of the LEDs on the Summit X250e series switches

LEDs on the Summit X250e Series Switches

Table 10: Front Panel

Label or Type	Color/State	Meaning
MGMT	Blinking green (fast)	Power-on self-test (POST) in progress
	Steady green	POST passed. System is booting image.
	Blinking green (slow)	Normal operation.
	Blinking amber	Switch diagnostics are running. or 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
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
Port number 1 – 24 or 1 – 48	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.
Port number 25, 26 or 49, 50 (Shared ports)	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.
Stack 1, Stack 2	Steady green	Link OK on the indicated stack port.
	Blinking green	Activity on the indicated stack port.
Stack Number Indicator	Off	This switch is not in stacking mode.
	Top half of number blinking	This switch is the stack master.
	Lower half of number blinking	This switch is the stack backup.
	Number lights steadily	This switch is a standby switch (neither the master nor the backup).

Table 11: Additional Port LED Meanings for PoE Switches: Summit X250e-24p & Summit X250e-48p

Label or Type	Color/State	Meaning
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.

Table 12: Rear Panel

Label or Type	Color/State	Meaning
Management Port	Right LED: Steady green	Link OK
	Left LED: Blinking green	Activity
	Both LEDs off	Link is not present.
Stack Port 1, Stack Port 2	Steady green	Link OK
	Blinking green	Activity
	Off	No link

Summit X350 Series Switches

The Summit X350 series switches provide 24 or 48 Ethernet ports that deliver high-density fast Ethernet connectivity using fixed 10/100/1000BASE-T ports.

Each Summit X350 series switch has four combination ports that provide 10/100/1000 BASE-T or SFP connectivity for 2 Gbps of copper or fiber connectivity. A serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations.

The rear panel of the switch has an option slot to accommodate one of the following Summit port option cards:
- Summit XGM2-2xf option card, which allows you to add one or two 10-gigabit XFP modules.
- Summit XGM2-2xn option card, which allows you to add one or two 10-gigabit XFP modules.
- Summit XGM2-2bt option card, which allows you to add one or two fixed 10GBASE-T ports.
- Summit XGM2-2sf option card, which allows you to add one or two 10-gigabit SFP+ modules.

For option card installation instructions, see Installing Optional Ports.

Power connectors on the rear panel of the switch include an AC power input socket and a redundant power connector. The internal AC power supply operates from 100 VAC to 240 VAC. The switch automatically adjusts to the supply voltage. The redundant power connector allows you to connect the switch to the EPS-500 external power supply. When a compatible external power supply is used with the Summit X350 series switch, the internal and external power supplies are fully fault tolerant and load-sharing. If one power supply fails, the other power supply provides sufficient power to operate the switch.

The Summit X350 series switches include the following models:

- Summit X350-24t Switch
- Summit X350-24t-TAA switch
- Summit X350-48t Switch
- Summit X350-48t-TAA switch

> **Note**
>
> In the descriptions that follow, references to a Summit X350 series model number also apply to the equivalent TAA-compliant switch version.

Summit X350-24t Switch

The front panel of the Summit X350-24t switch includes:

- Twenty fixed autosensing 10/100/1000BASE-T ports (ports 1–20) that provide 20 Gbps of high-density copper connectivity
- Four combination ports (ports 21-24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPS, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X350 Series Switch LEDs.

- Serial console port used to connect a terminal and perform local management


Figure 23: Summit X350-24t Switch Front Panel

The rear panel of the Summit X350-24t switch (as shown in) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 13: Port Option Cards for Summit X350 Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Module (Model No. 10907).

    The connecting redundant power supply cable is shipped with the EPS-500 unit. See EPS-500 External Power Supply Unit for more information.
- AC power input socket

    The internal power supply operates from 100 VAC to 240 VAC.

Figure 24: Summit X350-24t Switch Rear Panel

Summit X350-48t Switch

The front panel of the Summit X350-48t switch includes:

- Forty-four fixed autosensing 10/100/1000 BASE-T ports (ports 1–44) that provide 44 Gbps of high-density copper connectivity
- Four combination ports (ports 45–48) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

    For more information about combination ports, see Combination Ports and Failover.

    For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see Summit X350 Series Switch LEDs.

- Serial console port used to connect a terminal and perform local management

Combination ports

10/100/1000 Mbps ports

Console port

Figure 25: Summit X350-48t Switch Front Panel

The rear panel of the Summit X350-48t switch (shown in Figure 26: Summit X350-48t Switch Rear Panel on page 36) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 14: Port Option Cards for Summit X350 Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Supply Unit (Model No. 10911)

  The connecting redundant power supply cable is shipped with the EPS-500 power supply. See EPS-500 External Power Supply Unit for more information.
- AC power input socket

  The internal power supply operates from 100 VAC to 240 VAC.

External power supply connection

Management port

10 Gigabit uplink option

Power socket

Figure 26: Summit X350-48t Switch Rear Panel

Summit X350 Series Switch LEDs

The following table describes the meanings of the LEDs on the Summit X350 series switches.

Table 15: Front Panel

Label or Type	Color/State	Meaning
MGMT	Blinking green (fast)	Power-on self-test (POST) in progress.
	Steady green	POST passed. System is booting image.
	Blinking green (slow)	Normal operation
	Blinking amber	Switch diagnostics are running. or System is disabled. POST failed or system overheated.
FAN	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power
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 16: Front-panel Port LEDs

Label or Type	Color/State	Meaning
Ethernet Ports 1 – 24 or 1 – 48 (21 – 24 and 45 – 48 are shared ports)	Steady green	Link OK
	Blinking green	Activity
	Off	Link is not present. or Port is disabled.

Table 17: Rear Panel

Label or Type	Color/State	Meaning
Management Port	Steady green	Link OK
	Blinking green	Activity
	Off	Link is not present.
SFP+ 10G Port (on installed option card)	Steady green	Link OK
	Blinking green	Activity
	Off	Link down

Table 17: Rear Panel (continued)

Label or Type	Color/State	Meaning
XFP 10G Port (on installed option card)	Steady green	Link OK
	Blinking green	Activity
	Off	Link down

Summit X430 Series Switches

The Summit X430 series switches provide 8, 24, or 48 Ethernet ports that deliver high-density fast Ethernet or Gigabit Ethernet connectivity using fixed 10/100/1000Base-T copper or POE+ ports, plus four 100/1000Base-X fiber ports via SFP modules on some models.

For all models, a serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations. The rear panel provides an AC power input socket.

The Summit X430 series switches include the following models:
- Summit X430-8p switch
- Summit X430-24t switch
- Summit X430-24p switch
- Summit X430-48t switch

Summit X430-8p Switch

The front panel of the Summit X430-8p switch includes:
- Eight fixed autosensing 10/100/1000BASE-T ports (ports 1–8) that provide 8 Gbps of high-density copper connectivity. In addition, all of these ports (ports 1-8) also support the POE protocol IEEE802.af and POE+ protocol IEEE 802.at standard. Using the POE protocol, the switch can provide 15.4 Watts of power on a single port up to a total power budget of 60 Watts. Using the POE + protocol, the switch can provide 30 Watts of power on a single port up to a total power budget of 60 Watts.
- Two unpopulated 1000BASE-X SFP ports (ports 9–10) that provide 2 Gbps of fiber connectivity.

> **Note**
> All the eight 10/100/1000BASE-T ports and all of the 1000BASE-X SFP ports can be used simultaneously.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see Summit X430 LEDs.
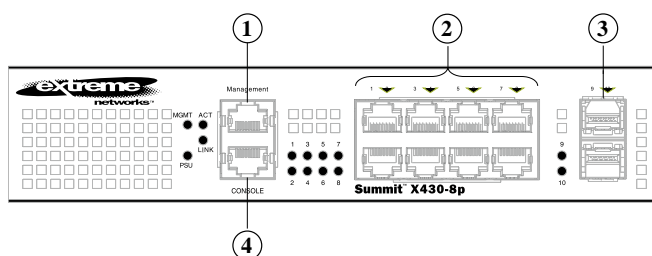
Figure 27: Summit X430-8p Switch Front Panel

1 = Ethernet management port	3 = SFP ports
2 = 10/100/1000BASE-T POE+ ports	4 = Console port

The rear panel of the Summit X430-8p switch includes:

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
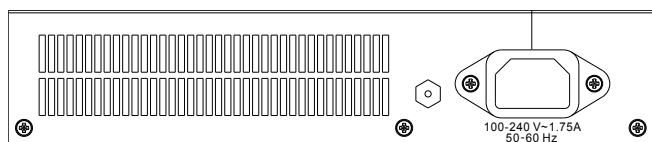
Figure 28: Summit X430-8p Switch Rear Panel

1 = AC power input connector

Summit X430-24t Switch

The front panel of the Summit X430-24t switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity.
- Four unpopulated 1000BASE-X SFP ports (ports 25–28) that provide 4 Gbps of fiber connectivity.

> **Note**
> All of the 10/100/1000BASE-T ports and four 1000BASE-X SFP ports can be used simultaneously.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X430 LEDs.
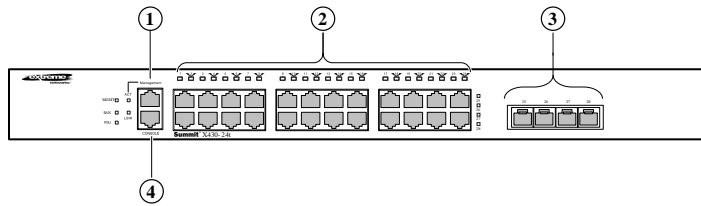
Figure 29: Summit X430-24t Switch Front Panel

1 = Ethernet management port	3 = SFP ports
2 = 10/100/1000BASE-T ports	4 = Console port

The rear panel of the Summit X430-24t switch (shown in Figure 30: Summit X430-24t Switch Rear Panel on page 40) includes:

- AC power input socket

   The internal AC power supply operates from 100 VAC to 240 VAC.
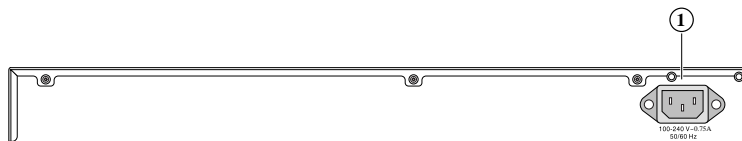
Figure 30: Summit X430-24t Switch Rear Panel

1 = AC power input connector

Summit X430-24p Switch

The front panel of the Summit X430-24p switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity.In addition, all of these ports (ports 1-24) also support the POE protocol IEEE802.af and POE+ protocol IEEE 802.at standard. Using the POE protocol, the switch can provide 15.4 Watts of power on a single port up to a total power budget of 370 Watts. Using the POE+ protocol, the switch can provide 30 Watts of power on a single port up to a total power budget of 370 Watts.
- Four unpopulated 1000BASE-X SFP ports (ports 25–28) that provide 4 Gbps of fiber connectivity.

> **Note**
>
> All the twenty-four 10/100/1000BASE-T ports and all four of the 1000BASE-X SFP ports can be used simultaneously.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port

- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X430 LEDs.
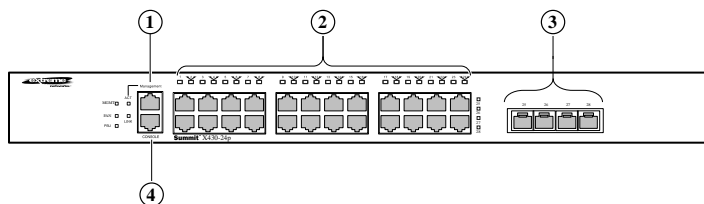
Figure 31: Summit X430-24p Switch Front Panel

1 = Ethernet management port	3 = SFP ports
2 = 10/100/1000BASE-T POE+ ports	4 = Console port

The rear panel of the Summit X430-24p switch (shown in Figure 32: Summit X430-24p Switch Rear Panel on page 41) includes:

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
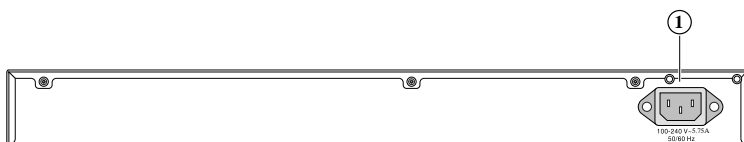
Figure 32: Summit X430-24p Switch Rear Panel

1 = AC power input connector

Summit X430-48t Switch

The front panel of the Summit X430-48t switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity.
- Four 1000BASE-X SFP ports (ports 49–52) that provide 4 Gbps of fiber connectivity.

> **Note**
> All the forty-eight 10/100/1000BASE-T ports and all four of the 1000BASE-X SFP ports can be used simultaneously.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X430 LEDs.
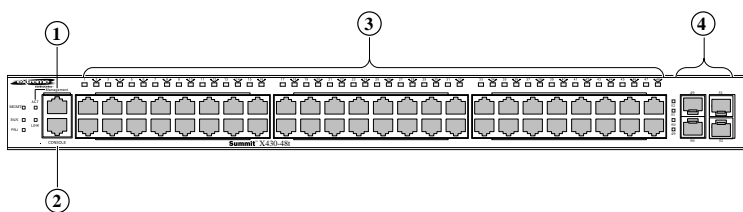
Figure 33: Summit X430-48t Switch Front Panel

1 = Ethernet management port	3 = 10/100/1000BASE-T ports
2 = Console port	4 = SFP ports

The rear panel of the Summit X430-48t switch (shown in Figure 34: Summit X430-48t Switch Rear Panel on page 42) includes:

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
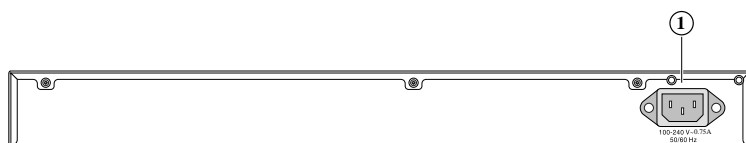
Figure 34: Summit X430-48t Switch Rear Panel

1 = AC power input connector

Summit X430 Series Switch LEDs

The following table describes the meanings of the LEDs on the Summit X430 series switches.

Table 18: X430 Front Panel LEDs

Label or Type	Color/State	Meaning
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.

Table 18: X430 Front Panel LEDs (continued)

Label or Type	Color/State	Meaning
FAN	Steady green	Normal operation, fan is good.
	Blinking amber	Fan failure. Switch will continue to operate unless it overheats.
	Off	No power
PSU (Internal power supply)	Steady green	Normal operation.
	Off	No power is attached/Power failure.
Port number 1-8 or 1 – 24 or 1 – 48	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Solid Amber (POE only)	POE delivering with Ethernet link OK.
	Fast Blinking Amber (POE only)	POE delivering and port is transmitting packets.
	Slow Blinking Amber (POE only)	POE fault detected.
	Off	Link is not present, or port is disabled.
Port number 9-10 or 25 – 28 or 49 – 52 (SFP ports)	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.

Summit X440 Series Switches

The Summit X440 series switches provide 8, 24, or 48 Ethernet ports that deliver high-density fast Ethernet or Gigabit Ethernet connectivity using fixed 10/100/1000BASE-T ports. Additional ports on various models include the following:

Table 19: X440 Series Switches and Port Types

	10/100/1000BASE-T RJ45	10/100/1000BASE-T POE+ RJ45	100/1000BASE-X SFP	10G BASE-X SFP+
X440-8t	8		4 (unpopulated)	
X440-8p		8	4 (unpopulated)	
X440-24t X440-24tDC	24 (four are combo ports)		4 (unpopulated combo ports)	
X440-24p		24 (four are combo ports)	4 (unpopulated combo ports)	
X440-24x	4 (four are combo ports)		24 (unpopulated) (four are combo ports)	
X440-L2-24t	24 (four are combo ports)		4 (unpopulated combo ports)	

Table 19: X440 Series Switches and Port Types (continued)

	10/100/1000BASE-T RJ45	10/100/1000BASE-T POE+ RJ45	100/1000BASE-X SFP	10G BASE-X SFP+
X440-24t-10G	24		4 (unpopulated combo ports)	2 (unpopulated)
X440-24p-10G		24 (four are combo ports)	4 (unpopulated combo ports)	2 (unpopulated)
X440-24x-10G	4 (combo ports)		24 (unpopulated) (four are combo ports)	2 (unpopulated)
X440-48t X440-48tDC	48 (four are combo ports)		4 (unpopulated combo ports)	
X440-48p		48 (four are combo ports)	4 (unpopulated combo ports)	
X440-L2-48t	48 (four are combo ports)		4 (unpopulated combo ports)	
X440-48t-10G	48 (two are combo ports)		2 (unpopulated combo ports)	2 (unpopulated)
X440-48p-10G		48 (two are combo ports)	2 (unpopulated combo ports)	2 (unpopulated)

For all models, a serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations.

Most models have two high-speed stacking ports that allow you to combine multiple units into a single SummitStack management entity. On the 8-port models, the stacking ports are on the front panel. On the 24 and 48 port 10-G models, the SFP+ 10G ports on the front panel can be used as alternate stack ports. On all other Summit X440 series switches (except the x440-L2-24t and x440-L2-48t which do not have stacking capability), the stacking ports are on the back panel. Stacking port locations are listed in the following table.

X440 Switch Type	Stacking Port type	Port Location
8p and 8t	High-speed stacking port	Front panel
24p, 24t, 24tDC, 24x, 48p, 48t, 48tDC	High-speed stacking port	Rear panel
24p-10G, 24t-10G, 24x-10G 48p-10G, 48t-10G	SFP+	Front panel

Note

The X440-L2-24t and the X440-L2-48t do not have stacking capability.

The rear panel provides an AC power input socket or DC input connector; 24-port and 48-port switch models also include a redundant power connector. The switch automatically adjusts to the supply voltage. The redundant power connector allows you to connect the switch to the EPS-C2 external

power system. When a compatible external power supply is used with the Summit X440 series switch, the internal and external power supplies are fully fault tolerant. If one power supply fails, the other power supply will provide sufficient power to operate the switch.

Most Summit switches have fans that can change speeds depending upon operating conditions. See Summit X440 Series Switches for specifications.

The Summit X440 series switches include the following models:

- Summit X440-8t Switch
- Summit X440-8p Switch
- Summit X440-24t Switch
- Summit X440-24tDC Switch
- Summit X440-L2-24t Switch
- Summit X440-24p Switch
- Summit X440-24x Switch
- Summit X440-24t-10G Switch
- Summit X440-24p-10G Switch
- Summit X440 24x-10G Switch
- Summit X440-48t Switch
- Summit X440-48tDC Switch
- Summit X440-L2-48t Switch
- Summit X440-48p Switch
- Summit X440-48t-10G Switch
- Summit X440-48p-10G Switch

Summit X440-8t Switch

The front panel of the Summit X440-8t switch includes:

- Eight fixed autosensing 10/100/1000BASE-T ports (ports 1–8) that provide 8 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 9–12) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Two high-performance stacking ports with associated LEDs
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

*   Stack number indicator

Note

If you are desktop mounting Summit X440-8t switches directly on top of each other, you must use the four rubber pads to maintain sufficient airflow around the units. See Free-Standing and Desktop Mount of Multiple Switches for installation instructions.

Note

If you are rack mounting Summit X440-8t switches, you must use special "keep out" rack mounting hardware. See Installing a Summit X440-8t Switch on page 249 for installation instructions.

Figure 35: Summit X440-8t Switch Front Panel

1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T ports	5 = Console port
3 = SFP ports	6 = Stacking Ports

The rear panel of the Summit X440-8t switch provides an AC power input socket. The internal AC power supply operates from 100 VAC to 240 VAC.
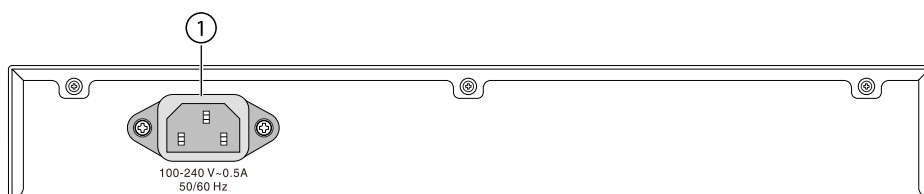
1 = AC power input connector

Figure 36: Summit X440-8t Switch Rear Panel

Summit X440-8p Switch

The front panel of the Summit X440-8p switch includes:

- Eight fixed autosensing 100/1000BASE-T PoE+ ports (ports 1–8). In addition to 8 Gbps of high-density copper connectivity, these ports also supports the PoE+ IEEE 802.3a standard and provide up to 30 Watts of power per port up to a total power budget of 170 Watts.
- Four unpopulated SFP ports (ports 9–12) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Two high-performance stacking ports with associated LEDs
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator
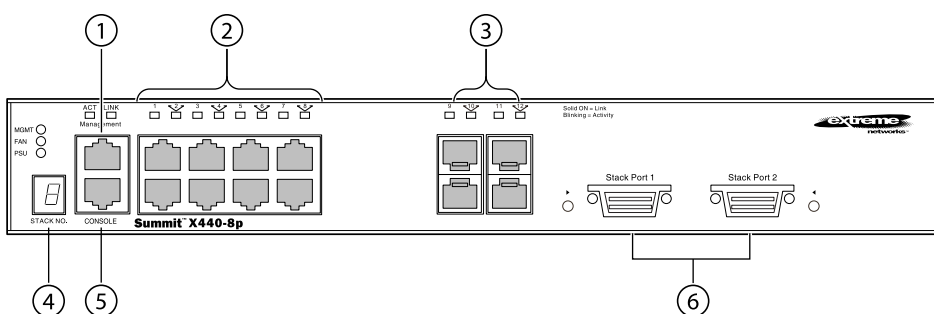
Figure 37: Summit X440-8p Switch Front Panel

1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T PoE ports	5 = Console port
3 = SFP ports	6 = Stacking ports

The rear panel of the Summit X440-8t switch provides an AC power input socket. The internal AC power supply operates from 100 VAC to 240 VAC.
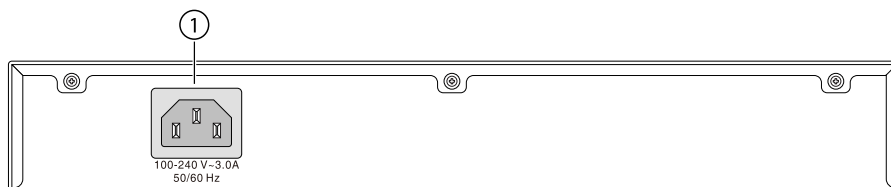
1 = AC power input connector

Figure 38: Summit X440-8p Switch Rear Panel

Summit X440-24t Switch

The front panel of the Summit X440-24t switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator

Figure 39: Summit X440-24t Switch Front Panel

1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T ports	5 = Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-24t switch (shown in Figure 40: Summit X440-24t Switch Rear Panel on page 49) includes:
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 40: Summit X440-24t Switch Rear Panel

1 = AC power input connector	3 = Redundant power connector
2 = Stacking ports	

Summit X440-24tDC Switch

The front panel of the Summit X440-24tDC switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity.
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

- Stack number indicator.

Figure 41: Summit X440-24tDC Switch Front Panel

1 = LEDs	4 = Stack number indicator
2 = 10/100/1000BASE-T ports	5 = Ethernet management port/Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-24tDC switch (shown in Figure 42: Summit X440-24tDC Switch Rear Panel on page 50) includes:

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- DC power input connectors. The DC power supply operates at -48V.

Figure 42: Summit X440-24tDC Switch Rear Panel

1 = DC power input connectors	3 = Redundant power connector
2 = Stacking ports	

Summit X440-24x Switch

The front panel of the Summit X440-24x switch includes:

- 24 unpopulated SFP ports (ports 1–24) that provide 24 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Four autosensing 10/100/1000BASE-T ports (ports 21–24) that provide 4 Gbps of high-density copper connectivity.

  These ports are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator
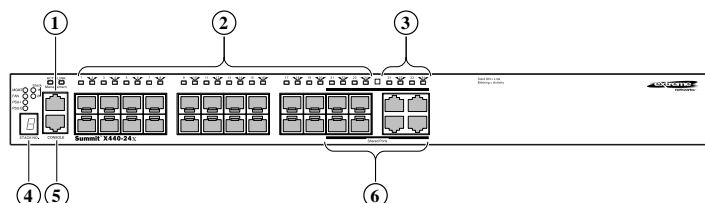
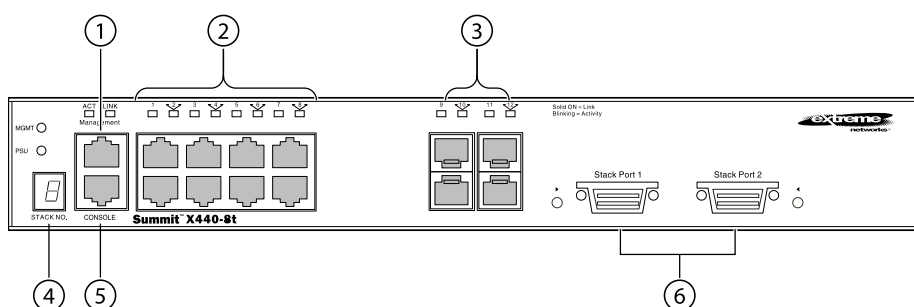**Figure 43: Summit X440-24x Switch Front Panel**

1 = Ethernet management port	4 = Stack number indicator
2 = SFP ports	5 = Console port
3 = 10/100/1000BASE-T ports	6 = Combination ports

The rear panel of the Summit X440-24x switch includes:

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
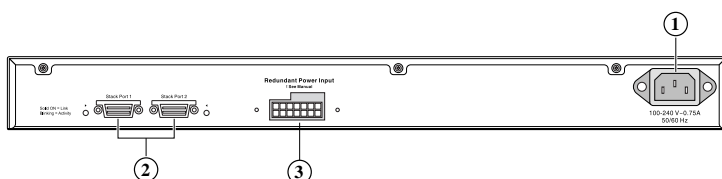
Figure 44: Summit X440-24x Switch Rear Panel

1 = AC power input connector	3 = Redundant power connector
2 = Stacking ports	

Summit X440-L2-24t Switch

The front panel of the Summit X440-L2-24t switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

 For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

Figure 45: Summit X440-L2-24t Switch Front Panel

1 = Ethernet management port	4 = Console port
2 = 10/100/1000BASE-T ports	5 = Combination ports
3 = SFP ports	

The rear panel of the Summit X440-L2-24t switch (shown in Figure 46: Summit X440-L2-24t Switch Rear Panel on page 52) includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 46: Summit X440-L2-24t Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-24p Switch

The front panel of the Summit X440-24p switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T PoE+ ports (ports 1–24). The Summit X440-24p switch supports the PoE+ IEEE 802.3a standard and provides up to 30 Watts of power per port. This switch provides a total switch PoE power budget of 380 Watts.
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.
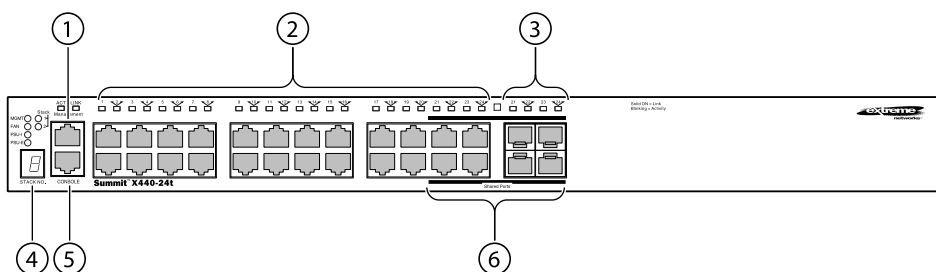
  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator

Figure 47: Summit X440-24p Switch Front Panel

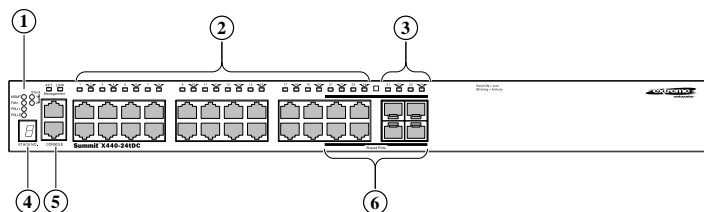| 1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T PoE ports	5 = Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-24p switch includes:
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 48: Summit X440-24p Switch Rear Panel

1 = AC power input connector	3 = Redundant power connector
2 = Stacking ports	

Summit X440-24t-10G Switch

The front panel of the Summit X440-24t-10G switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Two unpopulated SFP+ ports (ports 25 and 26) that provide 20 Gbps of fiber connectivity
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
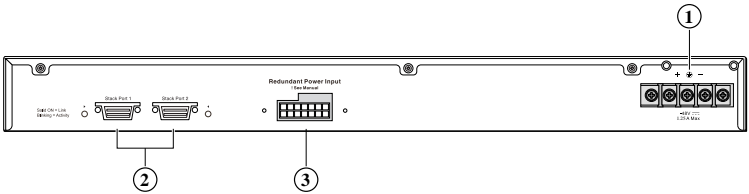

Figure 49: Summit X440-24t-10G Switch Front Panel

1 = Ethernet management port	5 = Console port
2 = 10/100/1000BASE-T ports	6 = Combination ports

3 = SFP ports	7 = SFP+ ports
4 = Stack number indicator	

The rear panel of the Summit X440-24t-10G switch (Figure 50: Summit X440-24t-10G Switch Rear Panel on page 55) includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
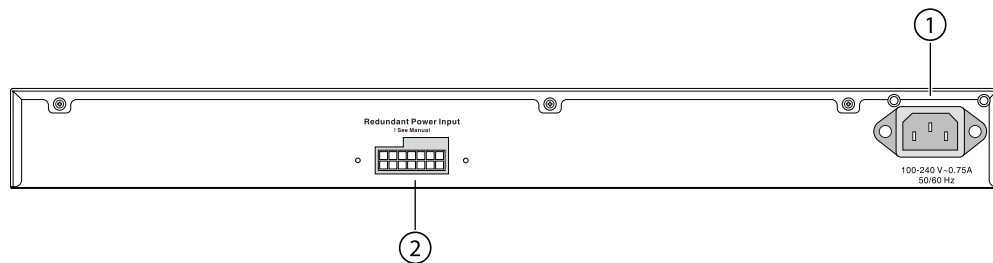
Figure 50: Summit X440-24t-10G Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-24p-10G Switch

The front panel of the Summit X440-24p-10G switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T PoE+ ports (ports 1–24). In addition to 24 Gbps of high-density copper connectivity, these ports also provide a full 30 Watts of PoE+ per port. This switch provides a total switch PoE power budget of 380 Watts.
- Four unpopulated SFP ports (ports 21–24) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

 For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Two unpopulated SFP+ ports (ports 25 and 26) that provide 20 Gbps of fiber connectivity
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

Figure 51: Summit X440-24p-10G Switch Front Panel

1 = Ethernet management port	5 = Console port
2 = 10/100/1000BASE-T PoE ports	6 = Combination ports
3 = SFP ports	7 = SFP+ ports
4 = Stack number	

The rear panel of the Summit X440-24p-10G switch (Figure 52: Summit X440-24p-10G Switch Rear Panel on page 56) includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
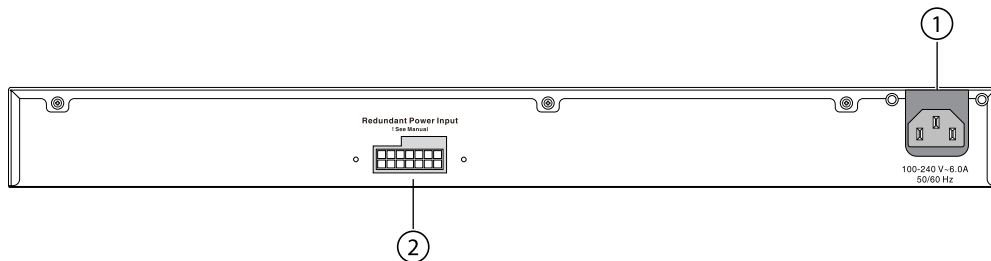
Figure 52: Summit X440-24p-10G Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-24x-10G Switch

The front panel of the Summit X440-24x-10G switch includes:

- Twenty-four unpopulated SFP ports (ports 1–24) that provide 24 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.
- Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover

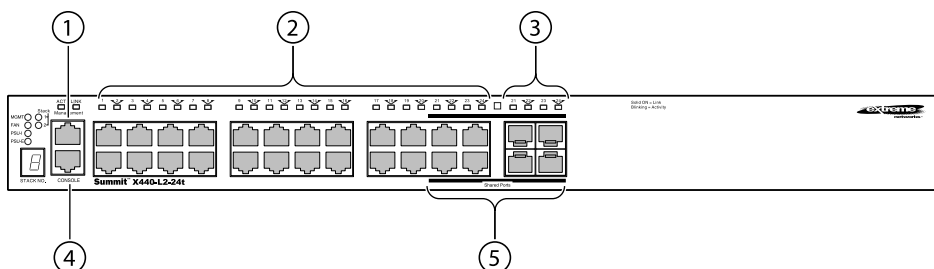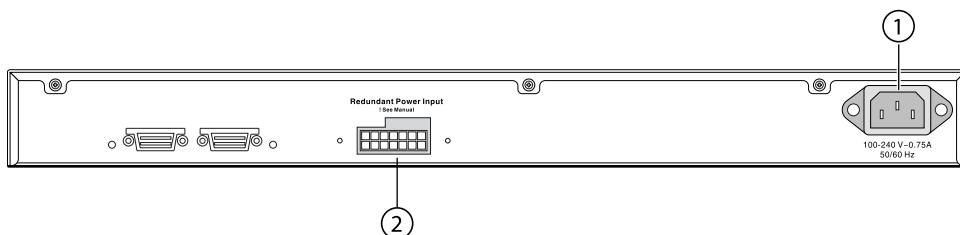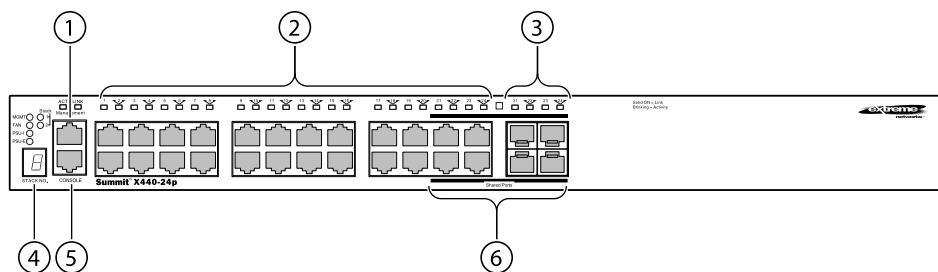 For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Four autosensing 10/100/1000BASE-T ports (ports 21–24) that provide 4 Gbps of high-density copper connectivity.

  These ports are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

- Two unpopulated SFP+ ports (ports 25 and 26) that provide 20 Gbps of fiber connectivity.
- Ethernet management port.
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management.
- LEDs to indicate port status and switch operating conditions.

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
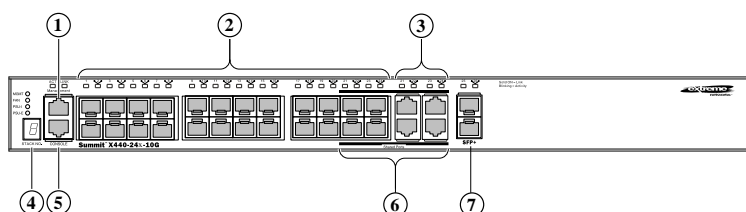
Figure 53: Summit X440-24x-10G Switch Front Panel

1 = Ethernet management port	5 = Console port
2 = SFP ports	6 = Combination ports
3 = 10/100/1000BASE-T ports	7 = SFP+ ports
4 = Stack number indicator	

The rear panel of the Summit X440-24x-10G switch includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.

- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.
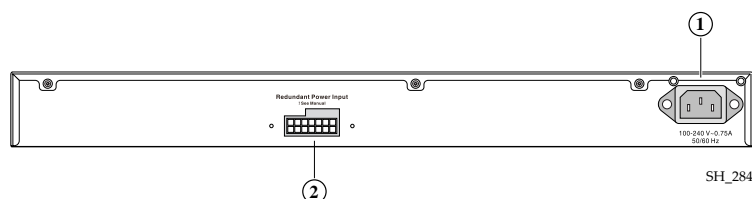
Figure 54: Summit X440-24x-10G Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-48t Switch

The front panel of the Summit X440-48t switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity.
- Four unpopulated SFP ports (ports 45–48) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 45 through 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management.
- LEDs to indicate port status and switch operating conditions.

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator.

Figure 55: Summit X440-48t Switch Front Panel

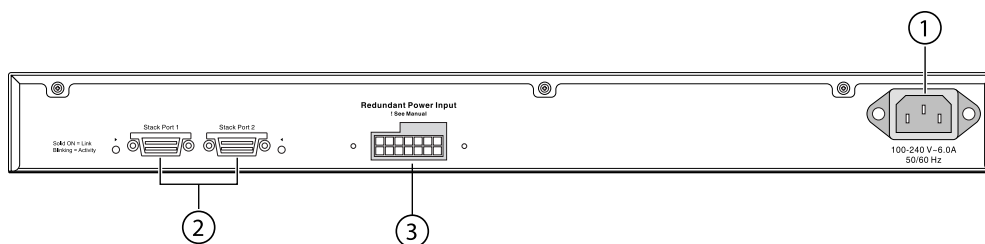| 1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T ports	5 = Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-48t switch includes:

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input connector.
- The internal AC power supply operates from 100 VAC to 240 VAC.
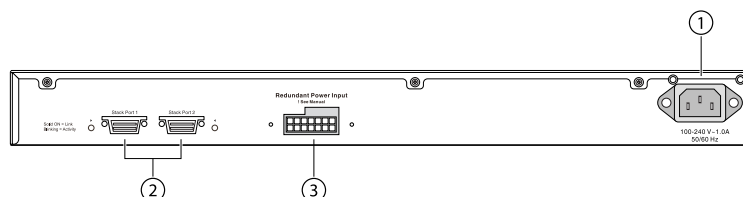
Figure 56: Summit X440-48t Switch Rear Panel

1 = AC power input connector	3 = Redundant power connector
2 = Stacking ports	

Summit X440-48tDC Switch

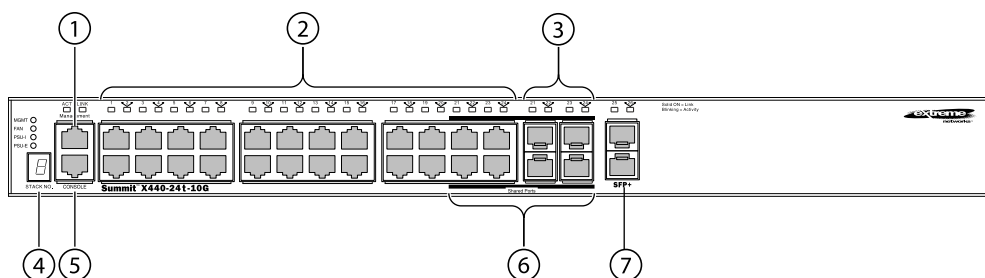The front panel of the Summit X440-48tDC switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity.
- Four unpopulated SFP ports (ports 45–48) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 45 through 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management.
- LEDs to indicate port status and switch operating conditions.

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator.

Figure 57: Summit X440-48tDC Switch Front Panel

1 = LEDs	4 = Stack number indicator
2 = 10/100/1000BASE-T ports	5 = Ethernet management port/Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-48tDC switch includes:

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- DC power input connectors. The DC power supply operates at -48V.

Figure 58: Summit X440-48tDC Switch Rear Panel

1 = DC power input connectors	3 = Redundant power connector
2 = Stacking ports	

Summit X440-L2-48t Switch

The front panel of the Summit X440-L2-48t switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 45–48) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 45 through 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

Figure 59: Summit X440-L2-48t Switch Front Panel

1 = Ethernet management port	4 = Console port
2 = 10/100/1000BASE-T ports	5 = Combination ports
3 = SFP ports	

The rear panel of the Summit X440-L2-48t switch includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 60: Summit X440-L2-48t Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-48p Switch

The front panel of the Summit X440-48p switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T PoE+ ports (ports 1–48). In addition to 48 Gbps of high-density copper connectivity, these ports also provide a full 30 Watts of PoE+ per port. This switch provides a total switch PoE power budget of 380 Watts.
- Four unpopulated SFP ports (ports 45 – 48) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 45 through 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.
- Stack number indicator

Figure 61: Summit X440-48p Switch Front Panel

1 = Ethernet management port	4 = Stack number indicator
2 = 10/100/1000BASE-T PoE ports	5 = Console port
3 = SFP ports	6 = Combination ports

The rear panel of the Summit X440-48p switch (Figure 62: Summit X440-48p Switch Rear Panel on page 62) includes:

- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C2 External Power Module

    The connecting redundant power supply cable is shipped with the power module. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

    The internal AC power supply operates from 100 VAC to 240 VAC.
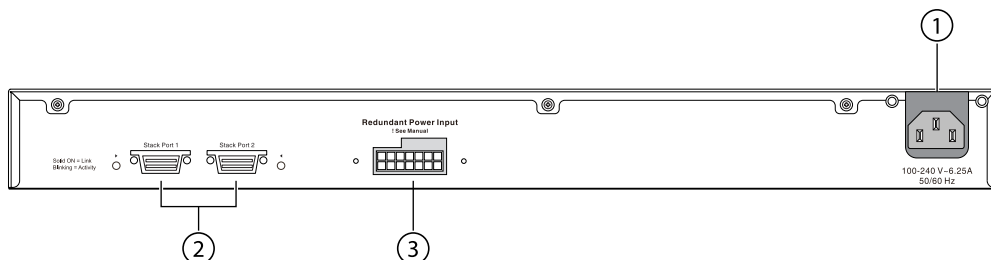
Figure 62: Summit X440-48p Switch Rear Panel

1 = AC power input connector	3 = Redundant power connector
2 = Stacking ports	

Summit X440-48t-10G Switch

The front panel of the Summit X440-48t-10G switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity
- Two unpopulated SFP ports (ports 47 and 48) that provide 2 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.
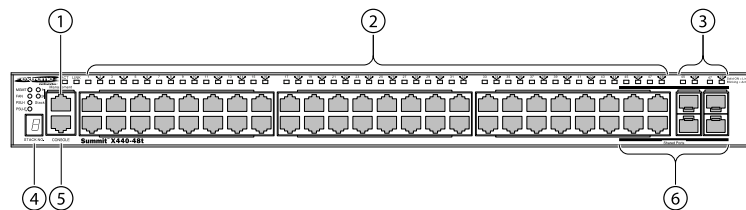
Ports 47 and 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Two unpopulated SFP+ ports (ports 49 and 50) that provide 20 Gbps of fiber connectivity
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

Figure 63: Summit X440-48t-10G Switch Front Panel

|	
1 = Ethernet management port	5 = Console port
2 = 10/100/1000BASE-T ports	6 = Combination ports
3 = SFP ports	7 = SFP+ ports
4 = Stack number indicator	

The rear panel of the Summit X440-48t-10G switch includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module unit. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 64: Summit X440-48t-10G Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440-48p-10G Switch

The front panel of the Summit X440-48p-10G switch includes:

- Forty-eight fixed autosensing 10/100/1000BASE-T PoE+ ports (ports 1–48). In addition to 48 Gbps of high-density copper connectivity, these ports also provide a full 30 Watts of PoE+ per port. This switch provides a total switch PoE power budget of 380 Watts.
- Two unpopulated SFP ports (ports 47 and 48) that provide 2 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.
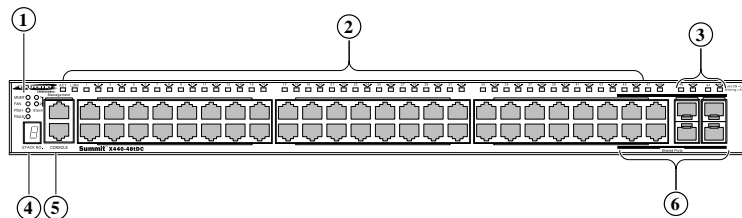
  Ports 47 and 48 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Two unpopulated SFP+ ports (ports 49 and 50) that provide 20 Gbps of fiber connectivity
- Ethernet management port
- Serial console port implemented as an RJ-45 connector, used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X440 Series Switch LEDs.

Figure 65: Summit X440-48p-10G Switch Front Panel

1 = Ethernet management port	5 = Console port
2 = 10/100/1000BASE-T PoE ports	6 = Combination ports
3 = SFP ports	7 = SFP+ ports
4 = Stack number indicator	

The rear panel of the Summit X440-48p-10G switch includes:

- Redundant power input connector for optional connection to the EPS-C2 External Power Module

  The connecting redundant power supply cable is shipped with the power module. See Installing an EPS-C2 Chassis for more information.
- AC power input socket

  The internal AC power supply operates from 100 VAC to 240 VAC.

Figure 66: Summit X440-48p-10G Switch Rear Panel

1 = AC power input connector	2 = Redundant power connector

Summit X440 Series Switch LEDs

LEDs on the Summit X440 Series Switches

Table 20: Front Panel

Label or Type	Color/State	Meaning
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.

Table 20: Front Panel (continued)

Label or Type	Color/State	Meaning
FAN	Steady green	Normal operation, fan is good. **Note** For the following Summit models, fan light is "ON" only when the fan is running: • Summit X440-24t model No. 800471-00 Revision 6 or lower • Summit X440-24t-10G model No. 800475-00 Revision 5 or lower • Summit X440-L2-24t model No. 800526-00 Revision 1
	Blinking amber	Fan failure. Switch will continue to operate unless it overheats.
	Off	No power **Note** For the following Summit models, fan light "OFF" indicates either no power to the fan or temperature is below threshold where fans are needed: • Summit X440-24t model No. 800471-00 Revision 6 or lower • Summit X440-24t-10G model No. 800475-00 Revision 5 or lower • Summit X440-L2-24t model No. 800526-00 Revision 1
PSU-I (Internal power supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No power is attached.
PSU-E (External power supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No external power attached.
Port number 1 – 8 or 1 – 24 or 1 – 48	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.
Port number 21 – 24 or 45 – 48 (Shared ports)	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.

Table 20: Front Panel (continued)

Label or Type	Color/State	Meaning
Port number 25 – 26 or 49 – 50 (10G ports)	Steady green	Link is OK.
	Blinking green	Port is transmitting packets.
	Off	Link is not present, or port is disabled.
Stack 1, Stack 2 NOTE: The X440-L2-24t and X440-L2-48t do not have stacking capability; the stacking LEDs do not function.	Steady green	Link OK on the indicated stacking port.
	Blinking green	Activity on the indicated stacking port.
Stack Number Indicator NOTE: The X440-L2-24t and X440-L2-48t do not have stacking capability; the stacking LEDs do not function.	Top half of the stack number blinking	The switch is designated as master in the stack.
	Bottom half of the stack number blinking	The switch is designated as backup in the stack.
	Stack number steady	This switch is a standby switch (neither the master nor the backup) in the stack.
	Off	The stackable switch is not in stacking mode.

Table 21: Additional Port LED Meanings for PoE Switches: Summit X440-8p, X440-24p, X440-24p-10G, X440-48p, and X440-48p-10G

Label or Type	Color/State	Meaning
All front-panel ports	Steady green	Link OK; port is not powered.
	Steady amber	Link is OK; port is powered; no traffic.
	Blinking green	Link is OK and transmitting packets; port is not powered.
	Blinking amber	Link is OK and 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.

Summit X450, X450a, and X450e Series Switches

The Summit X450, X450a, and X450e series switches provide 24 or 48 Ethernet ports.

These switches deliver high-density fast Ethernet connectivity using fixed 10/100/1000BASE-T ports or installable small form pluggable (SFP) optical modules. Models in different series are available both with and without PoE and in AC or DC power versions.

Each Summit X450, X450a, or X450e series switch has four combination ports that provide 10/100/1000 BASE-T or SFP connectivity for 4 Gbps of copper or fiber connectivity. A serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet

management port on the back panel can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect the Ethernet management port directly to a laptop to view and locally manage the switch configurations.

The rear panel of the switch has an option slot to accommodate one of the Summit port option cards listed in the following table.

Table 22: Port Option Cards for Summit X450, X450a, and X450e Series Switches

Option Card Model	Type of Added Ports	For more information, see . . .
XGM-2xn option card	10-gigabit XENPAK modules	Summit XGM-2xn Option Card
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

Option card compatibility depends on the specific switch series. See the individual switch descriptions for the option card supported on each switch. For option card installation instructions, see Installing Optional Ports.

Two high-speed stacking ports allow you to combine multiple units into a single SummitStack management entity.

Power connectors include an AC or DC power input socket and a redundant power connector. (See specific switch descriptions for more information about the power options.) The switch automatically adjusts to the supply voltage. The redundant power connector allows you to connect the switch to the an external power supply. When a compatible external power supply is used with the Summit X450, X450a, or X450e series switch, the internal and external power supplies are fully fault tolerant. For most switches, if one power supply fails, the other power supply will provide sufficient power to operate the switch. For information about power supply redundancy with the Summit X450a-48p switch, see Summit X450e-48p Power Supplies.

For information about each switch series, see the following sections:
- Summit X450 Series Switches
- Summit X450a Series Switches
- Summit X450e Series Switches

Summit X450 Series Switches

The Summit X450 series switches are 24-port switches without PoE options.

The ports are implemented as fixed 10/100/1000BASE-t RJ-45 ports or as installable SFP modules. These switches are available only with AC internal power supplies.

The Summit X450 series switches include the following models:
- Summit X450-24t Switch
- Summit X450-24x Switch

Summit X450-24t Switch

The front panel of the Summit X450-24t switch includes:

- Twenty fixed autosensing 10/100/1000BASE-T ports (ports 5–24) that provide 20 Gbps of high-density copper connectivity
- Four combination ports (ports 1–4) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPS, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 67: Summit X450-24t Switch Front Panel

The rear panel of the Summit X450-24t switch includes:

- Slot for the Summit XGM-2xn option card, which allows you to add one or two 10-gigabit XENPAK modules

  See Summit XGM-2xn Option Card.
- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-160 External Power Module (Model No. 10907)

  The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.
- AC power input socket

  The internal power supply operates from 100 VAC to 240 VAC.

Figure 68: Summit X450-24t Switch Rear Panel

Summit X450-24x Switch

The front panel of the Summit X450-24x switch includes:

* Twenty fixed SFP ports (ports 5–24) that provide 20 Gbps of high-density fiber connectivity

  For information about SFPS, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*

* Four combination ports (ports 1–4) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

* LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.

* Stack number indicator showing the position of this switch in a stacked configuration
* Serial console port used to connect a terminal and perform local management
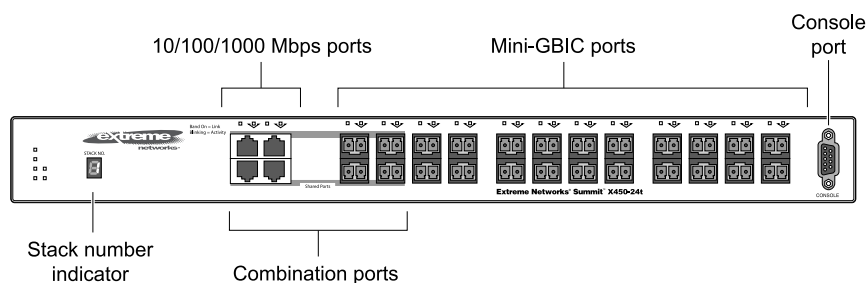
Figure 69: Summit X450-24x Switch Front Panel

The rear panel of the Summit X450-24x switch includes:

* Slot for the Summit XGM-2xn option card, which allows you to add one or two 10-gigabit XENPAK modules

  See Summit XGM-2xn Option Card.

* Management port with associated LEDs
* Two high-performance stacking ports with associated LEDs
* Redundant power input connector for optional connection to the EPS-160 External Power Module (Model No. 10907).

The connecting redundant power supply cable is shipped with the EPS-160 unit. See EPS-160 External Power Module (with EPS-T) for more information.

- AC power input socket

The internal power supply operates from 100 VAC to 240 VAC.
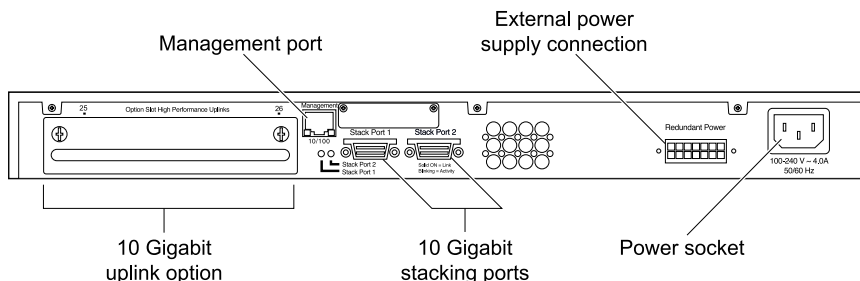
Figure 70: Summit X450-24x Switch Rear Panel

Summit X450a Series Switches

The Summit X450a series switches are 24-port or 48-port switches without PoE options.

The Ethernet ports are implemented as fixed 10/100/1000BASE-T RJ-45 ports or as installable SFP modules. These switches are available with either AC or DC internal power supplies. The switch automatically adjusts to the supply voltage. The internal AC power supply operates from 100 VAC to 240 VAC. The internal DC power supply operates from -36 VDC to -72 VDC.

The Summit X450a series switches include the following switches:

- Summit X450a-24t Switch
- Summit X450a-24t-TAA switch
- Summit X450a-24tDC Switch
- Summit X450a-24tDC-TAA switch
- Summit X450a-24x Switch
- Summit X450a-24x-TAA switch
- Summit X450a-24xDC Switch
- Summit X450a-24xDC-TAA switch
- Summit X450a-48t Switch
- Summit X450a-48t-TAA switch
- Summit X450a-48tDC Switch
- Summit X450a-48tDC-TAA switch

> **Note**
>
> In the descriptions that follow, references to a Summit X450a series model number also apply to the equivalent TAA-compliant switch version.

Summit X450a-24t Switch

The front panel of the Summit X450a-24t switch includes:

- Twenty fixed autosensing 10/100/1000 BASE-T ports (ports 1–20) that provide 20 Gbps of high-density copper connectivity
- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 71: Summit X450a-24t Switch Front Panel

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 23: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to one of the following redundant power supplies:
  - EPS-LD External Power Supply Unit (Model No. 45019)

    See EPS-LD External Power Supply Unit for more information.

- EPS-500 External Power Supply (Model 10911)

    See EPS-500 External Power Supply Unit for more information.

    The connecting redundant power supply cable is shipped with the external power supply.
- AC power input socket

    The internal power supply operates from 100 VAC to 240 VAC.
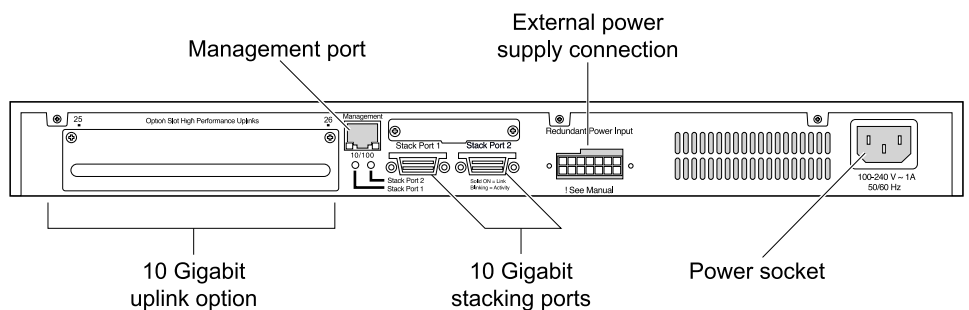
Figure 72: Summit X450a-24t Switch Rear Panel

Summit X450a-24tDC Switch

The front panel of the Summit X450a-24tDC switch includes:

- Twenty fixed autosensing 10/100/1000 BASE-T ports (ports 1–20) that provide 20 Gbps of high-density copper connectivity
- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

    For more information about combination ports, see Combination Ports and Failover.

    For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

    For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 73: Summit X450a-24tDC Switch Front Panel

The rear panel of the Summit X450a-24tDC switch (shown in Figure 74: Summit X450a-24tDC Switch Rear Panel on page 75) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 24: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Ethernet management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-150DC External Power Module (Model No. 10909)

  The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-150DC External Power Module (with EPS-T2) for more information.
- DC power input socket

  The internal power supply operates from -36 VDC to -72 VDC.
- Grounding lug

Note

For centralized DC power connection, this product is intended to be installed in a restricted access location (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

External power
supply connection

Management port

Grounding
lug

10 Gigabit
uplink option

10 Gigabit
stacking ports

DC power
socket

Figure 74: Summit X450a-24tDC Switch Rear Panel

Summit X450a-24x Switch

The front panel of the Summit X450a-24x switch includes:

- Twenty 1000BASE-X ports (ports 1–20) that provide 20 Gbps of high-density fiber (SFP) connectivity
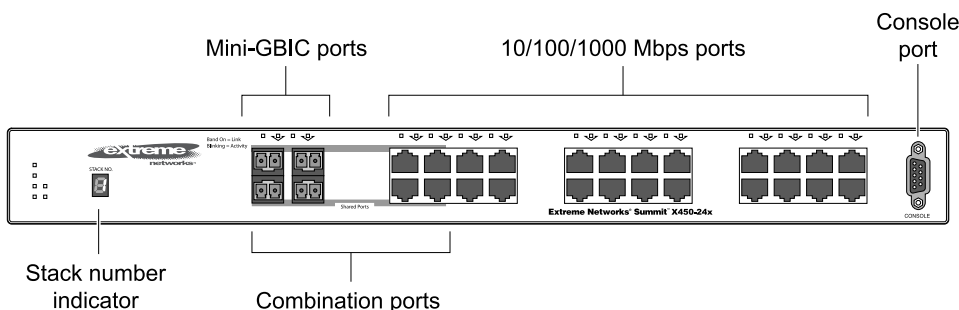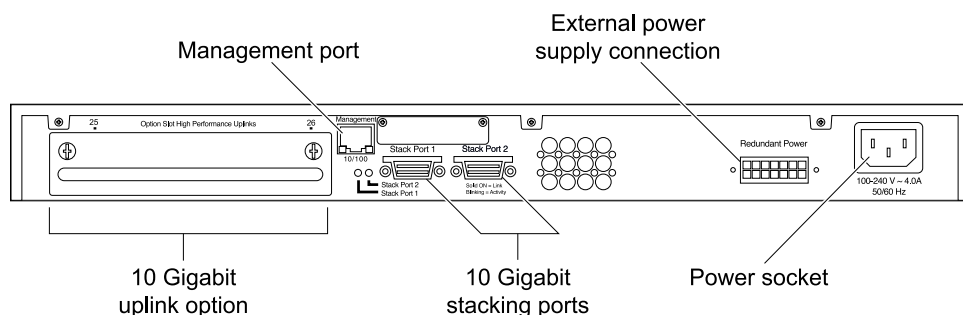- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Combination ports

Stack number
indicator

1000BASE-X ports

Console
port

Figure 75: Summit X450a-24x Switch Front Panel

The rear panel of the Summit X450a-24x switch (Figure 76: Summit X450a-24x Switch Rear Panel on page 76) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 25: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to one of the following external redundant power supplies:
  - EPS-LD External Power Supply Unit (Model No. 45019)

    See EPS-LD External Power Supply Unit for more information.
  - EPS-500 External Power Supply (Model 10911)

    See EPS-500 External Power Supply Unit for more information.

    The connecting redundant power supply cable is shipped with the external power supply.
- AC power input socket

  The internal power supply operates from 100 VAC to 240 VAC.

Figure 76: Summit X450a-24x Switch Rear Panel

Summit X450a-24xDC Switch

The front panel of the Summit X450a-24xDC switch includes:

- Twenty fixed autosensing 1000BASE-X ports (ports 1–20) that provide 20 Gbps of high-density fiber (SFP) connectivity
- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity
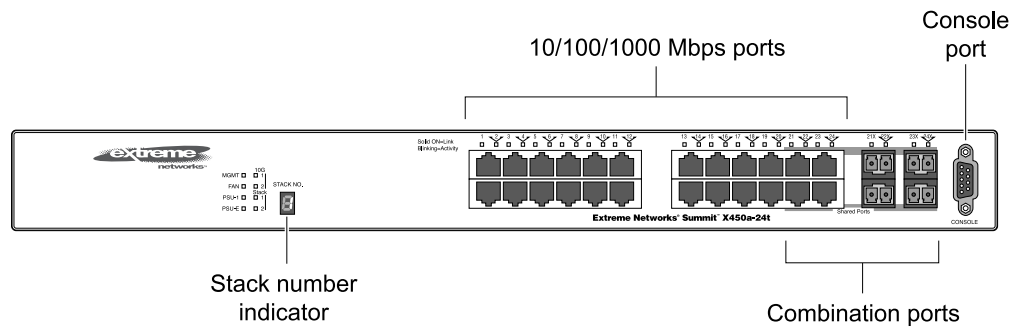
  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 77: Summit X450a-24xDC Switch Front Panel

The rear panel of the Summit X450a-24xDC switch (Figure 78: Summit X450a-24xDC Switch Rear Panel on page 78) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 26: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-150DC External Power Module (Model No. 10909)

  The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-150DC External Power Module (with EPS-T2) for more information.
- DC power input socket

  The internal power supply operates from -36 V DC to -72 V DC.
- Grounding lug

Note

For centralized DC power connection, this product is intended to be installed in a restricted access location (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Figure 78: Summit X450a-24xDC Switch Rear Panel

Summit X450a-48t Switch

The front panel of the Summit X450a-48t switch includes:

- Forty-four fixed autosensing 10/100/1000 BASE-T ports (ports 1–44) that provide 44 Gbps of high-density copper connectivity
- Four combination ports (ports 45–48) using RJ-45 connectors and SFPs to provide 4 Gbps of fiber or copper connectivity
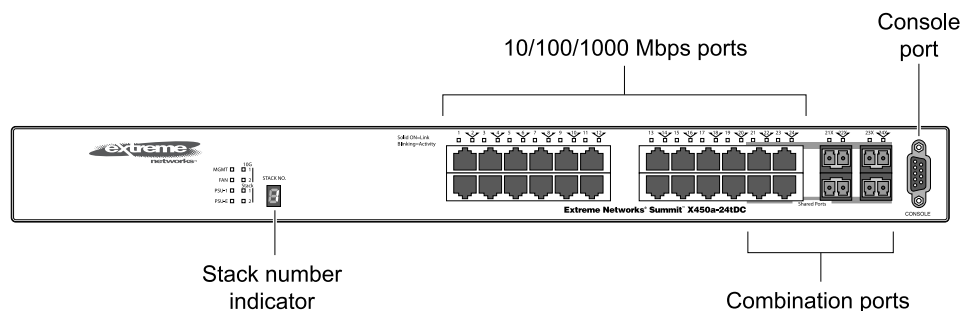
  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.

- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management
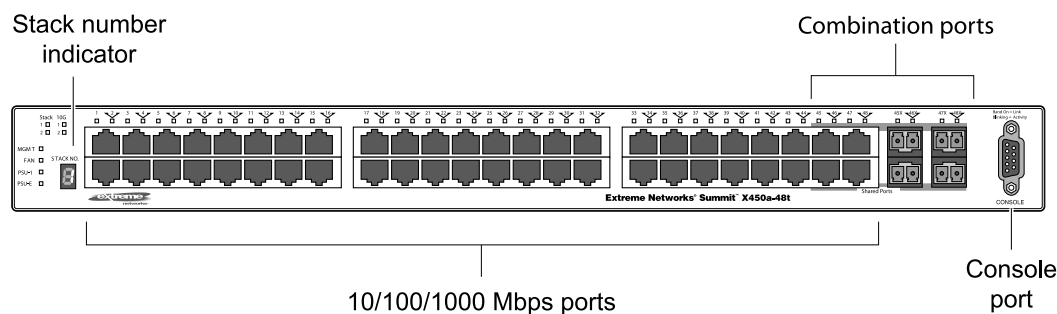
Figure 79: Summit X450a-48t Switch Front Panel

The rear panel of the Summit X450a-48t switch (Figure 80: Summit X450a-48t Switch Rear Panel on page 79) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 27: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Supply Unit (Model No. 10911)

  The connecting redundant power supply cable is shipped with the EPS-500 power supply. See EPS-500 External Power Supply Unit for more information.
- AC power input socket

  The internal power supply operates from 100 VAC to 240 VAC.

Figure 80: Summit X450a-48t Switch Rear Panel

Summit X450a-48tDC Switch

The front panel of the Summit X450a-48tDC switch includes:

- Forty-four fixed autosensing 10/100/1000 BASE-T ports (ports 1–44) that provide 44 Gbps of high-density copper connectivity
- Four combination ports (ports 45–48) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management

Figure 81: Summit X450a-48tDC Switch Front Panel

The rear panel of the Summit X450a-48tDC switch (Figure 82: Summit X450a-48tDC Switch Rear Panel on page 81) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 28: Port Option Cards for Summit X450a Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-150DC External Power Module (Model No. 10909)

  The connecting redundant power supply cable is shipped with the EPS-150DC unit. See EPS-500 External Power Supply Unit for more information.
- DC power input socket

  The internal power supply operates from -36 V DC to -72 V DC.
- Grounding lug

Note

For centralized DC power connection, this product is intended to be installed in a restricted access location (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

Figure 82: Summit X450a-48tDC Switch Rear Panel

Summit X450e Series Switches

The Summit X450e series switches provide 24 or 48 fixed 10/100/1000BASE-T Ethernet ports using RJ-45 connectors.

Models are available with PoE and without PoE. These switches are available only in AC-powered models.

The Summit X450e series of switches consists of the following switches:

- Summit X450e-24t Switch
- Summit X450e-24t-TAA switch
- Summit X450e-48t Switch
- Summit X450e-48t-TAA switch
- Summit X450e-24p Switch
- Summit X450e-24p-TAA switch
- Summit X450e-48p Switch
- Summit X450e-48p-TAA switch

> **Note**
>
> In the descriptions that follow, references to a Summit X450e series model number also apply to the equivalent TAA-compliant switch version.

Summit X450e-24t Switch

The front panel of the Summit X450e-24t switch includes:

- Twenty fixed autosensing 10/100/1000BASE-T ports (ports 1–20) that provide 20 Gbps of high-density copper connectivity
- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.
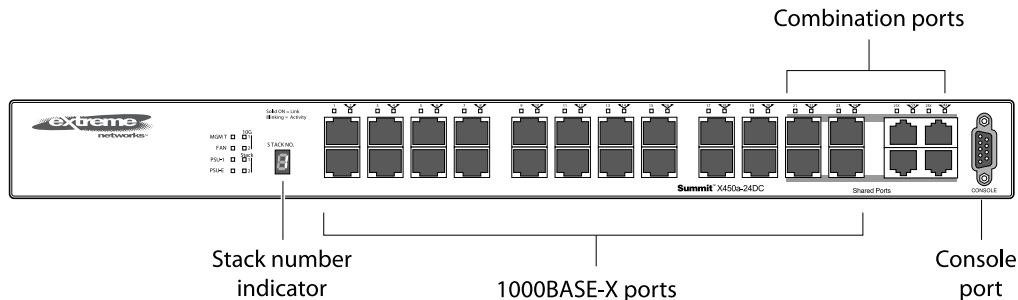
  For information about SFPS, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

For a description of the LEDs and their operation, see LEDs on the Summit X450, X450a, and X450e Switches LEDs on the Summit X450, X450a, and X450e Switches.

- Serial console port used to connect a terminal and perform local management

The rear panel of the Summit X450e-24t switch (Figure 83: Summit X450e-24t Switch Rear Panel on page 82) includes:

- Slot for one of the Summit option cards listed in Port Option Cards for Summit X450a Series Switches. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 29: Port Option Cards for Summit X450e Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Module (Model No. 10907).

  The connecting redundant power supply cable is shipped with the EPS-500 unit. See EPS-500 External Power Supply Unit for more information.
- AC power input socket

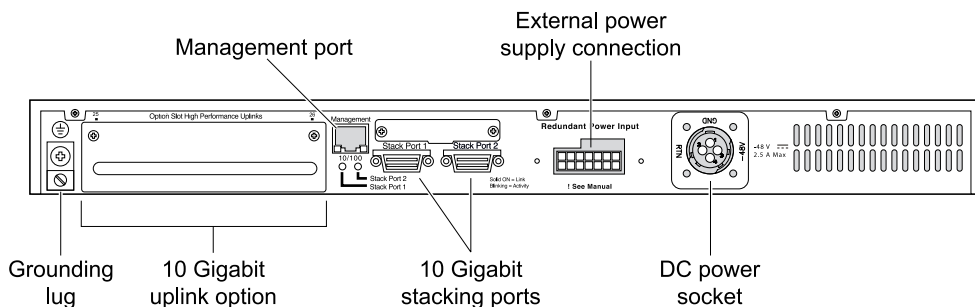 The internal power supply operates from 100 VAC to 240 VAC.

Figure 83: Summit X450e-24t Switch Rear Panel

Summit X450e-48t Switch

The front panel of the Summit X450e-48t switch includes:

- Forty-four fixed autosensing 10/100/1000 BASE-T ports (ports 1–44) that provide 44 Gbps of high-density copper connectivity
- Four combination ports (ports 45–48) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.

- Serial console port used to connect a terminal and perform local management

Figure 84: Summit X450e-48t Switch Front Panel

The rear panel of the Summit X450e-48t switch (Figure 85: Summit X450e-48t Switch Rear Panel on page 84) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

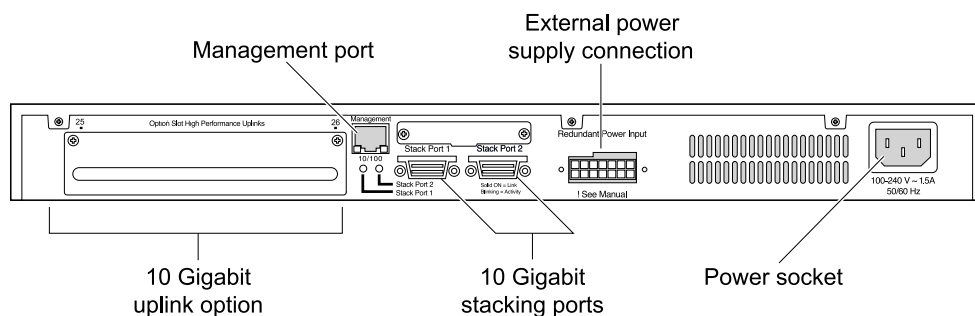**Table 30: Port Option Cards for Summit X450e Series Switches**

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-500 External Power Supply Unit (Model No. 10911).

  See EPS-500 External Power Supply Unit for more information. The connecting redundant power supply cable is shipped with the EPS-500 power supply.

- AC power input socket

  The power supply operates from 100 VAC to 240 VAC.
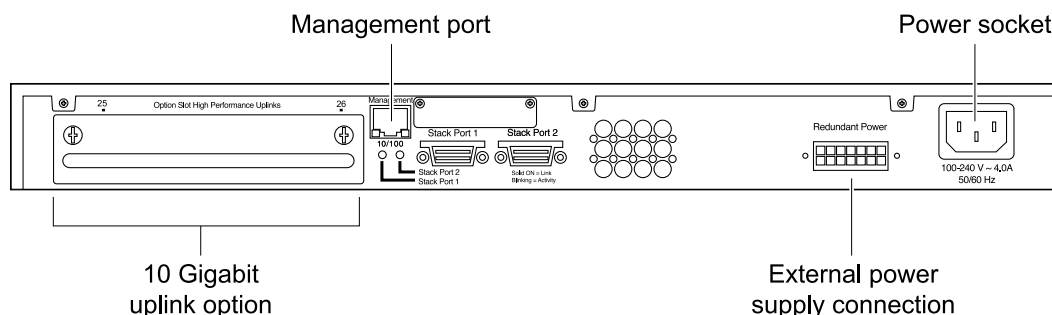
Figure 85: Summit X450e-48t Switch Rear Panel

Summit X450e-24p Switch

The front panel of the Summit X450e-24p switch includes:

- Twenty fixed autosensing 10/100/1000 BASE-T PoE ports (ports 1–20) that provide high-density copper connectivity and a full 15.4 Watts of PoE per port
- Four combination ports (ports 21–24) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

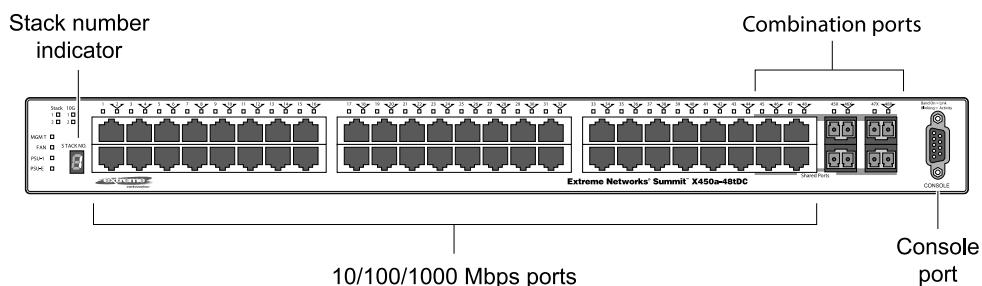   For more information about combination ports, see Combination Ports and Failover.

   For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*

> **Note**
>
> All 24 ports can provide PoE power.

- LEDs to indicate port status and switch operating conditions

   For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management
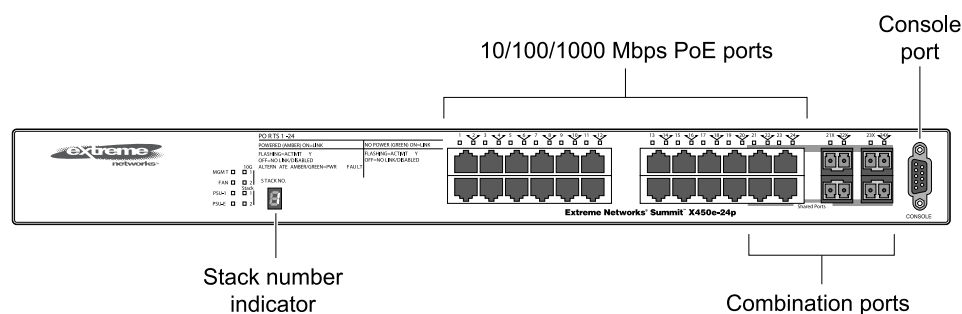
Figure 86: Summit X450e-24p Switch Front Panel

The rear panel of the Summit X450e-24p switch (Figure 87: Summit X450e-24p Switch Rear Panel on page 85) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

Table 31: Port Option Cards for Summit X450e Series Switches

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to one of the following external redundant power supplies with full PoE power support:
  - EPS-LD External Power Supply Unit (Model 45019)

    See EPS-LD External Power Supply Unit for more information.
  - EPS-500 External Power Supply (Model 10911).

    See EPS-500 External Power Supply Unit for more information.

    The connecting redundant power supply cable is shipped with the power supply.
- AC power input socket

  The internal power supply operates from 100 VAC to 240 VAC.
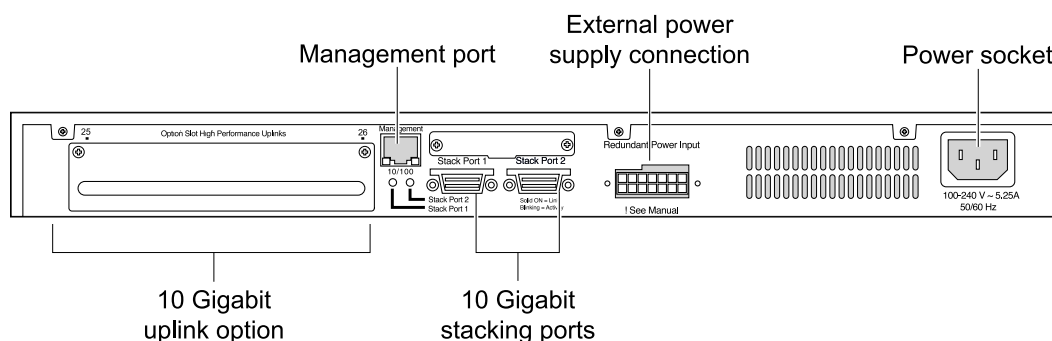
Figure 87: Summit X450e-24p Switch Rear Panel

Summit X450e-48p Switch

The front panel of the Summit X450e-48p switch includes:

- Forty-four fixed autosensing 10/100/1000 BASE-T PoE ports (ports 1–44) that provide high-density copper connectivity and a full 15.4 Watts of PoE per port when used with the EPS-C/EPS-600LS
- Four combination ports (ports 45–48) using RJ-45 connectors and SFPs to provide 4 Gbps of copper or fiber connectivity

  For more information about combination ports, see Combination Ports and Failover.

For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

Note

All 48 ports can provide PoE power

- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X450, X450a, and X450e Series Switch LEDs.
- Stack number indicator showing the position of this switch in a stacked configuration
- Serial console port used to connect a terminal and perform local management
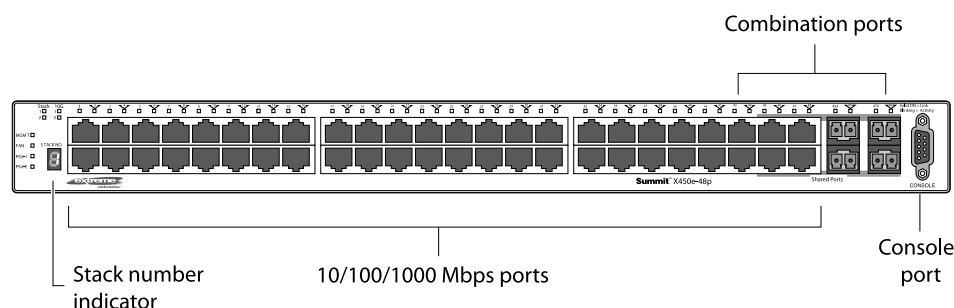
Figure 88: Summit X450e-48p Switch Front Panel

The rear panel of the Summit X450e-48p switch (Figure 89: Summit X450e-48p Switch Rear Panel on page 87) includes:

- Slot for one of the Summit option cards listed in the following table. These port option cards allow you to add one or two high-speed uplink ports to the switch.

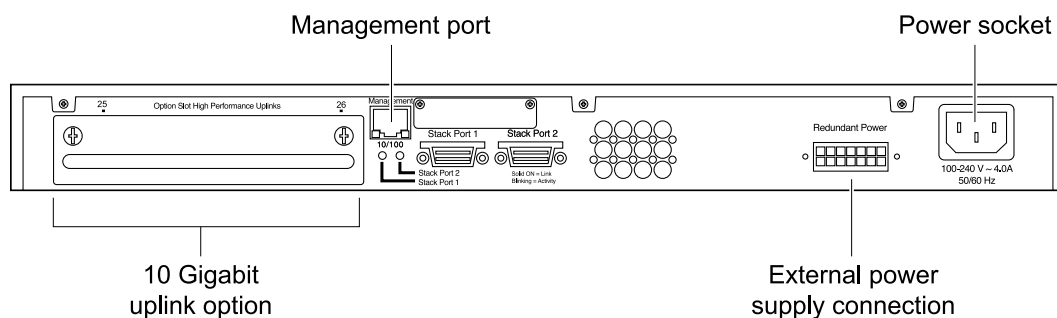**Table 32: Port Option Cards for Summit X450e Series Switches**

Option Card Model	Type of Added Ports	For More Information, see . . .
XGM2-2xn option card	10-gigabit XENPAK modules	Summit XGM2-2xn Option Card
XGM2-2xf option card	10-gigabit XFP modules	Summit XGM2-2xf Option Card
XGM2-2sf option card	10-gigabit SFP+ modules	Summit XGM2-2sf Option Card
XGM2-2bt option card	Fixed 10GBASE-T copper	Summit XGM2-2bt Option Card

- Management port with associated LEDs
- Two high-performance stacking ports with associated LEDs
- Redundant power input connector for optional connection to the EPS-C chassis (Model No. 10912). This chassis can hold up to three EPS-600LS External Power Modules (Model No. 10913). The connecting redundant power supply cable is shipped with the EPS-C chassis.

  The PoE capability of the Summit X450e-48p switch varies depending on the number of external power modules in use. For more information, see Summit X450e-48p Power Supplies and EPS-600LS External Power Module.
- AC power input socket

  The power supply operates from 100 VAC to 240 VAC.
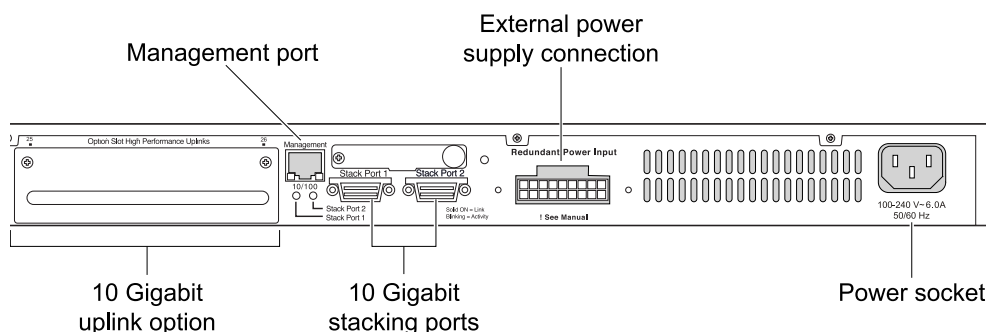
Figure 89: Summit X450e-48p Switch Rear Panel

Summit X450e-48p Power Supplies

Internal Power Supply

The Summit X450e-48p switch is powered by both an internal power supply and an optional external redundant power supply system.

The internal Summit X450e-48p power supply can provide 370 W of PoE power, as follows:

- In a 24-port configuration, it provides 15.4 W to each port.
- In 48-port configuration or any combination of ports where total PoE power does not exceed 370 watts, it provides 7.7 W to each port.

If the total system demands exceed this power limit, you can 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**
>
> For a detailed discussion of these concepts, see the Power over Ethernet section in the *ExtremeXOS Concepts Guide*.

External Power Supplies

The Summit X450e-48p switch can 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. The following table summarizes the PoE power behavior for the Summit X450e-48p switch based on the number of power supply modules in use.

Internal Power Supply Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External Power Supply/ 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 more information, see EPS-600LS External Power Module.

Summit X450, X450a, and X450e Series Switch LEDs

The following describes the meanings of the LEDs on the Summit X450, X450a, and X450e series switches.

Table 33: Front Panel

Label or Type	Color/State	Meaning
MGMT	Blinking green (fast)	Power-on self-test (POST) in progress.
	Steady green	POST passed. System is booting image.
	Blinking green (slow)	Normal operation
	Blinking amber	Switch diagnostics running. or System is disabled. POST failed or system overheated.
	Off	No external power attached.
FAN	Steady green	Normal operation
	Steady amber*	A single fan in the array has failed. The switch can continue to operate indefinitely.*
	Blinking amber	Failure or Two or more fans in the array have failed. Because system cooling is compromised, you should replace the switch.*
	Off	No power
	* These states for the Fan LED occur only on Summit X450a-48tDC switches with a manufacturing part number of 800294-00 and X450a-48tDC-TAA switches with a manufacturing part number of 800337-00.	
PSU-I (Internal power supply)	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power

Table 33: Front Panel (continued)

Label or Type	Color/State	Meaning
PSU-E (External power supply)	Steady green	Normal operation
	Blinking amber	Failure
	Off	No external power attached.
Ethernet Ports 1 – 24 or 1 – 48 (21 – 24 and 45 – 48 are shared ports)	Steady green	Link OK
	Blinking green	Activity
	Off	Link is not present or port is disabled.
Stack Number Indicator	Top half of number blinking	This switch is the stack master.
	Lower half of number blinking	This switch is the stack backup.
	Number lights steadily	This switch is a standby node (neither the master nor the backup).
	LED dark	This stackable switch is not in stacking mode.

Table 34: Additional Port LED meanings for PoE switches: Summit X450e-24p & Summit X450e-48p

Label or Type	Color/State	Meaning
All front-panel ports	Steady 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 has a fault.
	Off	Port is not powered, has no link, or is disabled.

Table 35: Rear Panel

Label or Type	Color/State	Meaning
Management Port	Steady green	Link OK
	Blinking green	Activity
Stacking Port	Steady green	Link OK
	Blinking green	Activity
SFP 1G Port (on installed option card)	Steady green	Link OK
	Blinking green	Activity
XENPAK 10G Port (on installed option card)	Steady green	Link OK
	Blinking green	Activity
XFP 10G Port (on installed option card)	Steady green	Link OK
	Blinking green	Activity

Summit X460 Series Switches

The Summit X460 series switches are 24-port or 48-port switches that provide Ethernet connectivity using fixed 10/100/1000BASE-T RJ-45 ports or installable SFP or SFP+ optical modules.

Two Summit X460 models support the PoE+ IEEE 802.3at standard and provide up to 30 Watts of power per port. These models provide a total switch PoE power budget of 380 Watts with a single installed power supply and 760 Watts with two installed power supplies.

Four of the Summit X460 models include ports that support Synchronous Ethernet. Five models have four combination ports that provide 10/100/1000 BASE-T or SFP connectivity for 4 Gbps of copper or fiber connectivity.

A serial console port on the front panel allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configurations. The Ethernet management port supports 10/100/1000 Mbps speeds.

The rear panel of the switch provides slots for installing the Summit option cards listed in the following table. These port option cards allow you to add high-speed data ports or stacking ports to the switch.

Port Option Cards for Summit X460 Series Switches

Table 36: Slot A

Option Card Model	Connector Type	Port Type	More Information, Is on . . .
XGM3-2sf	10-gigabit XENPAK modules	Data	XGM3-2sf Port Option Card
XGM3S-2sf	10-gigabit SFP+ modules	Data with Sync-E support	XGM3S-2sf Port Option Card
XGM3S-2xf	10-gigabit XFP modules	Data with Sync-E support	XGM3S-2xf Port Option Card

Table 37: Slot B

Option Card Model	Connector Type	Port Type	More Information, Is on . . .
SummitStack stacking module	Integrated stacking ports	20-Gbps bidirectional stacking	Summit X460 Series Stacking Modules
SummitStack-V80 stacking module	QSFP+ optical modules or QSFP+ compatible active or passive cables	20-Gbps bidirectional stacking	Summit X460 Series Stacking Modules
XGM3SB-4sf	10-gigabit SFP+ modules	Data with Sync-E support	XGM3SB-4sf Port Option Card

Cooling is provided by a replaceable fan module. Two power supply bays accommodate either an AC or DC power supply; the PoE-capable models require a specific AC power supply. For more information

about the power supplies used in the Summit X460 switches, see Summit Replaceable Internal Power Supplies.

The Summit X460 series switches include the following base models:

- Summit X460-24t Switch
- Summit X460-48t Switch
- Summit X460-24x Switch
- Summit X460-48x Switch
- Summit X460-24p Switch
- Summit X460-48p Switch

Summit X460-24t Switch

The front panel of the Summit X460-24t switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24) that provide 24 Gbps of high-density copper connectivity
- Eight unpopulated SFP ports (ports 21–28) that provide 8 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.
- Stack number indicator

Figure 90: Summit X460-24t Switch Front Panel

The rear panel of the Summit X460-24t switch (Figure 91: Summit X460-24t Switch Rear Panel on page 92) includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)

- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 300-Watt AC and DC Power Supplies)
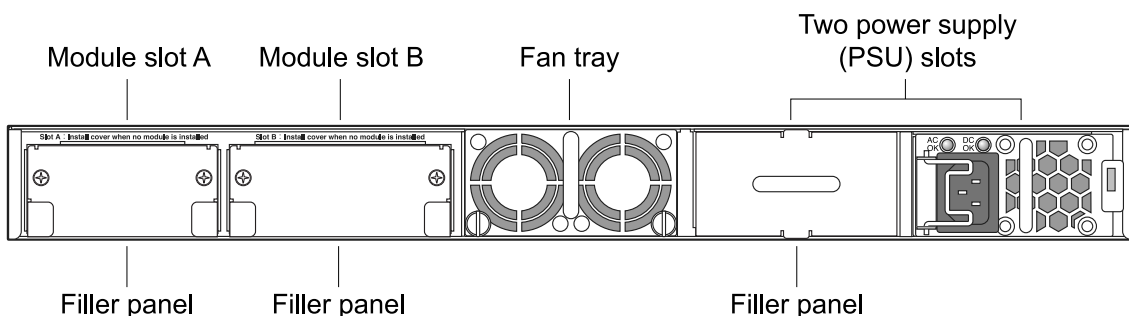
Figure 91: Summit X460-24t Switch Rear Panel

Summit X460-48t Switch

- Forty-eight fixed autosensing 10/100/1000BASE-T ports (ports 1–48) that provide 48 Gbps of high-density copper connectivity
- Four unpopulated SFP ports (ports 49–52) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.
- Stack number indicator
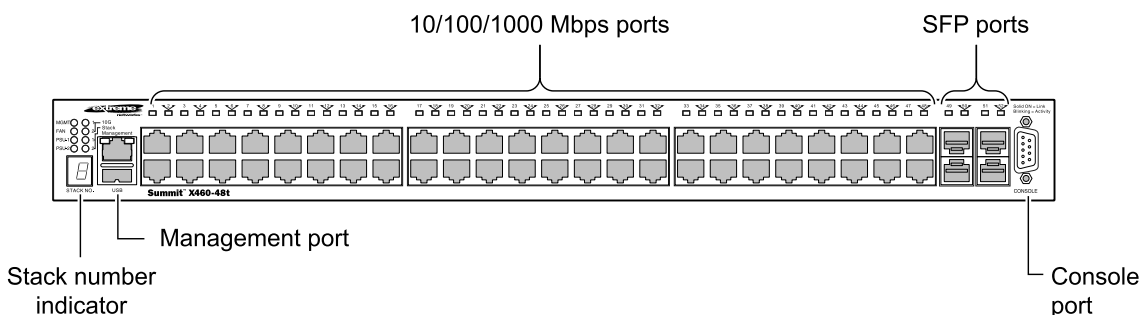
Figure 92: Summit X460-48t Switch Front Panel

The rear panel of the Summit X460-48t switch includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 300-Watt AC and DC Power Supplies)

Module slot A   Module slot B   Fan tray   Two power supply (PSU) slots

Filler panel   Filler panel   Filler panel
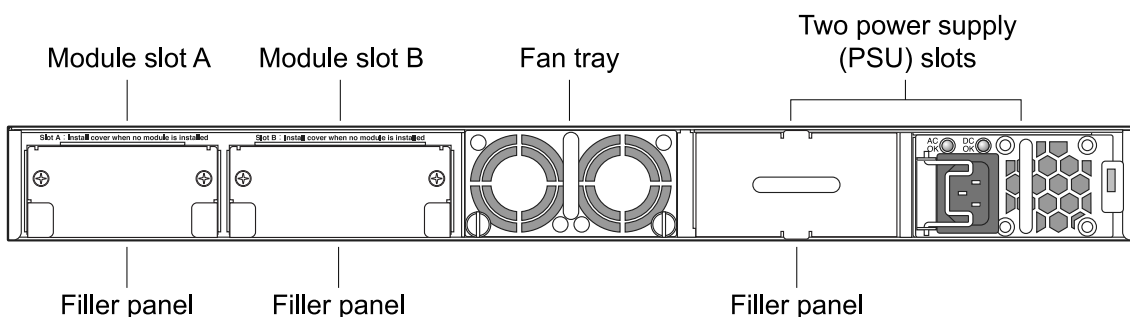
Figure 93: Summit X460-48t Switch Rear Panel

Summit X460-24x Switch

The front panel of the Summit X460-24x switch includes:

- Twenty-four unpopulated SFP ports (ports 1–24) that provide 24 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

- Eight fixed autosensing 10/100/1000BASE-T ports (ports 21–28) that provide 8 Gbps of high-density copper connectivity

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  Ports 1 through 28 support Synchronous Ethernet. For information about this feature, see the *ExtremeXOS Concepts Guide*.

- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.

- Stack number indicator

SFP ports   10/100/1000 Mbps ports

Stack number indicator   Management port   Combination ports   Console port
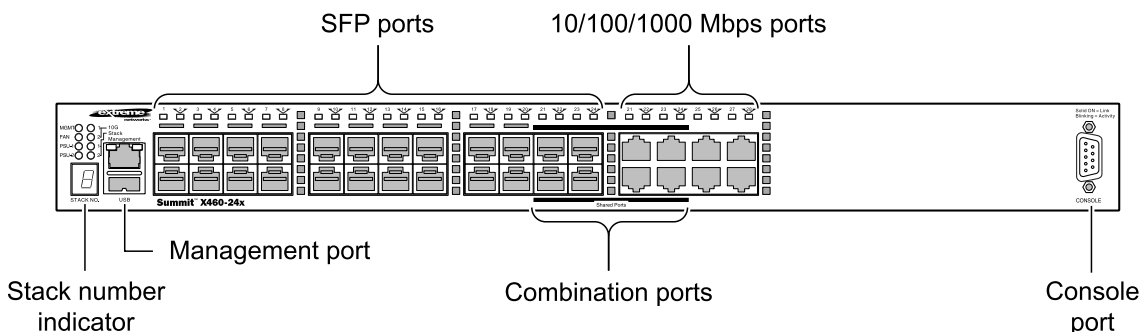
Figure 94: Summit X460-24x Switch Front Panel

The rear panel of the Summit X460-24x switch (Figure 95: Summit X460-24x Switch Rear Panel on page 94) includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 300-Watt AC and DC Power Supplies)
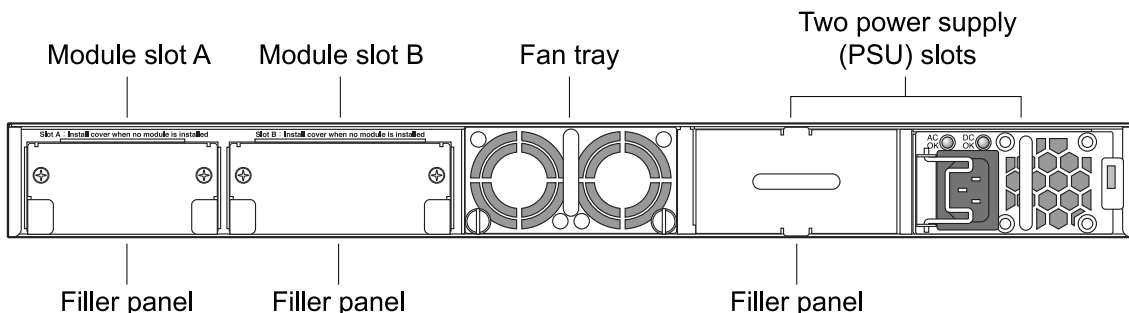
Figure 95: Summit X460-24x Switch Rear Panel

Summit X460-48x Switch

- Forty-eight unpopulated SFP ports (ports 1–48) that provide 48 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.

  All the front-panel ports on the Summit X460-48x switch support Synchronous Ethernet. For information about this feature, see the *ExtremeXOS Concepts Guide*.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.
- Stack number indicator
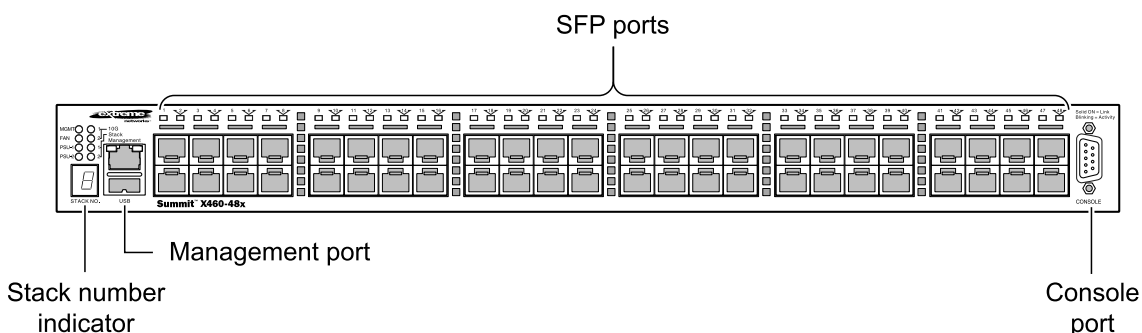
Figure 96: Summit X460-48x Switch Front Panel

The rear panel of the Summit X460-48x switch includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)

- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 300-Watt AC and DC Power Supplies
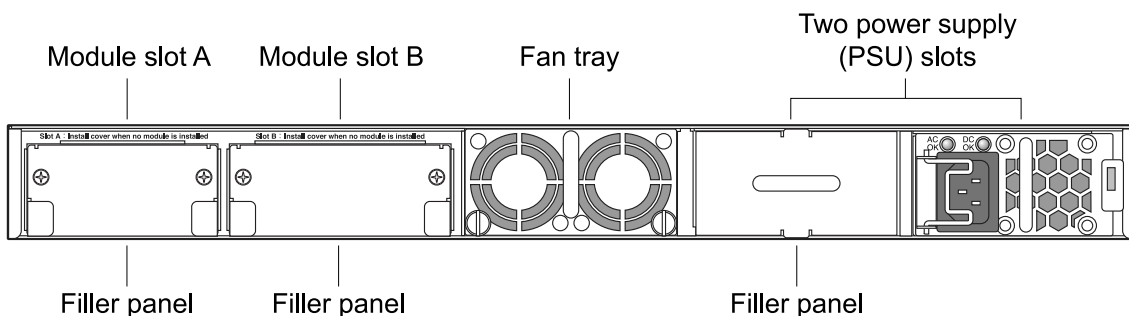
Figure 97: Summit X460-48x Switch Rear Panel

Summit X460-24p Switch

The front panel of the Summit X460-24p switch includes:

- Twenty-four fixed autosensing 10/100/1000BASE-T ports (ports 1–24). In addition to 24 Gbps of high-density copper connectivity, these ports also provide up to 30 Watts of PoE per port.
- Eight unpopulated SFP ports (ports 21–28) that provide 8 Gbps of fiber connectivity. The SFP ports support both 100BASE-X and 1000BASE-X optical modules.

  Ports 21 through 24 are implemented as shared ports that pair a copper port with a fiber port. For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.
- Stack number indicator

Figure 98: Summit X460-24p Switch Front Panel

The rear panel of the Summit X460-24p switch (Figure 99: Summit X460-24p Switch Rear Panel on page 96) includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)
- Replaceable fan tray
- Two power supply bays for the Summit 750 W AC power supply (see Summit 750-Watt AC Power Supply

> **Note**
>
> Only the Summit 750 W AC power supply is compatible with the Summit X460-24p switch. Other Summit replaceable power supplies do not support PoE operation in this switch.
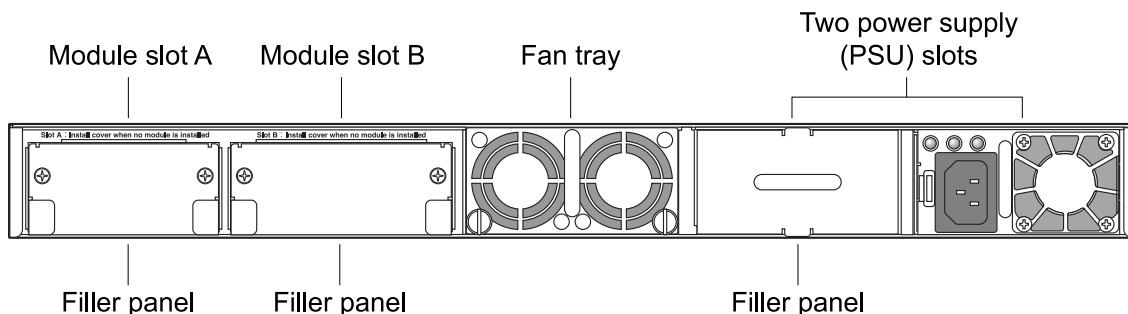
Figure 99: Summit X460-24p Switch Rear Panel

Summit X460-48p Switch

The front panel of the Summit X460-48p switch includes:

- Forty-eight autosensing 10/100/1000BASE-T ports (ports 1–48). In addition to 48 Gbps of high-density copper connectivity, these ports provide up to 30 Watts of PoE per port.
- Four unpopulated SFP ports (ports 49–52) that provide 4 Gbps of fiber connectivity. The SFP ports support both 100BASE-FX and 1000BASE-X optical modules.
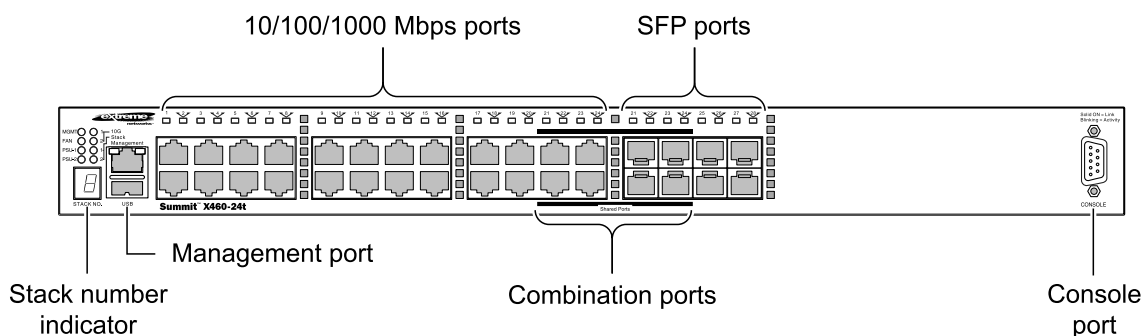
  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X460 Series Switch LEDs.
- Stack number indicator

10/100/1000 Mbps ports   SFP ports

Management port

Stack number   Console
indicator   port
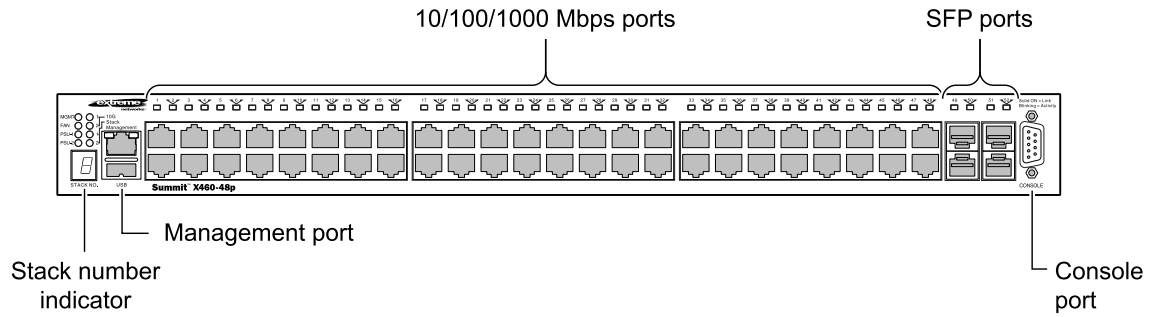
Figure 100: Summit X460-48p Switch Front Panel

The rear panel of the Summit X460-48p switch (Figure 101: Summit X460-48p Switch Rear Panel on page 97) includes:

- Two slots for port option cards or stacking modules (see Port Option Cards for Summit X460 Series Switches)
- Replaceable fan tray
- Two power supply bays for the Summit 750 W AC power supply (see Summit 750-Watt AC Power Supply)

Note

Only the Summit 750 W AC power supply is compatible with the Summit X460-24p switch. Other Summit replaceable power supplies do not support PoE operation in this switch.

Module slot A   Module slot B   Fan tray   Two power supply
                                              (PSU) slots

Filler panel   Filler panel   Filler panel
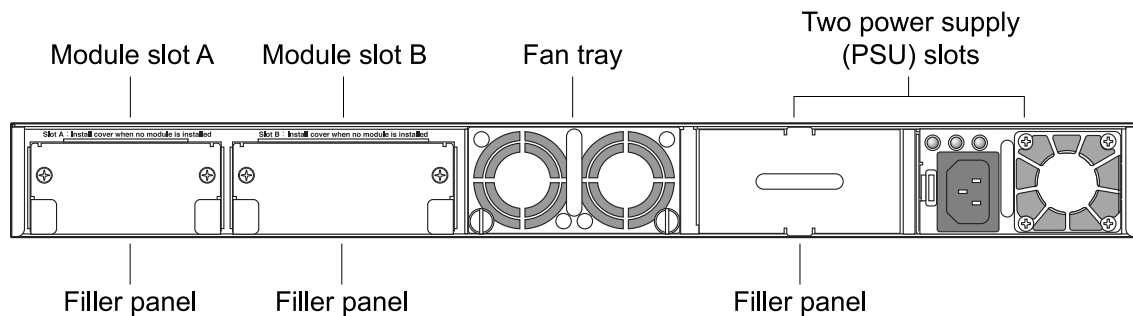
Figure 101: Summit X460-48p Switch Rear Panel

Summit X460 Series Switch LEDs

The following table describes the LEDs on the Summit X460 series switches.

Table 38: Front Panel LEDs

Label or Type	Color/State	Meaning
MGMT	Steady green	Power-on self test (POST) completed successfully; normal operation.
	Blinking green	POST is in progress.
	Blinking amber	POST failed, or the system has over-heated.
	Off	No external power attached.
FAN	Steady green	Normal operation.
	Blinking amber	Failure.
	Off	No power.
PSU-1, PSU-2	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Failure.
	Off	No power is attached.
10G 1 – 2	Steady green	Link OK on the indicated 10-Gbps port.
	Blinking green	Activity on the indicated 10-Gbps port.
Stack Management 1 – 2	Steady green	Link OK on the indicated stack port.
	Blinking green	Activity on the indicated stack port.

Table 39: 2-digit Stack number Indicator

Label or Type	Color/State	Meaning
Left digit (1)		*Reserved for future use*
Right digit (1 – 8) Indicates the position of this switch in the SummitStack configuration.	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.
Ethernet Ports 1 – 28 or 1 – 48	Steady green	Link OK
	Blinking green	Activity
	Off	No link, or port is disabled.

Table 40: Additional Port LED meanings for PoE switches: Summit X460-24p & Summit X460-48p

Label or Type	Color/State	Meaning
All front-panel ports	Steady amber	Port is powered with link, no traffic
	Blinking amber	Port is powered with link, traffic
	Off	Port is not powered, has no link, or is disabled

Table 40: Additional Port LED meanings for PoE switches: Summit X460-24p & Summit X460-48p (continued)

Label or Type	Color/State	Meaning
Management Port	Steady green	Link OK
	Blinking green	Activity
	Off	No link, or port is disabled.

Table 41: Back Panel

Label or Type	Color/State	Meaning
Port LED (on installed port option card)	Steady green	Link OK
	Blinking green	Activity
Stacking Port LED (on installed SummitStack or SummitStack-V80 module)	Steady green	Link OK
	Blinking green	Activity

Summit X460-G2 Series Switches

The Summit 460-G2 series switches provide 24 or 48 Ethernet ports that deliver high-density fast Ethernet or Gigabit Ethernet connectivity using fixed 10/100/1000BASE-T ports or 100/1000 BASE-X ports. In addition some models offer either 24 or 48 POE+ ports.

The Summit X460 series G2 switches include the following base models:
- Summit X460-G2-24t-GE4 switch
- Summit X460-G2-24t-10GE4 switch
- Summit X460-G2-48t-GE4 switch
- Summit X460-G2-48t-10GE4 switch
- Summit X460-G2-24p-GE4 switch
- Summit X460-G2-24p-10GE4 switch
- Summit X460-G2-48p-GE4 switch
- Summit X460-G2-48p-10GE4 switch
- Summit X460-G2-24x-10GE4 switch
- Summit X460-G2-48x-10GE4 switch

Each base model is available with either front-to-back or back-to-front cooling. There is no operational difference between these switch versions.

A serial console port on the front panel of the Summit X460-G2 series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

Switch cooling is provided by replaceable fan modules. Fan modules are available in two different models that direct the airflow either from front to back or from back to front. Two power supply bays

accommodate either AC or DC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fans.

Like the fan modules, the power supplies are available in models with either front-to-back or back-to-front cooling airflow. For more information about the power supplies used in the Summit X460-G2 switches, see Summit Replaceable Internal Power Supplies.

> **Caution**
> Air must flow in the same direction for all installed fan modules and power supplies in a switch.

Versatile Interface Module (VIM) Options for X460-G2 Series Switches

- VIM-2q Ethernet Module with 2x40G ports.
- VIM-2ss SummitStack Module.
- VIM-2t Ethernet Module with 2x10GBase-T ports.
- VIM-2x Ethernet Module with 2x10GSFP+ ports.
- TM-CLK Clock Module to support Sync-E and 1588.

> **Warning**
> The switch must be powered off before you install any interface module options (VIMs or Clock Modules). The interface module options are not hot swappable.

For more information on X460-G2 VIM and Clock module options, see Optional Ports for the Summit X460-G2 Series Switches on page 166

Summit X460-G2-24t-GE4 Switch Ports and Slots

The Summit X460-G2-24t-GE4 switch ports and slots include:

- 24 front panel ports of 10/100/1000BASE-T (ports 1-24, four of which are shared with SFP ports), four combo (shared) SFP ports, and four dedicated SFP ports (100/1000BASE-X and 100FX), and four ports of 1G SFP (ports 29-32).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 102: Summit X460-G2-24t-GE4 Front Panel

1 = Stack number indicator	5 = Combo ports
2 = Console port/Ethernet management port	6 = SFP ports
3 = USB port	7 = SFP 1G ports
4 = 10/100/1000BASE-T ports	
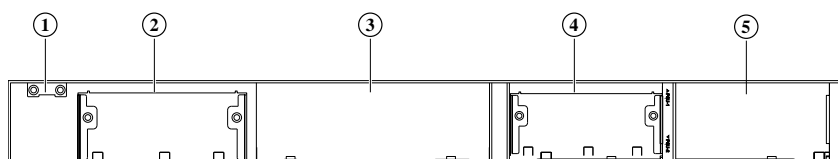
Figure 103: Summit X460-G2-24t-GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-24t-10GE4 Switch Ports and Slots

The Summit X460-G2-24t-10GE4 switch ports and slots include:

- 24 front panel ports of 10/100/1000BASE-T (ports 1-24, four of which are shared with SFP ports), four combo (shared) SFP ports, and four dedicated SFP ports (100/1000BASE-X and 100FX), and four ports of 10G SFP+ (ports 29-32, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 104: Summit X460-G2-24t-10GE4 Front Panel

1 = Stack number indicator	5 = Combo ports
2 = Console port/Ethernet management port	6 = SFP ports
3 = USB port	7 = SFP+ 10G ports
4 = 10/100/1000BASE-T ports	

Figure 105: Summit X460-G2-24t-10GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-48t-GE4 Switch Ports and Slots

The Summit X460-G2-48t-GE4 switch ports and slots include:

- 48 front panel ports of 10/100/1000BASE-T (ports 1-48), and four ports of 1G SFP (ports 49-52).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 106: Summit X460-G2-48t-GE4 Front Panel

1 = Stack number indicator	5 = SFP 1G ports
2 = Console port/Ethernet management port	
3 = USB port	
4 = 10/100/1000BASE-T ports	

Figure 107: Summit X460-G2-48t-GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-48t-10GE4 Switch Ports and Slots

The Summit X460-G2-48t-10GE4 switch ports and slots include:

- 48 front panel ports of 10/100/1000BASE-T (ports 1-48), and four ports of 10G SFP+ (ports 49-52, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 108: Summit X460-G2-48t-10GE4 Front Panel

1 = Stack number indicator	4 = 10/100/1000BASE-T ports
2 = Console port/Ethernet management port	5 = SFP+ 10G ports
3 = USB port	

Figure 109: Summit X460-G2-48t-10GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-24p-GE4 Switch Ports and Slots

The Summit X460-G2-24p-GE4 switch ports and slots include:

- 24 front panel POE+ ports of 10/100/1000BASE-T (ports 1-24, four of which are shared with SFP ports), four combo (shared) SFP ports, and four dedicated SFP ports (100/1000BASE-X and 100FX), and four ports of 1G SFP (ports 29-32).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 110: Summit X460-G2-24p-GE4 Front Panel

1 = Stack number indicator	5 = combo ports
2 = Console port/Ethernet management port	6 = SFP ports
3 = USB port	7 = SFP 1G ports
4 = POE+ 10/100/1000BASE-T ports	

Figure 111: Summit X460-G2-24p-GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-24p-10GE4 Switch Ports and Slots

The Summit X460-G2-24p-10GE4 switch ports and slots include:

- 24 front panel POE+ ports of 10/100/1000BASE-T (ports 1-24, four of which are shared with SFP ports), four combo SFP ports, and four dedicated SFP ports (100/1000BASE-X and 100FX), and four ports of 10G SFP+ (ports 29-32, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.
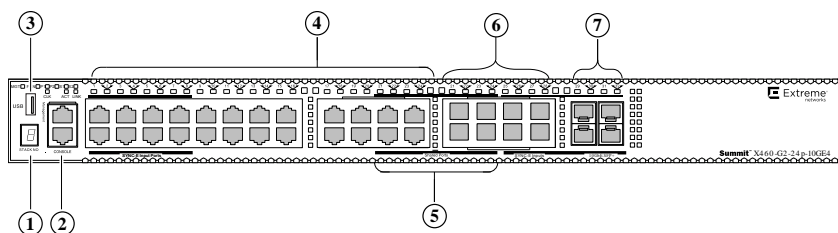
Figure 112: Summit X460-G2-24p-10GE4 Front Panel

1 = Stack number indicator	5 = combo ports
2 = Console port/Ethernet management port	6 = SFP ports
3 = USB port	7 = SFP+ 10G ports
4 = POE+ 10/100/1000BASE-T ports	
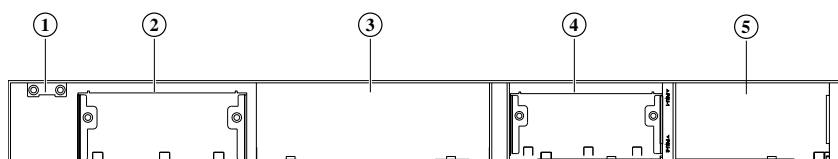
Figure 113: Summit X460-G2-24p-10GE4 Rear Panel

1= TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-48p-GE4 Switch Ports and Slots

The Summit X460-G2-48p-GE4 switch ports and slots include:

- 48 front panel POE+ ports of 10/100/1000BASE-T (ports 1-48), and four ports of 1G SFP (ports 49-52).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 114: Summit X460-G2-48p-GE4 Front Panel

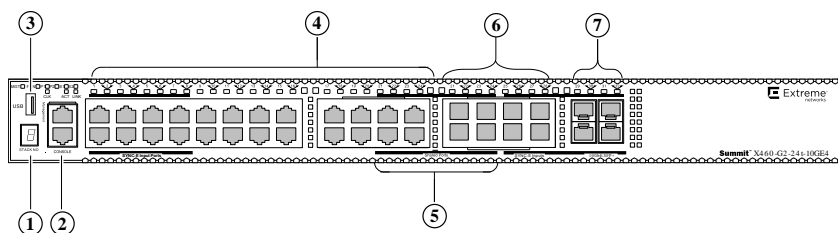| 1 = USB port	4 = POE+ 10/100/1000BASE-T ports
2 = Stack number indicator	5 = SFP 1G ports
3 = Console port/Ethernet management port	
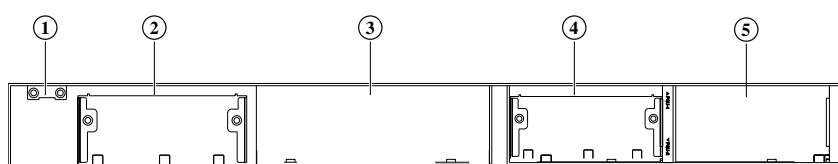
Figure 115: Summit X460-G2-48p-GE4 Rear Panel

1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-48p-10GE4 Switch Ports and Slots

The Summit X460-G2-48p-10GE4 switch ports and slots include:

- 48 front panel POE+ ports of 10/100/1000BASE-T (ports 1-48), and four ports of 10G SFP+ (ports 49-52, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot.
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.

Figure 116: Summit X460-G2-48p-10GE4 Front Panel

1 = USB port	4 = POE+ 10/100/1000BASE-T ports
2 = Stack number indicator	5 = SFP+ 10G ports
3 = Console port/Ethernet management port	
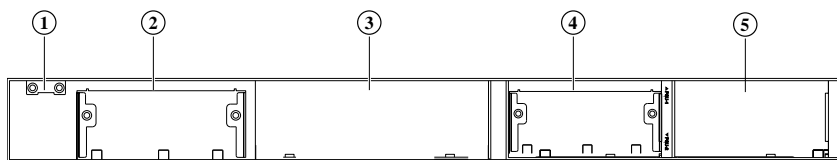
Figure 117: Summit X460-G2-48p-10GE4 Rear Panel

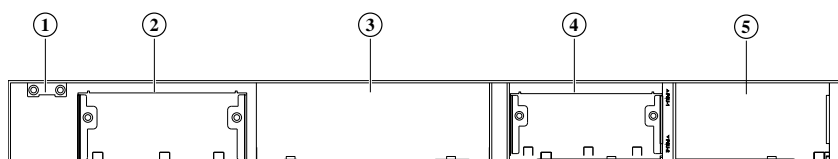|	
1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2-24x-10GE4 Switch Ports and Slots

The Summit X460-G2-24x-10GE4 switch ports and slots include:

- 24 front panel ports of 100/1000BASE-X and 100FX (ports 1-24, four of which are shared with 10/100/1000BASE-T ports), four combo (shared) 10/100/1000BASE-T ports, and four dedicated ports (10/100/1000BASE-T), and four ports of 10G SFP+ (ports 29-32, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.
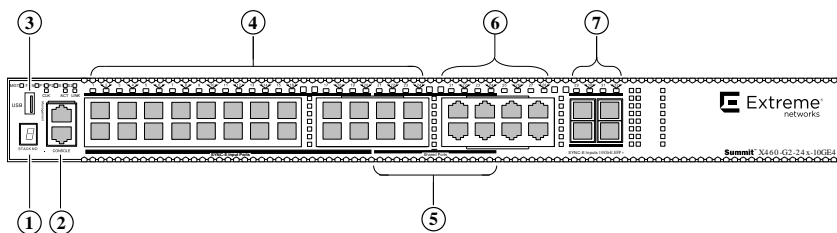
Figure 118: Summit X460-G2-24x-10GE4 Front Panel

1 = Stack number indicator	5 = Combo ports
2 = Console port/Ethernet management port	6 = 10/100/1000BASE-T ports

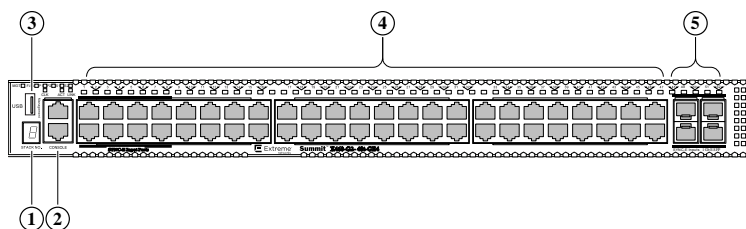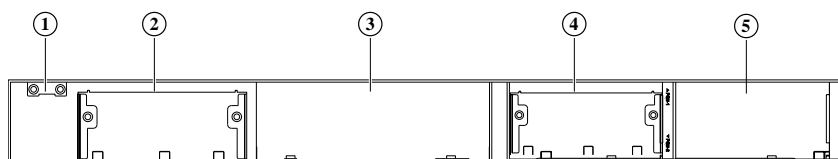| 3 = USB port	7 = SFP+ 10G ports
4 = 100/1000BASE-X ports	
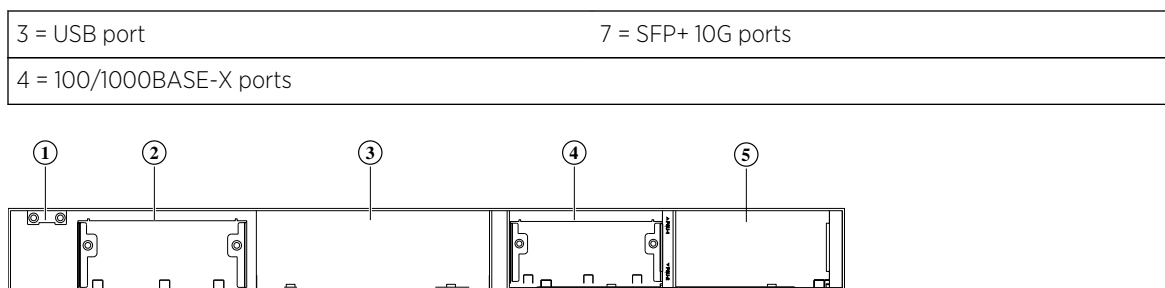
Figure 119: Summit X460-G2-24x-10GE4 Rear Panel

1= TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

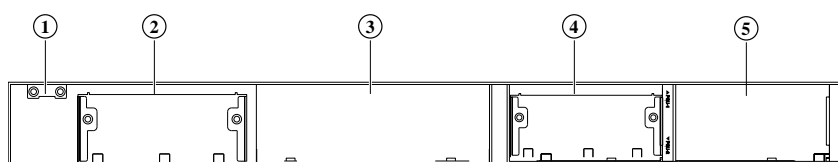## Summit X460-G2-48x-10GE4 Switch Ports and Slots

The Summit X460-G2-48x-10GE4 switch ports and slots include:

- 48 front panel ports of 100/1000BASE-X and 100FX (ports 1-48), and four ports of 10G SFP+ (ports 49-52, with two of these ports configurable to be stacking ports).
- One front panel USB port.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- One rear panel VIM slot
- One rear panel TM-CLK (clock) slot.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- One rear slot for fan module with front-to-back or back-to-front airflow.
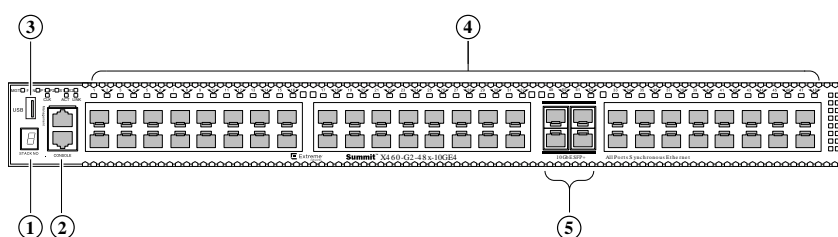
Figure 120: Summit X460-G2-48x-10GE4 Front Panel

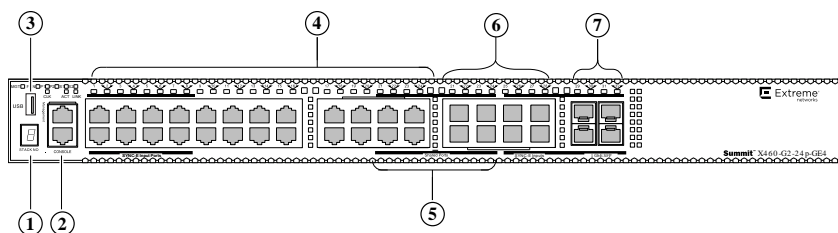| 1 = Stack number indicator	4 = 100/1000BASE-X ports
2 = Console port/Ethernet management port	5 = SFP+ 10G ports
3 = USB port	
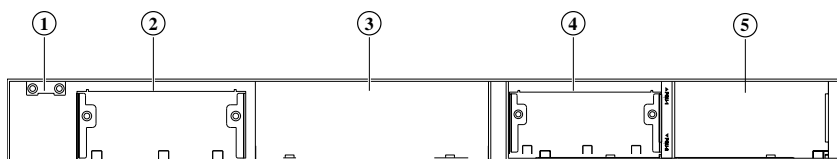
Figure 121: Summit X460-G2-48x-10GE4 Rear Panel

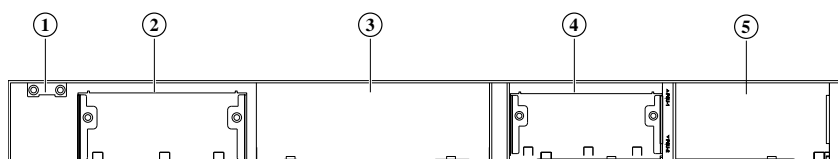|	
1 = TM-CLK (clock) slot cover	4 = Blank power supply cover
2 = VIM slot cover	5 = Power supply slot
3 = Fan module slot	

Summit X460-G2 Series Switch LEDs

The following table describes the LEDs on the Summit X460-G2 series switches.

Table 42: Summit X460-G2 Front Panel LEDs

Label or Type	Color/State	Meaning
M (Management)	Steady green	Power-on self test (POST) has finished. Normal operation.
	Blinking green	POST in progress.
	Blinking amber	POST failed.
	Off	No external power is attached.
S1, S2 (Stack Management)	Steady green	Link OK on the indicated stacking port.
	Blinking green	Activity on the indicated stacking port.
FAN	Steady green	Normal operation.
	Blinking amber	Failure.
	Off	No power.
P1, P2 (Power Supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No power is attached.
Ethernet Port 1-32 or 1-52	Steady green	Link OK.
	Blinking green	Activity on the indicated port.
	Off	No link or port disabled.
1G SFP ports or 10G SFP+ ports 29, 30, 31, and 32 or 53, 54, 55, and 56	Steady green	Link OK
	Blinking green	Activity on the indicated port
	Off	No 1G or 10G link, or port disabled.

Table 43: Additional Port LED Meanings for POE Switches: Summit X460-G2-24p-GE4, X460-G2-24p-10GE4, X460-G2-48p-GE4, and X460-G2-48p-10GE4

Label or Type	Color/State	Meaning
All front panel ports 1-24 or 1-48	Steady green	Link is OK; port is not powered.
	Steady amber	Link is OK; port is powered; no traffic.
	Blinking green	Link is OK and transmitting packets; port is not powered.
	Blinking amber	Link is OK and 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.

Table 44: Summit X460-G2 2-digit Stack Number Indicator

Label or Type	Color/State	Meaning
Left digit (1)	*Reserved for future use.*	
Right digit (1 – 8)	Indicates the position of this switch in the SummitStack configuration.	
	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.

Summit X480 Series Switches

The Summit X480 series switches are 24-port or 48-port switches that provide Ethernet connectivity using fixed 10/100/1000BASE-T RJ-45 ports, installable SFP optical modules, or installable XFP optical modules. The Summit X480 series switches include the following base models:

- Summit X480-24x Switch
- Summit X480-48x Switch
- Summit X480-48t Switch

A serial console port on the front panel of the Summit X480 series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

The rear panel of the switch provides a slot for an installed option card called a versatile interface module or VIM. The VIMs allow you to add high-speed data ports or stacking ports to the switch. the following table lists the available VIM types for the Summit X480 series switches.

Note

Only VIM2 modules are compatible with the Summit X480 switches. Other VIM types that may appear to be mechanically compatible with the Summit X480 switches will not function if they are installed in these switches.

Table 45: Versatile Interface Modules for Summit X480 Series Switches

VIM Model	Number of Ports	Port Type	More Information, Is on . . .
VIM2-10G4X	4	10-Gbps XFP data	VIM2-10G4X Versatile Interface Module
VIM2-SummitStack	2	20-Gbps stacking	VIM2-SummitStack Versatile Interface Module
VIM2-SummitStack128	2	64-Gbps stacking	VIM2-SummitStack128 Versatile Interface Module
VIM2-SummitStack-V80	2	40-Gbps stacking	VIM2-SummitStack-V80 Versatile Interface Module

Switch cooling is provided by a replaceable fan module. Two power supply bays accommodate either AC or DC power supplies.

Summit X480-24x Switch

The front panel of the Summit X480-24x switch includes:

- Twelve autosensing 100/1000BASE-X ports (ports 1–12) that provide 12 Gbps of high-density fiber (SFP) connectivity
- Twelve combination ports (ports 13–24) using RJ-45 connectors or SFPs to provide 12 Gbps of copper or fiber connectivity. The SFP ports support both 100BASE-X and 1000BASE-X optical modules.

    For more information about combination ports, see Combination Ports and Failover.

    For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- Two unpopulated 10-Gbps XFP-based ports
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

    For a description of the LEDs and their operation, see Summit X480 Series Switch LEDs.
- Stack number indicator
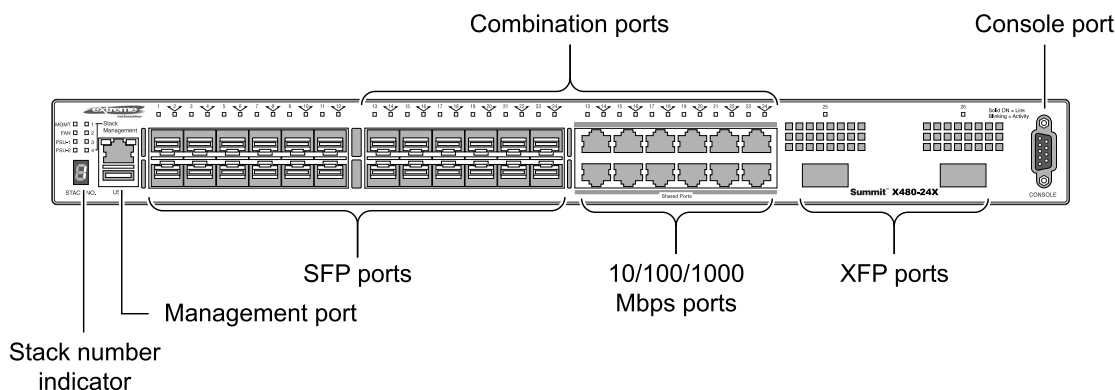
Figure 122: Summit X480-24x Switch Front Panel

Console	Port

The rear panel of the Summit X480-24x switch (Figure 123: Summit X480-24t Rear Panel on page 113) includes:

- Slot for a VIM2 virtual interface module (see Versatile Interface Modules for the Summit X480 Series Switches)
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 450-Watt AC and DC Power Supplies)
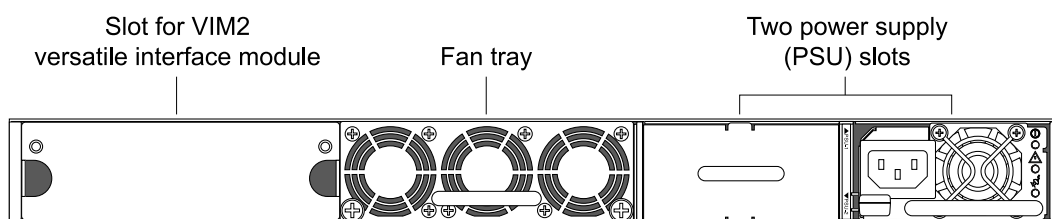
Figure 123: Summit X480-24t Rear Panel

Summit X480-48x Switch

The front panel of the Summit X480-48x switch includes:

- Forty-eight 100/1000BASE-X SFP ports that provide 48 Gbps of high-density fiber connectivity

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions.

  For a description of the LEDs and their operation, see Summit X480 Series Switch LEDs.
- Stack number indicator

SFP ports

Management port

Stack number
indicator

Console
port

Figure 124: Summit X480-48x Switch Front Panel

The rear panel of the Summit X480-48x switch (Figure 125: Summit X480-48x Rear Panel on page 114)
includes:

- Slot for a VIM2 virtual interface module (see Versatile Interface Modules for the Summit X480 Series
Switches
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 450-Watt AC and DC
Power Supplies)

Slot for VIM2
versatile interface module

Fan tray

Two power supply
(PSU) slots
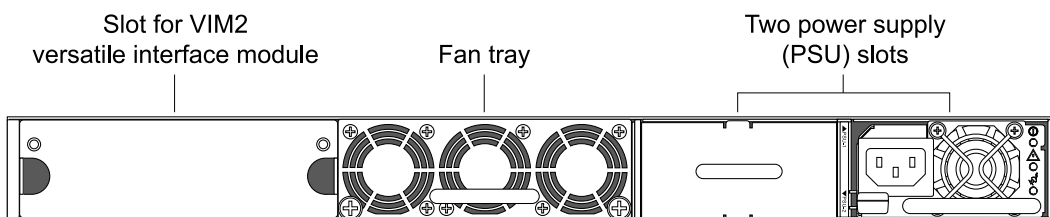
Figure 125: Summit X480-48x Rear Panel

Summit X480-48t Switch

The front panel of the Summit X480-48t switch includes:

- Forty-four fixed 10/100/1000BASE-T autosensing ports (ports 1–44) that provide 44 Gbps of high-
density copper connectivity
- Four combination ports (ports 45–48) using RJ-45 connectors or SFPs to provide 4 Gbps of copper
or fiber connectivity. The SFP ports support both 100BASE-X and 1000BASE-X optical modules.

  For more information about combination ports, see Combination Ports and Failover.

  For information about SFPs, see the *Extreme Networks Pluggable Interface Modules Installation
Guide*.
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X480 Series Switch LEDs.
- Stack number indicator

10/100/1000 Mbps ports

Console port

Management port

Stack number indicator

Combination ports

Figure 126: Summit X480-48t Switch Front Panel

The rear panel of the Summit X480-48t switch () includes:

- Slot for a VIM2 virtual interface module (see Versatile Interface Modules for the Summit X480 Series Switches
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 450-Watt AC and DC Power Supplies)

Slot for VIM2 versatile interface module

Fan tray

Two power supply (PSU) slots

Figure 127: Summit X480-48t Rear Panel

Summit X480 Series Switch LEDs

Table 46: Front Panel LEDs

Label or Type	Color/State	Meaning
MGMT	Blinking green (slow)	Normal operation
	Blinking green (rapid)	Switch is booting; power-on self test (POST) is in progress.
	Blinking amber	Power-on self test (POST) failed.
	Off (FAN and PSU are also off.)	No external power is attached.
	Off (FAN and PSU are lit.)	Switch is booting.

Table 46: Front Panel LEDs (continued)

Label or Type	Color/State	Meaning
FAN	Steady green	Normal operation
	Blinking green (rapid)	Power-on self test (POST) is in progress.
	Blinking amber	Failure
	Off	No power
PSU-1	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power; no power supply present.
PSU-2	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power; no power supply present.
Stack Management 1 – 4	Steady green	Link OK on the indicated stack port.
	Blinking green	Activity on the indicated stack port.

Table 47: 2-digit Stack number Indicator

Label or Type	Color/State	Meaning
Left digit (1)		*Reserved for future use.*
Right digit (1 – 8) Indicates the position of this switch in the SummitStack configuration.	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.
Ethernet Ports 1 – 24 or 1 – 48	Steady green	Link OK
	Blinking green	Activity
	Off	No link; port is disabled.

Table 48: Management Port

Label or Type	Color/State	Meaning
Left LED	Blinking green	Activity
	Off	No link; 10/100-Mbps link
Right LED	Steady green	1-Gbps link
	Off	No link; 10/100-Mbps link

Table 49: Back Panel

Label or Type	Color/State	Meaning
Stacking Port LED (on installed VIM)	Steady green	Link OK
	Blinking green	Activity

Table 49: Back Panel (continued)

Label or Type	Color/State	Meaning
XFP Port LED (on installed VIM)	Steady green	Link OK
	Blinking green	Activity
	Off	Port is disabled.

Summit X650 Series Switches

The Summit X650 series switches have 24 front-panel Ethernet ports that provide 10-gigabit Ethernet connectivity using fixed 10GBASE-T RJ-45 ports or installable SFP+ optical modules. The Summit X650 series switches include the following base models:

- Summit X650-24t Switch
- Summit X650-24x Switch

A serial console port on the front panel of the Summit X650 series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

The rear panel of the switch requires an installed versatile interface module or VIM. The following table lists the types of VIM available for the Summit X650 series switch.

Table 50: Versatile Interface Modules for Summit X650 Series Switches

VIM Model	Number of Ports	Port Type	More Information, Is on . . .
VIM1-SummitStack	2 4	20-Gbps stacking 1-Gbps SFP data	VIM1-SummitStack Versatile Interface Module
VIM1-10G8X	2 8	20-Gbps stacking 10-Gbps SFP+ data	VIM1-10G8X Versatile Interface Module
VIM1-SummitStack512	4	128-Gbps stacking	VIM1-SummitStack512 Versatile Interface Module
VIM1-SummitStack256	2	128-Gbps stacking	VIM1-SummitStack256 Versatile Interface Module
VIM3-40G4X	4	40-Gbps QSFP+ data	VIM3-40G4X Versatile Interface Module
XGM3SB-4sf	10-gigabit SFP+ modules		XGM3SB-4sf Port Option Card

The Summit X650 series switch must have an installed VIM; the switch will not operate correctly and enter into reboot loop without a VIM.

Note

The Summit X650 switches require VIM1 or VIM3 modules. Other VIM types that may appear to be mechanically compatible with the Summit X650 switches will not function if they are installed in these switches.

Cooling is provided by a replaceable fan module. Two power supply bays accommodate either AC or DC power supplies.

Summit X650-24t Switch

The front panel of the Summit X650-24t switch includes:

- Twenty-four fixed autosensing 1000/10000 BASE-T ports (ports 1–24) that provide high-density copper connectivity
- 10/100/1000 Mbps management port
- Serial console port used to connect a terminal and perform local management
- LEDs to indicate port status and switch operating conditions

    For a description of the LEDs and their operation, see Summit X650 Series Switch LEDs.

- Stack number indicator
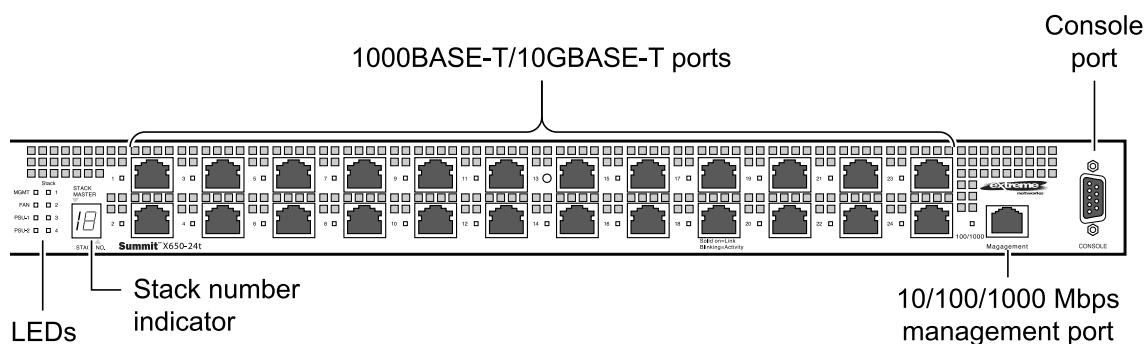
Figure 128: Summit X650-24t Front Panel

The rear panel of the Summit X650-24t switch () includes:

- Installed VIM1 virtual interface module (VIM1-SummitStack shown) (see Versatile Interface Modules for the Summit X650 Series Switches)
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 850-Watt AC and DC Power Supplies)

Figure 129: Summit X650-24t Rear Panel

Summit X650-24x Switch
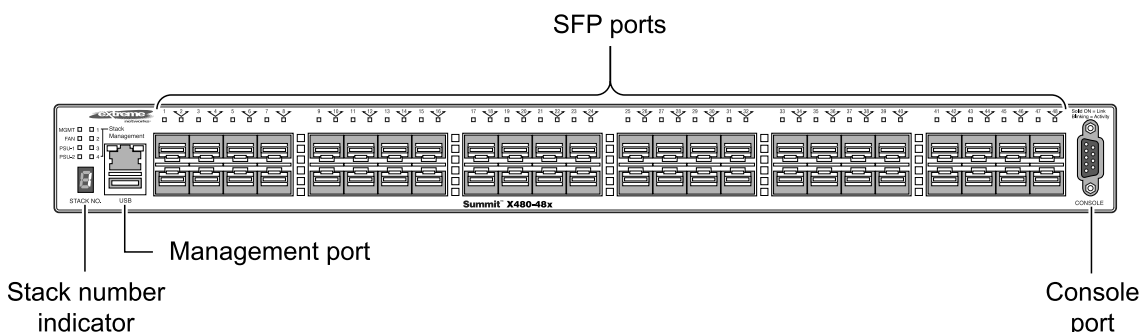
The front panel of the Summit X650-24x switch includes:

- Twenty-four ports that can use 10GBASE-X SFP+ optical modules. (Ports 1–24 can also be populated with 1000BASE-X SFP modules.)

  For information about supported optical modules, see the latest version of the *ExtremeXOS Release Notes*.
- 10/100/1000 Mbps management port
- Console port
- LEDs to indicate port status and switch operating conditions.

 For a description of the LEDs and their operation, see Summit X650 Series Switch LEDs.
- Stack number indicator

Figure 130: Summit X650-24x Front Panel

The rear panel of the Summit X650-24x switch (Figure 131: Summit X650-24x Rear Panel on page 119) includes:
- Installed VIM1 virtual interface module (VIM1-SummitStack shown) (see Versatile Interface Modules for the Summit X650 Series Switches)
- Replaceable fan tray
- Two power supply bays for either AC or DC power supplies (see Summit 850-Watt AC and DC Power Supplies)
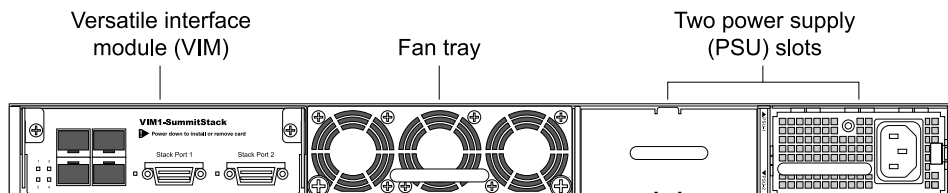
Figure 131: Summit X650-24x Rear Panel

Summit X650 Series Switch LEDs

The following table describes the LEDs on the Summit X650 series switches.

Table 51: Front Panel LEDs

Label or Type	Color/State	Meaning
MGMT	Blinking green	Normal operation
	Blinking amber	Power-on self test (POST) failed; diagnostic test in progress.
	Off	No external power is attached.
FAN	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power
PSU-1	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power
PSU-2	Steady green	Normal operation
	Blinking amber	Failure
	Off	No power
Stack 1 – 4	Steady green	Link OK on the indicated stack port.
	Blinking green	Activity on the indicated stack port.

Table 52: 2-digit Stack number Indicator

Label or Type	Color/State	Meaning
Left digit (1)		*Reserved for future use.*
Right digit (1 – 8)		Indicates the position of this switch in the SummitStack configuration.
	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.
Ethernet Ports 1 – 24	Steady green	Link OK
	Blinking green	Activity
Management Port	Steady green	Link OK
	Blinking green	Activity

Table 53: Back Panel

Label or Type	Color/State	Meaning
Stacking Port LED (on installed VIM1 module)	Steady green	Link OK
	Blinking green	Activity
SFP/SFP+ port LED (on installed VIM1 module)	Steady green	Link OK
	Blinking green	Activity

Summit X670 Series Switches

The Summit X670 series switches have 48 front-panel Ethernet ports that can provide 10-gigabit Ethernet connectivity using copper ports or installable SFP+ optical modules.

The Summit X670 series switches have 48 front-panel Ethernet ports that provide 10-gigabit Ethernet connectivity using installable SFP+ optical modules. The Summit X670 series switches include the following base models:

- Summit X670-48x Switch
- Summit X670V-48x Switch
- Summit X670V-48t Switch

Each base model is available with either front-to-back or back-to-front cooling. There is no operational difference between these switch versions.

The Summit X670-48x and Summit 670V-48x have SFP+ ports support dual interface speeds of Gigabit Ethernet and 10-Gigabit Ethernet. SFP+ ports can accept both gigabit SFP and 10 gigabit SFP, and depending upon the pluggable optics you choose, SFP+ modules can work in both modes.

The Summit X670V-48t has 10G BASE-T copper ports. The switch also has fiber combo ports that support dual interface speeds of Gigabit Ethernet and 10-Gigabit Ethernet.

A serial console port on the front panel of the Summit X670 series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

The X670-48x and X670V-48x models are equipped with a motion sensor. A motion sensor on the front of the switch allows you to control the power to the port LEDs. When the motion sensor is enabled, the port LEDs are turned off if motion is not detected during a specified amount of time. When motion is detected, the port LEDs are turned back on. You can adjust how long the LEDs stay lit after motion is detected. When the motion sensor is disabled, the port LEDs are always on.

Note
The X670V-48t switch does not have a motion sensor.

The rear panel of the Summit X670V-48t and the X670V-48x switches provides a slot for an installed option card called a versatile interface module or VIM. The VIM4-40G4X (Part No. 17122) module adds four QSFP+-based 40-Gbps ports to the Summit X670V series switches.

Note
Only VIM4 modules are compatible with the Summit X670 series switches. Other VIM types that may appear to be mechanically compatible with the Summit X670 series switches will not function if they are installed in these switches.

Switch cooling is provided by three replaceable fan modules. Fan modules are available in two different models that direct the airflow either from front to back or from back to front. All five installed fan modules must be of the same model, so that they all direct the airflow in the same direction. Two

power supply bays accommodate either AC or DC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fans. Like the fan modules, the power supplies are available in models with either front-to-back or back-to-front cooling airflow.

> **Note**
>
> Air must flow in the same direction for all installed fan modules and power supplies in a switch.

Summit X670-48x Switch

The front panel of the Summit X670-48x switch includes:

- Forty-eight unpopulated optical ports that can accommodate 10GBASE-X SFP+ or 1000BASE-X SFP optical modules to provide high-density fiber connectivity

  For information about SFP+ and SFP optical modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*
- 10/100/1000-Mbps management port
- Serial console port used to connect a terminal and perform local management
- USB port for access to external storage
- Motion sensor
- Grounding stud
- LEDs to indicate port status and switch operating conditions

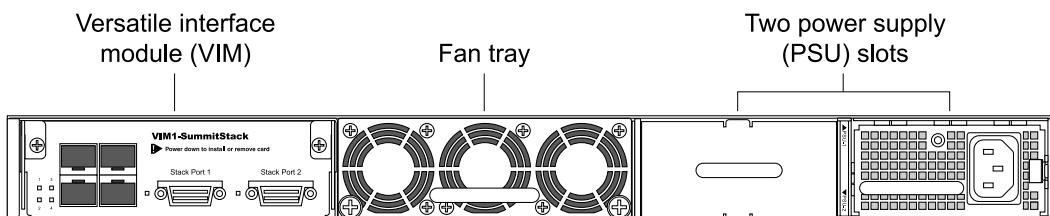 For a description of the LEDs and their operation, see Summit X670 Series Switch LEDs.
- Stack number indicator

Figure 132: Summit X670-48x Front Panel

The rear panel of the Summit X670-48x switch (Figure 133: Summit X670-48x Rear Panel on page 123) includes:

- Three replaceable fan modules
- Two power supply bays for either AC or DC power supplies (see Summit 450-Watt AC and DC Power Supplies and Summit 550-Watt AC and DC Power Supplies)
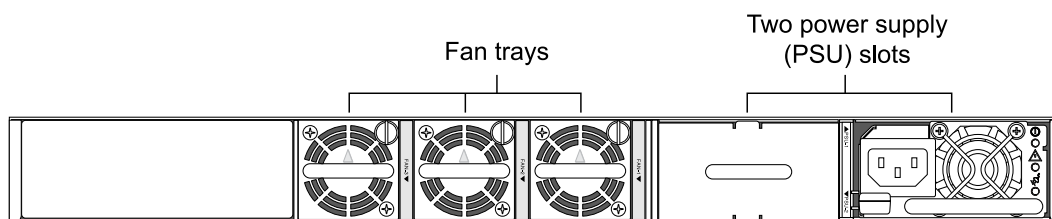
Figure 133: Summit X670-48x Rear Panel

Summit X670V-48x switch
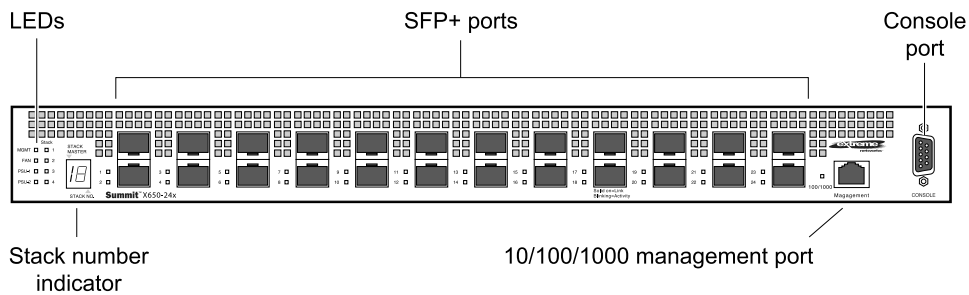
The front panel of the Summit X670V-48x switch includes:

- Forty-eight unpopulated optical ports that can accommodate 10GBASE-X SFP+ or 1000BASE-X SFP optical modules to provide high-density fiber connectivity

  For information about SFP+ and SFP optical modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.
- 10/100/1000-Mbps management port
- Serial console port used to connect a terminal and perform local management
- USB port for access to external storage
- Motion sensor
- Grounding stud
- LEDs to indicate port status and switch operating conditions

 For a description of the LEDs and their operation, see Summit X670 Series Switch LEDs.
- Stack number indicator

Figure 134: Summit X670V-48x Front Panel

The rear panel of the Summit X670-48x switch includes:

- Slot for a VIM4-40G4X versatile interface module (see VIM4-40G4X Versatile Interface Module for the Summit X670 Switch)
- Three replaceable fan modules
- Two power supply bays for either AC or DC power supplies (see Summit 450-Watt AC and DC Power Supplies and Summit 550-Watt AC and DC Power Supplies)
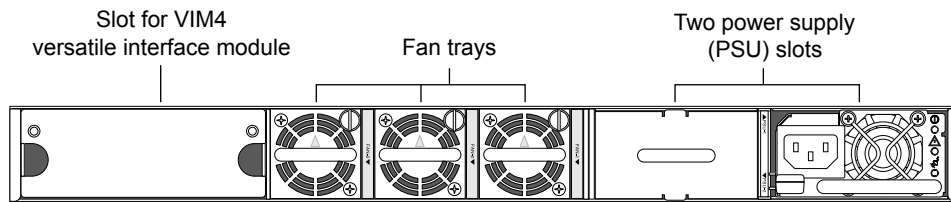
Figure 135: Summit X670V-48x Rear Panel

Summit X670V-48t switch

The front panel of the Summit X670V-48t switch includes:

- Forty-four 100/1000/10000 BASE-T copper ports plus four combo ports of 10G BASE-X SFP+ and 10G BASE-T (1G/10G dual speed for the combo ports)

  For information about SFP+ and SFP optical modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide.*
- 10/100/1000-Mbps management port
- Serial console port used to connect a terminal and perform local management
- USB port for access to external storage
- Grounding stud
- LEDs to indicate port status and switch operating conditions

  For a description of the LEDs and their operation, see Summit X670 Series Switch LEDs.
- Stack number indicator
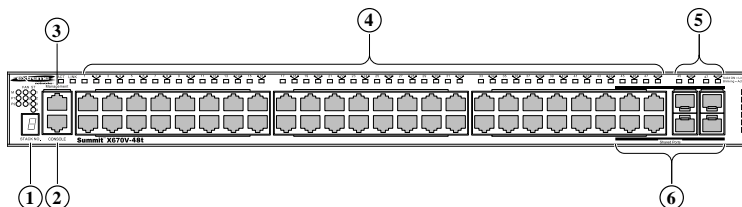
Figure 136: Summit X670V-48t Front Panel

Table 54: Summit X670V-48t Front Panel

1 = Stack number indicator	4 = 10G BASE-T (100 Mbps/1G/10G Tri-speed) ports
2 = Console port	5 = SFP+ ports
3 = Ethernet management port	6 = Combination ports (1G/10G only)

The rear panel of the Summit X670-48t switch () includes:

- Slot for a VIM4-40G4X versatile interface module (see VIM4-40G4X Versatile Interface Module for the Summit X670 Switch)

- Three replaceable fan modules
- Two power supply bays for either AC or DC power supplies (see Summit 550-Watt AC and DC Power Supplies)

Figure 137: Summit X670V-48t Rear Panel

Summit X670 Series Switch LEDs

The following table describes the LEDs on the Summit X670 series switches.

Table 55: Front Panel LEDs

Label or Type	Color/State	Meaning
M (Management)	Steady green	Power-on self test (POST) has finished. This is normal operation.
	Blinking green	POST in progress.
	Blinking amber	POST failed.
	Off	No external power is attached.
FAN 1, 2, 3	Steady green	Normal operation.
	Blinking amber	Failure.
	Off	No power.
P1, P2 (Power Supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No power is attached.
Stack 1 – 4	Steady green	Link OK on the indicated stack port.
	Blinking green	Activity on the indicated stack port.

Table 55: Front Panel LEDs (continued)

Label or Type	Color/State	Meaning
MD	Steady green	The motion detector feature is enabled. This LED stays lit if the motion detector feature shuts down the other LEDs on the switch.
	Blinking green (other switch LEDs are also lit)	Motion has been detected. The green blinking continues for a few seconds, and then the MD LED lights steady green.
	Blinking amber (other switch LEDs are off)	Motion has been detected. The motion detector feature turns on the other switch LEDs. The amber blinking continues for a few seconds, and then the MD LED lights steady green.
	Off	The motion detector feature is disabled.

Table 56: 2-digit Stack number Indicator

Label or Type	Color/State	Meaning
Left digit (1)	*Reserved for future use.*	
Right digit (1 – 8)	Indicates the position of this switch in the SummitStack configuration.	
	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.
Ethernet Ports 1 – 48	Steady green	Link OK
	Blinking green	Activity
	Off	No link or port disabled.
Management Port	Steady green	Link OK
	Blinking green	Activity

Table 57: Back Panel

Label or Type	Color/State	Meaning
QSFP+ port LED (on installed VIM3 module)	Steady green	Link OK
	Blinking green	Activity

Summit X670-G2 Series Switches

The Summit X670 G2 series switches have 48 or 72 front-panel Ethernet ports that can provide 10-gigabit Ethernet connectivity using installable SFP+ optical modules. In addition, the X670-G2-48x-4q series switches offer four QSFP+ ports.

The Summit X670-G2 series switches include the following base models:

- Summit X670-G2-48x-4q switch
- Summit X670-G2-72x switch

Each base model is available with either front-to-back or back-to-front cooling. There is no operational difference between these switch versions.

The Summit X670-G2-48x-4q and X670-G2-72x have SFP+ ports that support dual interface speeds of Gigabit Ethernet and 10-Gigabit Ethernet. SFP+ ports can accept both gigabit SFP and 10 gigabit SFP+, and depending upon the pluggable optics you choose, SFP+ ports can work in both modes.

The front panel of the X670-G2-48x-4q switch also provides four QSFP+ based 40Gbps ports. With appropriate cabling, each of the four QSFP+ ports can be divided into four 10Gbps ports.

A serial console port on the front panel of the Summit X670-G2 series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds.

Switch cooling is provided by replaceable fan modules. Fan modules are available in two different models that direct the airflow either from front to back or from back to front. All installed fan modules must be of the same model, so that they all direct the airflow in the same direction. Two power supply bays accommodate either AC or DC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fans. Like the fan modules, the power supplies are available in models with either front-to-back or back-to-front cooling airflow.

> **Caution**
> Air must flow in the same direction for all installed fan modules and power supplies in a X670-G2 series switch.

Summit X670-G2-48x-4q Switch Ports and Slots

The Summit X670-G2-48x-4q switch ports and slots include:

- Forty-eight fixed autosensing 10GBASE-X SFP+ ports (ports 1-48) that provide 10 Gbps high-density fiber connectivity. Two of these ports are configurable to be stacking ports.
- Four 40GBASE-X unpopulated QSFP+ ports (ports 49, 53, 57, and 61 in 40G mode or ports 49 to 64 in 10G mode) that provide 40 Gbps of fiber connectivity. Two (stacking V160 or V80) or four (stacking V320) of these four ports are configurable to be stacking ports.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- USB port.
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- Three rear slots for fan modules with front-to-back or back-to-front airflow.
- Two mini-BNC connectors labeled OUT for connecting a Building Integrated Timing Supply (BITS) or GPS timing source on the rear panel.
  - 1 PPS frame output
  - 10 MHz output
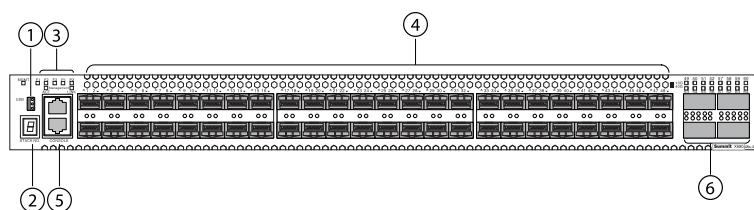
Figure 138: Summit X670-G2-48x-4q Front Panel

1 = USB port	5 = Console port
2 = Stack number indicator	6 = QSFP+ ports
3 = Ethernet management port	
4 = 10GBASE-X SFP+ ports	
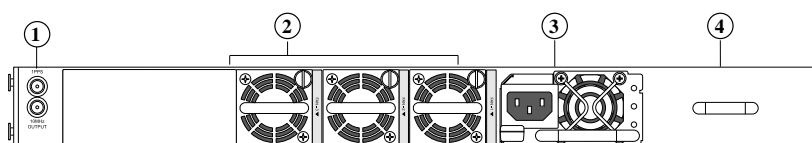
Figure 139: Summit X670-G2-48x-4q Rear Panel

1 = BNC Timing ports	4 = Blank power supply cover
2 = Replaceable fan modules	
3 = Power supply	

Summit X670-G2-72x Switch Ports and Slots

The Summit X670-G2-72x switch ports and slots include:

- Seventy-two fixed autosensing 10GBASE-X SFP+ ports (ports 1-72) that provide 10 Gbps high-density fiber connectivity. Two of these ports are configurable as stacking ports.
- Ethernet management port 1 x 10/100/1000BASE-T.
- Serial console port implemented as an RJ-45 connector used to connect a terminal and perform local management.
- Rear panel USB port
- Rear dual PSU power slots with front-to-back or back-to-front airflow.
- Five rear slots for fan modules with front-to-back or back-to-front airflow.
- Two mini-BNC connectors labeled OUT for connecting a Building Integrated Timing Supply (BITS) or GPS timing source on the rear panel.
  - 1 PPS frame output
  - 10 MHz output
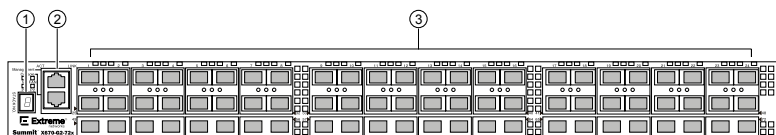
Figure 140: Summit X670-G2-72x Front Panel

1 = Stack number indicator port	3 = 10GBASE-X SFP+ ports
2 = Ethernet management port/console port	
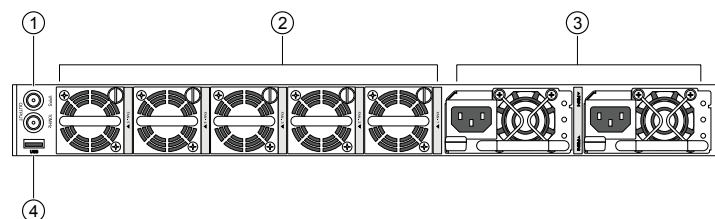
Figure 141: Summit X670-G2-72x Rear Panel

1 = BNC Timing ports	4 = USB port
2 = Replaceable fan modules	
3 = Power supplies	

Summit X670-G2 Series Switch LEDs

The following table describes the LEDs on the Summit X670-G2 series switches.

Table 58: Summit X670-G2 Front Panel LEDs

Label or Type	Color/State	Meaning
M (Management)	Steady green	Power-on self test (POST) has finished. Normal operation.
	Blinking green	POST in progress.
	Blinking amber	POST failed.
	Off	No external power is attached.
FAN 1, 2, 3, 4, 5	Steady green	Normal operation.
	Blinking amber	Failure.
	Off	No power.
P1, P2 (Power Supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No power is attached.

Table 58: Summit X670-G2 Front Panel LEDs (continued)

Label or Type	Color/State	Meaning
Ethernet Port 1-48 or 1-72	Steady green	Link OK.
	Blinking green	Activity on the indicated port.
	Off	No link or port disabled.
670-G2-48x-4q QSFP+ ports 40G mode (49, 53, 57, 61)	Steady blue	Link OK
	Blinking blue	Activity on the indicated port
670-G2-48x-4q QSFP+ ports 10G mode (49-64)	Steady green	Link OK
	Blinking green	Activity on the indicated port

Table 59: Summit X670-G2 2-digit Stack Number Indicator

Label or Type	Color/State	Meaning
Left digit (1)	*Reserved for future use.*	
Right digit (1 – 8)	Indicates the position of this switch in the SummitStack configuration.	
	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.

Summit X770 Series Switches

The Summit X770 series switches have 32 front-panel Ethernet ports that can provide 40-gigabit Ethernet connectivity using installable QSFP+ optical modules. The ports can operate in 40-gigabit mode, or with appropriate optical modules can be divided into 10-gigabit data lanes. Both Native Stacking and Alternate Stacking is supported using the front panel-ports. For details on port data capacity and numbering, see Summit X770-32q switch on page 131.

The Summit X770 provides latency less than 600 nanoseconds and supports cut-through switching to help optimize high frequency trading applications as well as latency sensitive cluster computing.

Each base model is available with either front-to-back or back-to-front cooling. There is no operational difference between these switch versions.

A serial console port on the front panel of the Summit X770-32q series switch allows you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to a parallel management network for administration. Alternatively, you can use an Ethernet cable to connect this port directly to a laptop to view and locally manage the switch configuration. The Ethernet management port supports 10/100/1000 Mbps speeds. There is also a USB port.

The X770 also supports Boundary Clock (BC), Transparent Clock (TC), and Ordinary Clock (OC) protocols for synchronizing phase and frequency, and allowing the network and the connected devices to be synchronized down to microseconds of accuracy over Ethernet connections.

Switch cooling is provided by five hot-swappable fan modules providing N+1 redundancy. Fan modules are available in two different models that direct the airflow either from front to back or from back to front. All five installed fan modules must be of the same model, so that they all direct the airflow in the same direction. Two power supply bays accommodate either AC or DC power supplies. Power supplies have integrated cooling fans that operate independently of the switch fans. Like the fan modules, the power supplies are available in models with either front-to-back or back-to-front cooling airflow.

> **Note**
>
> Air must flow in the same direction for all installed fan modules and power supplies in a switch.

Summit X770-32q switch

The front panel of the Summit X770-32q switch includes:

- 32 40-Gigabit Ethernet ports capable of supporting passive copper QSFP+, and active fiber QSFP+. With quad fan out SFP+ cables, the QSFP+ ports can be divided 10-gigabit data lanes (24 of the ports can be divided into four 10-gigabit data lanes, and the remaining eight ports can be used as single 10-gigabit data lanes) for a total of 104 10-Gigabit ports as shown in the following figure:
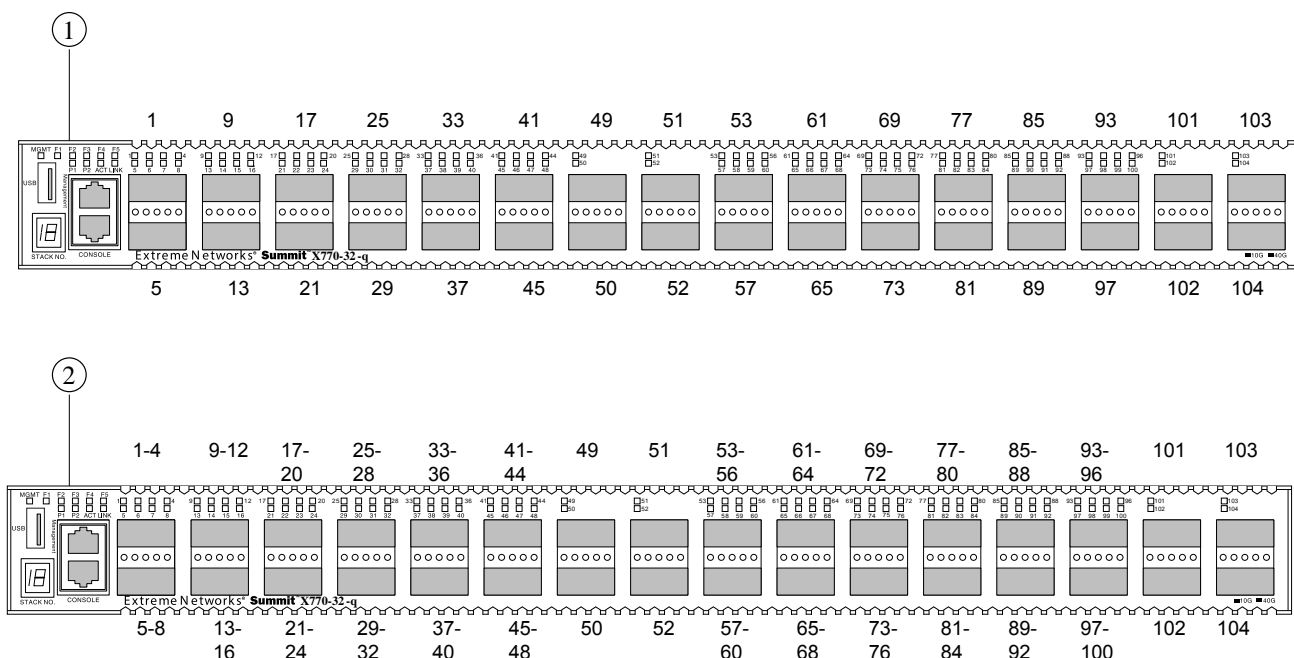
Figure 142: X770 Port Number for 10G mode and 40G Mode

Table 60: X770-32q 40G and 10G Port Numbering

1 = 40G mode (32 ports)	2 = 10G mode (104 ports)

For information about QSFP+ optical modules, see the Extreme Networks Pluggable Interface Modules Installation Guide.

- Groups of two or four ports configurable to be stacking ports as shown in the following table:

Table 61: X770 Stacking Method and Ports

Stacking Method	Ports
SummitStack-V	103 and 104
SummitStack-V160	103 and 104
SummitStack-V-320	101 and 103, 102 and 104

> **Note**
>
> When ports are used for stacking they are not available for normal ethernet connectivity.

For information about stacking, see Building Stacks on page 187

- 10/100/1000-Mbps management port.
- USB port for access to external storage.
- RJ-45 RS-232c serial console port used to connect a terminal and perform local management.
- LEDs to indicate port status and switch operating conditions..

  For a description of the LEDs and their operation, see Summit X770 Series Switch LEDs on page 133

- Stack number indicator.
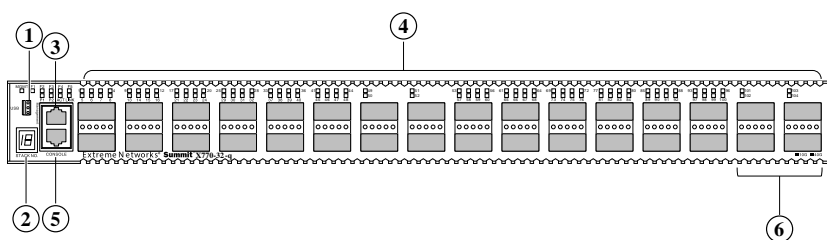
Table 62: Summit X770-32q Front Panel

1 = USB port	4 = 40G/10G QSFP+ Ethernet ports
2 = Stack number indicator	5 = Console port
3 = Management port	6 = Stacking ports

The rear panel of the Summit X770-32q switch (Summit X770-32q switch on page 131) includes:

- Five replaceable fan modules
- Two power supply bays for either AC or DC power supplies (see Summit 550-Watt AC and DC Power Supplies)
- Two mini-BNC connectors labeled OUT for connecting a Building Integrated Timing Supply (BITS) or GPS timing source:
  - 1 PPS frame output
  - 10 MHz output
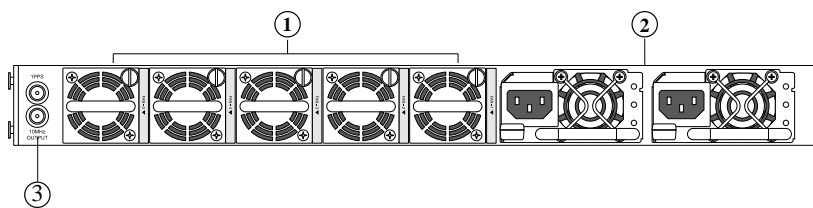
Table 63: Summit X770-32q Rear Panel

1 = Fan modules	3 = mini-BNC connectors
2 = Power supply	

Summit X770 Series Switch LEDs

The following table describes the LEDs on the Summit X770 series switches.

Table 64: Front Panel LEDs

Label or Type	Color/State	Meaning
M (Management)	Steady green	Power-on self test (POST) has finished. This is normal operation.
	Blinking green	POST in progress.
	Blinking amber	POST failed.
	Off	No external power is attached.
FAN 1, 2, 3, 4, 5	Steady green	Normal operation.
	Blinking amber	Failure.
	Off	No power.
P1, P2 (Power Supply)	Steady green	Normal operation.
	Steady amber	Power is attached, but no power is on.
	Blinking amber	Power failure.
	Off	No power is attached.
Ethernet Ports 40G mode 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 50 51, 52, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 102, 103, 104	Steady blue	Link OK.
	Blinking blue	Activity on the indicated port.
	Off	No link or port disabled.
Ethernet Ports 10G mode 1-104	Steady green	Link OK
	Blinking green	Activity on the indicated port
	Off	No 10G link or port disabled.

Table 65: 2-digit Stack Number Indicator

Label or Type	Color/State	Meaning
Left digit (1)	*Reserved for future use.*	
Right digit (1 – 8)	Indicates the position of this switch in the SummitStack configuration.	
	Upper half blinking	This switch is the stack master node.
	Lower half blinking	This switch is the stack backup node.
	Lit steadily	This switch is a standby node in the stack.
Stacking Ports 40G mode (V160 and V320 stacking) ports 101, 102, 103, and 104	Steady blue	Link OK
	Blinking blue	Activity
	Off	No link or port disabled.
Stacking Ports 10G mode (Alternate stacking) ports 103 and 104	Steady green	Link OK
	Blinking green	Activity
	Off	No link or port disabled

Pluggable Interfaces for Summit Family Switches

Many Summit family switches include ports that are compatible with a variety of optical modules, including SFP, SFP+, QSFP+, and XFP modules. Extreme Networks optical modules are tested to work in all supported Extreme Networks devices. We recommend that all customers use Extreme Networks optical modules in their Extreme Networks devices. Extreme Networks assumes no liability for third-party optical modules. Although Extreme Networks does not block third-party optical modules, we cannot ensure that all third-party optical modules operate properly in all Extreme Networks devices. The customer assumes all risks associated with using third-party optical modules in Extreme Networks devices.

2 Summit Power Supplies

Power supply overview
External Power Supplies
Summit Replaceable Internal Power Supplies

This section contains the following subsections:
- Power supply overview
- External power supplies
- Summit replaceable internal power supplies

Power supply overview

Summit family switches are shipped with an internal power supply (replaceable on the Summit X460, X480, X650, and X670 series switches) that supplies all of the power needed for most switch operation.

An optional redundant power supply can be added to most Summit models to protect against a power supply failure and to provide increased support for PoE operation on applicable switches.

The following Summit switch series use external power supplies for redundancy:
- Summit X150 series
- Summit X250e series
- Summit X350 series
- Summit X440 series
- Summit X450 series
- Summit X450a series
- Summit X450e series

The following Summit switch series provide power redundancy by installing a second replaceable power supply:
- Summit X460 series
- Summit X480 series
- Summit X650 series
- Summit X670 series

External Power Supplies

The following table lists the compatible power supply models for the Summit family switches that use external power supplies for redundancy.

External Power Supplies

Table 66: Summit X150 Series Switches

Switch Model	Compatible EPS	Model Number
Summit X150-24t	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X150-24x	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
Summit X150-24p	EPS-500 External Power Supply Unit	10911
Summit X150-48t	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906

Table 67: Summit X250e Series Switches

Switch Model	Compatible EPS	Model Number
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-24x	EPS-160 External Power Module with EPS-T	EPS-160: 10907 EPS-T: 10906
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 or Summit 750 W Power Supply with EPS-C2 chassis	EPS-600LS: 10913 EPS-C: 10912 EPS-C2: 10936 Power supply: 10931

Table 68: Summit X350 Series Switches

Switch Model	Compatible EPS	Model Number
Summit X350-24t	EPS-500 External Power Supply Unit	10911
Summit X350-48x	EPS-500 External Power Supply Unit	10911

Table 69: Summit X450 Series Switches

Switch Model	Compatible EPS	Model Number
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

Table 70: Summit X440 Series Switches

Switch Model	Compatible EPS	Model Number
Summit X440-24t	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-L2-24t	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-24p	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-24t-10G	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-24p-10G	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-48t	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-L2-48t	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-48p	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-48t-10G	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931
Summit X440-48p-10G	Summit 750 W Power Supply with EPS-C2 chassis	EPS-C2: 10936 Power supply: 10931

Table 71: Summit X450a Series Switches

Switch Model	Compatible EPS	Model Number
Summit X450a-24t	EPS-LD External Power Supply Unit	45019
	EPS-500 External Power Supply Unit	10911
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
	EPS-500 External Power Supply Unit	10911
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 72: Summit X450e Series Switches

Switch Model	Compatible EPS	Model Number
Summit X450e-24p	EPS-LD External Power Supply Unit	45019
	EPS-500 External Power Supply Unit	10911

Table 72: Summit X450e Series Switches (continued)

Switch Model	Compatible EPS	Model Number
Summit X450e-48p	EPS-600LS External Power Module with EPS C chassis or Summit 750 W Power Supply with EPS-C2 chassis	EPS-600LS: 10913 EPS-C: 10912 EPS-C2: 10936 Power supply: 10931
Summit X450e-24t	EPS-500 External Power Supply Unit	10911
Summit X450e-48t	EPS-500 External Power Supply Unit	10911

Note

The Summit switches listed in each section of this chapter run ExtremeXOS software. For information about compatible switches running ExtremeWare® software, refer to the Consolidated "i" and "e" Series Hardware Installation Guide.

EPS-160 External Power Module (with EPS-T)

The EPS-160 External Power Module (Model 10907) is a modular power supply for use with the EPS-T chassis.

You can use the EPS-160 as a redundant power supply with the following Extreme Networks switches:
- Summit X150-24t switch
- Summit X150-24x switch
- Summit X150-48t switch
- Summit X250e-24t switch
- Summit X250e-24x switch
- Summit X250e-48t switch
- Summit X450-24t switch
- Summit X450-24x switch

The EPS-T is a rack-mountable chassis or tray that holds one or two EPS-160 power supplies. Each EPS-160 power supply provides one-to-one redundancy for an attached Extreme Networks switch.

You can order the EPS-T chassis with one or two EPS-160 power supplies already installed. You can also order an additional power supply from your Extreme Networks reseller.

The front of the EPS-160 unit has a green LED to indicate operating status, as explained in the table below.

Table 73: EPS-160 LED Indications

Power LED	Meaning
Green, solid	The external power supply is operating normally.
Off	The external power supply is not connected.

Note

An AC power input cord is not provided; you can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Each EPS-160 power supply is shipped with a special redundant power supply cord.
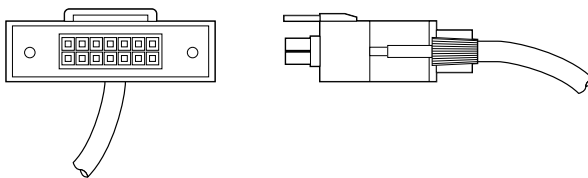
Figure 143: EPS-160 Redundant Power Cord Connector

EPS-LD External Power Supply Unit

You can use the Extreme Networks EPS-LD External Power Supply Unit (Model 45019) as a redundant power supply with the following Extreme Networks switches:

- Summit X450a-24t switch
- Summit X450e-24p switch

When attached to the Summit X450e-24p switch, the EPS-LD provides 465 W total power with 375 W dedicated for PoE applications.

The front of the EPS-LD has a green LED to indicate operating status as shown in the following table:

Power LED	Meaning
Green, solid	The external power supply is operating normally.
Off	The external power supply is not connected.

Note

An AC power input cord is not provided; you can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Each EPS-160 power supply is shipped with a special redundant power supply cord.

Figure 144: EPS-LD Redundant Power Cord Connector

EPS-500 External Power Supply Unit

The Extreme Networks EPS-500 External Power Supply Unit (Model 10911) provides additional power to compatible Power over Ethernet (PoE) switches and other Extreme switches. You can use the EPS-500 power supply as a redundant power supply with the following Extreme Networks switches:

- Summit X150-24p switch
- Summit X250e-24p switch
- Summit X350-24t switch
- Summit X350-48t switch
- Summit X450a-24t switch
- Summit X450a-24x switch
- Summit X450a-48t switch
- Summit X450e-24p switch
- Summit X450e-24t switch
- Summit X450e-48t switch

The EPS-500 power supply provides up to 500 W of total power and up to 375 W of power dedicated to PoE applications. When this power supply is used with one of the listed Summit switches, the internal and external power supplies 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 front of the EPS-500 has a green LED to indicate operating status as shown in the following table.

Power LED	Meaning
Green, solid	The external power supply is operating normally.
Off	The external power supply is not connected.

Note

An AC power input cord is not provided; you can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Each EPS-500 power supply is shipped with a special redundant power supply cord.
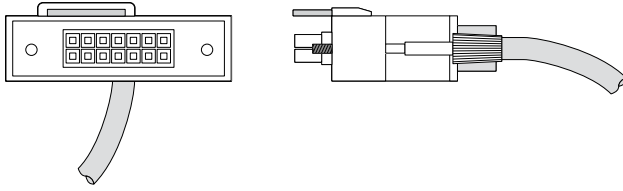
Figure 145: EPS-500 Redundant Power Cord Connector

EPS-600LS External Power Module

The EPS-600LS External Power Module (Model 10913) is a 600-watt redundant power supply unit that can be used with the following Extreme Networks switches:

- Summit X450e-48p switch
- Summit X250e-48p switch

You install one, two, or three EPS-600LS power modules in the EPS-C chassis (Model 10912) to build an external redundant power system for the Summit switch. A redundant power cable shipped with the EPS-C chassis provides the connection between the external power system and the redundant power input connector on the back of the switch.

LEDs on the front panel of the EPS-C indicate operating status for the installed EPS-600LS modules as shown in the following table.

Label	Color and State	Meaning
DC Good (PSU1, PSU2, and PSU3)	Green steady	Power supply is present and DC power is good.
	Off	No power.
AC Good (PSU1, PSU2, and PSU3)	Green steady	Power supply is present and AC power is good.
	Off	No power.

Note

An AC power input cord is not provided with the EPS-600LS power module. You can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Each EPS-C chassis is shipped with a special redundant power supply cord for connection to the Summit switch. Make sure that the EPS-C chassis is installed in the equipment rack before installing an EPS-600LS power module.

PoE Redundant Power Configurations

The PoE capability of the Summit X450e-48p or X250e-48p varies depending on the number of external power modules in use.

The following table summarizes the PoE power behavior for the Summit X450e-48p or X250e-48p switch based on the number of power modules in use.

Table 74: POE Power Behavior

Internal Power Supply Status	EPS-600LS (1x)	EPS-600LS (2x)	EPS-600LS (3x)	External Power Supply/ 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

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 power supply.

The internal Summit X450e-48p or X250e-48p power supply 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 power supply fails, the external power module will provide power to PoE devices at the same power levels as the internal power supply without any power interruptions.
* If the EPS-600LS power module fails or is removed, the internal power supply 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; this power level allows 15.4 W of PoE power to all 48 ports.

In this full-power configuration, the internal power supply 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. If one of the EPS-600LS power modules fails, the third power module continues to provide uninterrupted full PoE power. The internal power supply is disabled in this configuration.

Internal-to-External Power Supply 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 Power Supply 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 power supply 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 power supply is disabled to prevent damage from excessive current demands beyond the capabilities of the internal power supply.

External-to-Internal Power Supply Transfer

This section describes what happens if power from an external power module either fails or is disconnected.

Active Internal Power Supply with Single 600-LS Module Failure

When an EPS-C 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 power supply without power interruption to the PoE-connected devices.

Inactive Internal Power Supply with a Dual EPS-600LS Configuration and Module Failure

In an EPS-c chassis with two EPS-600-LS power modules, 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 Power over Ethernet section of the *ExtremeXOS Concepts Guide*. With only a single operating power module, the remaining EPS-600LS behaves as a redundant power module. The internal power supply 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 power supply. The internal power supply 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 Power over Ethernet section of the *ExtremeXOS Concepts Guide*.

Disconnect the EPS-C/EPS-600LS

To manually disconnect an EPS-C or to remove the EPS-600LS modules, the recommended practice is to disconnect the EPS-600LS modules one at a time, pausing two seconds after each EPS-600LS disconnect.

This enables a graceful power transition from the external power supplies to the internal power supply.

Example: Two active EPS-600LS modules in an EPS-C

1 Unplug one EPS-600LS unit from its power source.

 PoE power is automatically reduced to 370 watts and the internal switch power supply is enabled, providing redundant 370 watt PoE power.

2 Wait at least two seconds before disconnecting the remaining EPS-600LS unit.

3   Unplug the second EPS-600LS unit from its power source.

The internal power supply 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 Remove an EPS-600LS Power Module for disconnection and removal instructions.

4   Disconnect the EPS-C from the switch.

EPS-150DC External Power Module (with EPS-T2)

The EPS-150DC External Power Module (Model 10909) is a modular power supply for use in the EPS-T2 External Power System Tray.

You can use the EPS-150DC as a redundant power supply with the following Extreme Networks switches:

* Summit X250e-24tDC switch
* Summit X250e-24xDC switch
* Summit X250e-48tDC switch
* Summit X450a-24tDC switch
* Summit X450a-24xDC switch
* Summit X450a-48tDC switch

When this power supply is used with one of the listed Summit switches, the internal and external power supplies 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-T2 is a rack-mountable chassis or tray that holds one or two EPS-150DC power supplies. Each EPS-150DC provides one-to-one redundancy to an attached Extreme switch. You must install the EPS-150DC power supply in the EPS-T2 tray.

The front panel of the EPS-150DC unit has a green LED to indicate operating status as shown in the following table.

Power LED	Meaning
Green, solid	The external power module is operating normally.
Off	The external power module is not connected.

> **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.

Each EPS-150DC power supply is shipped with a special redundant power supply cord.
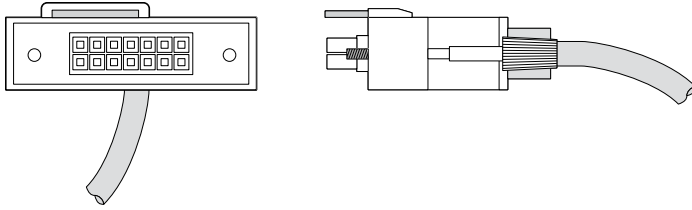
Figure 146: EPS-150DC Redundant Power Cord Connector

EPS-C2 Redundant Power System

The EPS-C2 is an external power supply system that supplies redundant power to Summit switches.

It is a standalone unit that can be rack mounted in a regular 19-inch rack system. The EPS-C2 can be populated with up to three Summit 750W PoE AC PSUs (power supply units) to provide a total redundant power budget of up to 2040W. The redundant power supply system can connect up to five Summit X440s to actively provide power to all five if needed.

The EPS-C2 redundant power system consists of the EPS-C2 chassis (Model 10936) plus one, two, or three installed Summit 750 W AC power supplies (Model 10931). For more information about the 750 W AC power supply including LED meanings, see Summit 750-Watt AC Power Supply.

The EPS-C2 system is compatible with the following Extreme Networks switches:
- Summit X440-24t switch
- Summit X440-24t-10G switch
- Summit X440-24p switch
- Summit X440-24p-10G switch
- Summit X440-48t switch
- Summit X440-48t-10G switch
- Summit X440-48p switch
- Summit X440-48p-10G switch
- Summit X450e-48p switch
- Summit X250e-48p switch

The EPS-C2 system provides redundant power for up to five Summit X440 series switches or for a single Summit X450e-48p or Summit X250e-48p switch. Redundant power connectors on the rear panel of the EPS-C2 chassis are specific to the supported switch type; a selection switch toggles between the connector type. There are five 2x7 connectors used for the Summit X440 switches, and one 2x9 connector for the other Summit switches.

The 750W AC PoE PSU used on the EPS-C2 has two power rails: 12V and PoE. These two power rails are independent. If the PoE rail overloads, it will shut down all PoE but the 12V rail will continue to function. If the 12V rail overloads, the 12V shuts down and the PoE rail will continue to function.

One redundant 2x7 power cable is shipped with the EPS-C2 chassis to provide the connection between the external power system and the redundant power input connector on the back of a switch. Additional redundant power cables are available from Extreme Networks.

The following table lists the power capability in watts of the EPS-C2 based on the number of installed PSUs. Check the power requirements of your switches to determine how many PSUs you need to install into the EPS-C2 chassis.

	12V Power (W)	PoE Power (W)
1 PSU	300	380
2 PSU	600	760
3 PSU	900	1140

EPS-C2 2x7 connector and 2x9 connector

2x7 connector

The following subsections describe the differences in how the EPS-C2 delivers power to the 2x7 connector and 2x9 connector.

The 2x7 connector is compatible with Summit X440 switches. Using the 2x7 connector, the EPS-C2 provides redundant PoE power at the same level no matter how many PSUs are installed. That is, if there are one, two, or three PSUs installed into the EPS-C2, the EPS-C2 will provide redundant PoE power capability at the same 380 watts capacity as the internal power supply of the connected Summit X440 series switches. The PoE power supplied does not increase more than 380 watts even if additional PSUs are installed.

Internal-to-External Power Supply Transfer

When a EPS-C2 is connected to the Summit X440 switch and the internal power supply fails, power is drawn from the EPS-C2 without power interruption to the switch or PoE connected devices.

External-to-Internal Power Supply Transfer

When a EPS-C2 is connected to the Summit X440 switch and the EPS-C2 fails or is disconnected, power is drawn from the internal power supply without interruption to the switch or PoE connected devices.

2x9 connector

The 2x9 connector is compatible with the Summit X450e-48p or Summit X250e-48p switch. Unlike the function on the 2x7 connector, the PoE capability of the EPS-C2 using the 2x9 connector for the Summit X450e-48p or X250e-48p varies depending on the number of PSUs installed in the EPS-C2. The following table summarizes the PoE power provided using the 2x9 connector to a Summit X450e-48p or X250e-48p switch based on the number of installed PSUs.

Warning

The 2x9 cable is not hot-pluggable. Do not attach a powered EPS-C2 to any Summit switch using the 2x9 connector. See Installing an EPS-C2 Chassis for installation instructions.

Switch Internal Power Supply Status	One installed 750W PoE PSU	Two installed 750W PoE PSU	Three installed 750W PoE PSU	External Power Supply/ Chassis Failed/ Disconnected
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
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 750W PoE PSU Configuration: Redundant PoE Power

A single 750W PoE PSU provides redundant PoE power capability with the same 370-watt capacity as the internal power supply. The internal Summit X450e-48p or X250e-48p power supply is capable of 370 Watts of PoE power: 15.4 Watts supplied to each port for a 24-port configuration and 7.7 Watts supplied to each port for a 48-port configuration.

If the internal power supply fails, the external power module will provide power to the switch and PoE devices at the same power levels as the internal power supply without any power interruptions.

If the 750W PoE PSU fails or is removed, the internal power supply of the switch continues to provide PoE power without any power interruptions.

Dual 750W PoE PSUs Configuration: Full Power

Two 750W PoE PSUs provide full power at 740 Watts; this power level allows 15.4 Watts of PoE power to all 48 ports. In this full-power configuration, the internal power supply is disabled, and therefore redundant power is not available.

Triple 750W PoE PSUs Configuration: Full Redundant Power

Three 750W PoE PSUs provide the full 740 Watts of power for 15.4 Watts of PoE power to all 48 ports. In addition, this configuration provides 2:1 redundancy. If one of the 750W PoE PSU fails, the third power module continues to provide uninterrupted full PoE power. The internal power supply of the switch is disabled in this configuration.

For information on installing the EPS-C2, see Installing an EPS-C2 Chassis.

Each EPS-C2 power supply is shipped with a special redundant power supply cord.
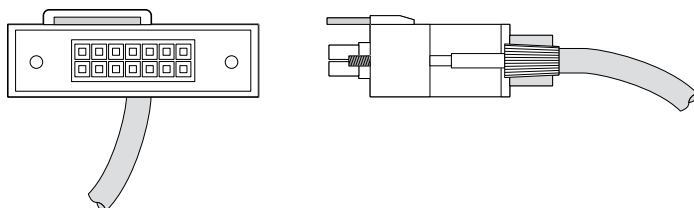
Figure 147: EPS-C2 2x7 Pin Redundant Power Cable

Summit Replaceable Internal Power Supplies

The Summit X460, X480, X650, and X670, and X770 series switches have two bays for installing one or two Extreme Networks AC or DC power supplies.

In a redundant power configuration, both power supplies are fully fault-tolerant and load-sharing. You can remove one power supply without interrupting switch operation.

Specific switch series and models are compatible with different power supply models, as shown in the following table:

Table 75: Summit Replaceable Internal Power Supply Compatibility

	Power Supply Model					
Summit Switch Model	300 W AC (10930) 300 W DC (10933) 300 W DC (10934A)	450 W AC (10917) 450 W DC (10918)	550 W AC-FB (10925) 550 W DC-FB (10926)	550 W AC-BF (10927) 550 W DC-BF (10928)	750 W AC (10931)	850 W AC (10914) 850 W DC (10915)
Summit X460-24t Summit X460-48t Summit X460-24x Summit X460-48x	Yes					
Summit X460-24p Summit X460-48p					Yes	
Summit X480 series		Yes				
Summit X650 series*						Yes*
Summit X670-48x-FB Summit X670V-48x-FB		Yes	Yes			
Summit X670-48x-BF Summit X670V-48x-BF				Yes		
Summit X770-32q-FB			Yes			
Summit X770-32q-BF				Yes		
* Extreme networks does not recommend combining an AC and DC power supply in the same Summit X650 series switch.						

> **Note**
>
> An AC power input cord is not provided with a Summit AC power supply. You can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Summit 300-Watt AC and DC Power Supplies

The following 300 W power supplies are available:

- Summit 300W AC power supply (Model 10930)

- Summit 300W DC power supply (Model 10933)
- Summit 300W DC power supply (Model 10934A)

The Summit 300 W power supplies (AC and DC) have the status LEDs listed in the following table.

Table 76: Summit 300 W LED Status Indications

LED Label and Color		Meaning
In OK Green	Out DC OK Green/red bicolor	
Off	Off	No input power
Off	Steady red	No input power; receiving standby output from system.
On	Off	Input good; 12 V output is disabled. Standby output is ON.
On	Steady red	Input good; fault in 12 V output.
On	Flashing green and red	Input good, 12 V output good. Power supply alert: power supply is likely to fail because of a developing fault, such as abnormal thermal conditions or poor fan performance.
On	Steady green	Input good; DC outputs good.

Summit 450-Watt AC and DC Power Supplies

The following Summit 450 W power supplies are available:

- Summit 450 W AC power supply (Model 10917)
- Summit 450 W DC power supply (Model 10918)

The Summit 450 W power supplies have the status LEDs listed in the following table.

Table 77: Summit 450 W LED Status Indications

Position	Color and State	Meaning
Top	Steady Green	+3.3VSB ok; 12 V ok; power supply is working properly.
Middle	Steady Amber	Fault condition (for example, 3.3VSB OCP/UCP, 12V OCP/UCP, or fan failure).
Bottom	Steady Green	Power supply is connected to power. If the cord is connected and this LED is off, the power supply is defective.

Summit 550-Watt AC and DC Power Supplies

Summit 550 W power supplies are available in the following models:

- 550 W AC PSU-FB (Model 10925)—AC power supply with front-to-back ventilation airflow
- 550 W DC PSU-FB (Model 10926)—DC power supply with front-to-back ventilation airflow
- 550 W AC PSU-BF (Model 10927)—AC power supply with back-to-front ventilation airflow
- 550 W DC PSU-BF (Model 10928)—DC power supply with back-to-front ventilation airflow

These power supplies are compatible with Summit X670 switch models that have the same airflow direction as the power supply. In a redundant power configuration, the airflow direction must be the same for both power supplies, and it must match the airflow direction of the fans in the switch.

The Summit 550 W power supplies have the status LEDs listed in the following table.

Table 78: Summit 550 W LED Status Indications

Position	Color and State	Meaning
Top	Steady Green	+3.3VSB ok; 12 V ok; power supply is working properly.
Middle	Steady Amber	Fault condition (for example, 3.3VSB OCP/UCP, 12V OCP/UCP, or fan failure).
Bottom	Steady Green	Power supply is connected to power. If the cord is connected and this LED is off, the power supply is defective.

Summit 750-Watt AC Power Supply

The Summit 750 W AC power supply (Model 10931) is available for PoE models of the Summit X460 series switches.

This power supply is also used in the EPS-C2 external power system (see EPS-C2 Redundant Power System). Each installed Summit 750 W AC power supply can provide up to 380 Watts of PoE power budget.

The Summit 750 W AC power supply has the status LEDs listed in the following table.

Table 79: Summit 750 W LED Status Indications

Label and Color	State	Meaning
AC OK Green	Off	No AC input
	On	AC input is good.
DC OK Green	Off	Both DC outputs (55 V and 12 V) are bad or not enabled.
	Blinking	One output is enabled and good; the second output is bad or not enabled.
	On	Both the 55 V and 12 V outputs are enabled and good.
ALM Red	Off	No fault condition exists.
	Blinking	Power supply alert: power supply is likely to fail because of a developing fault, such as abnormal thermal conditions or poor fan performance. or One output (55 V or 12 V) is bad.
	On	Both outputs (55 V and 12 V) are bad. Power supply is receiving 3.3 VSB from the system. (AC OK and DC OK are off.) Thermal shutdown, fan failure, or any fault condition when both 55 V and 12 V are turned OFF.

Summit 850-Watt AC and DC Power Supplies

The following 850-watt power supplies are available:

- Summit 850 W AC power supply (Model 10914)
- Summit 850 W DC power supply (Model 10915)

These power supplies are compatible with the Summit X650 series switches.

Note

Extreme Networks does not recommended using the Summit 850 W DC power supply in combination with a Summit 850 W AC power supply in the same Summit X650 series switch.

The Summit 850 W AC and DC power supplies have the status LED described in the following table.

Table 80: Summit 850 W LED Status Indications

Color and State	Meaning
Blinking green	AC in; no output
Steady green	Normal operation
Blinking red	Output error
Steady red	Critical error

3 Summit Option Cards and Versatile Interface Modules

Overview
Summit XGM-2xn Option Card
Summit XGM2-2xn Option Card
Summit XGM2-2xf Option Card
Summit XGM2-2sf Option Card
Summit XGM2-2bt Option Card
Versatile Interface Modules for the Summit X650 Series Switches
Versatile Interface Modules for the Summit X480 Series Switches
Optional Ports for the Summit X460 Series Switches
Optional Ports for the Summit X460-G2 Series Switches
VIM4-40G4X Versatile Interface Module for the Summit X670 Switch

This section describes port option cards, versatile interface modules (VIMs), and stacking modules that are available for use with Summit family switches.

These option cards add 10-Gbps copper or fiber I/O ports or high-performance stacking ports to the back panel of compatible switches.

Overview

Summit port option cards, versatile interface modules, or stacking modules are installed in dedicated slots at the back of the switch to provide optional I/O ports or stacking ports. The option slot is covered by a blank panel if no card or module is installed.

The following table lists the types of Summit port option cards, VIMs, and stacking modules and their compatible Summit switch series.

Table 81: Summit Card, VIM, and Module Compatibility

Card or Module Type	Name	No. of Ports	Type of Ports	Compatible Switch Series
10-Gbps I/O Port XGM series	XGM-2xn	2	XENPAK optical I/O ports	Summit X450
	XGM2-2xn	2	XENPAK optical I/O ports	Summit X450a, X450e
	XGM2-2xf	2	XFP optical I/O ports	Summit X350, X450a, X450e
	XGM2-2sf	2	SFP+ optical I/O ports	Summit X350, X450a, X450e
	XGM2-2bt	2	10GBASE-T copper I/O ports	Summit X350, X450a, X450e
	XGM3-2sf	2	SFP+ optical I/O ports	Summit X460 (slot A)
	XGM3S-2sf	2	SFP+ optical I/O ports with Sync-E	Summit X460 (slot A)
	XGM3S-2xf	2	XFP optical I/O ports with Sync-E	Summit X460 (slot A)
	XGM3SB-4sf	4	SFP+ optical I/O ports with Sync-E	Summit X460 (slot B)
VIM1	VIM1-SummitStack	2	20-Gbps stacking ports	Summit X650
		4	1-Gbps SFP I/O ports	Summit X650
	VIM1-10G8X	2	20-Gbps stacking ports	Summit X650
		8	10-Gbps SFP+ I/O ports	Summit X650
	VIM1-SummitStack512	4	128-Gbps stacking ports	Summit X650
	VIM1-SummitStack256	2	128-Gbps stacking ports	Summit X650
VIM2	VIM2-SummitStack	2	20-Gbps stacking ports	Summit X480
	VIM2-10G4X	4	10-Gbps XFP I/O ports	Summit X480
	VIM2-SummitStack128	2	64-Gbps stacking ports	Summit X480
	VIM2-SummitStack-V80	2	40-Gbps QSFP+ stacking ports	Summit X480
Stacking Module	SummitStack	2	20-Gbps stacking ports	Summit X460 (slot B)
	SummitStack-V80	2	40-Gbps QSFP+ stacking ports	Summit X460 (slot B)
VIM3	VIM3-40G4X	4	40-Gbps QSFP+ stacking ports	Summit X480, X650
VIM4	VIM4-40G4X	4	40-Gbps QSFP+ stacking ports	Summit X670V-48x switch

Summit XGM-2xn Option Card

The Summit XGM-2xn option card allows you to add one or 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)

For current information about compatible XENPAK modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For more information about XENPAK modules, refer to the *Extreme Networks Pluggable Interface Modules Installation Guide*.

> **Note**
>
> The ExtremeXOS software also recognizes standards-based CX-4 XENPAKs; contact your CX-4 module vendor to obtain these.

Mixing ZR XENPAKs with Other Types

The following table 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 the following table for the switch to discover the ZR XENPAK correctly.

Left Slot	Right Slot
ZR XENPAK	Empty
ZR XENPAK	SR XENPAK

Summit XGM2-2xn Option Card

The Summit XGM2-2xn option card allows you to add one or two 10-gigabit XENPAK modules to the following switches:

- Summit X350 series switch, running ExtremeXOS 12.1.2 (or later). Summit X350 series switches do not support the LW XENPAK module in the XGM2-2xn card.
- 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)
- Summit X450e-24t switch, running ExtremeXOS 12.5.1 (or later)
- Summit X450e-48t switch, running ExtremeXOS 12.5.1 (or later)
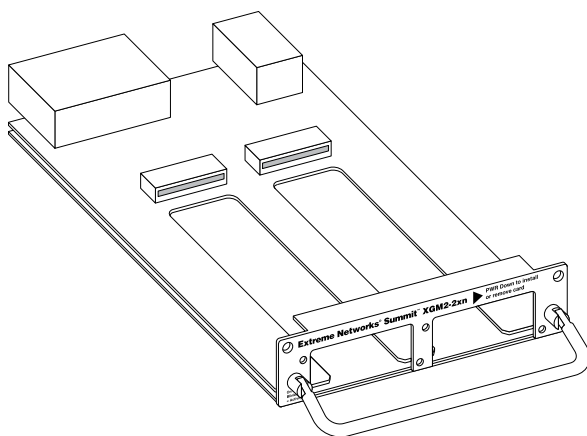
Figure 148: Summit XGM2-2xn Option Card

In Summit X450a and X450e series switches, the ports on the XGM2-2xn option card can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

For current information about compatible XENPAK modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For information about XENPAK modules, refer to the *Extreme Networks Pluggable Interface Modules Installation Guide*.

> **Note**
> Standards-based CX-4 XENPAKs are also recognized by ExtremeXOS; contact your CX-4 module vendor to obtain these.

Summit XGM2-2xf Option Card

The Summit XGM2-2xf option card allows you to add one or two 10-gigabit XFP modules to the following switches:

- Summit X350 series switch, running ExtremeXOS 12.1.2 (or later)
- 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)
- Summit X450e-24t switch, running ExtremeXOS 12.5.1 (or later)
- Summit X450e-48t switch, running ExtremeXOS 12.5.1 (or later)

The following figure shows the Summit XGM2-2xf option card.

Figure 149: Summit XGM2-2xf Option Card

The ports on the XGM2-2xf option card can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

For current information about compatible XFP modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For more information about XFP modules, refer to the *Extreme Networks Pluggable Interface Modules Installation Guide*.

Summit XGM2-2sf Option Card

- Summit X350 series switch, running ExtremeXOS 12.2.1 or later
- Summit X450a series switch, running ExtremeXOS 12.2.1 or later
- Summit X450e-24p or X450e-48p switch, running ExtremeXOS 12.2.1 or later
- Summit X450e-24t or X450e-48t switch, running ExtremeXOS 12.5.1 (or later)

In Summit X450a and X450e series switches, the ports on the XGM2-2sf option card can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

For current information about compatible SFP+ modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For more information about SFP+ modules, refer to the *Extreme Networks Pluggable Interface Modules Installation Guide*.
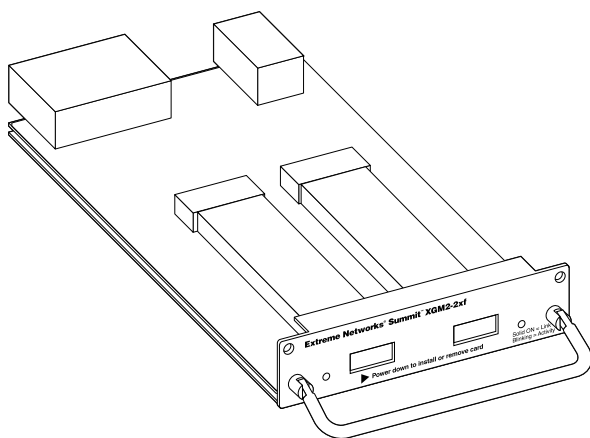
Summit XGM2-2bt Option Card

The XGM2-2bt option card allows you to add two fixed 10GBASE-T ports to the following switches:

- Summit X350 series switch, running ExtremeXOS 12.2.1 or later
- Summit X450a series switch, running ExtremeXOS 12.2.1 or later
- Summit X450e-24p or X450e-48p switch, running ExtremeXOS 12.2.1 or later
- Summit X450e-24t or X450e-48t switch, running ExtremeXOS 12.5.1 (or later)

In Summit X450a and X450e series switches, the ports on the XGM2-2bt option card can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

The 10GBASE-T standard (IEEE 802.3an) allows the use of standard CAT5E, CAT6, or CAT6A cable for connection to the XGM2-2bt ports (see the following table).

Table 82: Standard Cable Distances

Cable Type	Maximum Distance
CAT5E	55 meters
CAT6	75 meters
CAT6A	100 meters

Versatile Interface Modules for the Summit X650 Series Switches

The back panel of the Summit X650 series switch has a replaceable VIM1 or VIM3 versatile interface module.

These modules provide dedicated high-speed stacking ports or Ethernet ports. For more information about using the stacking ports, see Summit Family Switches.

The following VIMs are available for the Summit X650 series switches:

- VIM1-10G8X Virtual Interface Module
- VIM1-SummitStack Versatile Interface Module
- VIM1-SummitStack512 Versatile Interface Module
- VIM1-SummitStack256 Versatile Interface Module
- VIM3-40G4X Versatile Interface Module

VIM1-10G8X Versatile Interface Module

The VIM1-10G8X versatile interface module provides eight cages for installed SFP or SFP+ optical modules.

In addition, the VIM1-10G8X module is compatible with the SFP+ direct-attach passive copper cable. For information about the supported optical modules, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

The VIM1-10G8X module also provides two high-performance stacking ports that allow you to combine multiple units into a single SummitStack management entity. The stacking ports on the VIM1-10G8X module are not shared with the front panel ports.

Ports 31 and 32 on the VIM1-10G8X module can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.
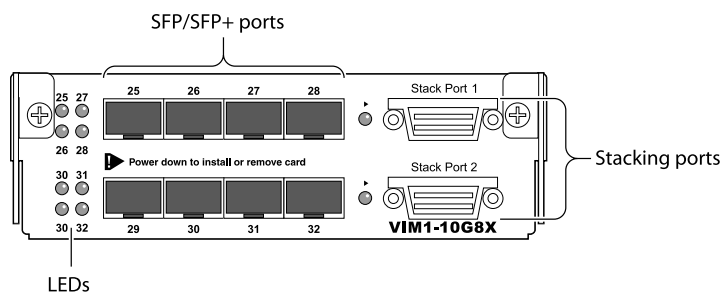
Figure 150: VIM1-10G8X Versatile Interface Module

VIM1-10G8X Versatile Interface Module

The VIM1-10G8X versatile interface module provides eight cages for installed SFP or SFP+ optical modules.

In addition, the VIM1-10G8X module is compatible with the SFP+ direct-attach passive copper cable. For information about the supported optical modules, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

The VIM1-10G8X module also provides two high-performance stacking ports that allow you to combine multiple units into a single SummitStack management entity. The stacking ports on the VIM1-10G8X module are not shared with the front panel ports.

Ports 31 and 32 on the VIM1-10G8X module can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

Figure 151: VIM1-10G8X Versatile Interface Module

VIM1-SummitStack512 Versatile Interface Module

The VIM1-SummitStack512 versatile interface module provides four 128-Gbps stacking ports that are used to cross-connect two Summit X650 series switches.

Each switch must have an installed VIM1-SummitStack512 module. To connect these ports, you must use stacking cables with compatible connectors, available from Extreme Networks.

The VIM1-SummitStack512 module requires ExtremeXOS 12.3.3 software (or later) installed on the Summit X650 series switch.

Figure 152: VIM1-SummitStack512 Versatile Interface Module

VIM1-SummitStack256 Versatile Interface Module

The VIM1-SummitStack256 versatile interface module provides two 128-Gbps SummitStack stacking ports.

To connect these ports, you must use stacking cables with compatible connectors, available from Extreme Networks.

The VIM1-SummitStack256 module requires ExtremeXOS 12.4.1 software (or later) installed on the Summit X650 series switch.
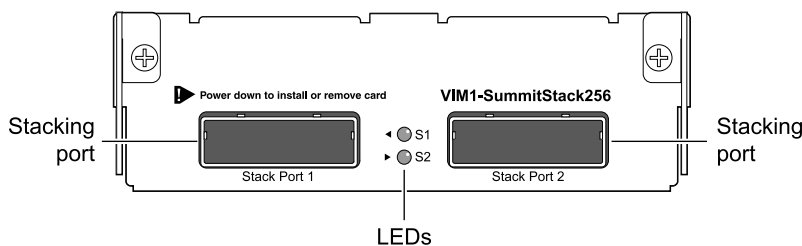
Figure 153: VIM1-SummitStack256 Versatile Interface Module

VIM3-40G4X Versatile Interface Module

The VIM3-40G4X versatile interface module provides four unpopulated cages for QSFP+ optical modules or QSFP+ compatible direct-attach active or passive cables.

Ports S3 and S4 can be enabled as native stacking ports for the Summit X650 series switch.

Each physical port can be configured to operate as a single 40-Gbps port or as four 10-Gbps ports. When the port operates in 40-Gbps mode, you can connect the port using either a QSFP+ direct-attach cable or an installed QSFP+ module and compatible fiber optic cable. When the port is configured to operate in 10-Gbps mode, you must connect it using a special 1-to-4 breakout fiber optic cable.

The VIM3-40G4X module requires ExtremeXOS 12.6.1 software (or later) installed on the Summit X650 series switch.

Figure 154: VIM3-40G4X Versatile Interface Module

1 = QSFP+ port	2 = Port LEDs

Versatile Interface Modules for the Summit X480 Series Switches

A VIM2 or VIM3 versatile interface module can be installed in a dedicated slot at the back of the Summit X480 series switch to provide high speed stacking ports or 10-Gbps Ethernet ports.

VIM2-10G4X Versatile Interface Module

The VIM2-10G4X versatile interface module provides four 10-Gbps ports using XFP optical modules.

For information about the supported optical modules, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.
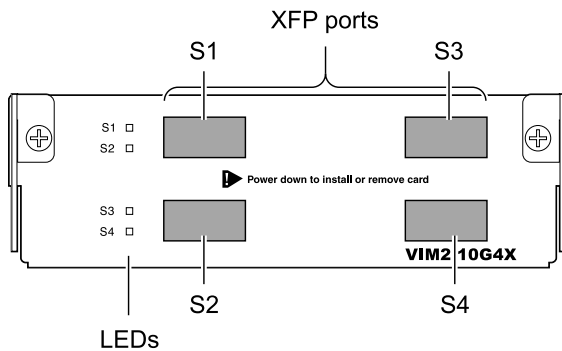
Figure 155: VIM2-10G4X Versatile Interface Module

The XFP ports are labeled S1, S2, S3, and S4. ExtremeXOS software assigns port numbers to the XFP ports based on the switch model in which the VIM2-10G4X module is installed (see the following table).

Table 83: Port Numbers for XFP Ports on the VIM2-10G4X Module

Port Label	Summit X480-48t or Summit X480-48xPort Number	Summit X480-24tPort Number
S1	49	27
S2	50	28
S3	51	29
S4	51	30

Ports S3 and S4 can be used as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.
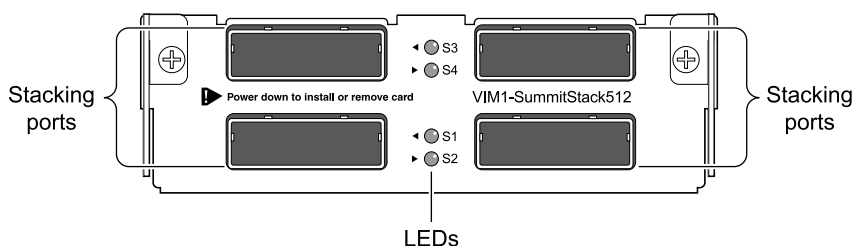
VIM2-SummitStack Versatile Interface Module

The VIM2-SummitStack module provides two high-performance stacking ports that allow you to combine multiple units into a single SummitStack management entity.

For more information about configuring and operating a SummitStack configuration, refer to the *ExtremeXOS Concepts Guide* and the *ExtremeXOS Command Reference Guide*.
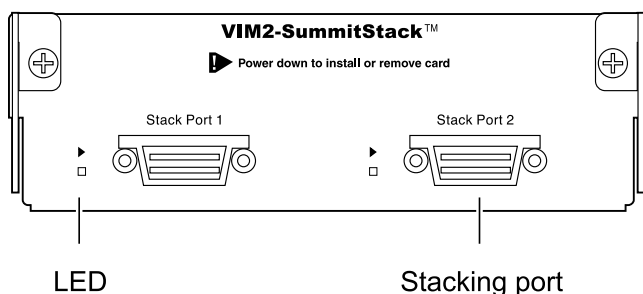
Figure 156: VIM2-SummitStack Versatile Interface Module

VIM2-SummitStack128 Versatile Interface Module

The VIM2-SummitStack128 versatile interface module provides two 64-Gbps SummitStack stacking ports.

To connect these ports, you must use stacking cables with compatible connectors, available from Extreme Networks.
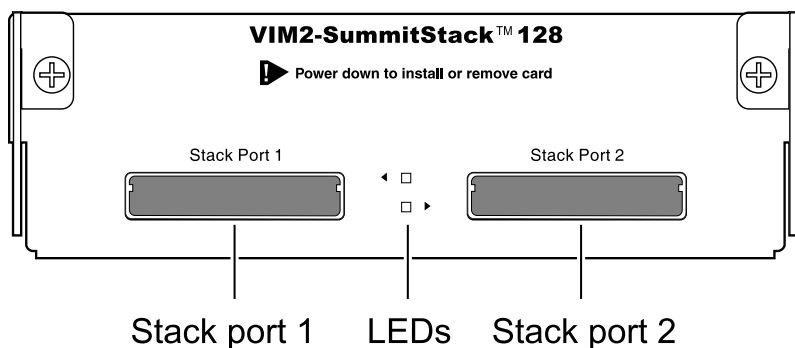
Figure 157: VIM2-SummitStack128 Versatile Interface Module

VIM2-SummitStack-V80 Versatile Interface Module

The VIM2-SummitStack-V80 versatile interface module provides two unpopulated cages for QSFP+ optical modules or QSFP+ compatible active or passive cables.

These ports support 20-Gbps bidirectional stacking connections.
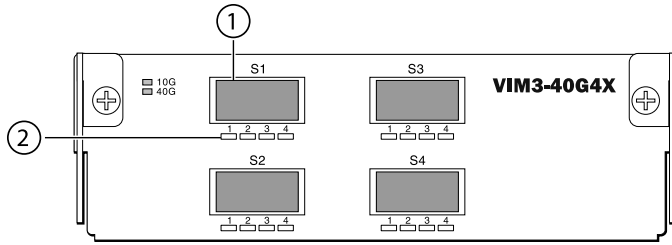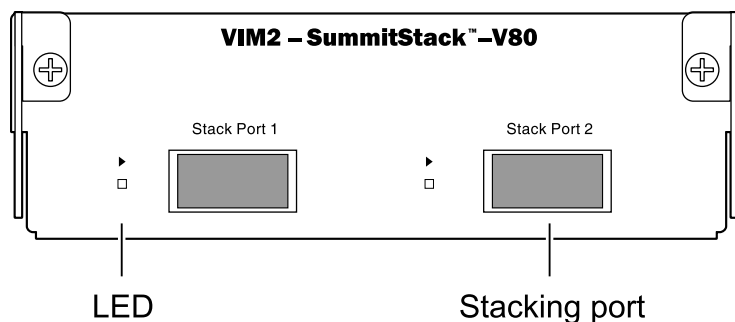
Figure 158: VIM2-SummitStack-V80 Module

VIM3-40G4X Versatile Interface Module

The VIM3-40G4X versatile interface module provides four unpopulated cages for QSFP+ optical modules or QSFP+ compatible direct-attach active or passive cables.

Ports 25 and 26 can be enabled as alternate stacking ports for the Summit X480 series switch.

Each physical port can be configured to operate as a single 40-Gbps port or as four 10-Gbps ports. When the port operates in 40-Gbps mode, you can connect the port using either a QSFP+ direct-attach cable or an installed QSFP+ module and compatible fiber optic cable. When the port is configured to operate in 10-Gbps mode, you must connect it using a special 1-to-4 breakout fiber optic cable.

The VIM3-40G4X module requires ExtremeXOS 15.1.2 software (or later) installed on the Summit X480 series switch.
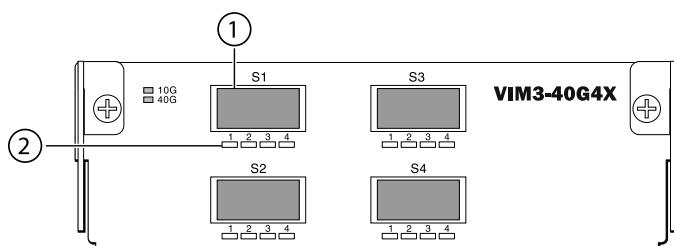
Figure 159: VIM3-40G4X Versatile Interface Module

1 = QSFP+ port	2 = Port LEDs

Optional Ports for the Summit X460 Series Switches

The rear panel of all Summit X460 switches provides slots to install the following option cards:

- XGM3-2sf port option card
- XGM3S-2sf option card
- XGM3S-2xf option card

- Summit X460 series stacking module
- XGM3SB-4sf option card

	Note
	Option cards for the Summit X460 series switches are not compatible with the Summit X460-G2 series switrches.

	Caution
	Option cards are not hot swappable. You must power down the switch before installing any option cards.

XGM3-2sf Port Option Card

The XGM3-2sf option card allows you to add one or two 10-gigabit SFP+ optical ports to slot A on the rear panel of a Summit X460 series switch.

	Caution
	Option cards are not hot swappable. You must power down the switch before installing any option cards.

The XGM3-2sf option card supports SFP+ optical modules and the SFP+ direct-attach passive copper cable.

The ports on the XGM3-2sf option card can be configured as alternate stacking ports in a SummitStack configuration that uses the SummitStack-V feature. For more information about stacking Summit family switches, see Summit Family Switches.

Figure 160: XGM3-2sf Option Card

For current information about compatible SFP+ modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For more information about SFP+ modules, refer to the *Extreme Networks Pluggable Interfaces Hardware Installation Guide*.

XGM3S-2sf Port Option Card

The XGM3S-2sf option card allows you to add one or two 10-Gigabit SFP+ optical ports to slot A on the rear panel of a Summit X460 series switch.

> **Caution**
> Option cards are not hot swappable. You must power down the switch before installing any option cards.

These ports support synchronous Ethernet (Sync-E). The XGM3S-2sf option card supports either SFP+ optical modules or the SFP+ direct-attach passive copper cable.
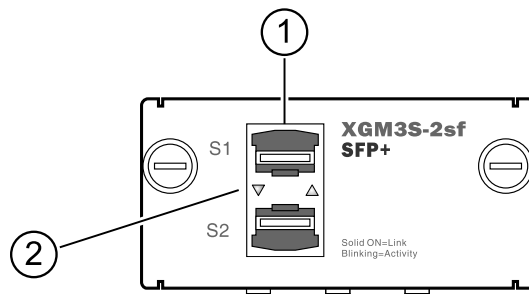
Figure 161: XGM3S-2sf Option Card

1 = SFP+ ports	2 = LEDs

XGM3S-2xf Port Option Card

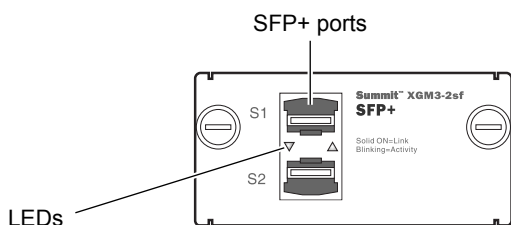The XGM3S-2xf option card allows you to add one or two 10-Gigabit XFP optical ports to Slot A on the rear panel of the Summit X460 series switch.

> **Caution**
> Option cards are not hot swappable. You must power down the switch before installing any option cards.

These ports support synchronous Ethernet (Sync-E).

Figure 162: XGM3S-2xf Option Card

1 = XFP ports	2 = LEDs

Summit X460 Series Stacking Modules

Summit X460 series stacking modules allow you to add two high-performance SummitStack ports to slot B on the rear panel of a Summit X460 series switch.

> **Caution**
> Stacking modules are not hot swappable. You must power down the switch before installing any stacking modules.

These ports allow you to combine multiple units into a single SummitStack management entity, using stacking cables that are available from Extreme Networks.

Two stacking modules are available for the Summit X460 series switches (see Figure 163: Summit X460 Series Stacking Modules on page 165):

- SummitStack stacking module

  Provides two integrated 20-Gbps bidirectional stacking ports for stacking connections using Extreme Networks SummitStack cables.
- SummitStack-V80 stacking module

  Provides two unpopulated cages for QSFP+ optical modules or QSFP+ compatible active or passive cables. These ports support 20-Gbps bidirectional stacking connections.
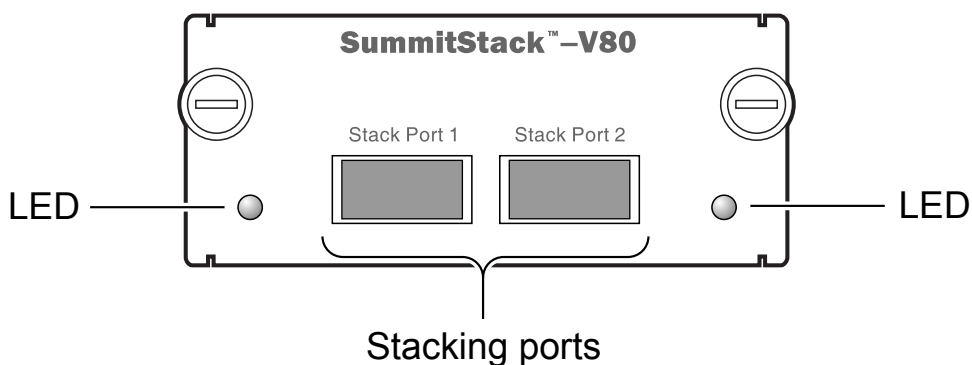
Figure 163: Summit X460 Series Stacking Modules

SummitStack	SummitStack-V80
Module	Module

XGM3SB-4sf Port Option Card

The XGM3SB-4sf option card allows you to add up to four 10-Gigabit SFP+ optical ports to Slot B on the rear panel of the Summit X460 series switch.

> **Caution**
> Option cards are not hot swappable. You must power down the switch before installing any option cards.

These ports support synchronous Ethernet (Sync-E). The XGM3SB-4sf option card supports either SFP+ optical modules or the SFP+ direct-attach passive copper cable.
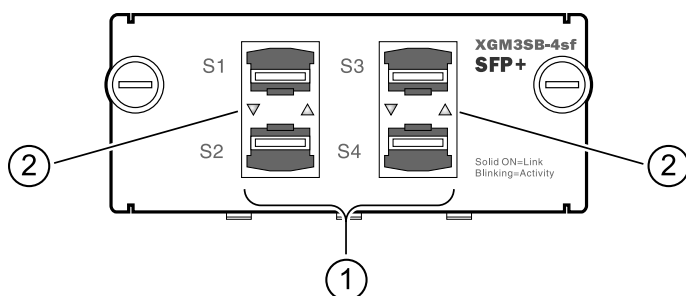
Figure 164: XGM3SB-4sf Option Card
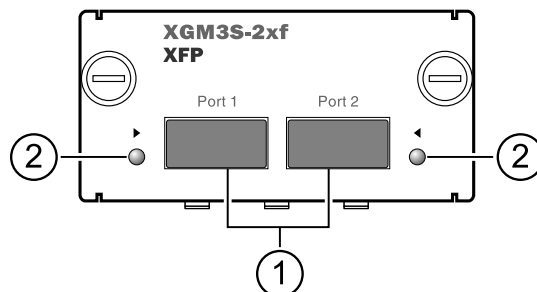
1 = SFP+ ports	2 = LEDs

Optional Ports for the Summit X460-G2 Series Switches

The rear panel of all Summit X460-G2 switches provides slots to install the following:

- VIM-2q Ethernet Module with 2x40G ports.
- VIM-2ss SummitStack Module with stacking ports.
- VIM-2t Ethernet Module with 2x10GBase-T ports.
- VIM-2x Ethernet Module with 2x10GSFP+ ports.
- TM-CLK Clock Module to support Sync-E and 1588.

> **Note**
>
> Optional VIM and clock modules for the Summit X460-G2 series switches are not compatible with Summit X460 series switrches.

> **Caution**
>
> The switch must be powered off before you install any interface module options (VIMs or clock modules). The interface module options are not hot swappable.

VIM-2q Port Option Card

The VIM-2q Ethernet Module option card allows you to add one or two 40 gigabit QSFP+ optical ports to the VIM (Versatile Interface Module) slot on the rear panel of a Summit X460-G2 series switch. The VIM-2q option card supports QSFP+ optical modules.

The ports on the VIM-2q option card can be configured as high speed stacking ports in a SummitStack configuration with a stack link speed of 40G. For more information about stacking Summit family switches, see Summit Family Switches.

> **Note**
>
> 40G ports on the VIM-2q cannot be partitioned into four 10G ports.

> **Caution**
>
> VIM modules are not hot swappable. You must power down the switch before installing any VIM modules.
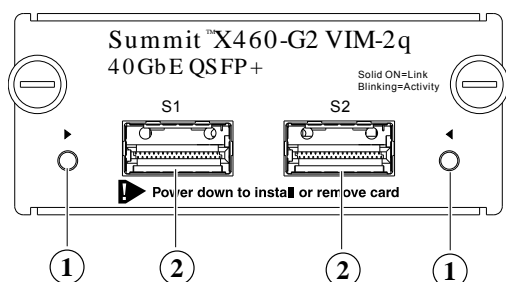
Figure 165: VIM-2q Port Option Card

Table 84: VIM-2q

1 = LEDs	2 = QSFP+ ports

For current information about compatible QSFP+ modules and the minimum required software, refer to the most recent version of the *ExtremeXOS Hardware and Software Compatibility Matrix*.

For more information about QSFP+ modules, refer to the *Extreme Networks Pluggable Interfaces Hardware Installation Guide*.

VIM-2ss Port Option Card

Summit X460-G2 series stacking modules allow you to add two high-performance SummitStack ports to the VIM (Versatile Interface Module) slot on the rear panel of a Summit X460-G2 series switch. These ports allow you to combine multiple units into a single SummitStack management entity, using stacking cables that are available from Extreme Networks. The VIM-2ss stacking module Figure 166: VIM-2ss SummitStack Module on page 168 provides two integrated CX4 SummitStack 10-Gbps bidirectional stacking ports for stacking connections using Extreme Networks SummitStack cables.

> **Caution**
>
> VIM modules are not hot swappable. You must power down the switch before installing any VIM modules.

> **Note**
>
> Alternate stacking with the VIM-2x is not supported with the current release of the EXOS software.
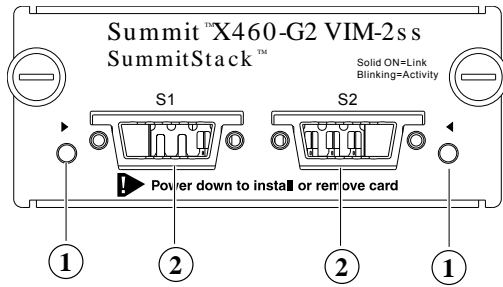
Figure 166: VIM-2ss SummitStack Module

Table 85: VIM-2ss

1 = LEDs	2 = Stacking Ports

VIM-2t Port Option Card

The VIM-2t Ethernet Module option allows you to add one or two 10-Gigabit copper BASE-T ports to the VIM (Versatile Interface Module) slot on the rear panel of a Summit X460-G2 series switch. These ports support 10G BASE-T RJ45 cables. Sync-E support is available on the S1 port.

> **Caution**
> VIM modules are not hot swappable. You must power down the switch before installing any VIM modules.
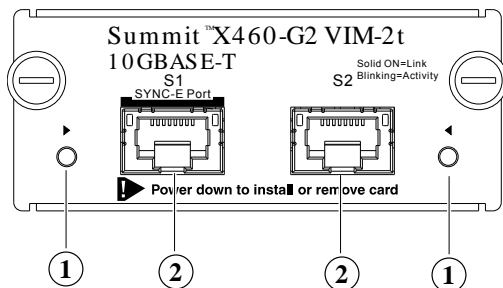
Figure 167: VIM-2t Ethernet Module Option

Table 86: VIM-2t

1 = LEDs	2 = 10G BASE-T ports

VIM-2x Ethernet Module Port Option Card

The VIM-2x Ethernet Module option card Figure 168: VIM-2x Ethernet Module Option on page 169allows you to add up to two 10-Gigabit SFP+ optical ports to the VIM slot on the rear panel of the Summit X460-G2 series switch. These ports support SFP+ optical modules.

> **Caution**
>
> VIM modules are not hot swappable. You must power down the switch before installing any VIM modules.

> **Note**
>
> Alternate stacking with the VIM-2x is not supported with the current release of the EXOS software.
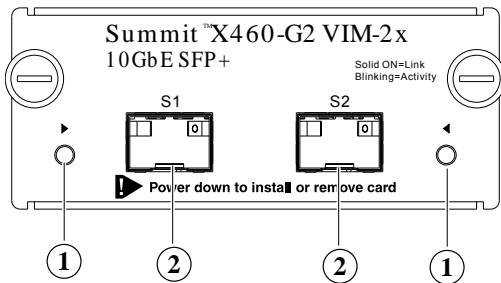
Figure 168: VIM-2x Ethernet Module Option

Table 87: VIM-2x

1 = LEDs	2 = SFP+ ports

TM-CLK Clock Module

The TM-CLK Clock Module provides an Oven-controlled Crystal Oscillator (OCXO), stable to better than one part per million for use as a reference frequency for SyncE and 1588v2 precision time features. The EXOS configuration selects the input to the clock module from a SyncE master port or a 1588v2 grandmaster clock. The TM-CLK module is required for SyncE on the X460-G2. The 1588v2 Precision Time feature on the X460-G2 requires the TM-CLK module and the Network Timing Feature Pack, and does not support stacking.

Two mini-BNC outputs deliver the following signals:
- 10MHz frequency reference

- 1 PPS signal at the top of each second

> **Caution**
>
> The clock modue is not hot swappable. You must power down the switch before installing any VIM modules.

> **Note**
>
> The TM-CLK module has no inputs for timing signals, and it cannot act as a 1588v2 grandmaster clock. The module provides no RJ-45 Building Integrated Timing System (BITS) output, and in particular does not provide the serial time of day output.

> **Note**
>
> The X460-G2 TM-CLK clock module does not accept both 10MHz and 1PPS signals at the same time, so it can take 10 to 20 minutes or more to lock onto a 1588v2 1PPS signal from the Apollo2 chip in addition to the usual 15 minutes or more for the 1588v2 servo to lock onto the remote grandmaster clock.
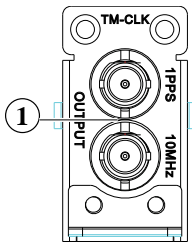
Figure 169: TM-CLK Module Option

Table 88: TM-CLK

1 = Timing signal mini-BNC outputs

VIM4-40G4X Versatile Interface Module for the Summit X670 Switch

The rear panel of the Summit X670 switch provides a slot for an optional VIM4-40G4X versatile interface module.

The VIM4-40G4X module (see) provides four unpopulated cages for QSFP+ optical modules or QSFP+ compatible active or passive cables.

Ports S3 and S4 can be enabled as native stacking ports for the Summit X670 switch. Each physical port can be configured to operate as a single 40-Gbps port or as four 10-Gbps ports. When the port operates in 40-Gbps mode, you can connect the port using either a QSFP+ direct-attach cable or an installed QSFP+ module and compatible fiber optic cable. When the port is configured to operate in 10-Gbps mode, you must connect it using a special 1-to-4 fan-out cable.

The VIM4-40G4X module requires ExtremeXOS 12.6.1 software (or later) installed on the Summit X670 switch.
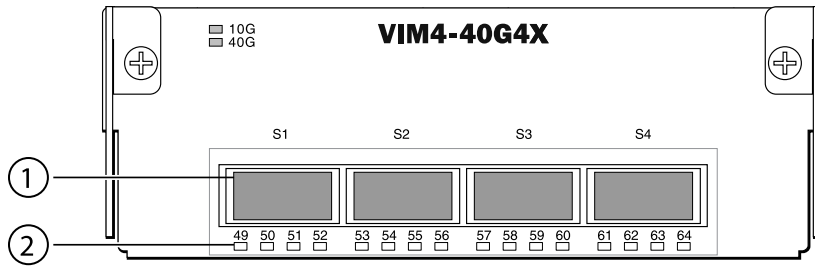
Figure 170: VIM4-40G4X Versatile Interface Module

1 = QSFP+ port	2 = Port LEDs

4 Site Preparation

Planning Your Site
Meeting Site Requirements
Evaluating and Meeting Cable Requirements
Meeting Power Requirements
Applicable Industry Standards

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.

The information in this chapter is intended for the system administrator, network equipment technician, network manager, or facilities manager responsible for installing and managing the network hardware. The chapter assumes a working knowledge of local area network (LAN) operations, and a familiarity with communications protocols that are used on interconnected LANs.

Only qualified service personnel should install, maintain, or remove a switch, chassis, or its components. 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.

> **Note**
> Before installing or removing any components of the system, or before carrying out any maintenance procedures, read the safety information in Technical Specifications of this guide.

Planning Your Site

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

1 Meeting site requirements.

    The 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
    • Equipment rack requirements

2 Evaluating and meeting cable requirements.

    After examining your physical site and verifying that 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.

3 Meeting power requirements.

To run your equipment safely, you must meet the specific power requirements for each switch and external power supply unit installed in the system. For power specifications of the switches, see the specific switch listings in Technical Specifications. For power specifications of the external power supplies, see Summit External Power Supplies.

Meeting Site Requirements

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 network, 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. This section lists resources for obtaining additional information.

For information about major building codes, consult the following organization:

International Code Council (ICC), 5203 Leesburg Pike; Falls Church, Virginia 22041 USA.

www.iccsafe.org

www.sbcci.org

The organizations listed in the following table are authorities on electrical codes.

Table 89: Authorities on Electrical Codes

Organization	Address	Web Site URL
National Electrical Code (NEC) Classification (USA only) 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).	NFPA 1 Batterymarch Park Quincy, Massachusetts 02169 USA	www.nfpa.org
Underwriters' Laboratory (UL) (USA only) 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."	UL 333 Pfingsten Road Northbrook, Illinois 60062-2096 USA	www.ul.com
National Electrical Manufacturing Association (NEMA) (USAonly) Organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components.	NEMA 1300 N. 17th Street Rosslyn, Virginia 22209 USA	www.nema.org

Table 89: Authorities on Electrical Codes (continued)

Organization	Address	Web Site URL
Electronics Industries Alliance (EIA) Trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry.	EIA 2500 Wilson Boulevard Arlington, Virginia 22201 USA	www.eia.org
Federal Communications Commission (FCC) (USA only) Commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of1934. The FCC regulates all U.S. telephone and cable systems.	FCC 445 12th Street S.W. Washington, D.C. 20554 USA	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 for information.
- Use appropriate AC or DC 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 equipment 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 the location of your equipment:

- 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 an ambient operating temperature of 32° to 104° F (0° to 40° C).
- Maintain a storage temperature of -40° to 158° F (-40° to 70° C).

> **Note**
>
> As with all electrical equipment, Extreme Networks product lifetimes degrade with increased temperature. Ifpossible, temperatures should be kept at approximately 78° F (25° C) or lower.

Humidity

To maximize equipment life, keep operating humidity between 50% and 70% relative humidity (non-condensing) during typical operation.

The equipment can operate between 10% and 95% relative humidity (non-condensing) for short intervals.

Spacing Requirements and Airflow

Be sure that cables and other equipment do not block the air intake or outflow on an Extreme Networks 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.

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.

  If you are working with pluggable interface modules, wear an ESD-preventive wrist strap and connect the metal end to a grounded equipment rack or other source of ground.

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 equipment 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.
- 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.

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.
- For a Summit DC-powered switch, use a minimum 14 AWG stranded copper wire for grounding.

  AC-powered Summit switches do not need separate chassis grounding.
- 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 ensure 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 30 inches (76 cm) behind the rack. When using a relay (two-post) rack, provide a minimum of 24 inches (61 cm) of space behind the mounted equipment. Extra room on each side is optional.

Warning

Extreme Networks switches do not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the switch is disconnected by removing the wall plug from the electrical outlet.

The DC-powered Summit switches include the X450a-24tDC, X450a-24xDC, X450a-48tDC switches, and the Summit X460, X480, and X650 series switches with installed DC power supplies. For these switches and the EPS-150DC power supply, turn off power to the chassis by de-energizing the circuit that feeds the power supply. This is usually accomplished by turning off a circuit breaker. Disconnecting the DC power cable from the DC power source must be done by 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.
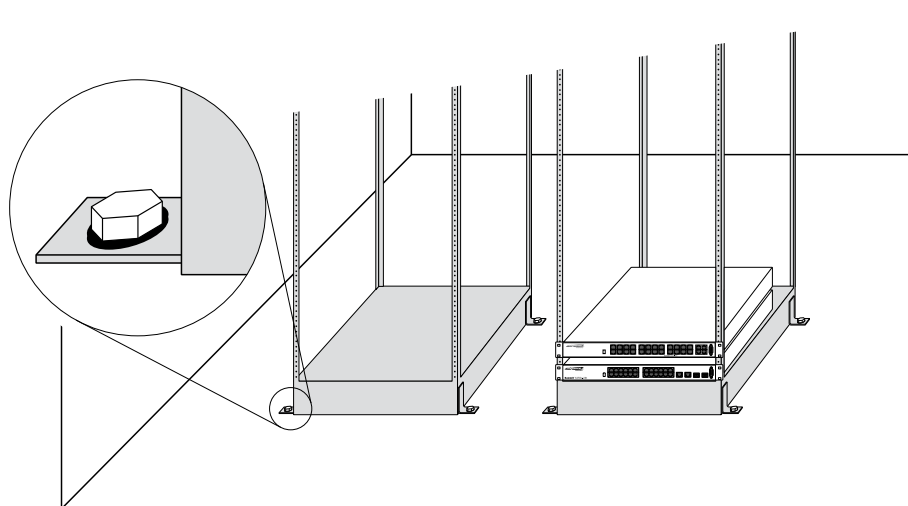
Figure 171: Properly Secured Rack

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

Evaluating and Meeting Cable Requirements

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: 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.

Follow these guidelines when setting up a cable labeling system suitable for your installation:

1 Identify cables by securely attaching labels to all cable ends.
2 Assign a unique block of sequential numbers to the group of cables that run between each pair of wiring closets.
3 Assign a unique identification number to each equipment rack.
4 Identify all wiring closets by labeling the front panel of your Extreme Networks equipment and other hardware.
5 Keep accurate and current cable identification records.
6 Post records near each equipment rack. For each cable drop, include information about the cable source, destination, and jumper location.

Installing Cable

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 Properly Installed and Bundled Cable.
- Bundle cable using hook-and-loop straps to avoid injuring cables.
- If you build your own cable, be sure that connectors are 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 RJ-45 Ethernet cable before plugging it into a port on the switch.

> **Caution**
>
> 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 RJ-45 connector into a LAN static discharge device or use an equivalent method.

- Use plenum-rated cable when it is necessary for safety and fire rating requirements. Consult your local building codes to determine when it is appropriate to use plenum-rated cable, or refer to IEC standard 850.
- Keep all ports and connectors free of dust.
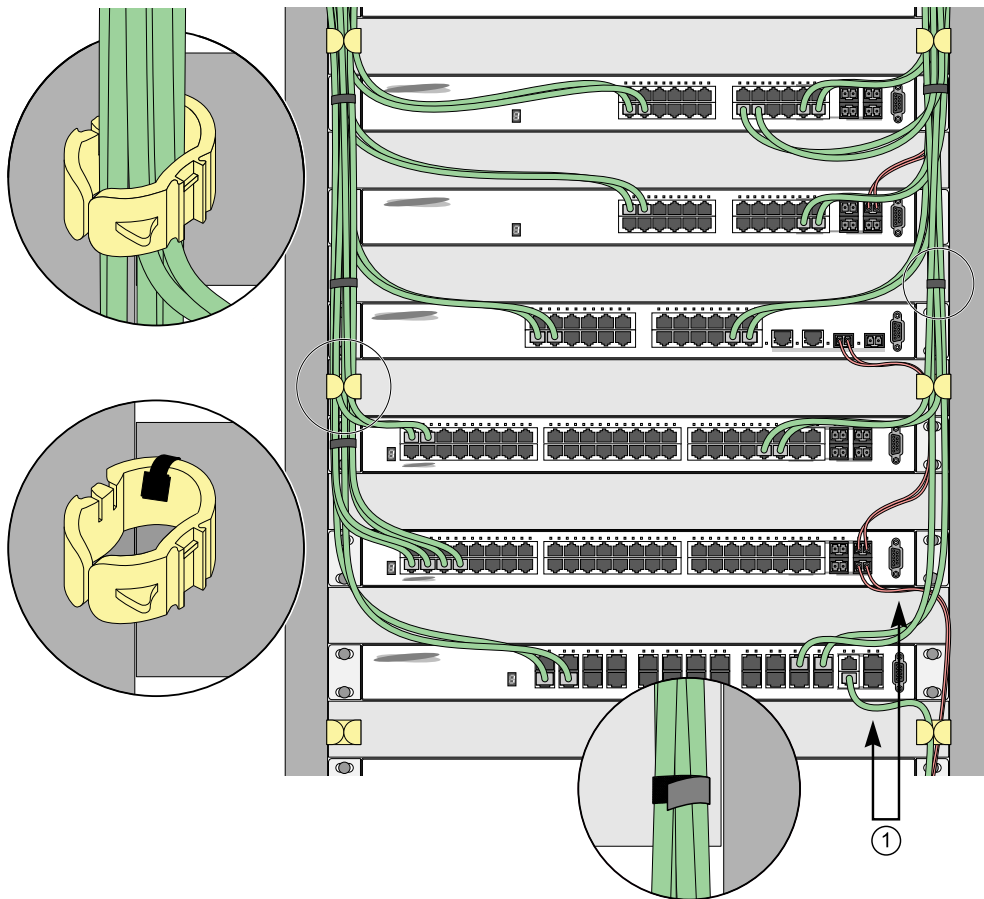
1 = Adequate slack and bend radius

Figure 172: Properly Installed and Bundled Cable

Fiber Optic Cable

Fiber optic cable must be handled carefully during installation.

Every cable has a minimum bend radius, example, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. Extreme Networks recommends that the bend radius for fiber optic cable equal 2 inches (5.08 cm) minimum for each 90-degree turn as shown in the following figure.

> **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.
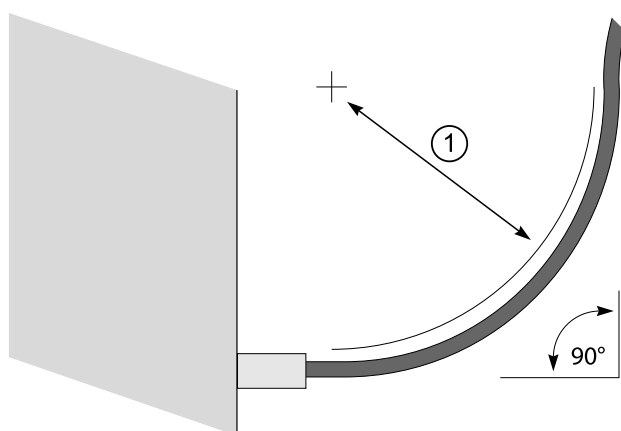
Figure 173: Bend Radius for Fiber Optic Cable

1 = Minimum 2-inch (5.08 cm) radius in 90° bend

Cable Distances and Types

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

The following table lists the available Extreme Networks direct-attach cables.

Table 90: Cable Distances and Types

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-SX (850nm 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

Table 90: Cable Distances and Types (continued)

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-LX (1300nm 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 (1550nm optical window)	10/125 µm single-mode fiber	–	80 km
100BASE-LX100 (1550nm optical window)	10/125 µm single-mode fiber	–	100 km
1000BASE-BX10 (1490nm optical window) (1310nm optical window)	10/125 µm single-mode fiber	–	10 km
1000BASE-LX70 (1550nm optical window)	10/125 µm single-mode fiber	–	70,000
10/100/1000BASE-T SFP	(1 Gbps link) Category 5 and higher UTP cable	–	100 meters
	(100 Mbps link) Category 5 and higher UTP cable	–	150 m
	(10 Mbps link) Category 5 and higher UTP cable	–	250 m
10GBASE-SR SFP+ (850nm optical window)	62.5 mm multimode fiber	160	26 m
	62.5 mm multimode fiber (OM1)	200	33 m
	50 mm multimode fiber	400	66 m
	50 mm multimode fiber (OM2)	500	82 m
	50 mm multimode fiber (OM3)	2000	300 m
10GBASE-LR SFP+ (1310nm optical window)	10/125 µm single-mode fiber	–	10 km
10GBASE-LRM SFP+ (1310nm optical window)	62.5/125 µm multimode fiber	–	220 m
10GBASE-ER SFP+ (1550nm optical window)	10/125 µm single-mode fiber	–	40 km
40GBASE-SR4 QSFP+ (850nm optical window)	50 mm multimode fiber (OM3)	–	100 meters
	50 mm multimode fiber (OM4)		150 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 µm single-mode fiber can use a maximum distance of 10,000 meters.			

Table 91: Extreme Networks Direct-Attach Cables

Cable Type	Model Number	Length
SFP+ passive copper cable	10304	1 meter
	10305	3 meters
	10306	5 meters
	10307	10 meters
QSFP+ passive copper cable	10311	0.5 meter
	10312	1 meter
	10313	3 meters
	10313A	3 meters (26 AWG)
	10323	5 meters
QSFP+ active optical cable	10315	10 meters
	10316	20 meters
	10318	100 meters
QSFP+-to-SFP+ fan-out passive coppercable	10202	1 meter (26 AWG)
	10203	2 meter (26 AWG)
	10321	3 meters
	10322	5 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.

The following figure shows examples of connector jacket types that are not recommended as well as those that are recommended.
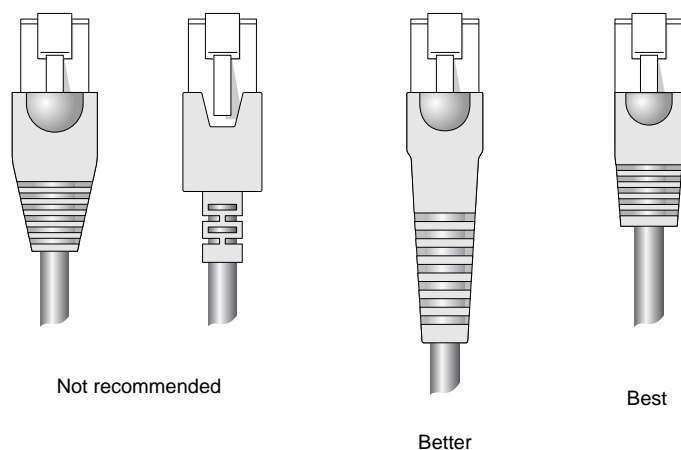
Figure 174: RJ-45 Connector Jacket Types

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 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).

Meeting Power Requirements

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.

Power Supply Requirements

Follow these recommendations when you plan power supply connections for the Summit family switches:

- Place the equipment in an area that accommodates the power consumption and component heat dissipation specifications.
- Be sure that your power supply meets the site DC power or AC power requirements of the network equipment.
- When you connect power to installed equipment, do not make this connection through an extension cord or power strip.
- If your switch includes more than one power supply, connect each power supply to a different, independent power source.

  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.
- In regions that are susceptible to electrical storms, we recommend that you plug your system into a surge suppressor.

For power specifications for the Summit family switches, see Technical Specifications.

Identify and Purchase of Power Cords

Extreme Networks equipment does not ship with power cords. Click the following link for locating the correct power cord for purchase and use on specific Extreme Networks equipment. Specifications for power cords in each country are also provided within this link allowing end user to purchase cords locally. http://www.extremenetworks.com/product/powercords/

The power cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

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.

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 a period of time after a blackout has occurred.

In addition, some UPS devices 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.

Select a UPS

To determine UPS requirements for your switch, answer 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 the installation will allow? (See UPS Transition Time)

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

Calculate Volt-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-Amperes (VA):

   VA = Volts x Amperes

2 Add the VA from all the pieces of equipment together to find the total VA requirement.

   To determine the minimum volt-amperage requirements for your UPS, Extreme Networks recommends 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.

DC Power Requirements

This system should be installed in a DC-I battery return configuration.

In a DC-I configuration, the battery return conductor should be connected directly to the central office power return bus, and not to the equipment frame or the grounding means of the equipment.

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: www.ansi.org or www.tiaonline.org

5 Building Stacks

This section provides information about how to build and connect a SummitStack configuration.

If you intend to use the SummitStack feature, read this chapter before installing the set of Summit family switches that will be included in the SummitStack configuration.

For instructions to install Summit family switches in equipment racks, see Installing Summit Family Switches.

Building Stacks Overview

A stack consists of a group of up to eight Summit switches that are connected together to form a connected ring.

The stacking connections can be made in either of the following ways:
- Using dedicated stacking connectors on the back of the switch; these ports are called native stacking ports.
- Using stacking-enabled 10-Gbps Ethernet ports, either at the front of the switch or on installed option cards at the back of the switch. This type of stacking is called SummitStack-V stacking (see Using the SummitStack-V Feature).

The stack can combine any Summit series switches that include support for stacking, as long as you follow port compatibility and cabling recommendations. See Placing Summit Family Switches for Stacked Operation and Connecting the Switches to Form the Stack Ring for more information about combining switches from different Summit series.
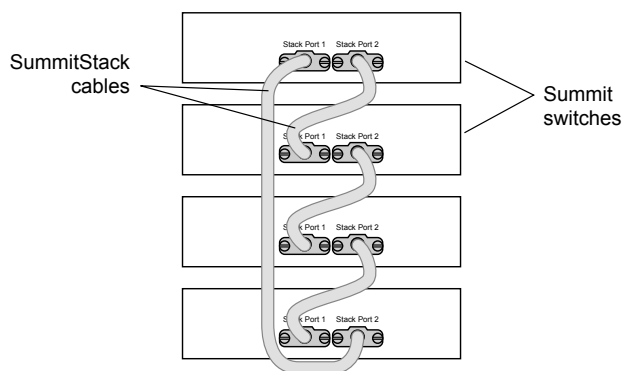
Figure 175: Summit Switches Connected in a SummitStack Configuration

The stack operates as a single switch with a single IP address and a single point of authentication. One switch, called the stack master, controls the stack. The master runs ExtremeXOS software and maintains all the software tables for all the switches in the stack. A stack of switches can have only one master switch. All switches in the stack, including the master switch, are called nodes.

Slot Numbers

A stack can be thought of as a virtual chassis. Each node operates as if it were occupying a slot in a chassis and is controlled by the master.

The high-speed stacking links function like the backplane links of a chassis.

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 and configure a vertical stack from the console on the switch at the top of the physical stack, the switches will be assigned slot numbers 1 through 8 from the top down, starting with slot 1.

Slot 1	Slot 3
Slot 2	Slot 4

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 that combines Summit X460, X480, or X670 series switches with other Summit switch models, a Summit X460, X480, or X670 series switch might provide more memory and more features than other Summit switch models in the stack. These differences can affect master node selection, backup node selection, and failover operation.

> **Note**
>
> The master and backup roles should be assigned to switches from the same series. For example, if the master node is a Summit X480 series switch, the backup node should also be a Summit X480 switch. Similarly, if the master node is a Summit X670 series switch, the backup node should also be a Summit X670 switch.

The choice of which switches should be the master and backup switches is based on a combination of the feature scalability of each switch, along with the switch speed. The easy setup configuration process selects the master and backup switches, based on capability and speed, in the following order:

1 Summit X770, X670, or X480 series
2 Summit X460 series
3 Summit X440 series

In comparing two switches in the same capability, the lower slot number takes precedence.

You should follow the same ranking hierarchy when you plan the physical placement of the switches in the stack.

Stacking Methods and Summit Switches

Each series of Summit switches can use more than one method of stacking.

The following tables shows the stacking methods available for each switch series, listed by stacking method and by switch series.

Table 92: Summit Stacking by Stacking Method

Stacking Method	Speed per Link (HDX)	Cable Type and Lengths	Summit Switch
SummitStack	10 Gbps	0.5m, 1.5m, 3.0m, 5.0m, 20Gbps Stacking Cable	Summit X440, X460, X460-G2, X480)
SummitStack-V	10 Gbps	0.5m - 40km SFP+, XENPAK (with SR, LR, and ER)	Summit X440 (10G models), X460 (XGM3-2sf,2xsf), X460-G2 10G models only), X480 (VIM2,3), X670 and X670V (ports 47 and 48), X670-G2, X770 (ports 103,104)
SummitStack-V80	20 Gbps	0.5m - 100m QSFP+ only	Summit X460 (SSv80), X480 (VIM2,3), X670V (VIM4-40G4X), X670-G2-48x-4q
SummitStack-V160	40 Gbps	0.5m - 100m QSFP+ only	X460-G2 (VIM-2q), Summit X480 (VIM3), X670 (VIM4), X770 (ports 103 and 104), X670-G2-48x-4q
SummitStack-V320	80 Gbps*	0.5m - 100m QSFP+ only	Summit X480 (VIM3), X670 (VIM4), X770 (ports 101 and 103, and 102 and 104), X670-G2-48x-4q
SummitStack128	32 Gbps	0.5m, 1.5m, 3.0m	Summit X480 (VIM2SS128)**

* Combined over paired ports

** VIM2-SS128 is a module that can stack with other X480 using VIM2-SS128. It can also stack with SS256 with a conversion cable.

The following table shows the stacking method available for each switch series, listed by the switch series.

Table 93: Switch Series and Summit Stacking

Summit Switch	Stacking Method	Speed per Link (HDX)	Cable Type and Lengths
Summit X440 Note: X440-L2-24t and X440-L2-48t do not have stacking capability.	SummitStack (Front panel for 8t and 8p models. Rear panel for all other models except 10G models; 10G models do not have native stacking ports)	10 Gbps	0.5m, 1.5m, 3.0m 20Gbps Stacking Cable
	SummitStack-V (Front panel 10G models)	10 Gbps	0.5m - 40km SFP+
Summit X460	SummitStack (Rear panel, with module)	10 Gbps	0.5m, 1.5m, 3.0m, 5.0m 20Gbps Stacking Cable
	SummitStack-V (with XGM3-2sf, XGM3S-2sf, XGM3S-2xf)	10 Gbps	0.5m - 40km SFP+, XFP
	SummitStack-V80 (wtih SSv80)	20 Gbps	0.5m - 100m QSFP+ only

Table 93: Switch Series and Summit Stacking (continued)

Summit Switch	Stacking Method	Speed per Link (HDX)	Cable Type and Lengths
Summit X460-G2	SummitStack (Rear panel, with VIM-2SS module	10 Gbps	0.5m, 1.5m, 3.0m, 5.0m
	SummitStack-V160 (Rear panel, with VIM-2q module)	40 Gbps	QSFP+
	SummitStack-V (front panel ports, 10G models only)	10 Gbps	0.5m - 40km SFP+
E4G400	SummitStack (Rear panel, with module)	10 Gbps	0.5m, 1.5m, 3.0m, 5.0m 20Gbps Stacking Cable
	SummitStack-V (with XGM3-2sf, XGM3S-2sf, XGM3S-2xf))	10 Gbps	0.5m - 40km SFP+, XFP
	SummitStack-V80 (with SSv80) (wtih SSv80)	20 Gbps	0.5m - 100m QSFP+ only
Summit X480	SummitStack (with VIM2-SummitStack)	10 Gbps	0.5m, 1.5m, 3.0m, 5.0m 20Gbps Stacking Cable
	SummitStack-V (with VIM2-10G4X)	10 Gbps	0.5m - 40km XFP
	SummitStack-V80 (with VIM2-SSV80 and VIM3-40G4X)	20 Gbps	0.5m - 100m QSFP+ only
	SummitStack-V160 (with VIM3-40G4X)	40 Gbps	0.5m - 100m QSFP+ only
	SummitStack-V320 (with VIM3-40G4X)	80 Gbps	0.5m - 100m QSFP+ only
	SummitStack128 (With VIM2-SS128)**	32 Gbps	0.5m, 1.5m, 3.0m
Summit X670	SummitStack-V (Front panel)	10 Gbps	0.5m - 40km SFP+
Summit X670V	SummitStack-V (Front panel)	10 Gbps	0.5m - 40km SFP+
	SummitStack-V80 (withVIM3-40G4X)	20 Gbps	0.5m - 100m QSFP+ only
	SummitStack-V160 (with VIM4-40G4X	40 Gbps	0.5m - 100m QSFP+ only
	SummitStack-V320 (With VIM4-40G4X)	80 Gbps*	0.5m - 100m QSFP+ only
Summit X670-G2-48x-4q	SummitStack-V	10Gbps	SFP+ to SFP+
	SummitStack-V80	20 Gbps	QSFP+ to QSFP+
	SummitStack-V160	40 Gbps	QSFP+ to QSFP+
	SummitStack-V320	80 Gbps*	QSFP+ to QSFP+
Summit X670-G2-72x	SummitStack-V	10 Gbps	SFP+ to SFP+

Table 93: Switch Series and Summit Stacking (continued)

Summit Switch	Stacking Method	Speed per Link (HDX)	Cable Type and Lengths
Summit X770	SummitStack-V (ports 103 and 104)	10Gbps	1m and 2m QSFP= 4xSFP+ fan-out cable
	SummitStack-V160 (ports 103 and 104)	40 Gbps	0.5m, 1m, and 3m (26 AWG) QSFP+
	SummitStack-V320 (ports 101 and 103, and 102 and 104)	80 Gbps*	0.5m, 1m, and 3m (26 AWG) QSFP+

* Combined over paired ports

** VIM2-SS128 is a module that can stack with other X480 using VIM2-SS128. It can also stack with SS256 with a conversion cable.

Combining Switches from Different Series

Matrix of Summit Switches and Stacking Methods

Summit switches can be stacked in the combinations listed in the following table:

Table 94:

Matrix of Summit Switches and Stacking Methods								
Stack with	**X440***	**X440-10G**	**X460**	**X460-G2 *****	**X480**	**X670**	**X670V**	**X670-G2 ****	**X770**
X440*	40G	-	40G	-	40G	-	-	-	-
X440-10G	-	V	V	V	V	V	V	V	V
X460	40G	V	40G, V, V80	V	40G, V, V80	V	V, V80	V, V80	V
X460-G2***	40G	V	V, 40G	V, 40G	V, 40G, V160	V	V, V160	V, V160	V, V160
X480	40G	V	40G, V, V80	V, V160	40G, V, V80, 128G, V160, V320	V	V, V80, V160, V320	V, V80, V160, V320	V, V160, V320
X670	-	V	V	V	V	V	V	V	V
X670V	-	V	V, V80	V,V160	V, V80	V	V, V160, V320	V, V160, V320	V, V160, V320
X670-G2**	-	V	V, V80	V, V160	V, V80, V160, V320	V	V,V80, V160, V320	V, V160, V320	V, V160, V320
X770	-	V	V	V, V160	V, V160, V320	V	V, V160, V320	V, V160, V320	V, V160, V320

*X440-L2 models cannot be stacked.

**X670-G2-72x can stack only with Summit Stack V using front panel 10G ports.

*** X460-G2 SummitStack-V available only on 10G models.

In a stack that has switch models from more than one Summit series, refer to the list in the previous section and follow these guidelines:

- The stack master and backup nodes should be from the same switch series. For example, if a Summit X480 series switch is the stack master, the backup node should also be a Summit X480 series switch.
- Follow these guidelines for the specific listed switch combinations:
  - If Summit X480 series and X650 series switches are both present in the stack, the master and backup nodes should both be Summit X480 series switches.
  - If Summit X480 switches and X670 series switches are both present in the stack, the master and backup nodes should both be Summit X670 series switches.
- Although you can combine Summit X460, X480, and X670 series switches in a stack, you should be aware that the routing table limit for the Summit X460 series is lower than the limits for the other two switch series. For more information, refer to the ExtremeXOS Configuration Guide.

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 network. 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 Concepts Guide.

Stacking Cables

Depending on the switch model and the number and type of stacking ports, the bidirectional stacking link provides 40 Gbps, 80 Gbps, 128 Gbps, 160 Gbps, 256 Gbps, or 512 Gbps full duplex bandwidth.

Stacking connections using the native stacking ports require stacking cables that are specific to the type of stacking port. These cables are available from Extreme Networks in lengths from 0.5 meter to 100 meters. The following table lists the cable types and compatible Summit switches or modules.

Table 95: Available Stacking Cables for Summit Switches

Model Number	Manufacturing Part Number	Cable Type, Length	Compatible Ports and Devices
16105	900449-10	SummitStack, 5 meter	20-Gbps fixed stacking ports on Summit X250e, X450, X450a, X450e series switches, 20-Gbps stacking ports on VIM-2ss on X460-G2 series switches, 20-Gbps stacking ports on VIM1-SummitStack or VIM1-10G8X modules in Summit X650 series switches, 20-Gbps stacking ports on VIM2-SummitStack modules in Summit X480 series switches
16106	900296-00/10/11	SummitStack, 0.5 meter	
16107	900297-00/10/11	SummitStack, 1.5 meter	
16108	900298-00/10/11	SummitStack, 3 meter	
17021	900610-10	SummitStack 128G, 0.5 meter	128-Gbps ports on VIM1-SummitStack256 or VIM1-SummitStack512 modules in Summit X650 series switches
17022	900611-10	SummitStack 128G, 1.0 meter	
17023	900612-10	SummitStack 128G, 3.0 meter	

Table 95: Available Stacking Cables for Summit Switches (continued)

Model Number	Manufacturing Part Number	Cable Type, Length	Compatible Ports and Devices
17026	900617-10	SummitStack 128G/64G, 1.0 meter	128-Gbps ports on VIM1-SummitStack256 modules in Summit X650 series switche and 64-Gbps ports on VIM2-SummitStack128 modules in Summit X480 series switches
17030	900614-10	SummitStack 64G, 1.0 meter	64-Gbps ports on VIM2-SummitStack128 modules in Summit X480 series switches
17034	900618-10	SummitStack 128G/20G, 1.0 meter	128-Gbps ports on VIM1-SummitStack256 modules in Summit X650 series switches and 20-Gbps fixed stacking ports on Summit X250e, X450, X450a, X450e series switches, 20-Gbps stacking ports on VIM1-SummitStack or VIM1-10G8X modules in Summit X650 series switches, 20-Gbps stacking ports on VIM2-SummitStack modules in Summit X480 series switches
17038	900619-10	SummitStack 64G/20G, 1.0 meter	64-Gbps ports on VIM2-SummitStack128 modules in Summit X480 series switches and 20-Gbps fixed stacking ports on Summit X250e, X450, X450a, X450e series switches, 20-Gbps stacking ports on VIM1-SummitStack or VIM1-10G8X modules in Summit X650 series switches, 20-Gbps stacking ports on VIM2-SummitStack modules in Summit X480 series switches
10311	900759-10	QSFP+ direct-attach passive copper cable, 0.5 meter	40-Gbps stacking ports on SummitStack-V80 modules in Summit X460 series switches and Summit X460-G2 series switches with VIM-2q modules (3 meter cable not supported for stacking), 40-Gbps stacking ports on VIM2-SummitStack-V80 modules in Summit X480 series switches, 80-Gbps stacking ports on VIM3-40G4X modules in Summit X480 and X650 series switches, 80-Gbps stacking ports on VIM4-40G4X modules in Summit X670 series switches, QSFP+ ports on X670-G2-48x-4q switches (3 meter cable not supported for stacking), and QSFP+ ports on X770 series switches.
10312	900760-10	QSFP+ direct-attach passive copper cable, 1 meter	
10313	900761-10	QSFP+ direct-attach passive copper cable, 3 meters	
10313A	900768-10	QSFP+ direct-attach passive copper cable, 3 meters, 26 AWG (for X770 to X770 stacking)	
10315	900763-10	QSFP+ direct-attach active optical cable, 10 meters	40-Gbps stacking ports on SummitStack-V80 modules in Summit X460 series switches, 40-Gbps stacking ports on VIM2-SummitStack-V80 modules in Summit X480 series switches, 80-Gbps stacking ports on VIM3-40G4X modules in Summit x480 and X650 series switches, 80-Gbps stacking ports on VIM4-40G4X modules in Summit X670 series switches, QSFP+ ports on X670-G2-48x-4q switches
10317	900765-10	QSFP+ direct-attach active optical cable, 50 meters	
10318	900766-10	QSFP+ direct-attach active optical cable, 100 meters	

Table 95: Available Stacking Cables for Summit Switches (continued)

Model Number	Manufacturing Part Number	Cable Type, Length	Compatible Ports and Devices
10202	908154-10	QSFP+ to 4x SFP+ fan-out copper cable, 26 AWG, 1 meters	X770 Alternate port stacking
10203	908155-10	QSFP+ to 4x SFP+ fan-out copper cable, 26 AWG, 2 meters	

Note

Additional types of stacking cables may have been released since this guide was published. Contact your Extreme Networks sales representative for the most recent information about available cables.

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 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 100 meters (see Available Stacking Cables).
- When possible, place all switches for the stack in the same rack or in adjacent racks; this facilitates using shorter stacking cables.
- The stack master is the switch through which you will perform the initial stack configuration, using the console port. For simplicity and ease of connecting the stacking cables, plan to designate the top switch in a vertical physical stack as the stack master. If switches are installed in several adjacent racks, place the stack master at one end of the row.
- Physically locate the intended master and backup nodes adjacent to each other, and connect these switches directly to each other.
- For easier software configuration of the stack, connect the stacking cables in the order and arrangement shown in the tables that accompany the examples starting Single-Rack Stacking Configurations.
- 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.
- Because of the weight of the cable, Extreme Networks strongly recommends the use of cable management hardware to support the cables and provide strain relief at the connectors when you use the SummitStack 128G cable, SummitStack 64G cable, or SummitStack 128G/64G cable. (See Connecting Stacking Cables.)

Using the SummitStack-V Feature

The dedicated stacking ports (either fixed or on installed VIMs or stacking modules) are called native stacking ports.

The SummitStack-V feature allows you to reconfigure one or two 10-Gbps Ethernet data ports to operate as stacking ports. When these ports are enabled to support stacking, they are called alternate stacking ports. This feature allows you to use less expensive cables to connect the switches in a stack. Because copper and fiber Ethernet ports support longer cable distances, this feature also allows you to extend the physical distance between stack nodes. The SummitStack-V feature supports stack nodes on different floors in a building or in different buildings on a campus.

A stack can use both native and alternate stacking ports. For example, on one switch you can use a native stacking port to connect to another switch in the same rack, and you can use an alternate stacking port to connect to another switch on a different floor.

On each switch model, only specific data ports can be used as alternate stacking ports. The alternate stacking ports must be 10-Gbps Ethernet ports, either on the front panel of the switch or on installed port option cards or versatile interface modules at the back of the switch. Switch models that do not have native stacking ports can still use the SummitStack-V feature if they have 10-Gbps Ethernet ports.

If you configure an alternate stacking port on a switch that has native stacking ports, the native stacking port becomes inactive and cannot be used. When a data port becomes an alternate stacking port, it can no longer operate as a data port.

When you connect distant nodes using alternate stacking ports, be sure to run the cables over physically different pathways to reduce the probability of a cut occurring to both links.

See the following table for the ports that are available on each switch model that supports this feature. For each switch model, the column labeled Alternate Stacking Port 1 shows the switch port that replaces native stacking port 1, and Alternate Stacking Port 2 lists the switch port that replaces native stacking port 2. Switch models that are not listed in the table do not support the SummitStack-V feature.

Note

The SummitStack-V feature is supported only on switches that are running ExtremeXOS 12.5.1 (or later).

Table 96: Alternate Stacking Ports

Switch Model	Type or location of Native Stacking Ports	Alternate Stacking Port 1	Alternate Stacking Port 2	Location of Alternate Stacking Ports
Summit X440-24t-10G Summit X440-24p-10G Summit X440-24x-10G	None (has only data ports)	25	26	Front panel
	NOTE: Ports 25 and 26 are not available as data ports when the alternate stacking ports are used.			
Summit X440-48t-10G Summit X440-48p-10G	None (has only data ports)	49	50	Front panel
	NOTE: Ports 49 and 50 are not available as data ports when the alternate stacking ports are used.			

Table 96: Alternate Stacking Ports (continued)

Switch Model	Type or location of Native Stacking Ports	Alternate Stacking Port 1	Alternate Stacking Port 2	Location of Alternate Stacking Ports
Summit X450a-24t Summit X450a-24tDC Summit X450a-24x Summit X450a-24xDC Summit X450a-24p Summit X450e-24t	Fixed (rear panel)	25	26	XGM2-2xf option card XGM2-2xn option card XGM2-2sf option card XGM2-2bt option card
Summit X450a-48t Summit X450a- 48tDC Summit X450e-48p	Fixed (rear panel)	49	50	XGM2-2xf option card XGM2-2xn option card XGM2-2sf option card XGM2-2bt option card
Summit X460-24t Summit X460-24x Summit X460-24p	SummitStack module SummitStack-V80 module	S1 (29)	S2 (30)	XGM3-2sf option card
Summit X460-48t Summit X460-48p	SummitStack module SummitStack-V80 module	S1 (53)	S2 (54)	XGM3-2sf option card
Summit X460-G2-24 x/t/p	VIM-2ss VIM-2q	31	32	Front panel NOTE: Ports 31 and 32 are not available as data ports when the alternate stacking ports are used on 10GE4 models. NOTE: Alternate stacking not available on GE4 models.
Summit X460-G2-48 x/t/p	VIM-2ss VIM-2q	51	52	Front panel NOTE: Ports 51 and 52 are not available as data ports when the alternate stacking ports are used on 10GE4 models. NOTE: Alternate stacking not available on GE4 models.
Summit X460-48x	SummitStack module SummitStack-V80 module	S1 (49)	S2 (50)	XGM3-2sf option card
Summit X480-24x	None (VIM has only data ports)	S3 (29)	S4 (30)	VIM2-10G4X module
	None (no installed VIM)	25	26	Front panel
	VIM2-SummitStack module VIM2-SummitStack128 module VIM2-SummitStack-V80 module VIM3-40G4X	25	26	Front panel
Summit X480-48t Summit X480-48x	None (VIM has only data ports)	S3 (51)	S4 (52)	VIM2-10G4X module
	NOTE: The Summit X480-48t or X480-48x switch must have an installed VIM2-10G4X to configure alternate stacking ports. Alternate stacking ports are not supported with the VIM3-40G4X.			

Table 96: Alternate Stacking Ports (continued)

Switch Model	Type or location of Native Stacking Ports	Alternate Stacking Port 1	Alternate Stacking Port 2	Location of Alternate Stacking Ports
Summit X670V-48x and Summit X670V-48t		47 (fiber medium only for X670V-48t)	48 (fiber medium only for X670V-48t)	Front panel
	NOTE: Ports 47 and 48 are not available as data ports when the alternate stacking ports are used.			
Summit X670-G2-48x-4q	Ports 49, 53, 57, 61	47	48	Front panel
	NOTE: Ports 47 and 48 are not available as data ports when the alternate stacking ports are used			
Summit X670-G2-72x	None	71	72	Front panel
	NOTE: Ports 71 and 72 are not available as data ports when the alternate stacking ports are used.			
Summit X770	QSFP+	103	104	Front panel
	NOTE: Ports 103 and 104 are not available as data ports when the alternate stacking ports are used.			

Summary of Conditions for Alternate Stacking Ports

Alternate stacking ports must be 10-Gbps Ethernet ports. In addition, specific switch models have the requirements listed in this section

Summit X440 series switches:

If ports 25 and 26 or 49 and 50 are used as alternate stacking ports, those ports are not available to use as data ports.

> **Note**
>
> The X440-L2-24t and X440-L2-48t do not have any stacking capability.

Summit X460 Series Switches:

To use the SummitStack-V feature, you must install an XGM3-2sf, XGM3S-2sf, or XGM3S-2xf port option card to add 10-Gbps ports to the switch.

Summit X480 series switches:

- Summit X480-48t and X480-48x switches do not have 10-Gbps ports on the base model switch. To use the SummitStack-V feature on these switches, you must install either a VIM2-10G4X module

(ports S3 (51) and S4 (52) can then be configured as alternate stacking ports). Alternate stacking ports are not supported with the VIM3-40G4X.

- On a Summit X480-24x with an installed VIM2-10G4X module, you can configure ports S3 (29) and S4 (30) as alternate stacking ports for the SummitStack-V feature. If you use a VIM3-40G4X module for stacking, ports 25 and 26 are configured as the alternate stacking ports.
- On a Summit X480-24x switch with no installed VIM2 module, you can configure ports 25 and 26 on the switch front panel as alternate stacking ports.
- On a Summit X480-24x switch with installed native stacking ports on a VIM2 module, you can do either of the following:
  - Configure both ports 25 and 26 on the switch front panel as alternate stacking ports.
  - Configure one alternate stacking port on the switch front panel and use a native stacking port on the installed VIM2 module.

Summit X670 series switches:

When ports 47 and 48 are used as alternate stacking ports, ports 45 and 46 are not available to use as data ports.

Summit X770 series switches:

When ports 103 and 104 are used as alternate stacking ports, ports 101 and 102 remain available to use as data ports.

Connecting the Switches to Form the Stack Ring

After you have installed the individual Summit switches, connect the switches together using the stacking cables.

The examples in this section show cable connections and the recommended order for connecting ports to facilitate the easy setup configuration.

In general, it is best to connect Stack Port 2 on one switch to Stack Port 1 on the switch with the next higher slot number. Although you can connect the switches in any order, connecting them as shown in these examples will produce better predictability and easier software configuration. It is essential to create an unbroken data path through all the switches in the stack.

Note

The connection recommendations in this section do not apply to Summit X650 series switches with installed VIM1-SummitStack512 modules. For information about connecting the ports on the VIM1-SummitStack512 modules, see Using the VIM1-SummitStack512 Module.

For instructions to connect specific types of stacking cables, see Connecting Stacking Cables.

Using SummitStack Ports and 40G Stacking Cables

SummitStack ports are integrated into the back panel of the Summit X250e, X440, X450, X450a, and X450e series switches.

In addition, the X460, X480, and X650 series switches accommodate VIMs or stacking modules that provide SummitStack ports. The Summit X770 can be stacked using QSFP+ front panel ports.

The examples in the following sections show various physical stacking arrangements: all switches in a single rack, switches in two adjacent racks, and switches at the tops of several racks in a row.

Single-Rack Stacking Configurations

These examples show stacks of either four or eight switches in a single rack.

The slot numbers presume a console connection to the switch at the top of the physical stack.

The following figure shows cable connections for a 4-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.
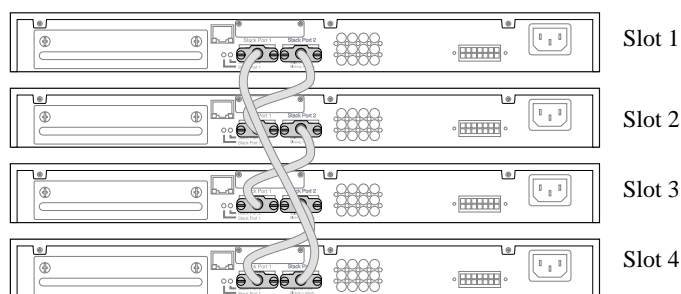
Figure 176: SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 1	Stack Port 1

The following figure shows cable connections for an 8-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.

Figure 177: SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 5	Stack Port 1
Slot 5	Stack Port 2	Slot 6	Stack Port 1
Slot 6	Stack Port 2	Slot 7	Stack Port 1
Slot 7	Stack Port 2	Slot 8	Stack Port 1
Slot 8	Stack Port 2	Slot 1	Stack Port 1

The following figure shows an example of a four-switch stack that includes two Summit X650 series switches. In the Summit X650 series switches, the SummitStack ports are on installed VIM1-SummitStack modules. The Summit X650 series switches are placed at the top of the stack and will be designated the stack master and backup nodes. The recommended order for connecting the stacking ports is the same as for SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports.

Figure 178: SummitStack Configuration Using SummitStack X650 Series Switches and SummitStack 40G Cables

The following figure shows an example of a four-switch stack that combines two Summit X650 series switches and two Summit X460 series switches. In the Summit X650 series switches, the stacking ports are on installed VIM1-SummitStack modules. In the Summit X460 series switches, the stacking ports are on installed SummitStack stacking modules. The recommended order for connecting the stacking ports is the same as for the example in SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports.
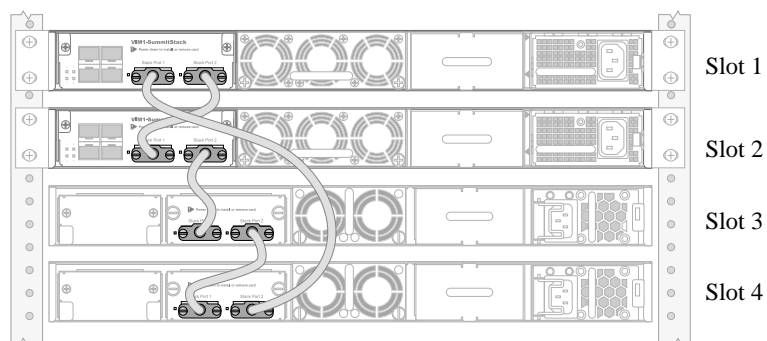
Figure 179: SummitStack Configuration Using Summit X650 and X460 Series Switches and SummitStack 40G Cables

Multiple-Rack Stacking Configurations

The following shows two Summit X480 series switches and two Summit X650 series switches physically located in two adjacent racks.

In each rack, a Summit X480 series switch is placed at the top, with a Summit X650 series switch below it. The switches are connected into a stack using SummitStack ports on installed VIM2-SummitStack and VIM1-SummitStack modules. In this example, start by connecting the Summit X480 switches together; they will be designated the stack master and backup nodes (slot 1 and slot 2, respectively).
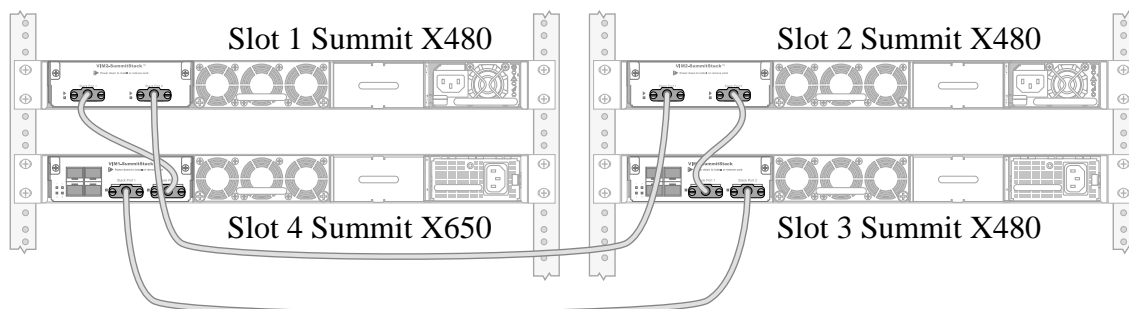
Figure 180: SummitStack Connections Using Four Summit Switches with SummitStack Ports on VIMs

The following table lists the recommended order for connecting the stacking ports in this example.

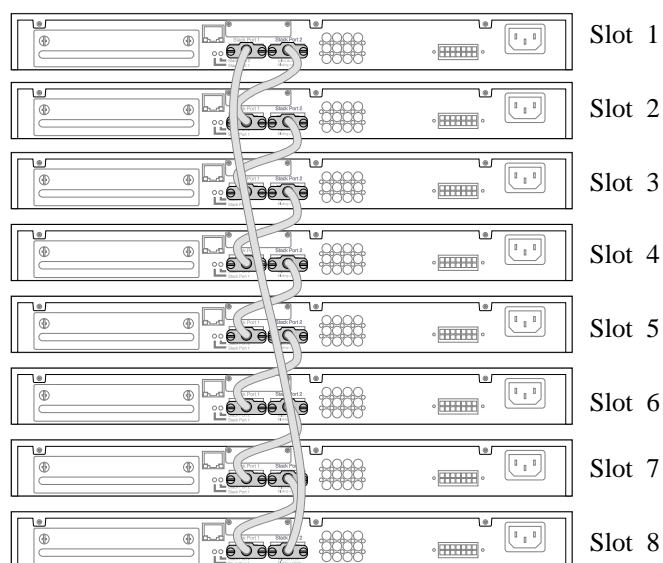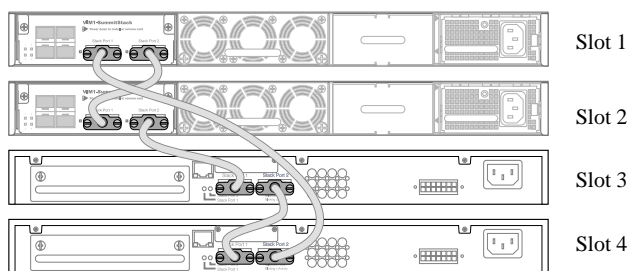| Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 1	Stack Port 1

The figure below shows five switches installed at the tops of five adjacent racks. To accommodate the shortest possible cables, immediately adjacent switches are not always connected together. Port 2 on one switch is connected to Port 1 on the next connected switch. If the easy setup feature is used to configure the stack parameters, the assigned slot numbers will be as shown in the figure.
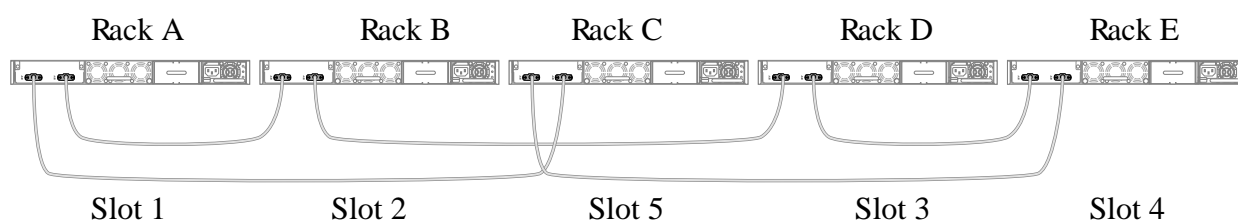
Figure 181: Top-of-Rack Stack Installation

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .			. . . To this slot and port		
Slot1	Rack A	Port 2	Slot 2	Rack B	Port 1
Slot 2	Rack B	Port 2	Slot 3	Rack D	Port 1
Slot 3	Rack D	Port 2	Slot 4	Reck E	Port 1

Connect this slot and port . . .			. . . To this slot and port		
Slot 4	Rack E	Port 2	Slot 5	Rack C	Port 1
Slot 5	Rack C	Port 2	Slot 1	(Rack A	Port 1

Single-Rack Stacking Configurations

These examples show stacks of either four or eight switches in a single rack.

The slot numbers presume a console connection to the switch at the top of the physical stack.

The following figure shows cable connections for a 4-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.

Slot 1

Slot 2

Slot 3

Slot 4
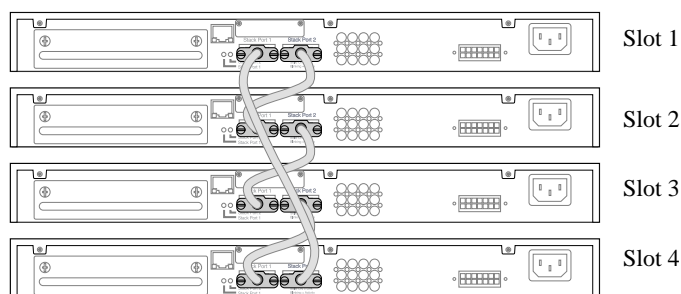
Figure 182: SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 1	Stack Port 1

The following figure shows cable connections for an 8-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.

Figure 183: SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 5	Stack Port 1
Slot 5	Stack Port 2	Slot 6	Stack Port 1
Slot 6	Stack Port 2	Slot 7	Stack Port 1
Slot 7	Stack Port 2	Slot 8	Stack Port 1
Slot 8	Stack Port 2	Slot 1	Stack Port 1

The following figure shows an example of a four-switch stack that includes two Summit X650 series switches. In the Summit X650 series switches, the SummitStack ports are on installed VIM1-SummitStack modules. The Summit X650 series switches are placed at the top of the stack and will be designated the stack master and backup nodes. The recommended order for connecting the stacking ports is the same as for SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports.

Slot 1

Slot 2

Slot 3

Slot 4

Figure 184: SummitStack Configuration Using SummitStack X650 Series Switches and SummitStack 40G Cables

The following figure shows an example of a four-switch stack that combines two Summit X650 series switches and two Summit X460 series switches. In the Summit X650 series switches, the stacking ports are on installed VIM1-SummitStack modules. In the Summit X460 series switches, the stacking ports are on installed SummitStack stacking modules. The recommended order for connecting the stacking ports is the same as for the example in SummitStack Cable Connections Using Eight Summit Switches with Integrated SummitStack Ports.

Slot 1

Slot 2

Slot 3

Slot 4
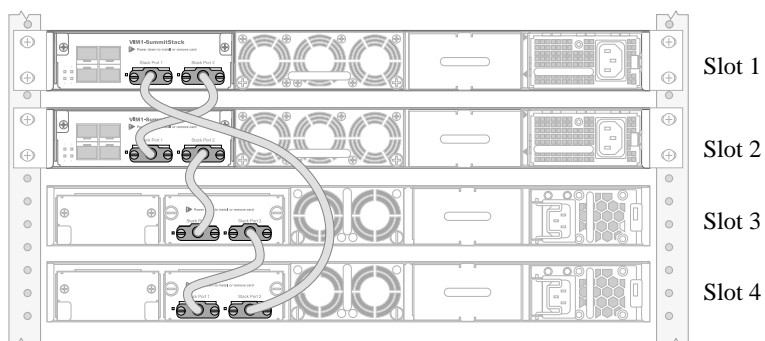
Figure 185: SummitStack Configuration Using Summit X650 and X460 Series Switches and SummitStack 40G Cables

Combining Different Types of Stacking Ports

Figure 186: Combining Stacking Port Types—A on page 207 shows a sample configuration using the following switches:

- Summit X650 series switches with installed VIM1-SummitStack256 modules
- Summit X450a series switch with integrated SummitStack ports
- Summit X480 series switch with installed VIM2-SummitStack module
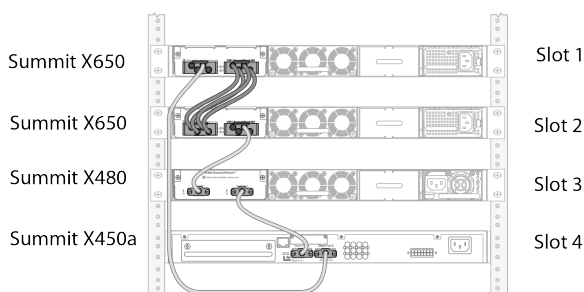
Figure 186: Combining Stacking Port Types—A

The following cables are used to make the stacking connections:

- SummitStack 128G cable between the two Summit X650 series switches at the top (slot 1 and slot 2)
- SummitStack 128G/20G stacking cable between the Summit X650 series switch and the Summit X480 series switch (between slot 2 and slot 3)
- SummitStack 20G stacking cable between the Summit X480 series switch and the Summit X450a series switch (between slot 3 and slot 4)
- SummitStack 128G/20G stacking cable between the Summit X450a series switch and the Summit X650 series switch (between slot 4 and slot 1)

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 1	Stack Port 1

shows a similar stack configuration using the following switches:

- Summit X650 series switches with installed VIM1-SummitStack256 modules
- Summit X460 series switches with installed SummitStack stacking modules
- Summit X450a series switch with integrated stacking ports
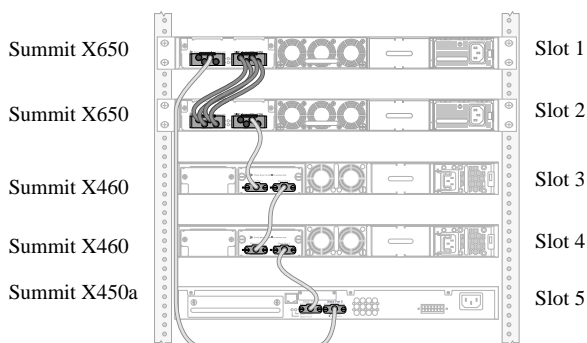
Figure 187: Combining Stack Port Types—B

The following cables are used to make the stacking connections:

- SummitStack 128G cable between the two Summit X650 series switches at the top (slot 1 and slot 2)
- SummitStack 128G/20G stacking cable between the Summit X650 series switch and the Summit X460 series switch (between slot 2 and slot 3)
- SummitStack 20G stacking cable between the two Summit X460 series switches (between slot 3 and slot 4)
- SummitStack 20G stacking cable between the Summit X460 series switch and the Summit X450a series switch (between slot 4 and slot 5)
- SummitStack 128G/20G stacking cable between the Summit X450a series switch and the Summit X650 series switch (between slot 5 and slot 1)

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 5	Stack Port 1
Slot 5	Stack Port 2	Slot 1	Stack Port 1

Using the SummitStack-V80 Stacking Module or VIM2-SummitStack-V80 Module

The SummitStack-V80 stacking module and VIM2-SummitStack-V80 module allow you to use active or passive direct-attach QSFP+ cables to connect stack members across rows in a data center.

In the figure Figure 188: Using the SummitStack-V80 Stacking Module or VIM2-SummitStack-V80 Module on page 209, passive copper cables are used to connect adjacent switches in the same rack, and the active fiber cables provide connections up to 100 meters long between racks. The illustration shows Summit X460 series switches; Summit X480 series switches could be used in the same way.
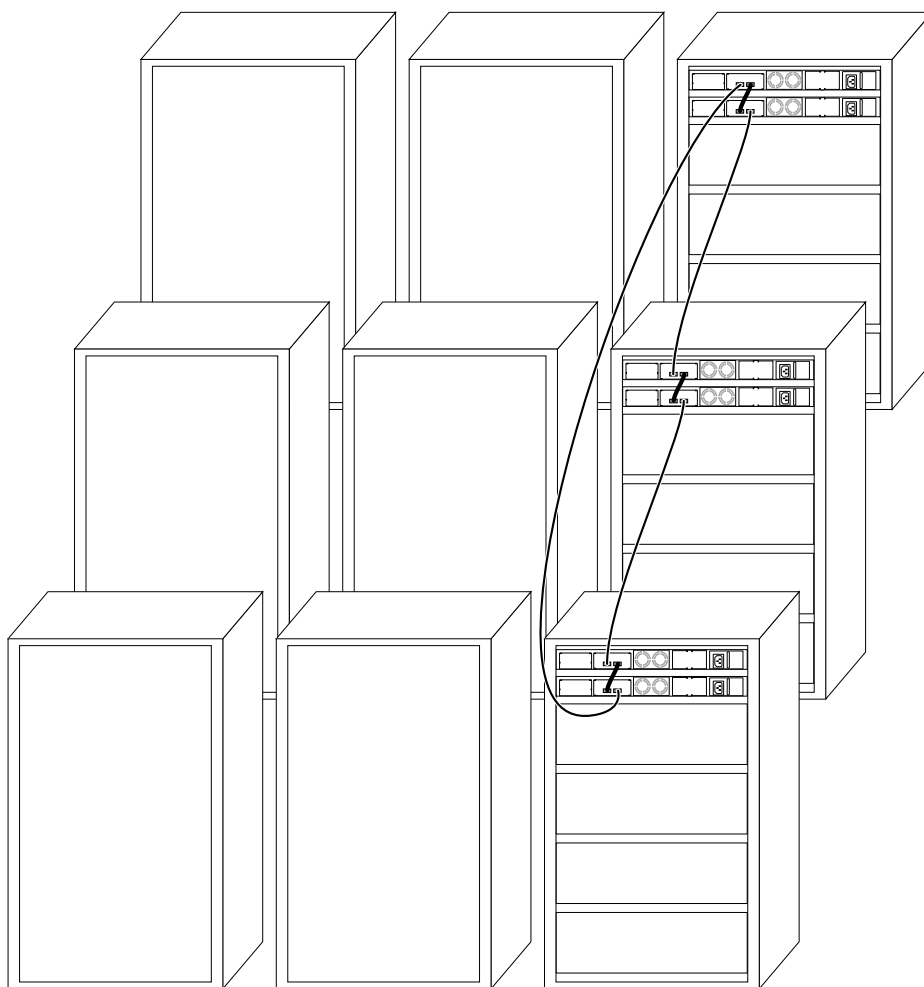
Figure 188: Using the SummitStack-V80 Stacking Module or VIM2-SummitStack-V80 Module

Using SummitStack-V160 Stacking

A stacking rate of 160 Gbps can be achieved using certain configurations of Summit switches. For example, a Summit X670V (X670V-48x or X670V-48t) switch can be connected to a Summit X650 series switch through 40-Gbps stacking connections that provide 160 Gbps full duplex bandwidth. This connection is performed using the VIM4-40G4X module in the Summit X670V switch and the VIM3-40G4X module in the Summit X650 series switch. V-160 stacking is also supported on the X480 series switch using the VIM3-40G4x module, and on the X770 using the QSFP+ ports.

On the VIM4-40G4X module, ports S3 and S4 are the stacking ports.

The following figure shows an example stack using Summit X670, X650, X480, and X460 series switches.

Slot 1 X670V-48x with VIM4-40G4X

Slot 2 X670V-48x with VIM4-40G4X

Slot 3 X650-48x with VIM3-40G4X

Slot 4 X480 with VIM2-SummitStack-V80

Slot 5 X460 with SummitStack-V80
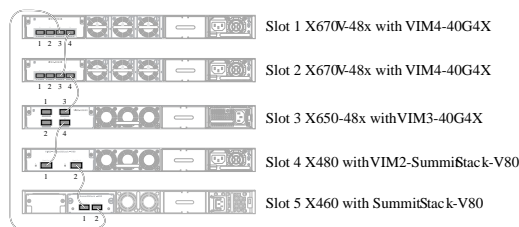
Figure 189: SummitStack-V160 Configuration

The following table lists the recommended order for connecting the stacking ports in this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2	Slot 2	Stack Port 1
Slot 2	Stack Port 2	Slot 3	Stack Port 1
Slot 3	Stack Port 2	Slot 4	Stack Port 1
Slot 4	Stack Port 2	Slot 5	Stack Port 1
Slot 5	Stack Port 2	Slot 1	Stack Port 1

To connect a VIM3-40G4X or VIM4-40G4X stacking port to a stacking port on a VIM2-SummitStack-V80 or SummitStack-V80 module, you must set the VIM3 or VIM4 port to operate at the slower speed of the SummitStack-V80 port. To do so, use the configure stacking-support stack-ports selection command. For more information about configuring stacking ports, see the ExtremeXOS Concepts Guide.

For SummitStack V-160 on the Summit X770, ports 103 and 104 are the stacking ports.

Using SummitStack-V320 Stacking

A stacking rate of 320 Gbps can be achieved across a stack of Summit X480 (with VIM3-40G4X), X650 (with VIM3-40G4X), X670V (with VIM4-40G4X), and X770 switches using the QSFP+ connection and cables. These Summit switches can use 80-Gbps stacking connections that provide 320 Gbps full duplex bandwidth..

The following figure shows an example of a SummitStack-V320 stack using Summit X670 and X650 series switches.

Slot 1 X670V-48x with VIM4-40G4X

Slot 2 X670V-48t with VIM4-40G4X

Slot 3 X650-48x with VIM3-40G4X
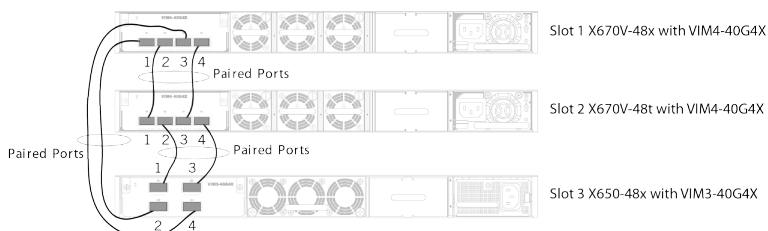
Figure 190: Example SummitStack-V320 Configuration

Slot 1: Summit X670V-48x switch with VIM4-40G4X
Slot 2: Summit X670V-48x switch with VIM4-40G4X
Slot 3: Summit X650 series switch with VIM3-40G4X

SummitStack V-320 stacking can be done with installable modules or using front panel ports, depending upon the type of switch you have. For SummitStack V-320 Stacking using the VIM3-40G4X and VIM4-40G4X modules, connections between the stacking ports must be done using paired bundles of physical ports. V320 stacking will not function unless the physical ports on the modules are paired to form stacking ports. lists the port pairings using installable modules.

VIM3-40G4X		VIM4-40G4X	
Paired physical ports	Stacking port	Paired physical ports	Stacking port
S1 and S3	S1	S1 and S3	S1
S2 and S4	S2	S2 and S4	S2

lists the port pairings for SummitStack V-320 using the front panel ports on the Summit X770.

Table 97: Physical Port Pairings for Front Panel Ports

Summit X770-32q	
Paired physical ports	Stacking port
101 and 103	S1
102 and 104	S2

lists the recommended order for connecting the stacking ports in the example stack shown in

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 2 (physical ports 2 and 4)	Slot 2	Stack Port 1 (physical ports 1and 3)
Slot 2	Stack Port 2 (physical ports 2 and 4)	Slot 3	Stack Port 1 (physical ports 1 and 3)
Slot 3	Stack Port 2 (physical ports 2 and 4)	Slot 1	Stack Port 1 (physical ports 1 and 3)

Note

SummitStack-V320 stacking can be mixed with V160, V80, and 10G alternate port stacking. For example, a Summit X460 with SummitStack-V80 could be added to the sample stack in Figure 190: Example SummitStack-V320 Configuration on page 210. However, you must restrict the speed of the ports on the VIM3-40G4X and VIM4-40G4X that connect to any ports on nodes operating at slower speeds. To reduce the speed of ports on the VIM3-40G4X or VIM4-40G4X, use the configure stacking-support stack-ports selection command. For more information about configuring stacking ports, see the ExtremeXOS Concepts Guide.

Using the VIM1-SummitStack512 Module

The VIM1-SummitStack512 versatile interface module allows you to connect two Summit X650 series switches in a cross-over or back-to-back configuration, using SummitStack 128G cables.

This configuration provides two bidirectional links operating at 256 Gbps between the two switches.
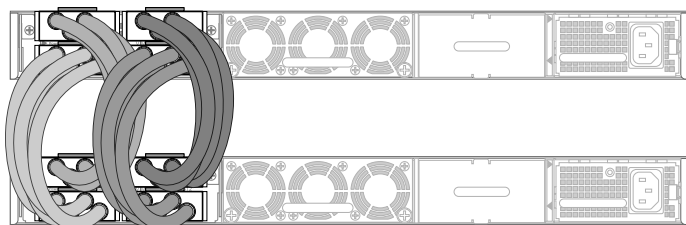
Figure 191: Stacking Connections Using VIM1-SummitStack512 Modules and SummitStack 128G Cables

Unlike other stacking configurations, with the VIM1-SummitStack512 modules, ports are connected in pairs of matching port numbers. When you connect stacking cables to installed VIM1-SummitStack512 modules, match the stacking ports as listed in the following table.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Stack Port 1	Slot 2	Stack Port 1
Slot 1	Stack Port 2	Slot 2	Stack Port 2
Slot 1	Stack Port 3	Slot 2	Stack Port 3
Slot 1	Stack Port 4	Slot 2	Stack Port 4

Example SummitStack-V Feature

The following shows an example of a stacking configuration that combines native and alternate stacking ports to form a stack of seven switches.

The Summit X650 series switches in slots 1 and 2 are connected through their native stacking ports on installed VIM1-SummitStack256 modules, using SummitStack128 stacking cables. Each Summit X650 series switch is connected through an alternate stacking port to an installed XGM2-sf option card in a Summit X450a series switch at another location. These connections use fiber cables connected to 10-Gbps SFP+ ports.

The Summit X450a series switches in slots 3, 4, and 5 are connected through their native stacking ports using SummitStack 40G cables. The Summit X450a switch in slot 5 is connected to the switch in slot 6 through alternate stacking ports on installed XGM2-2sf modules, using fiber optic cable. The switch in slot 6 is connected to the switch in slot 7 using native stacking ports and SummitStack 40G cables.
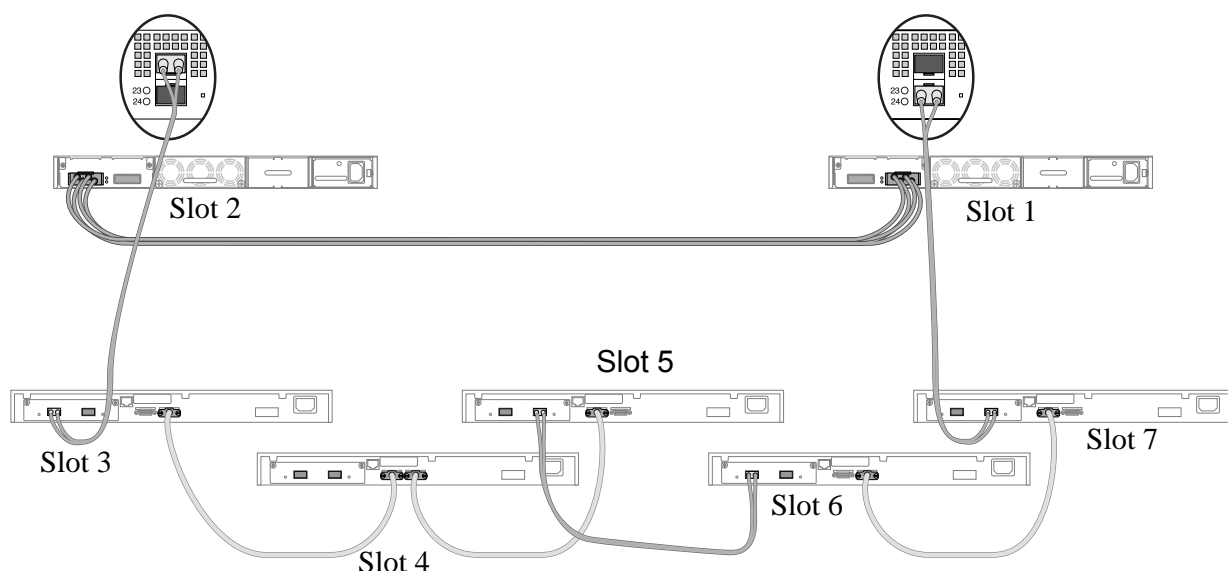
Figure 192: Using the SummitStack-V Feature

The following table lists the recommended port connection sequence for this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Native Stack Port 2	Slot 2	Native Stack Port 1
Slot 2	Alternate Stack Port 2	Slot 3	Alternate Stack Port 1
Slot 3	Native Stack Port 2	Slot 4	Native Stack Port 1
Slot 4	Native Stack Port 2	Slot 5	Native Stack Port 1
Slot 5	Alternate Stack Port 2	Slot 6	Alternate Stack Port 1
Slot 6	Native Stack Port 2	Slot 7	Native Stack Port 1
Slot 7	Alternate Stack Port 2	Slot 1	Alternate Stack Port 1

Figure Using the SummitStack-V Feature with Summit X670 Series Switchesshows a stack that combines Summit X670 series switches with Summit X650 and X460 series switches in a stack of five switches.

The Summit X670 series switches in slots 1 and 2 are connected through their alternate stacking ports using fiber optic cables. The alternate stacking port on the switch in slot 2 is connected to the Summit X650 series switch in 3 through the alternate stacking port on an installed VIM1-10G8X module.

The switches in slots 3, 4, and 5 are connected through their native stacking ports. On the Summit X650 series switch, the native stacking port is on the installed VIM1-10G8X module. On the Summit X460 series switches in slots 4 and 5, the native stacking ports are on installed SummitStack modules. From slot 5, alternate stack port 2 on the Summit X460 series switch is connected to alternate stack port 1 on the Summit X670 series switch in slot 1.
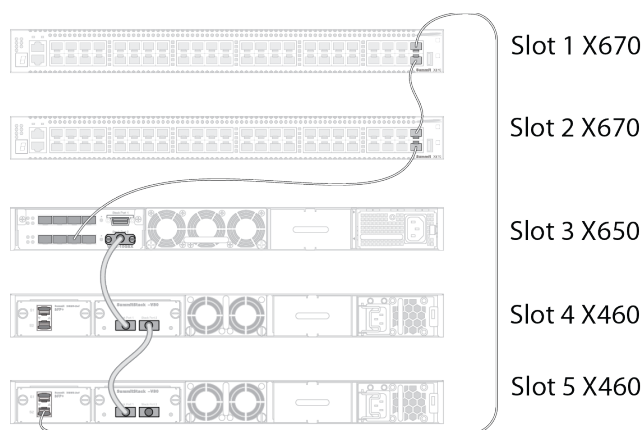
Figure 193: Using the SummitStack-V Feature with Summit X670 Series Switches

The following table lists the recommended port connection sequence for this example.

Connect this slot and port . . .		. . . To this slot and port	
Slot 1	Alternate Stack Port 2	Slot 2	Alternate Stack Port 1
Slot 2	Alternate Stack Port 2	Slot 3	Alternate Stack Port 1
Slot 3	Native Stack Port 2	Slot 4	Native Stack Port 1
Slot 4	Native Stack Port 2	Slot 5	Native Stack Port 1
Slot 5	Alternate Stack Port 2	Slot 1	Alternate Stack Port 1

Connecting Stacking Cables

To connect Summit switches in a SummitStack configuration, use the appropriate stacking cables for the specific stacking ports on the switches.

Connect a SummitStack 40G Cable to a Stacking Port

SummitStack 40G cables are used to connect 20-Gbps SummitStack ports on the following Summit switches:

- Summit X250e, X440, X450, X450a, and X450e series switches with integrated SummitStack ports
- Summit X480 series switches with installed VIM2-SummitStack modules
- Summit X650 switches with installed VIM1-SummitStack modules

To connect a Summit Stack 40G stacking cable:

1 Align the cable connector with the stacking port connector on the back of the first switch (see Figure 194: Connecting a Summit Stacking Cable on page 215).
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.
4 Repeat steps 1 through 3 to connect the cable to the second switch.
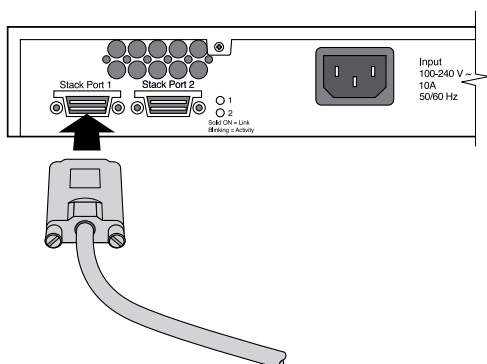
Figure 194: Connecting a Summit Stacking Cable

> ⚠ Caution
> Avoid making sharp bends in the cable. Sharp bends can stress the cable and cause damage.

Connect a SummitStack 128G Cable

Because of the weight of the SummitStack 128G cable, Extreme Networks strongly recommends the use of cable management hardware to support the cables and provide strain relief at the connectors. Figure 195: Cable Management Using a J-Shaped Support Bracket on page 216 and Figure 196: Cable Management Using Tie-Wraps and a Stand-Off on page 216 show representative types of cable management hardware. Your particular rack configuration may require other cable management solutions.
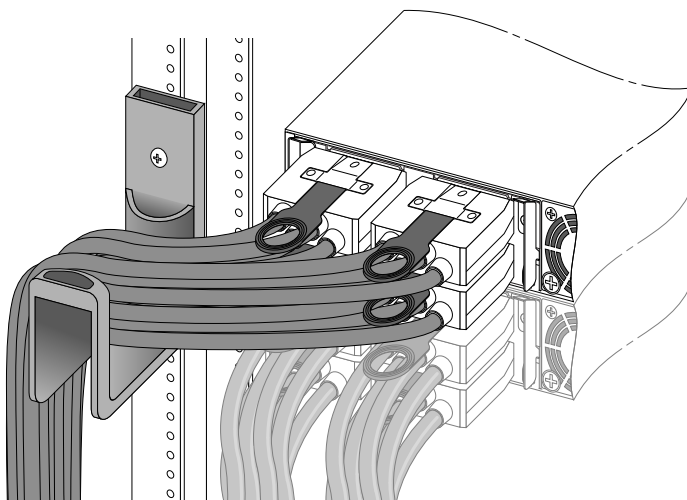
Figure 195: Cable Management Using a J-Shaped Support Bracket
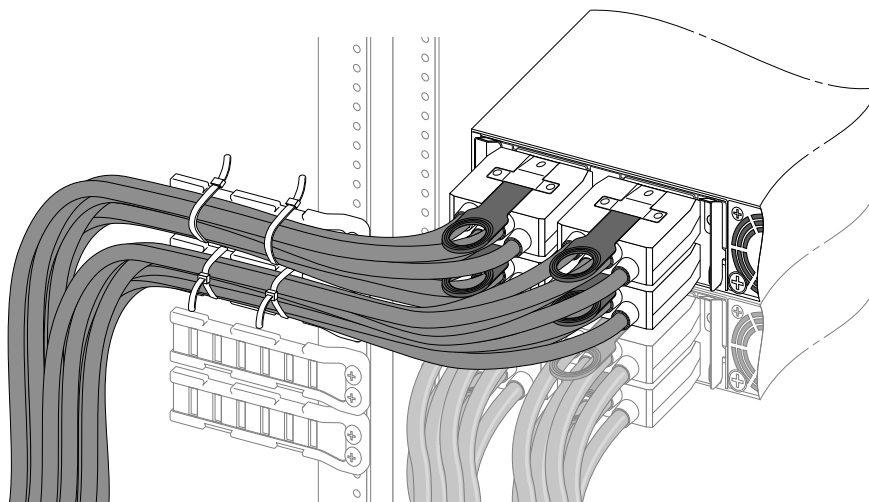
SH_12

Figure 196: Cable Management Using Tie-Wraps and a Stand-Off

Port Covers on the VIM1-SummitStack512 Module

On the VIM1-SummitStack512 module, EMI-protective covers are installed over the port connectors.

Before connecting the stacking cables, remove the connector covers from the ports that will be used.

To remove a connector cover:

1 On the side of the connector nearest to the inserter/ejector lever, find the notch between the two end tabs on the cover (see Figure 197: Removing a Connector Cover on page 217).

2 At the notch, set a small flat-blade screwdriver firmly against the connector housing.
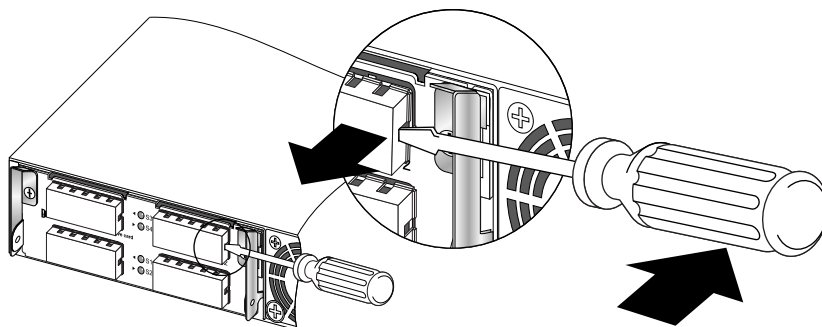
Figure 197: Removing a Connector Cover

3 Brace the screwdriver against the module inserter/ejector lever and pry the end of the connector cover loose.

4 Slide the cover off the connector.

> **Note**
>
> Store the connector covers for later re-use if the switch will be operated without connecting these ports.

> **Caution**
>
> To ensure satisfactory protection from EMI, leave the covers on all ports that are not connected to another VIM1-SummitStack512 module.

Connect the Cable

To connect a SummitStack 128G cable:

1 Holding the cable connector with the release tab on top, align the connector with the stacking port on the VIM1 module in the Summit X650 series switch (see).

Figure 198: Connecting a SummitStack 128G Cable

2 Firmly press the cable connector into the stacking port until the spring latch on top of the connector clicks into place.

3 Repeat steps 1 and 2 to connect the other end of the cable.

Connect a SummitStack 128G/20G Stacking Cable

SummitStack 128G/20G cables are used to connect the 128-Gbps stacking ports on Summit X650 series switches to 20-Gbps stacking ports on Summit X650 series or other Summit series switches.

The 128-Gbps ports are on VIM1-SummitStack256 modules in Summit X650 series switches. The 20-Gbps ports are on one of the following:

- VIM1-10G8X module installed in a Summit X650 series switch
- VIM1-SummitStack module in a Summit X650 series switch
- VIM2-SummitStack module in a Summit X480 series switch
- Rear panel of Summit X250e, X450, X450a, or X450e series switches.

To connect a SummitStack 128G/20G cable:

1 Connect the 128-Gbps connector to the VIM1-SummitStack256 module as follows:

a   Holding the cable connector with the release tab on top, align the connector with the stacking port on the VIM1 module in the Summit X650 series switch.
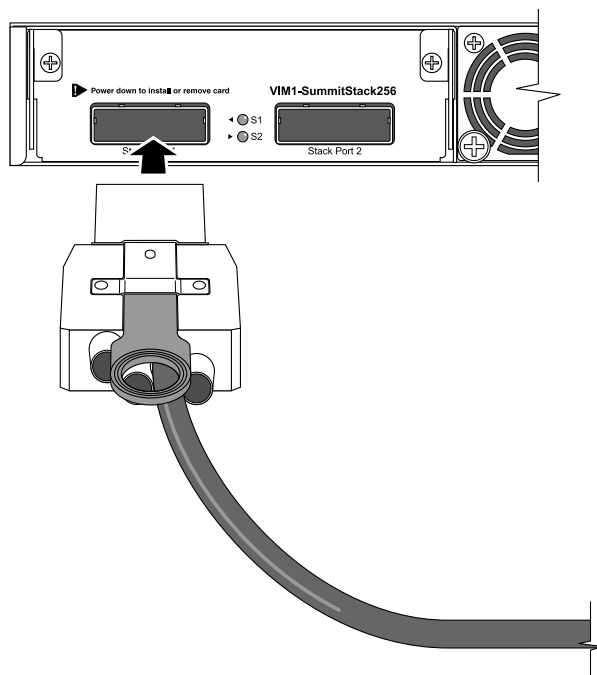
Figure 199: Connecting the 128G Connector

b   Firmly press the cable connector into the stacking port until the spring latch on top of the connector clicks into place.

2   Connect the 20G connector as follows:

a   Align the cable connector with the stacking port connector on the back of the switch (see).

b   Firmly press the cable connector into place on the mating stacking port connector.

c   Align and tighten the retaining screws on the cable connector.

Figure 200: Connecting the 20G Connector

Connect a SummitStack 128G/64G Stacking Cable

SummitStack 128G/64G cables are used to connect the 128-Gbps stacking ports on Summit X650 series switches to 64-Gbps stacking ports on Summit X480 series switches.

The 128-Gbps stacking ports are on VIM1-SummitStack256 modules; the 64-Gbps stacking ports are on VIM2-SummitStack128 modules.

Because of the weight of the SummitStack 128G/64G cable, Extreme Networks strongly recommends the use of cable management hardware to support the cables and provide strain relief at the connectors. Figure 201: Cable Management Using a J-Shaped Support Bracket on page 220 and Figure 202: Cable Management Using Tie-Wraps and Stand-Offs on page 221 show representative types of cable management hardware. Your particular rack configuration may require other cable management solutions.
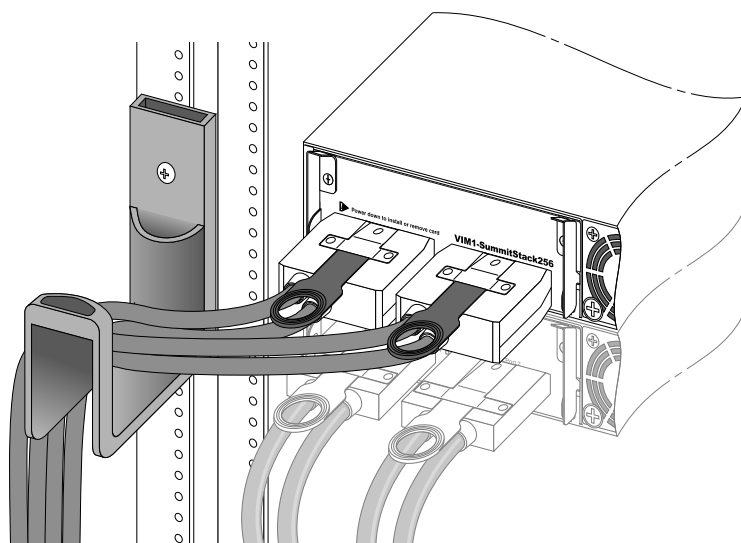
SH_16

Figure 201: Cable Management Using a J-Shaped Support Bracket
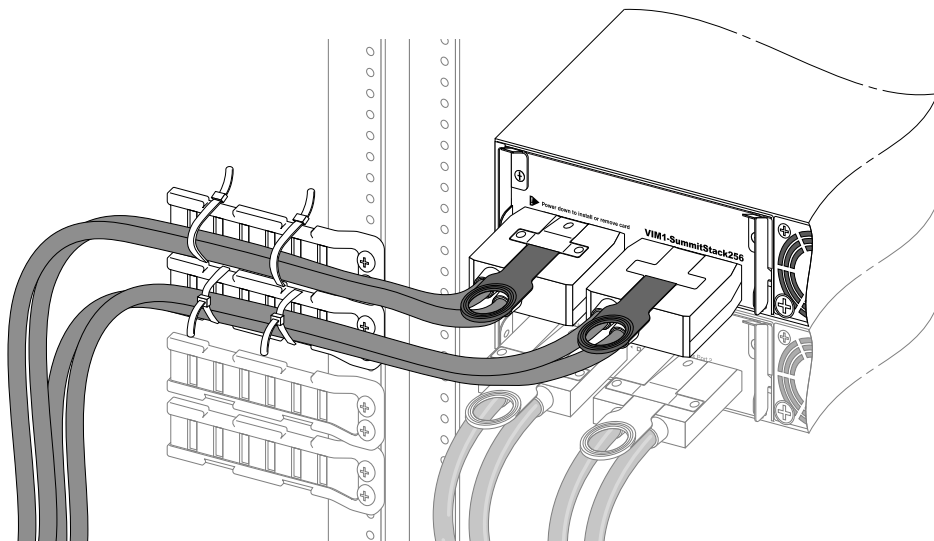
SH_17

Figure 202: Cable Management Using Tie-Wraps and Stand-Offs

At the Summit X650 series switch, connect the 128G connector to the VIM1-SummitStack256 module. At the Summit X480 series switch, connect the 64G connector to the VIM2-SummitStack128 module. The connection process is the same for each connector and the compatible VIM model.

To connect a 128G or 64G connector:

1   Holding the cable connector with the release tab on top, align the connector with the stacking port on the VIM1.
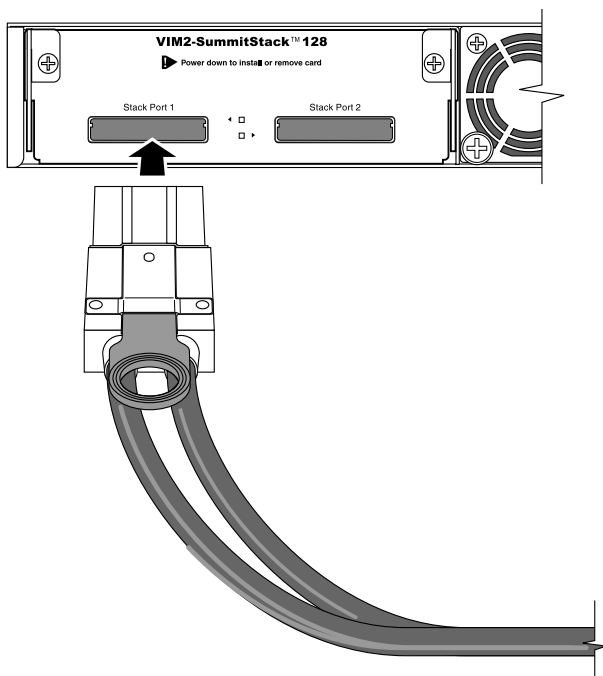
Figure 203: Connecting the 128G/64G Cable

128G Connector and VIM1-SummitStack256 Module
64G Connector and VIM2-SummitStack128 Module

2   Firmly press the cable connector into the stacking port until the spring latch on top of the connector clicks into place.

Connect a SummitStack 64G Stacking Cable

SummitStack 64G cables are used to connect the 64-Gbps stacking ports on the VIM2-SummitStack128 module in Summit X480 series switches.

Because of the weight of the SummitStack 64G cable, Extreme Networks strongly recommends the use of cable management hardware to support the cables and provide strain relief at the connectors. Figure 204: Cable Management Using a J-Shaped Support Bracket on page 223 and Figure 205: Cable Management Using Tie-Wraps and Stand-Offs on page 223 show representative types of cable management hardware. Your particular rack configuration may require other cable management solutions.
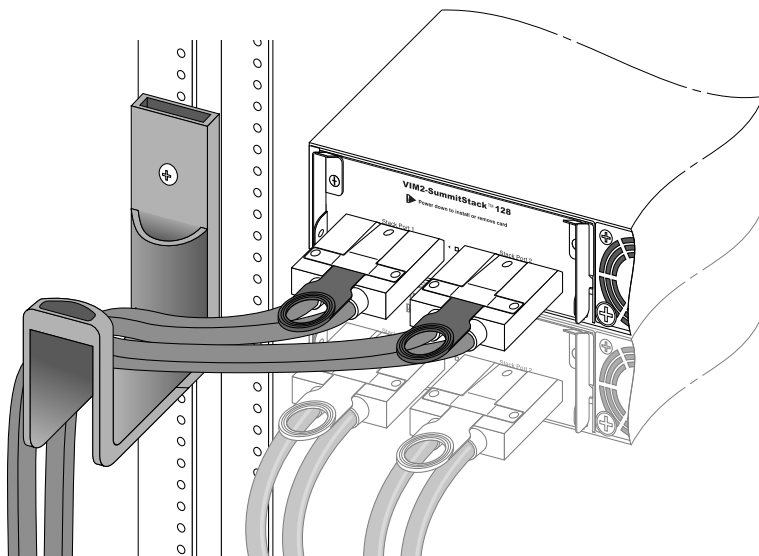
SH_166

Figure 204: Cable Management Using a J-Shaped Support Bracket
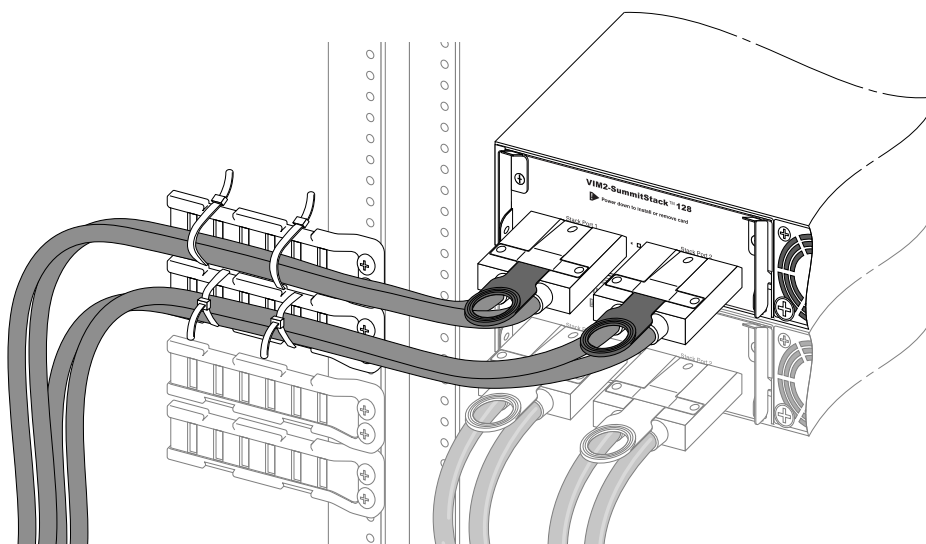
Figure 205: Cable Management Using Tie-Wraps and Stand-Offs

To connect a SummitStack 64G cable:

1   Holding the cable connector with the release tab on top, align the connector with the stacking port
    on the VIM2 module in the Summit X480 series switch (see Figure 206: Connecting a SummitStack
    64G Cable on page 224).
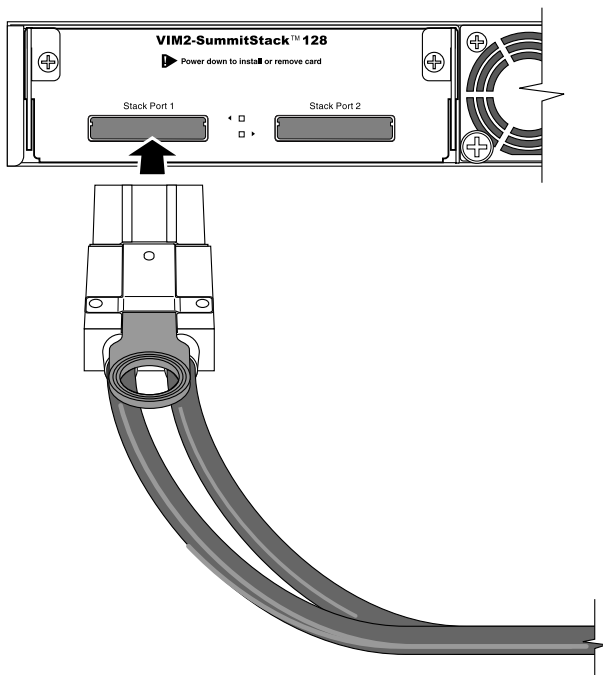
Figure 206: Connecting a SummitStack 64G Cable

2   Firmly press the cable connector into the stacking port until the spring latch on top of the connector
    clicks into place.
3   Repeat steps 1 and 2 to connect the other end of the cable.

Connect a SummitStack 64G/20G Stacking Cable

SummitStack 64G/20G cables are used to connect the 64-Gbps stacking ports on Summit X480 series
switches to 20-Gbps stacking ports on Summit X480 series, Summit X650 series, or other Summit
series switches.

The 64-Gbps ports are on VIM2-SummitStack128 modules in Summit X480 series switches. The 20-
Gbps ports are on one of the following:

• VIM1-10G8X module installed in a Summit X650 series switch
• VIM1-SummitStack module in a Summit X650 series switch
• VIM2-SummitStack module in a Summit X480 series switch
• Rear panel of Summit X250e, X450, X450a, or X450e series switches
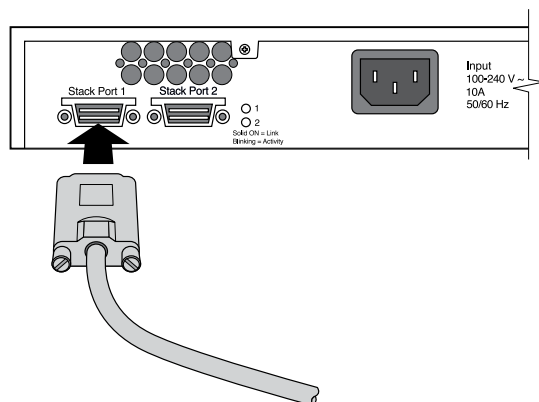
To connect a SummitStack 64G/20G cable:

1   Connect the 64-Gbps connector to the VIM2 module as follows:

a Holding the cable connector with the release tab on top, align the connector with the stacking port on the VIM2 module in the Summit X480 series switch.
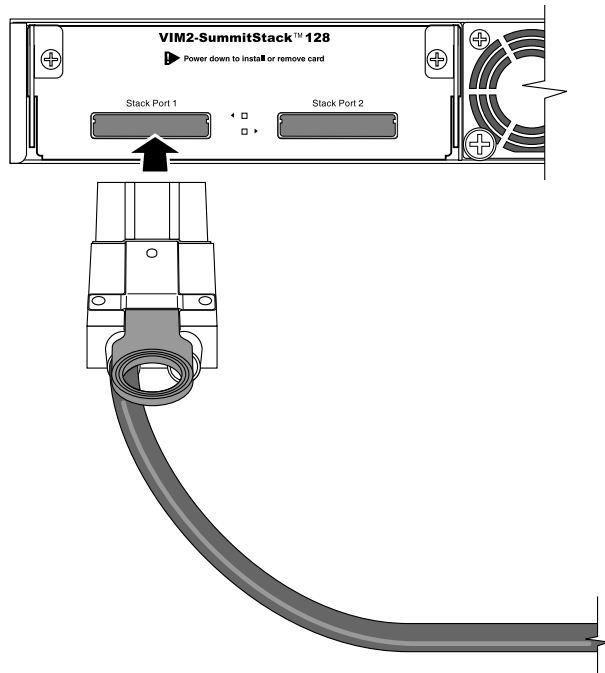
Figure 207: Connecting the 64G Connector

b Firmly press the cable connector into the stacking port until the spring latch on top of the connector clicks into place.

2 Connect the 20G connector as follows:

a Align the cable connector with the stacking port connector on the back of the switch (see Figure 208: Connecting the 20G Connector on page 225).

b Firmly press the cable connector into place on the mating stacking port connector.

c Align and tighten the retaining screws on the cable connector.

Figure 208: Connecting the 20G Connector

Connect Active or Passive QSFP+ Cables

The QSFP+ direct-attach cable is used to connect ports on either of the following modules:

- SummitStack-V80 stacking module installed in a Summit X460 series switch
- VIM2-SummitStack-V80 module installed in a Summit X480 series switch

To connect a QSFP+ direct-attach cable:

1 Holding the QSFP+ connector by its sides, insert the connector into the port on the switch.
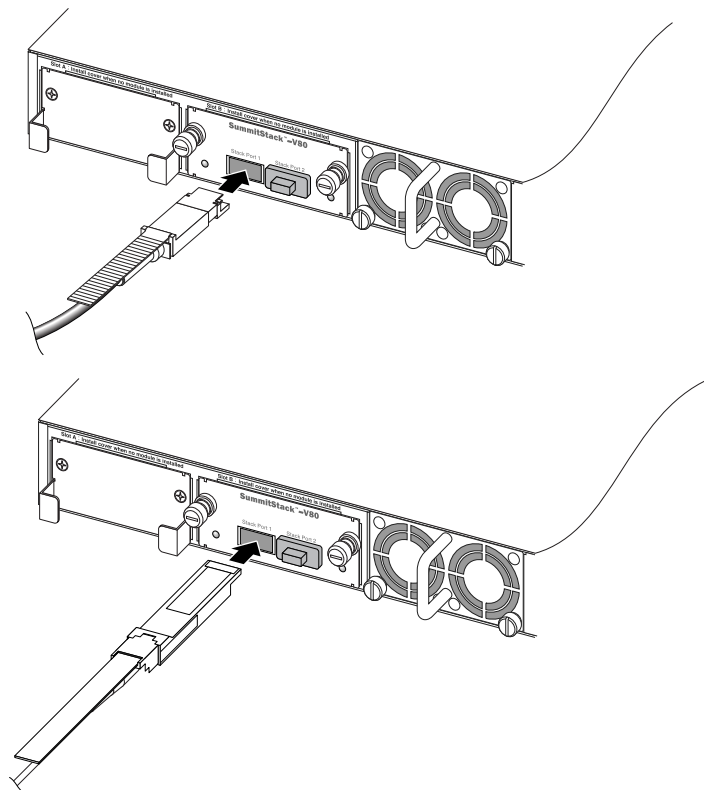
Figure 209: Connecting a QSFP+ Direct-Attach Cable to a SummitStack-V80 Module

Passive copper cable (top)	Active optical cable (bottom)

2 Push the connector into the port until you hear it click into place.

Connecting Console Ports for a Stack

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 Connecting the Switches to Form the Stack Ring, 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 steady green if the link is OK, blinking green if traffic is present, and off if no signal is present.

Stack Number Indicator LEDs

The Stack Number Indicator LED shows the slot number of the switch in the stack.

The top half of the number blinks if the switch is the master, and the bottom half blinks if it is the backup. If the LED is steadily lit, the switch is a standby. If the LED is off the switch is not configured as a member of a stack.

6 Installing Summit Family Switches

Safety Information

Installing a Summit Family Switch (Models Other than Summit X430-8p, X440-8t, X460, X480, X650, X670 and X770 Series)

Installing a Summit X460 Series Switch

Installing a Summit X430-8p Series Switch

Installing a Summit X440-8t Switch

Installing AC Power Supplies in Summit X460 Series Switches

Installing a Model 10933 or 10934A 300 W DC Power Supply in a Summit X460 Series Switch

Installing a Summit X480 Series Switch

Installing Summit 450 W and 550 W Power Supplies

Installing a Summit X650 Series Switch

Installing Summit X650 Power Supplies

Installing a Summit X670 or X770 Series Switch

Connecting Network Interface Cables

Initial Management Access

This chapter describes how to install Summit family switches and associated components. The chapter also includes information about connecting network interface cables and establishing management access.

Note

Be sure to note if you are installing an AC powered switch or a DC powered switch; the installation instructions are different depending upon what type of power is used.

If you intend to use the SummitStack feature, see Building Stacks on page 187 before you install the switches; the topic provides information about locating stacked switches and connecting the stacking cables.

Safety Information

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

> **Note**
>
> See Safety Information Appendix for additional safety information and 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 DC power cables.
>
> Be sure to disconnect the ground wire **after** you disconnect all DC power cables.

Installing a Summit Family Switch (Models Other than Summit X430-8p, X440-8t, X460, X480, X650, X670 and X770 Series)

This section describes how to install the following Summit family switches:

- Summit X150 series
- Summit X250e series
- Summit X350 series
- Summit X430 series (except for X430-8p)
- Summit X440 series (except for X440-8t)
- Summit X450 series
- Summit X450a series
- Summit X450e series

For instructions to install the Summit X430-8p series switches, see .Front-Mounting a X430-8p Switch in a Two-Post Rack on page 248

For instructions to install the Summit X460 series switches, see Installing a Summit X460 Series Switch.

For instructions to install the Summit X480 series switches, see Installing a Summit X480 Series Switch.

For instructions to install the Summit X650 series switches, see Installing a Summit X650 Series Switch.

For instructions to install the Summit X670 and X770 series switches, see Installing a Summit X670 or X770 Series Switch.

A Summit family switch can be mounted in a standard 19-inch (48.26 cm) rack or placed free-standing on a table. The installation process includes the following tasks:

- Install the switch in a rack or on a table.
- (Optional) Install port option cards.

- Ground the switch (DC-powered units only).
- Connect a redundant power supply (if applicable).
- Connect power cables.
- Connect network interface cables.

If you are installing Summit family switches for use in a SummitStack configuration, read Summit Family Switches before you install the switches.

For information about installing port option cards, see Installing Optional Ports.

For information about grounding and connecting DC-powered Summit family switches, see Installing Summit DC-Powered Switches.

For information about installing and connecting redundant power supplies, see Summit Power Supplies.

Rack-Mount a Summit Switch (Models Other than Summit X430-8p, X460, X480, X650, and X670 Series)

This section describes how to install Summit switch models other than the Summit X460, X480, X650, and X670 series switches.

The following items are provided with the Summit switch:
- Mounting brackets
- Screws to secure the mounting brackets to the switch
- Eight M3 screws for Summit X350, X440, X450, X450a, and X450e series switches
- Twelve M4 screws for Summit X150 and X250e series switches
- Four rubber mounting feet for table top stacking

To install the switch in a rack, you need the following additional tools and equipment:
- Four rack 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

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

  An AC power cord is not included with the Summit family switch. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

To rack-mount a Summit switch:

1 Place the switch upright on a stable work surface.
2 Place a mounting bracket over the mounting holes on one side of the unit.
3 Insert the screws and fully tighten with a suitable screwdriver.

SH_245_S150
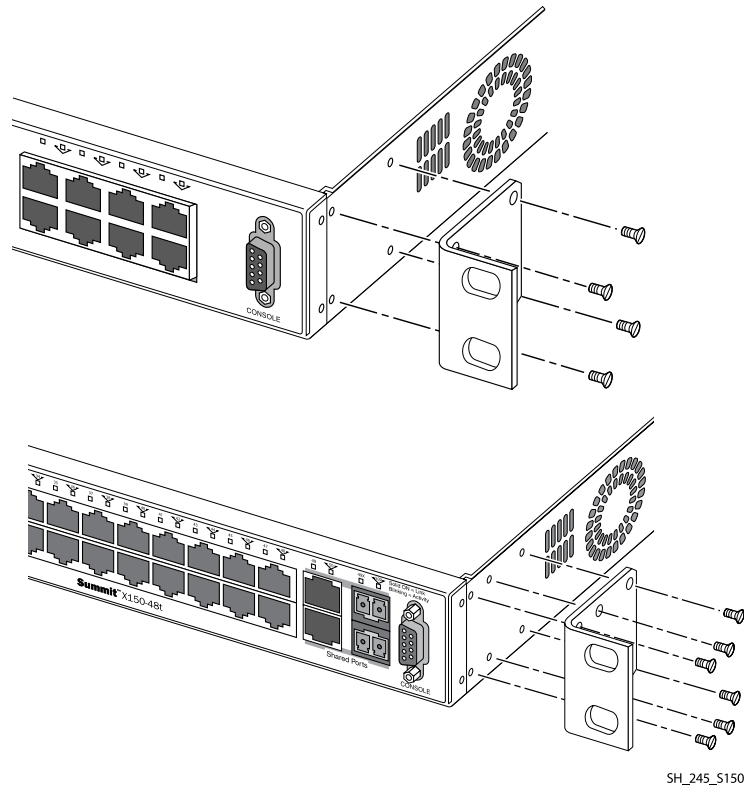
**Figure 210: Attaching the Mounting Bracket**

| Summit X350, X440, X450, X450a, and X450e, series | Summit X150 and X250e series |

4   Repeat steps 2 and 3 for the other side of the switch.

5 Slide the switch into the rack (see Figure 211: Installing a Switch in a Rack on page 232).

Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

Do not cover vents that would restrict airflow. Leave half a rack space between the units for adequate ventilation.
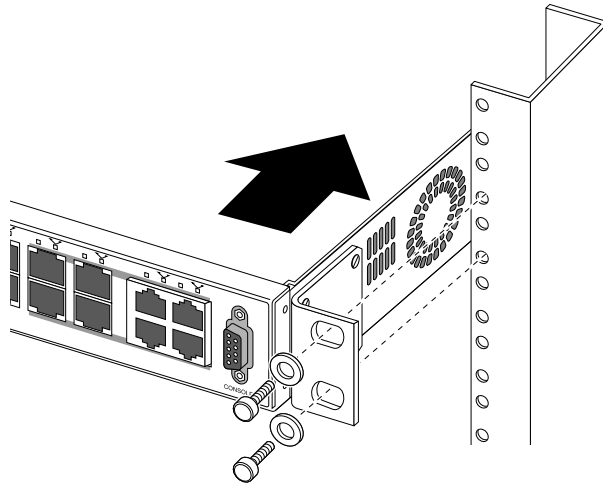
Figure 211: Installing a Switch in a Rack

6 Secure the switch with suitable screws (not provided).
7 Connect the power cables.

For AC-powered units, connect the power cable to the AC power connector on the back of the switch. Then connect the power cable to an AC power socket.

For information about DC-powered units, see Installing Summit DC-Powered Switches.

8 Connect the switch to the redundant power supply (if applicable). For instructions to install and connect redundant power supplies, see Summit Power Supplies.

Free-Standing and Desktop Mounting of Switches

Summit family switches are supplied with four self-adhesive rubber pads for desktop mounting.

The pads keep the switch from scratching the supporting surface and help ensure adequate airflow around the switches when they are mounted on top of one another.

> **Caution**
>
> You can not stack any switches on top of a desk mounted X430-8p switch. Do not place any equipment on top of a desktop mounted Summit X430-8p switch.
>
> For all Summit switches other than the X430-8p, you can safely stack up to four switches on top of one another.

> **Caution**
>
> If you are desktop mounting Summit X440-8t switches directly on top of each other, you must use the four rubber pads to maintain adequate airflow around the units.

To desktop mount your summit switches:

1 Carefully separate the four included rubber pads for each switch you are mounting.
2 Apply the pads to the underside of each device by placing a pad in the marked area at each corner of the switch, ensuring that all corners are aligned.
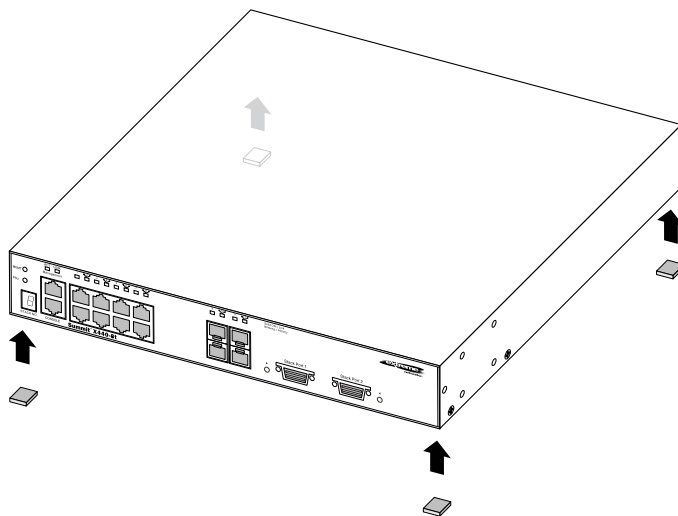
Figure 212: Applying the Rubber Pads to the Underside Corners of a Summit Switch

Installing Summit DC-Powered Switches

This section provides additional details about installing the following Summit DC-powered switches:

- Summit X250e-24tDC
- Summit X250e-24xDC
- Summit X250e-48tDC
- Summit X440-24tDC
- Summit X440-48tDC
- Summit X450a-24tDC

- Summit X450a-24xDC
- Summit X450a-48tDC

You must adhere to specific safety requirements when you connect to 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.

An optional redundant power supply, the EPS-150DC, is available for use with the Summit DC-powered switches. When the EPS-150DC is used with a DC-powered Summit 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. See EPS-150DC External Power Module (with EPS-T2) 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.

If you are installing a Summit DC-powered switch, you must ground the chassis before connecting the switch to the DC source voltage. (See Grounding a Summit X250 or X450 DC-Powered Switch on page 234.)

Grounding a Summit X250 or X450 DC-Powered Switch

Before you connect the power input cable to a Summit DC-powered switch, you must ground the chassis, following the instructions in this section.

Gather the following materials to ground the Summit X250 or X450 DC-powered switch:

- Stranded copper wire cable, minimum size 14 AWG, maximum size 6 AWG

  The wire should be long enough to reach from the installed switch to the facility ground point
- Torque screwdriver with 1/4-inch flat blade
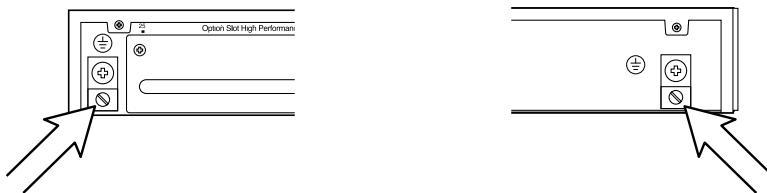- Additional grounding hardware appropriate to the earth ground connection at your site

Warning

Be sure to connect the chassis ground wire before you connect any power cables.

To ground the switch:

1 At one end of the wire, strip the insulation to expose 1/2 inch (12 mm) of bare wire.
2 Identify the grounding lug on the back of the switch.

The grounding lug is next to the edge of the back panel, identified by the international symbol for earth ground. Depending on the switch model, the grounding lug may be on either side.
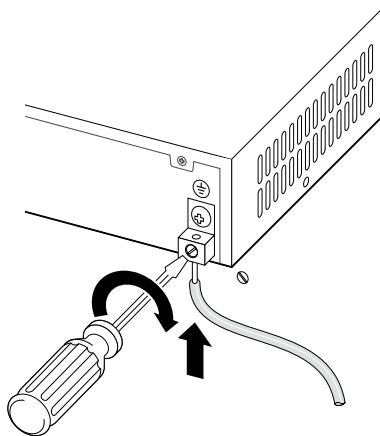
Figure 213: Location of the Grounding Lug

| Summit X450a series DC-powered switch | Summit X250e series DC-powered switch |

3   Insert the stripped wire into the grounding lug.
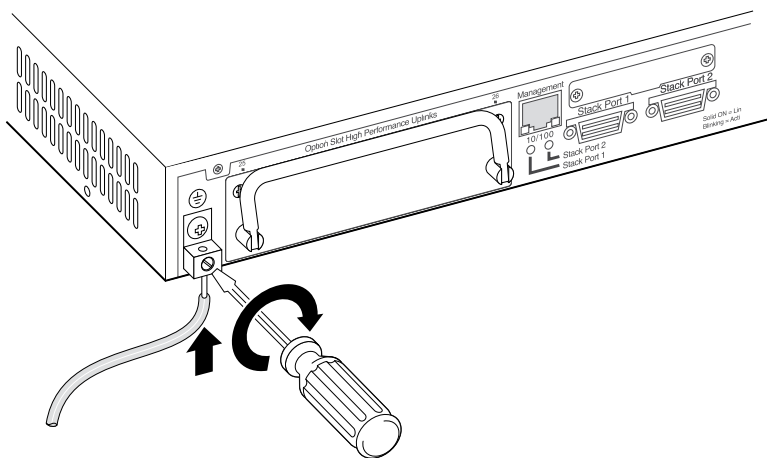
Figure 214: Attaching the Ground Wire to a Summit x450a Series Switch

Figure 215: Attaching the Ground Wire to a Summit X250e Series Switch

4   Using a straight-tip torque screwdriver, tighten the retaining screw to 20 pound-inches (2.25 Newton-meters).

5   Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the X250 or X450 DC Wiring Harness to the DC Source Voltage

A three-wire, 6-foot long DC wiring harness is included with the Summit family X250 or X450 DC-powered switch.

The DC wiring harness must be properly connected to the DC source voltage at your facility by a qualified electrician before you attach the connector on the wiring harness to the DC power supply socket on the switch. The figure below shows the wiring harness and connector. For information about the wire-to-pin connection, see Wire-to-Pin Connection Specifications Pinouts for the DB-9 Console Connector.

Warning

The Summit DC-powered switch and rack must be connected to protective earth ground before installing any switch components.

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 a Summit DC-powered switch 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.

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

Figure 216: Three-wire Cable Harness

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.

Grounding a Summit X440 DC-Powered Switch

Before you connect the power input cable to a Summit X440 DC-powered switch, you must ground the chassis, following the instructions in this section.

Gather the following materials to ground the Summit X440 DC-powered switch:

- Stranded copper wire cable, minimum size 14 AWG, maximum size 6 AWG

  The wire should be long enough to reach from the installed switch to the facility ground point
- Torque screwdriver with 1/4-inch flat blade
- Additional grounding hardware appropriate to the earth ground connection at your site
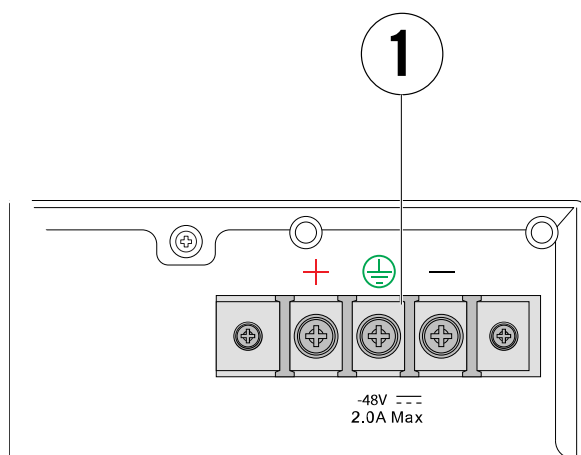
> ### Warning
> Be sure to connect the chassis ground wire before you connect any power cables.

To ground the switch:

1 Identify the grounding lug on the back of the switch. The grounding lug is is the middle screw of the power connector panel, identified by the international symbol for earth ground. See Grounding a Summit X440 DC-Powered Switch on page 236.

Figure 217: Location of the Grounding Lug on the X440 DC Powered Switch

1=Grounding lug

2 Insert the Insert the spade terminal of the ground wire underneath the grounding lug.
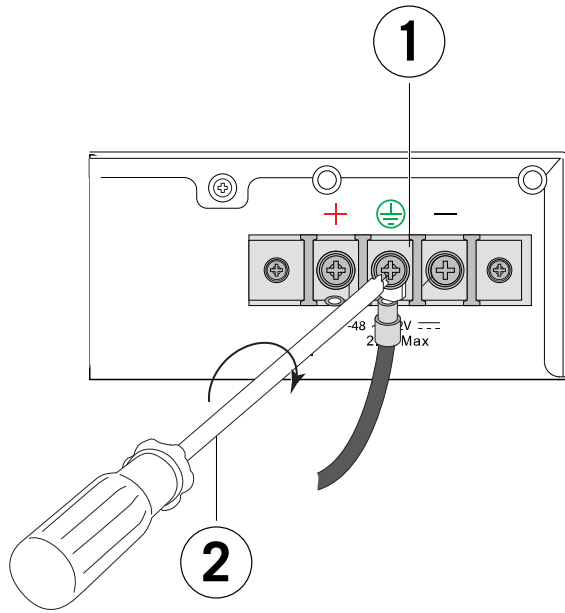
Figure 218: Attaching the Ground Wire to a Summit X440 DC Series Switch

1=Grounding lug	2=Tighten with screwdriver

> **Note**
> The DC power terminal is covered by a plastic shield when shipped. Remove the shield to access the terminals.

3   Using a cross-head (Phillips) torque screwdriver, tighten the retaining screw to 20 pound-inches (2.25 Newton-meters).
4   Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the DC Power Cables on the Summit X440-24tDC and X440-48tDC Switch to a -48V Power Source

> **Warning**
> Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables.

> **Warning**
> Be sure to ground the switch before connecting the power cables. See Grounding a Summit X440 DC-Powered Switch on page 236.

> **Caution**
> Provide proper connection and strain relief on the DC power cables in accordance with all local and national electrical codes.

To connect the DC power cables on X440 DC powered switches:

1   Verify that the DC circuit is de-energized.

2   Connect the DC power input cables as follows:

   a   On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer (see Figure 219: Connecting the DC Power Cables on page 239).

   b   Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled **–**48V).

   c   Slide the spade terminal of the **positive** wire (–48 V_RTN) under the captive square washer on the **positive** terminal (labeled **–**48V_RTN).
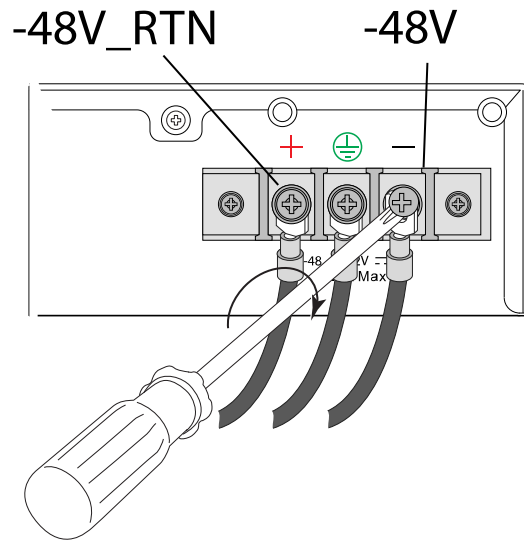
Figure 219: Connecting the DC Power Cables

   d   Tighten both screws on the terminal block to 20 pound-inches (2.25 Newton-meters).

3   Energize the DC circuit.

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 DC-powered switch without further electrician assistance.

Note

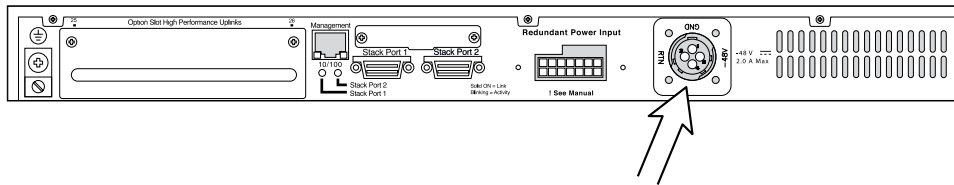Be sure that the DC circuit is de-energized before you connect the DC wiring harness to the DC power socket.

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:

1 Plug the DC wiring harness connector into the DC power supply socket on the rear of the switch (see the figure below).

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 314: Three-wire Cable Harness on page 329 for the DC wiring harness connector.

Figure 220: DC Power Socket on a Summit X450a Series DC-Powered Switch

> **Note**
>
> The figure above shows the rear panel of a Summit X450a series DC-powered switch. The rear panel of other Summit DC-powered 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.

Installing a Summit X460 Series Switch

The Summit X460 series switch fits into a standard 19-inch equipment rack.

The provided rack- mounting brackets attach to the front of the switch unit and are adaptable to either a front-mount or mid-mount installation.

The installation process includes the following tasks:

1 Install the switch in the rack.
2 Install the first power supply.
3 (Optional) Install a second power supply.
4 (Optional) Install a port option card or stacking module, or both.
5 Connect power cables.
6 For a stacked configuration, connect stacking cables
7 Connect network interface cables.

If you are installing Summit X460 series switches for use in a SummitStack configuration, read Summit Family Switches before you install the switches.

> **Note**
>
> Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

Pre-installation Requirements

Installing the Summit X460 series switch requires two people to maneuver the switch and attach mounting hardware.

Make sure there is adequate space behind the rack to provide access for installing power supplies, port option cards, and stacking modules.

The following items are provided with the Summit X460 series switch:
- Two rack mounting brackets adaptable for either a front-mount or mid-mount installation
- Twelve screws for attaching the brackets to the switch enclosure

You need the following additional tools and equipment:
- Four rack 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

  The screwdriver size will vary based on the requirements of your organization's rack system.
- AC power cord for each installed AC power supply

  An AC power cord is not included with the Summit X460 series switch. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
- ESD-preventive wrist strap for installing optional ports at the back of the switch

Mid-Mount a Switch in a Two-Post Rack

To mid-mount a Summit X460 series switch in a two-post rack:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
2 On one side of the switch, set the bracket against the switch housing, with the flange toward the back of the switch (see Figure 221: Attaching a Rack-mounting Flange on page 242).
3 Use six of the provided screws to secure the bracket to the switch housing.

4   Repeat step to attach the other bracket to the other side of the switch.

SH_197
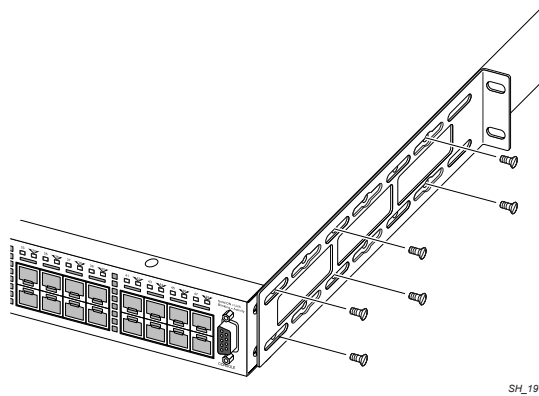
Figure 221: Attaching a Rack-mounting Flange

5   Slide the switch into the equipment rack.

SH_198
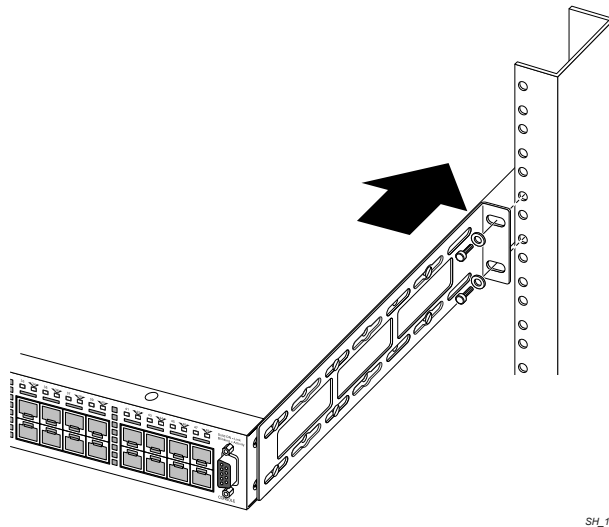
Figure 222: Installing the Summit X460 Series Switch

6   Secure the mounting bracket flanges to the rack, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

The Summit X460 series switch is shipped without installed power supplies. You can install one or two power supplies. After the switch is secured to the rack, install the necessary power supplies for your configuration. For instructions, see the following pages:

• 300 W AC power supply—Installing a 300 W AC Power Supply in a Summit X460 Series Switch

• 750 W AC power supply—Installing a 750 W AC Power Supply in a Summit X460 Series Switch

• 300 W DC power supply—Installing a Model 10933 or 10934A 300 W DC Power Supply in a Summit X460 Series Switch

To install an XGM3-2sf port card, see Installing a Summit XGM3 Series Port Option Card.

To install a stacking module, see Installing an Option Card or Port Option Card in Slot B of a Summit X460 Series Switch.

Installing Summit DC-Powered Switches

This section provides additional details about installing the following Summit DC-powered switches:

- Summit X250e-24tDC
- Summit X250e-24xDC
- Summit X250e-48tDC
- Summit X440-24tDC
- Summit X440-48tDC
- Summit X450a-24tDC
- Summit X450a-24xDC
- Summit X450a-48tDC

You must adhere to specific safety requirements when you connect to 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.

An optional redundant power supply, the EPS-150DC, is available for use with the Summit DC-powered switches. When the EPS-150DC is used with a DC-powered Summit 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. See EPS-150DC External Power Module (with EPS-T2) 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.

If you are installing a Summit DC-powered switch, you must ground the chassis before connecting the switch to the DC source voltage. (See Grounding a Summit X250 or X450 DC-Powered Switch on page 234.)

Grounding a Summit X250 or X450 DC-Powered Switch

Before you connect the power input cable to a Summit DC-powered switch, you must ground the chassis, following the instructions in this section.

Gather the following materials to ground the Summit X250 or X450 DC-powered switch:

- Stranded copper wire cable, minimum size 14 AWG, maximum size 6 AWG

  The wire should be long enough to reach from the installed switch to the facility ground point
- Torque screwdriver with 1/4-inch flat blade

- Additional grounding hardware appropriate to the earth ground connection at your site
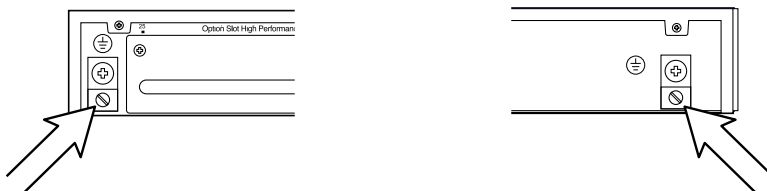
> ⚠️ **Warning**
> Be sure to connect the chassis ground wire before you connect any power cables.

To ground the switch:

1   At one end of the wire, strip the insulation to expose 1/2 inch (12 mm) of bare wire.
2   Identify the grounding lug on the back of the switch.

    The grounding lug is next to the edge of the back panel, identified by the international symbol for earth ground. Depending on the switch model, the grounding lug may be on either side.

Figure 223: Location of the Grounding Lug

| Summit X450a series DC-powered switch | Summit X250e series DC-powered switch |

3   Insert the stripped wire into the grounding lug.
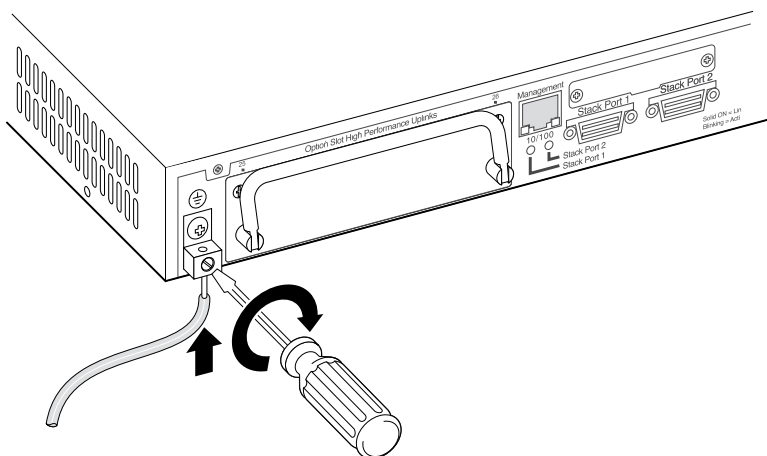
Figure 224: Attaching the Ground Wire to a Summit x450a Series Switch
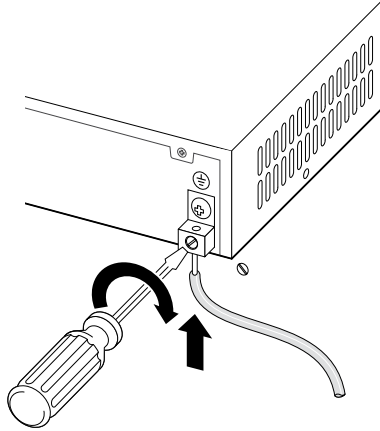
Figure 225: Attaching the Ground Wire to a Summit X250e Series Switch

4   Using a straight-tip torque screwdriver, tighten the retaining screw to 20 pound-inches (2.25 Newton-meters).

5   Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the X250 or X450 DC Wiring Harness to the DC Source Voltage

A three-wire, 6-foot long DC wiring harness is included with the Summit family X250 or X450 DC-powered switch.

The DC wiring harness must be properly connected to the DC source voltage at your facility by a qualified electrician before you attach the connector on the wiring harness to the DC power supply socket on the switch. The figure below shows the wiring harness and connector. For information about the wire-to-pin connection, see Wire-to-Pin Connection Specifications Pinouts for the DB-9 Console Connector.

Warning

The Summit DC-powered switch and rack must be connected to protective earth ground before installing any switch components.
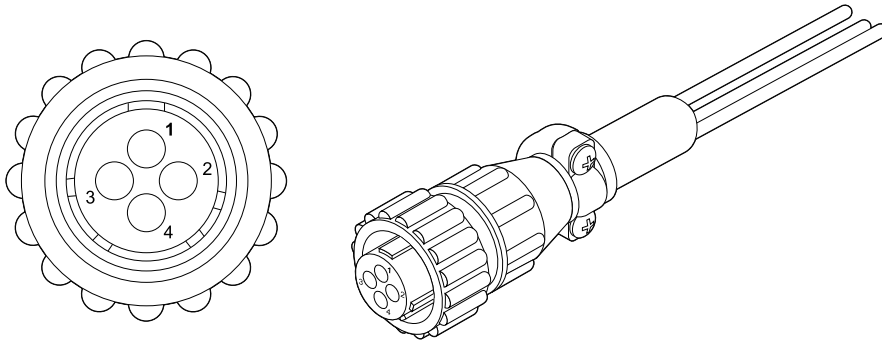
Wiring the DC input power harness to your facilities DC source voltage must be performed by a qualified, licensed electrician. After the wiring harness is connected to a permanent DC voltage source by a qualified, licensed electrician, you can remove, replace and maintain a Summit DC-powered switch without 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.

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

Figure 226: Three-wire Cable Harness

> **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.

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 DC-powered switch 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.
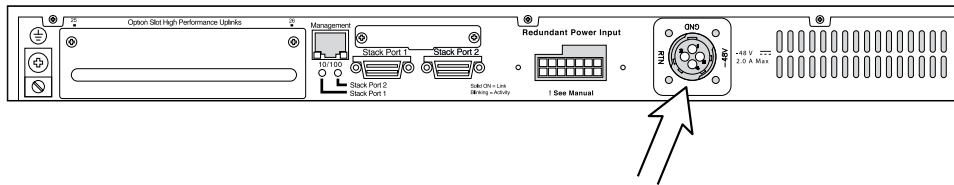
> **Caution**
>
> Be sure that proper ESD controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

To attach the DC wiring harness to the internal DC power supply:

1   Plug the DC wiring harness connector into the DC power supply socket on the rear of the switch (see the figure below).

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 314: Three-wire Cable Harness on page 329 for the DC wiring harness connector.

Figure 227: DC Power Socket on a Summit X450a Series DC-Powered Switch

Note

The figure above shows the rear panel of a Summit X450a series DC-powered switch. The rear panel of other Summit DC-powered 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.

Installing a Summit X430-8p Series Switch

The Summit X430-8p series switch fits into a standard 19-inch equipment rack.

The rack-mounting brackets (ordered separately) attach to the front of the switch for front-mount installation.

The installation process includes the following tasks:

1   Install the switch in the rack.

2   Connect power cables.

3   Connect network interface cables.

Note

Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

Summit X430-8p Pre-installation Requirements

Make sure there is adequate space behind the rack before you begin to install the switch.

Note

The X430-8p requires special mounting brackets. These brackets are not included with the shipped X430-8p switch and must be ordered separately.

Besides the mounting brackets, you need the following tools and equipment:

• Four rack 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

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

• AC power cord for each unit.

  Extreme Networks equipment does not ship with power cords. Click the following link for locating the correct power cord for purchase and use on specific Extreme Networks equipment. Specifications for power cords in each country are also provided within this link allowing end user to purchase cords locally. http://www.extremenetworks.com/product/powercords/

• ESD-preventive wrist strap.

Front-Mounting a X430-8p Switch in a Two-Post Rack

To front-mount a Summit X430-8p series switch in a two-post rack:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2 Ensure that there is adequate vertical space for the mounting brackets in the position provided for the switch. Ensure there is adequate space in front and behind the provided position for cabling and airflow.

3

Note
The brackets are not the same size. One of the brackets has special "keep out" flanges to prevent other equipment from being placed too close above or below the switch. The flanges ensure that there is at least two centimeters of empty space (approximately one half of a Rack Unit) above and below the X430-8p switch. The bracket with the "keep out" flanges can be placed on either side of the switch.

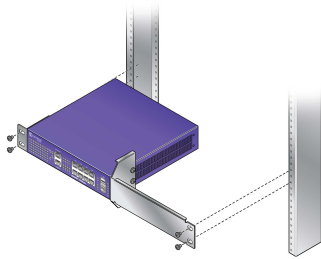Attach each mounting bracket as follows:.

a Set the brackets against the switch housing, with the flanges even with the front panel of the switch (Figure 228: Attaching brackets to the Summit X430-8p Series Switch on page 248).
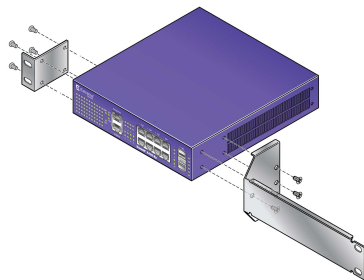
Figure 228: Attaching brackets to the Summit X430-8p Series Switch

b Use the provided screws to secure the bracket to the switch housing.

c Repeat steps a and b to attach the other bracket to the other side of the switch..

4   Slide the switch into the equipment rack ().

Figure 229: Installing the Summit X430-8p Series Switch

5   Secure the mounting bracket flanges to the rack, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

Installing a Summit X440-8t Switch

The Summit X440-8t series switch fits into a standard 19-inch equipment rack.

The rack-mounting brackets attach to the front of the switch for front-mount installation.

The installation process includes the following tasks:

1   Install the switch in the rack.
2   Connect power cables.
3   Connect network interface cables.

> **Note**
>
> Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

Summit X440-8t Pre-installation Requirements

Make sure there is adequate space behind the rack before you begin to install the switch.

> **Note**
>
> The X440-8t requires special mounting brackets.

Besides the mounting brackets, you need the following tools and equipment:

• Four rack 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

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

• AC power cord for each unit.

Extreme Networks equipment does not ship with power cords. Click the following link for locating the correct power cord for purchase and use on specific Extreme Networks equipment. Specifications for power cords in each country are also provided within this link allowing end user to purchase cords locally. http://www.extremenetworks.com/product/powercords/

- ESD-preventive wrist strap.

Front-Mounting a X440-8t Switch in a Two-Post Rack

To front-mount a Summit X440-8t series switch in a two-post rack:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2 Ensure that there is adequate vertical space for the mounting brackets in the position provided for the switch. Ensure there is adequate space in front and behind the provided position for cabling and airflow.

3

Note
The mountiung brackets have special "keep out" flanges to prevent other equipment from being placed too close above or below the switch. The flanges ensure that there is at least two centimeters of empty space (approximately one half of a Rack Unit) above and below the X440-8t switch. The brackets with the "keep out" flanges are placed on either side of the switch.

Attach each mounting bracket as follows:.

a Set the brackets against the switch housing, with the flanges even with the front panel of the switch.
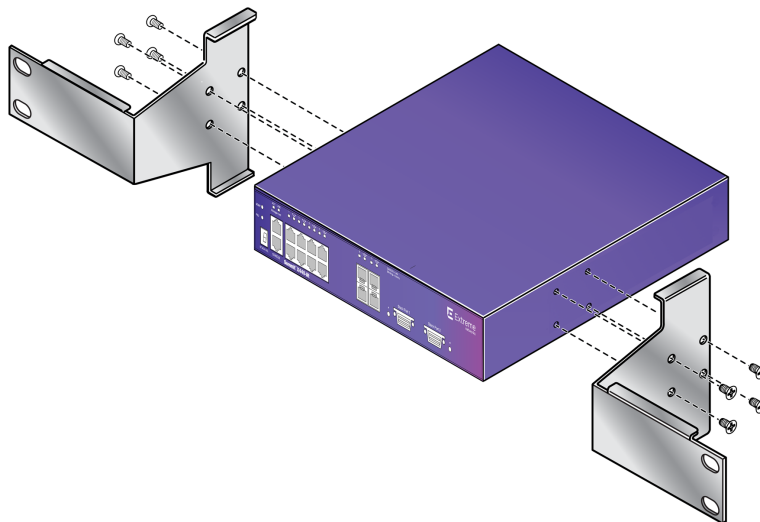
Figure 230: Attaching brackets to the Summit X440-8t Series Switch

b Use the provided screws to secure the bracket to the switch housing.

c Repeat steps a and b to attach the other bracket to the other side of the switch..

4   Slide the switch into the equipment rack.
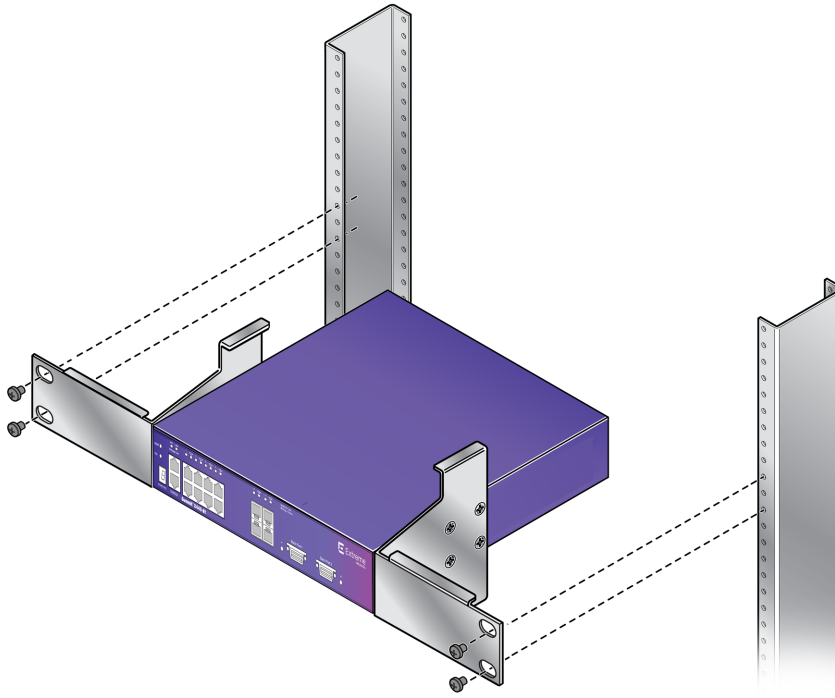
Figure 231: Installing the Summit X440-8t Series Switch

5   Secure the mounting bracket flanges to the rack, using screws that are appropriate for the rack (rack-mounting screws are not provided).

Installing AC Power Supplies in Summit X460 Series Switches

Two AC power supplies are available for the Summit X460 series switches:

- Summit 300 W AC power supply (Model 10930)

  This power supply is compatible with the Summit X460-24t, Summit X460-48t, Summit X460-24x, and Summit X460-48x switch.

- Summit 750 W AC power supply (Model 10931) for PoE models

  This power supply is compatible with the Summit X460-24p and Summit X460-48p switch.

AC Power Supply Cords

An AC power cord is not included with a Summit AC power supply.

You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. The cord must meet the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Installing a 300 W AC Power Supply in a Summit X460 Series Switch

Warning

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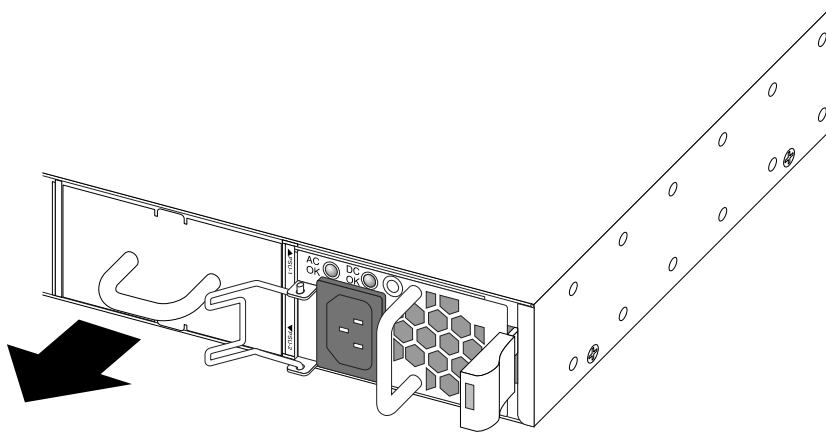
Caution

Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install a 300 W AC power supply in a Summit X460 series switch:

1 If necessary, remove a blank panel from the back of the Summit X460 series switch.
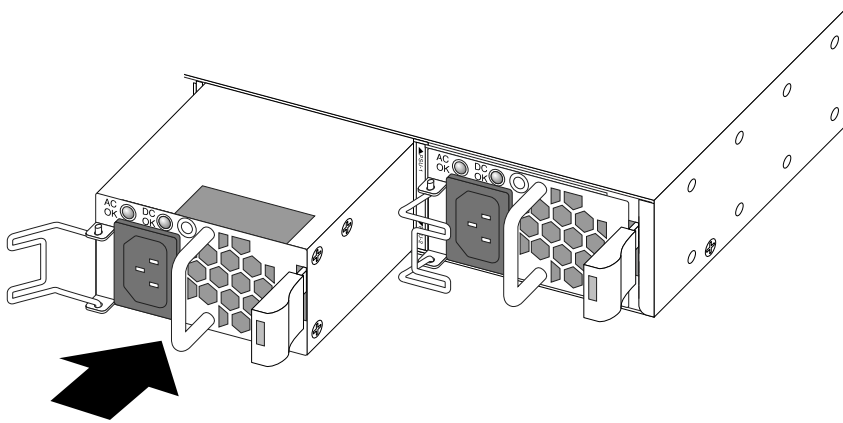

Figure 232: Removing a Blank Panel

2 Verify that the power supply is right side up (see).

3 Carefully slide the power supply all the way into the power supply bay (see).

4   Push the power supply in until the latch snaps into place.

> ### Caution
> Do not slam the power supply into the switch.

Figure 233: Installing a Power Supply

> ### Note
> If power supplies are not installed in both power supply bays, be sure to install a cover over the unoccupied bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5   Connect the AC power cord to the input connector on the power supply and rotate the wire clip into place over the power cord connector.
6   Connect the other end of the power cord to an AC power outlet.

> ### Warning
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

To install a second power supply, repeat steps 1 through 6.

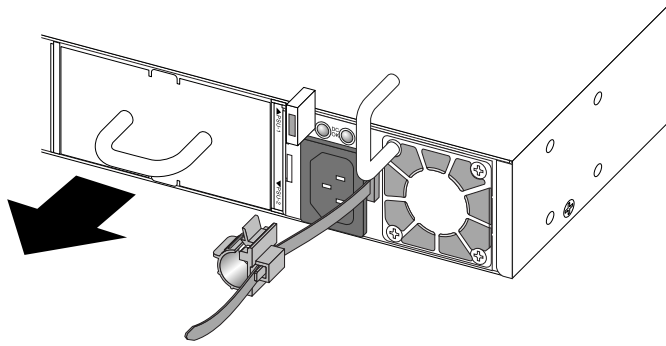## Installing a 750 W AC Power Supply in a Summit X460 Series Switch

> ### Warning
> To prevent an electrical hazard, make sure that the AC power cord is not connected to the power supply before you install the power supply in the power supply bay.

> ### Caution
> Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install a 750 W AC power supply in a Summit X460 series switch:

1 If necessary, remove a blank panel from the back of the Summit X460 series switch (Removing a Blank Panel).

Figure 234: Removing a Blank Panel

2 Verify that the power supply is right side up (see Installing a 750 W AC Power Supply).
3 Carefully slide the power supply all the way into the power supply bay (see Installing a 750 W AC Power Supply).

4 Push the power supply in until the latch snaps into place.

> **Caution**
>
> Do not slam the power supply into the switch.
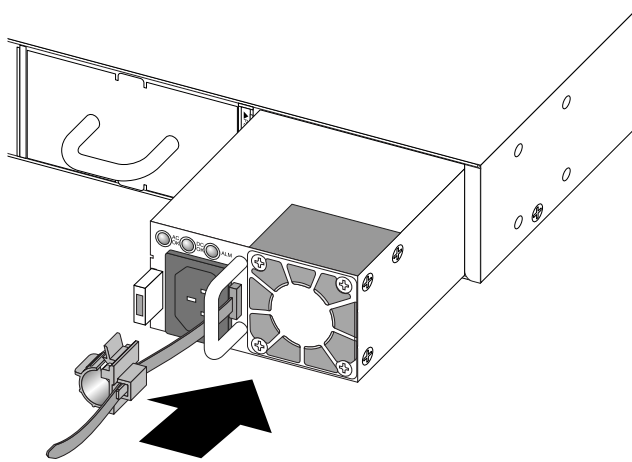
Figure 235: Installing a 750 W AC Power Supply

> **Note**
>
> If power supplies are not installed in both power supply bays, be sure to install a cover over the unoccupied bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.
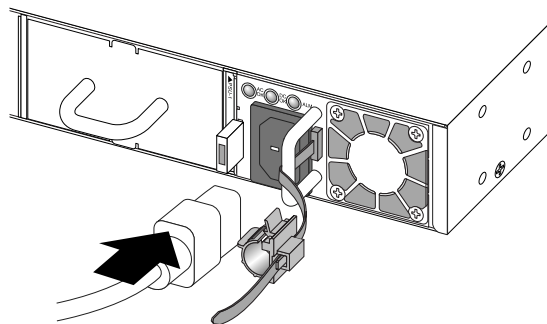
5 Connect the AC power cord as follows:

a   If necessary, slide the plastic cord retainer farther away from the back of the switch (Figure 236: Moving the Power Cord Retainer on page 256).
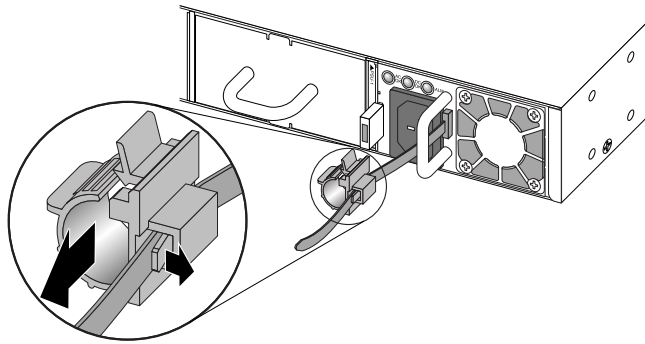
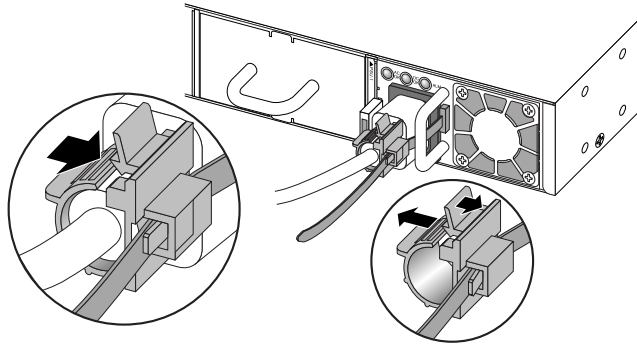**Figure 236: Moving the Power Cord Retainer**

b   Connect the AC power cord to the input connector (Figure 237: Connecting the Power Cord on page 256).

Figure 237: Connecting the Power Cord

c   Open the clip and slip it over the barrel of the connector (Figure 238: Attaching the Power Cord Retainer on page 257).

Figure 238: Attaching the Power Cord Retainer

d   Snap the clip firmly around the connector.

6   Connect the other end of the power cord to an AC power outlet.

Warning

Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

To install a second power supply, repeat steps 1 through 6.

Installing a Model 10933 or 10934A 300 W DC Power Supply in a Summit X460 Series Switch

---

Caution

Make sure that the DC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions. You may use up to a 30-Amp breaker.

To install a DC power supply in a Summit X460 switch, perform the following tasks in the order listed:

1   Prepare the power cables and ground cable by attaching the provided connection lugs to the cables (see Preparing the Cables).

2   Insert the power supply into the Summit X460 series switch (see Installing the Power Supply.)

3   Connect the ground (see Connecting the Ground Cable).

4   Have a qualified licensed electrician connect the power supply to the DC source voltage.

    See Connecting the Power Supply to the DC Source Voltage.

5   Energize the DC circuit.

Required Tools and Materials

You need the following tools and materials to install or remove a 300 W DC power supply in a Summit X460 series switch:

- Two spade terminals (Tyco part number 328281 or equivalent) for connecting the input power cables (provided)
- One ring terminal (Tyco part number 2-320561-4 or equivalent) and screw with captive lock washer (type 6-32 UNC) for connecting the ground wire (both provided)
- #14 AWG copper cable for grounding the power supply and connecting the power supply to the DC power source

  A DC power cord is not included with the 300 W DC power supply. You must provide the #14 AWG copper cable. Recommended insulation colors are:
- Red for the –48V connection (–)
- Black for the –48V RTN connection (+)
- Green or green with yellow stripe for the ground connection
- Connection hardware appropriate to the installation site:
  - Hardware for connecting the power wires to the DC source
  - Hardware for connecting the ground wire to the site grounding point
- Stripping tool
- Crimping tool for attaching the lug to the ground wire
- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- ESD-preventive wrist strap
- Thermal protective gloves (required for removal of a power supply)

Connection lugs for power and ground and a screw for connecting the ground wire are shipped with the power supply.

Preparing the Cables

A ring terminal and two spade terminals are provided with the power supply.

You need a crimping tool to attach the terminals to the power and ground cables.

To prepare the cables:

1 On each wire, strip 0.25 inch (6.35 mm) of insulation from one end.
2 Insert the stripped wire end all the way into the barrel of the terminal (see Figure 239: Attaching Power Connection Terminals to Cables on page 259 andFigure 240: Attaching ground terminal to cable on page 259) and crimp the terminal securely to the wire.

  Be sure to attach the ring terminal to the green/yellow wire.
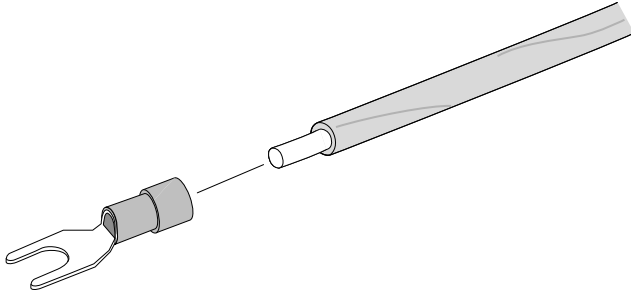
Figure 239: Attaching Power Connection Terminals to Cables
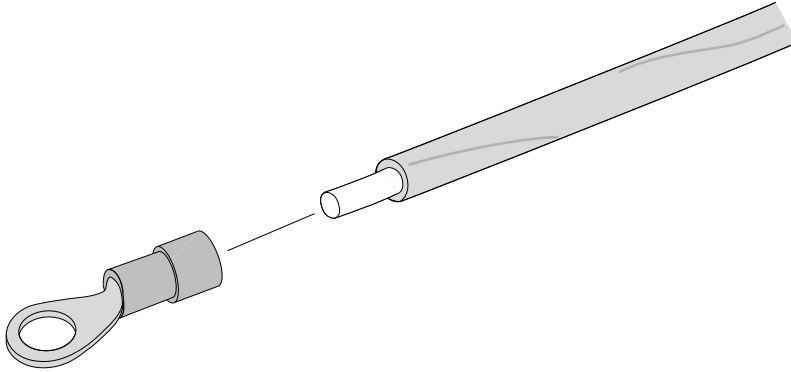
Figure 240: Attaching ground terminal to cable

Installing the Power Supply

⚠️ **Caution**

The handle on the Summit 300 W DC power supply is not designed to be used to lift or carry the Summit X460 series switch.

To install a DC power supply in a Summit X460 series switch:

1   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2   If necessary, remove a blank panel from the back of the Summit X460 series switch.
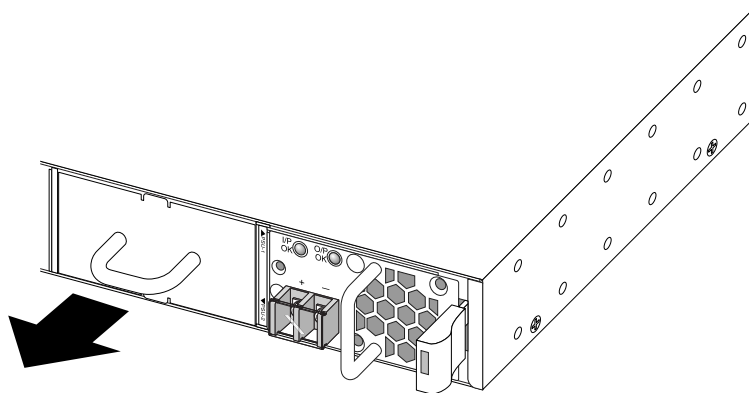
Figure 241: Removing a Blank Panel

3   Verify that the power supply is right side up (see the figures below).

4   Carefully slide the power supply all the way into the power supply bay (see the figures below).

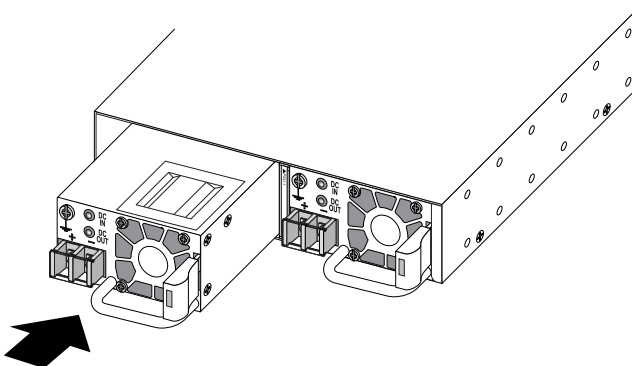5   Push the power supply in until the latch snaps into place.

> ⚠ Caution
> Do not slam the power supply into the switch.
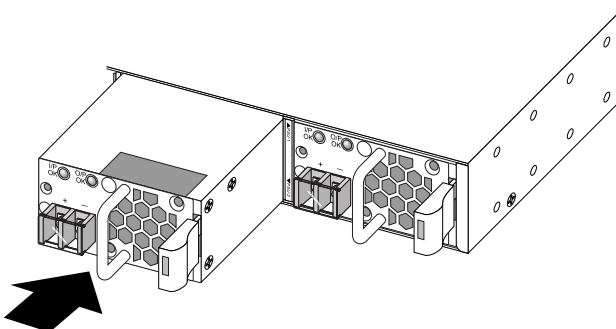
Figure 242: Installing a Summit 300 W DC Power Supply (Model 10934A)

Figure 243: Installing a Summit 300 W DC Power Supply (Model 10933)

To install a second power supply, repeat steps 2 through 5.

Connecting the Ground Cable

> ⚠️ **Warning**
> Be sure to connect the chassis ground wire before you connect any power cables.

> ⚠️ **Warning**
> Be sure to disconnect the ground wire after you disconnect all power cables.

To connect the ground wire:

1 Verify that the DC circuit is de-energized.
2 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3 Identify the grounding point on the front panel of the power supply (see Connecting the Power Supply to the DC Source Voltage).
4 Insert a a 6-32 UNC screw (provided) through the ring terminal and into the grounding point on the power supply.
5 Tighten the screw to 12.6 inch-pounds (1.42 Newton-meters).
6 Connect the other end of the wire to a known reliable earth ground point at your site.
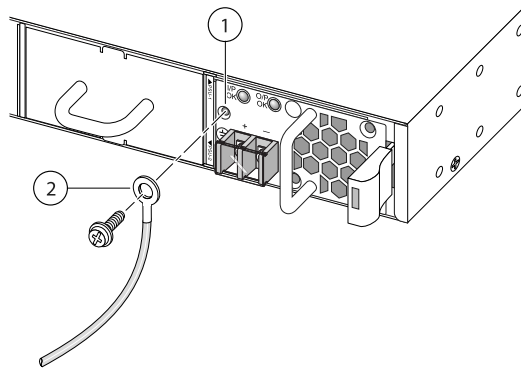
Figure 244: Connecting the Ground Wire (Model 10934A)

1 = Grounding point	2 = Ground wire
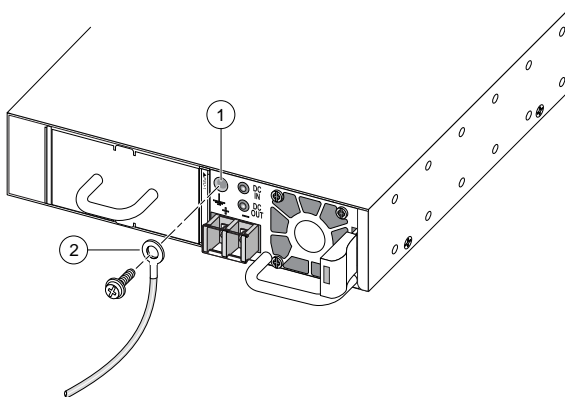
Figure 245: Connecting the Ground Wire (Model 10933)

1 = Grounding point	2 = Ground wire

Connecting the Power Supply to the DC Source Voltage

The DC power connection at your facility must be made by a qualified electrician, following the instructions in this section.

There are two 300W DC power supplies available: Model 10933 (recommended) and Model 10934A. The model 10933 can connect to both a +24V and -48V power source.

Note

The connection instructions are different depending upon which type of power source you are connecting to. The model 10933 can connect to both +24V and -48V sources, while the 10934A can connect to only -48V sources.

Warning

Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the 300 W DC power supply.

Caution

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

Connecting the Model 10933 DC Power Supply to a +24V Source

Caution

These instructions are for the Model 10933 DC power supply only. Do not connect a Model 10934A DC power supply to a +24V source.

To connect the DC power input cables on an model 10933 power supply to a +24V source:

1. Verify that the DC circuit is de-energized.
2. Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3. Slide the cover off the terminal block (see Figure 246: Connecting the DC Power Cables (Part 1) on page 263).
4. Connect the DC power input cables as follows:

   a. On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.
   b. Slide the spade terminal of the **negative** wire (–24 V) under the captive square washer on the **negative** terminal (labeled –24V).

c   Slide the spade terminal of the **positive** wire (+24 V) under the captive square washer on the **positive** terminal (+24V).

d   Tighten both screws on the terminal block to 11 inch-pounds (1.25 Newton-meters).
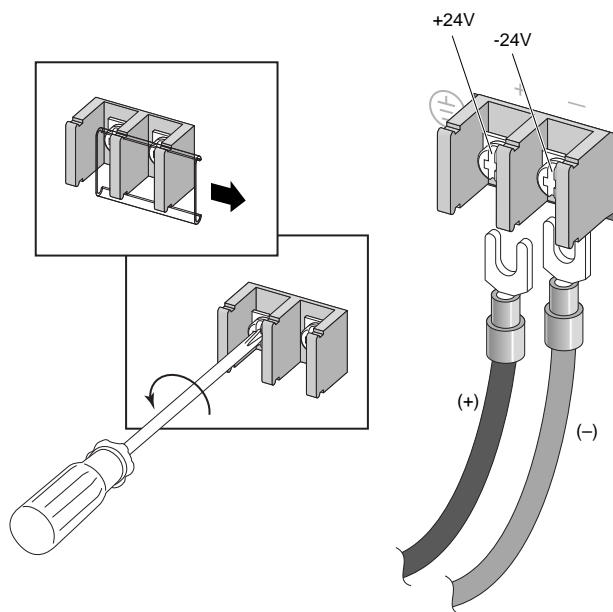
Figure 246: Connecting the DC Power Cables (Part 1)

5   Slide the cover into place over the terminal block.

Figure 247: Connecting the DC Power Cables (Part 2)

6   Connect the cables to the DC source voltage, using hardware appropriate to the installation site and following local and national electrical codes.

7   Energize the DC circuit.

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

Connecting the Model 10933 or 10934A DC power supply to a -48V source

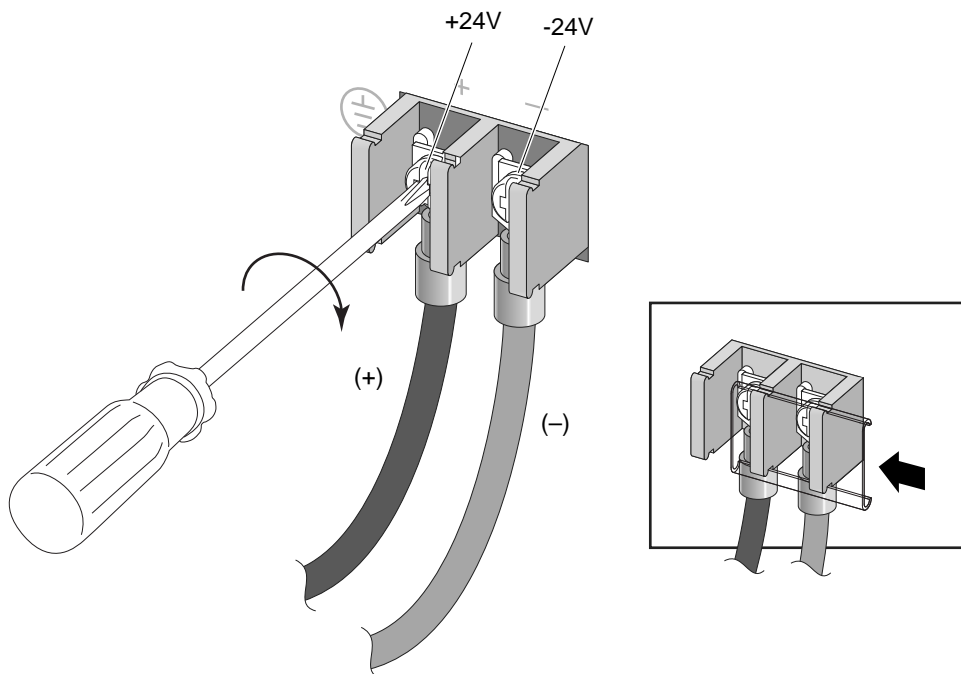To connect the DC power input cables on the Model 10933 or 10934A power supplies to a -48V source:

1   Verify that the DC circuit is de-energized.
2   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3   Slide the cover off the terminal block ().
4   Connect the DC power input cables as follows:

    a   On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.
    b   Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled –48V).

c   Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on
     the **positive** terminal (labeled RTN).

RTN

-48V

(+)

(−)

Figure 248: Connecting the DC Power Cables (Part 1)

d   Tighten both screws on the terminal block to 11 inch-pounds (1.25 Newton-meters) (
).

5   Slide the cover into place over the terminal block.

Figure 249: Connecting the DC Power Cables (Part 2)

6   Connect the cables to the DC source voltage, using hardware appropriate to the installation site and following local and national electrical codes.
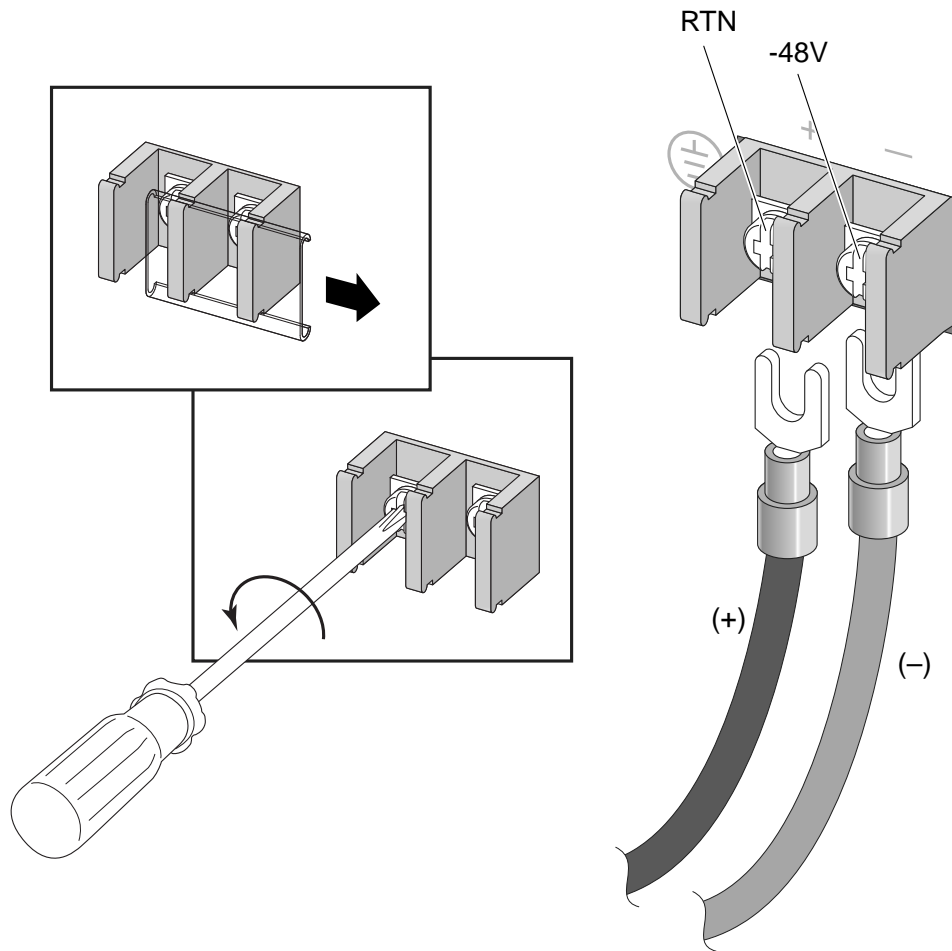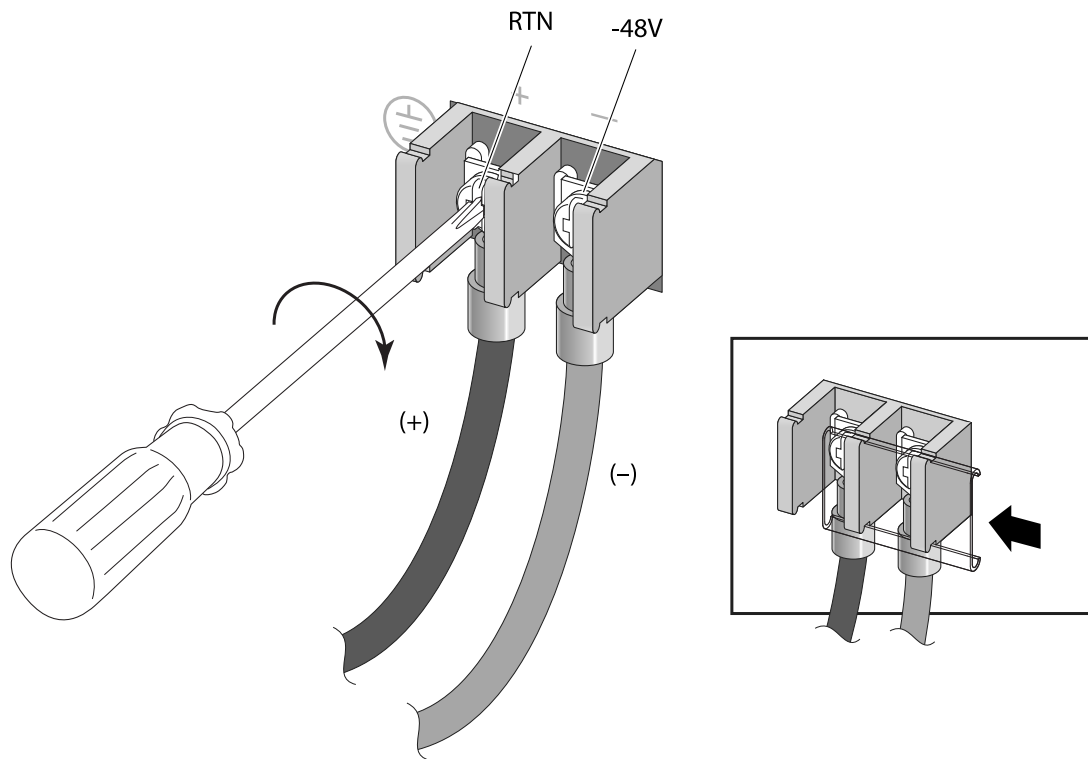
7   Energize the DC circuit.

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

Installing a Summit X480 Series Switch

The Summit X480 series switch fits into a standard 19-inch equipment rack. The provided rack-mounting brackets are adaptable to either two-post or four-post mounting.

The installation process includes the following tasks:

1   Install the switch in the rack.

2   (Optional) Install a VIM2 versatile interface module.

3   Install one or two power supplies and connect power cables.

4   Connect network interface cables.

If you are installing Summit X480 series switches for use in a SummitStack configuration, read Summit Family Switches before you install the switches.

> **Note**
>
> Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom and work up.

Required Tools and Materials

You need the following tools and materials to install or remove a 300 W DC power supply in a Summit X460 series switch:

- Two spade terminals (Tyco part number 328281 or equivalent) for connecting the input power cables (provided)
- One ring terminal (Tyco part number 2-320561-4 or equivalent) and screw with captive lock washer (type 6-32 UNC) for connecting the ground wire (both provided)
- #14 AWG copper cable for grounding the power supply and connecting the power supply to the DC power source

  A DC power cord is not included with the 300 W DC power supply. You must provide the #14 AWG copper cable. Recommended insulation colors are:
- Red for the –48V connection (–)
- Black for the –48V RTN connection (+)
- Green or green with yellow stripe for the ground connection
- Connection hardware appropriate to the installation site:
  - Hardware for connecting the power wires to the DC source
  - Hardware for connecting the ground wire to the site grounding point
- Stripping tool
- Crimping tool for attaching the lug to the ground wire
- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- ESD-preventive wrist strap
- Thermal protective gloves (required for removal of a power supply)

Connection lugs for power and ground and a screw for connecting the ground wire are shipped with the power supply.

Selecting Rear Mounting Brackets

The Summit X480 series switch has two sets of rear mounting brackets.

Use the bracket that best suits the type of rack installation:
- Shorter brackets—mid-mounting in a 2-post rack
- Longer brackets—mounting in a 4-post rack

Mid-Mount the Switch in a Two-Post Rack

Use the shorter rear mounting brackets for a mid-mounted switch.

To mid-mount the switch in a two-post rack:

1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
2 Using rack-mounting screws suitable for your rack, attach a rear mounting bracket to the back of each rack post.
   Do not tighten the screws all the way. You should be able to move the brackets against the rack post.
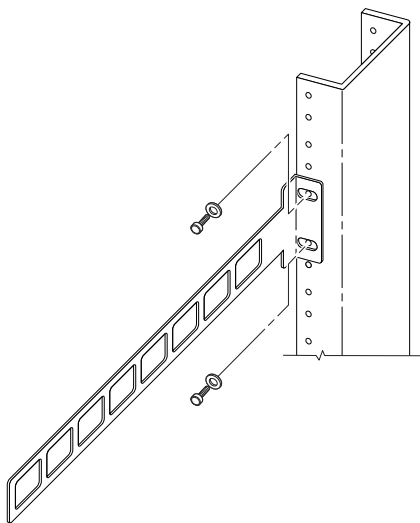
Figure 250: Attaching a Rear Mounting Bracket

3 From the back of the equipment rack, slide the switch into place over the mounting brackets. Make sure the brackets slide between the support pegs on both sides of the switch.
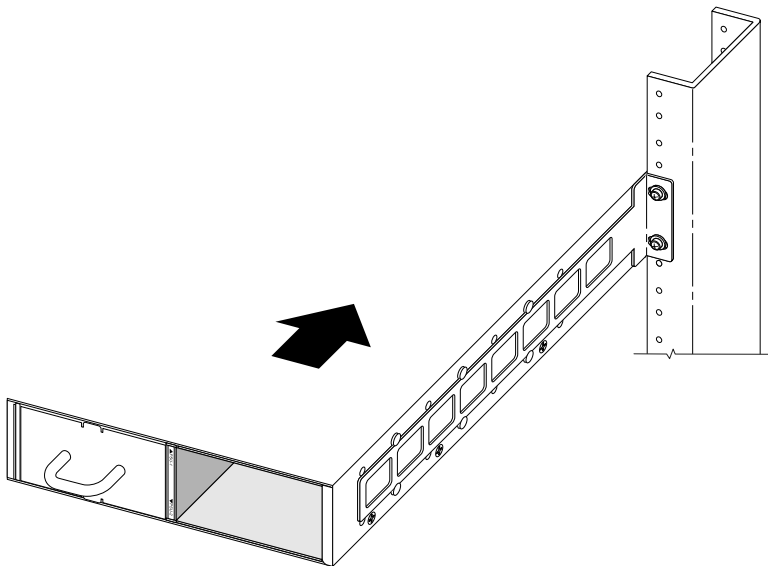
Figure 251: Sliding the Switch onto the Rear Mounting Brackets

4   Push the switch forward as far as it will go, until the bracket support pegs are against the T of the mounting bracket (see the following figure).

   a   Securely tighten the rack mounting screws.
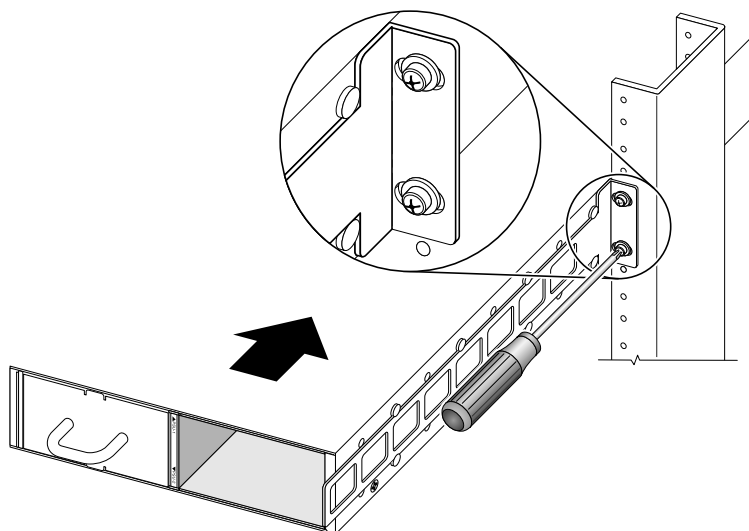
Figure 252: Fastening the Rear Mounting Brackets

5   At the front of the switch, place a front mounting bracket against each side of the switch, in front of the ventilation openings in the side of the switch.
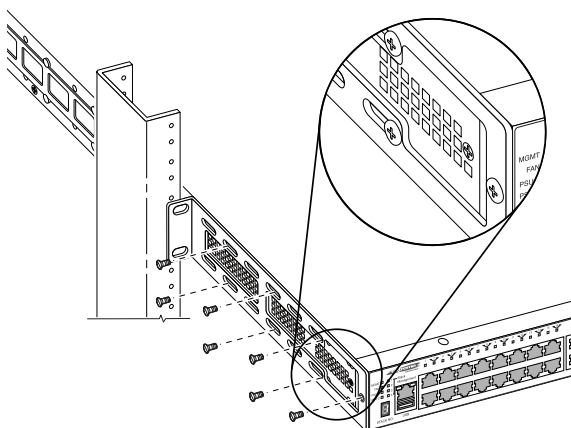
Figure 253: Positioning the Front Mounting Brackets

6   Using the provided screws, attach each front bracket to the switch (see the following figure).

7 Slide the switch back in the rack until the front mounting brackets are against the front of the rack post.
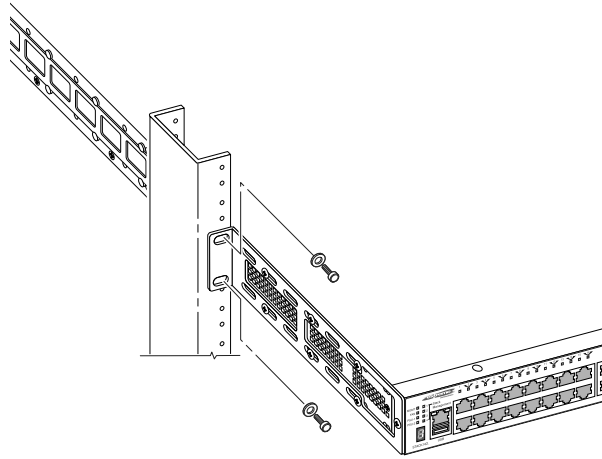
Figure 254: Securing the Front Mounting Brackets to the Rack

8 Using mounting screws suitable for your equipment rack, secure the mounting brackets to the front of the rack post.

After the switch is secured to the rack, install and connect power supplies as described on Installing a Summit 450 W or 550 W AC Power Supply for AC power supplies or on Installing a Summit 450 W or 550 W DC Power Supply for DC power supplies.

> **Note**
> If you are installing a VIM2 module, install it in the switch before you connect the switch to power (see Installing a Versatile Interface Module in a Summit X480, X650, or X670 Series Switch).

Front-Mount the Switch in a Two-Post Rack

1 Place the switch upright on a secure work surface.
2 Place a front mounting bracket over the mounting holes on one side of the unit, with the flange at the front of the switch (see Figure 255: Attaching a Front Mounting Bracket on page 271).

3   Insert and tighten seven screws to secure the bracket to the side of the switch.
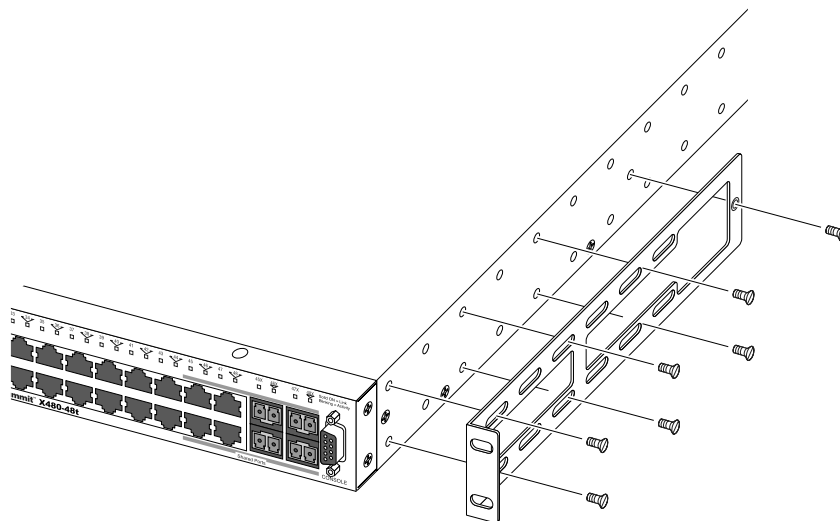
Figure 255: Attaching a Front Mounting Bracket

4   Repeat steps 2 and 3 to attach the remaining front bracket to the other side of the switch.
5   Slide the switch into the rack until the mounting bracket flanges are against the rack posts (see).
6   At each side, fasten the mounting bracket to the rack post using suitable screws.
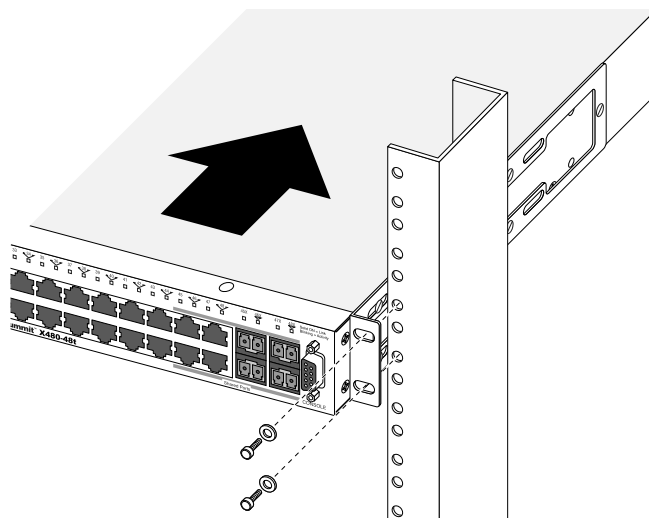
Figure 256: Front-Mounting a Switch

After the switch is secured to the rack, install and connect power supplies as described on Installing a Summit 450 W or 550 W AC Power Supply for AC power supplies or on Installing a Summit 450 W or 550 W DC Power Supply for DC power supplies.

> **Note**
>
> If you are installing a VIM2 module, install it in the switch before you connect the switch to power.

Installing the Switch in a Four-Post Rack

To install the switch in a four-post rack:

1 At the back of the rack, attach a rear mounting bracket to each rear post.
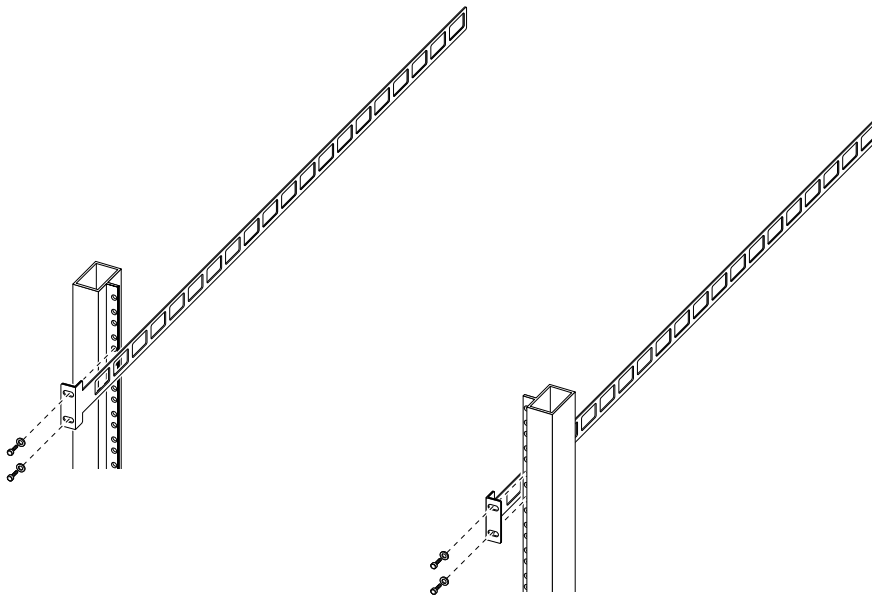
Figure 257: Attaching Rear Mounting Brackets—Four-Post Installation

2 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
3 Set the switch on a secure work surface.
4 At the front of the switch, attach a rack-mounting bracket to each side as shown in Attaching a Front Mounting Bracket.

a   Position the bracket with the flange at the front edge of the switch.
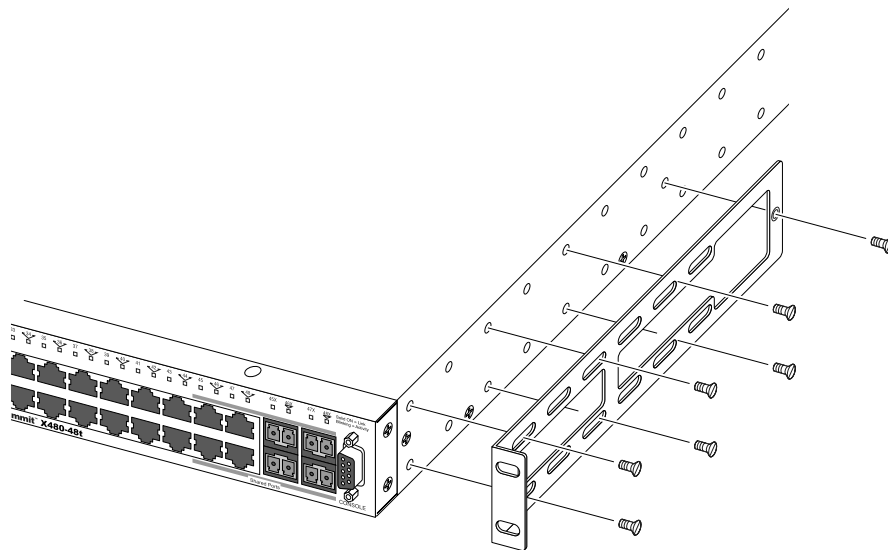
Figure 258: Attaching a Front Mounting Bracket

5   From the front of the rack, slide the switch onto the rear mounting brackets.
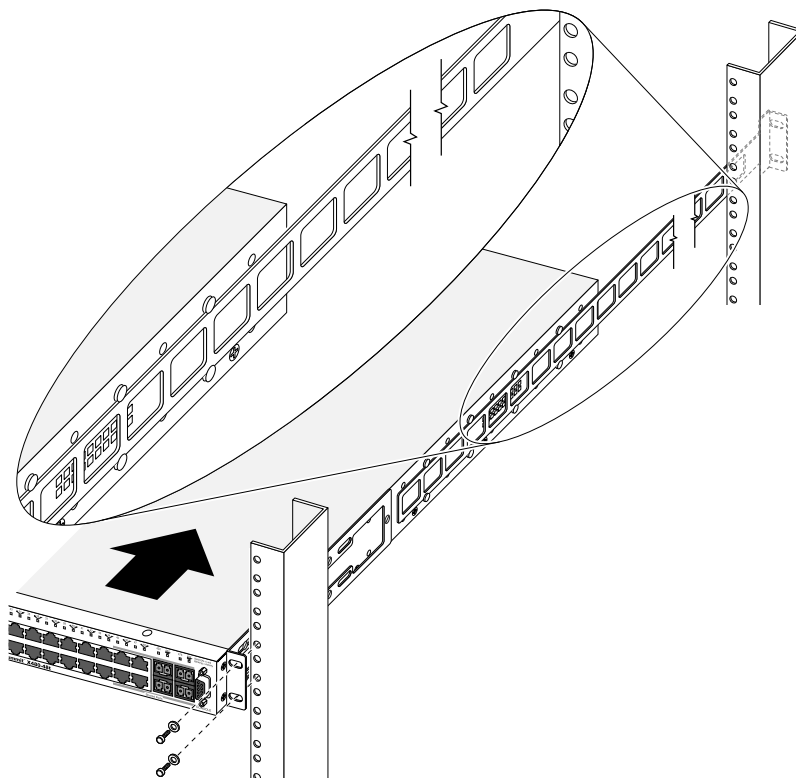
Figure 259: Installing the Switch—Four-Post Installation

6   Slide the switch all the way into the rack and secure the mounting brackets to the front posts using suitable screws.
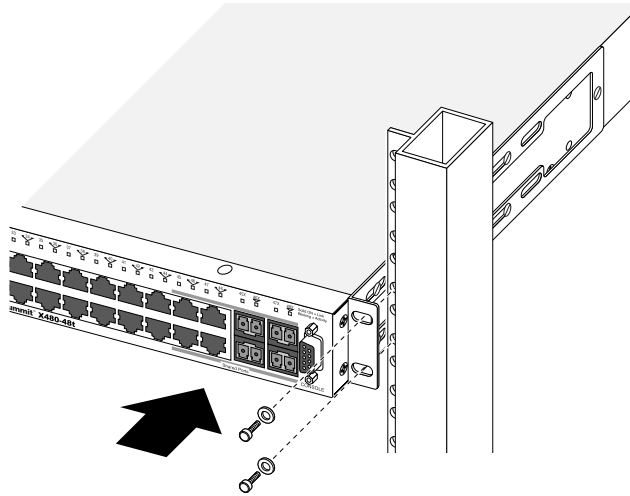
Figure 260: Securing the Switch to the Front Rack Posts—Four-Post Installation

After the switch is secured to the rack, install and connect power supplies as described in Installing a Summit 450 W or 550 W AC Power Supply for AC power supplies or in Installing a Summit 450 W or 550 W DC Power Supply for DC power supplies.

> **Note**
>
> If you are installing a VIM2 module, install it in the switch before you connect the switch to power.

Installing Summit 450 W and 550 W Power Supplies

Summit 450 W power supplies are compatible with the Summit X480 series switches and with Summit X670 series switches that have front-to-back ventilation airflow.

The Summit 550 W power supplies are compatible only with Summit X670 series switches. They are available in versions for switches with either front-to-back or back-to-front airflow.

The Summit X480 and X670 series switches are shipped without installed power supplies; they accommodate one or two Summit 450 W or 550 W power supply units.

> **Note**
>
> You cannot combine 450 W power supplies and 550 W power supplies in the same Summit X670 series switch.

Pre-installation Requirements

Installing the Summit X480 switch requires two people to maneuver the switch and attach mounting hardware.

To allow safe handling of the switch during the installation process, make sure you have the following available space around the rack:

- Back: Minimum 30 inches behind the rack posts.
- Sides: For a two-post rack installation, allow adequate space for access to the sides of the switch so that the front mounting brackets can be attached to the switch.

The following items are provided with the Summit X480 series switch:

- 2 front mounting brackets
- 16 screws for attaching the front mounting brackets to the switch enclosure
- 2 pairs of rear mounting brackets, one shorter and one longer

You need the following additional tools and materials:

- Four rack 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

  The screwdriver size will vary based on the requirements of your organization's rack system.
- AC power cord for each installed AC power supply

  An AC power cord is not included with the Summit X460 series switch. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
- ESD-preventive wrist strap for installing optional ports at the back of the switch

AC Power Supply Cords

An AC power cord is not included with the Summit AC power supply.

You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. The cord must meet the requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Installing a Summit 450 W or 550 W AC Power Supply

Warning

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

Caution

Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install a Summit 450 W or 550 W AC power supply:

1   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate grounding point.

2   If you are installing the power supply in a Summit X670 series switch:

   a   Verify that the switch chassis has been grounded (see step 6 on page 302).

   b   Verify that the airflow direction for the power supply is the same as the airflow direction of the installed fan modules in the switch.

3   If necessary, remove a blank panel from the back of the Summit X480 or X670 series switch.
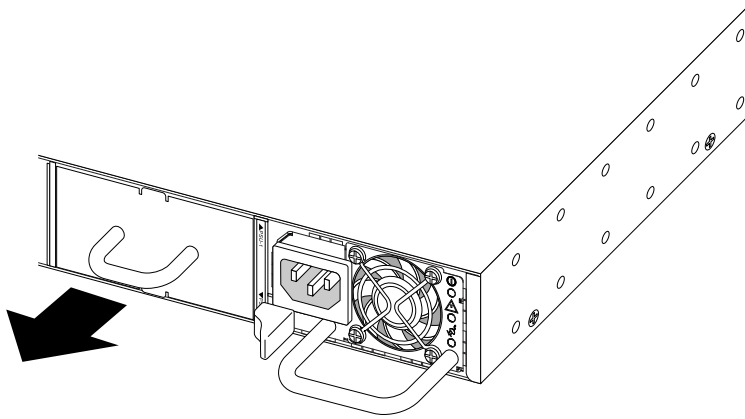
Figure 261: Removing a Blank Panel

4   Verify that the power supply is right side up, with the latching tab at the left of the unit (see Figure 262: Installing a Power Supply on page 276).

5   Carefully slide the power supply all the way into the power supply bay (see Figure 262: Installing a Power Supply on page 276).

6   Push the power supply in until the latch snaps into place.

> ⚠ **Caution**
> Do not slam the power supply into the switch.
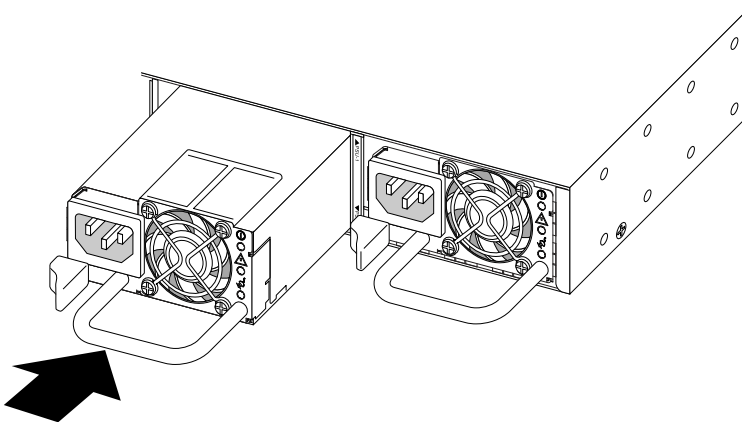
Figure 262: Installing a Power Supply

7   To install a second power supply, repeat steps 3 through 5.

> **Note**
>
> If power supplies are not installed in both power supply bays, be sure to install a cover over the unoccupied bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

8   Connect the AC power cord to the input connector on the power supply.

9   Then connect the cord to an AC power outlet.

> **Warning**
>
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

Installing a Summit 450 W or 550 W DC Power Supply

To install the Summit 450 W or 550 W DC power supply, perform the following tasks in the order listed:

1   Prepare the power cables and ground cable by attaching the provided connection lugs to the cables (see next section).

2   Insert the power supply into the Summit X480 or X670 series switch (see Installing the Power Supply).

3   Connect the ground (see Connecting the Ground Wire).

4   Have a qualified licensed electrician connect the power supply to the DC source voltage (see Connecting the Power Supply to the DC Source Voltage).

5   Energize the DC circuit.

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

> **Caution**
>
> Make sure that the DC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions. Do not use a breaker rated for higher than 30 Amps.

Required Tools and Materials

You need the following tools and materials to install or remove a Summit 450 W or 550 W DC power supply:

- Three spade terminals (Panduit part number PN14-6FN or equivalent) for connecting the ground and input power cables (provided)
- #14 AWG stranded copper cable for grounding the power supply and connecting the power supply to the DC power source

DC power and grounding cables are not included with the 450 W or 550 W DC power supply. You must provide the #14 AWG stranded copper cable. Recommended insulation colors are:

- Red for the –48V connection (–)
- Black for the –48V RTN connection (+)
- Green or green with yellow stripe for the ground connection

- Connection hardware appropriate to the installation site:
  - Hardware for connecting the power wires to the DC source
  - Hardware for connecting the ground wire to the site grounding point
- Stripping tool
- Crimping tool for attaching the lugs to the wires
- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- ESD-preventive wrist strap
- Thermal protective gloves (required for removal of a power supply)

Spade-type connection lugs for power and ground are shipped with the power supply.

Preparing the Cables

Three spade-type terminals are provided with the power supply.

You need a crimping tool to attach the terminals to the power and ground cables.

To prepare the cables:

1 On each wire, strip 0.25 inch of insulation from one end.
2 Insert the stripped wire end all the way into the barrel of the terminal and crimp the terminal securely to the wire.
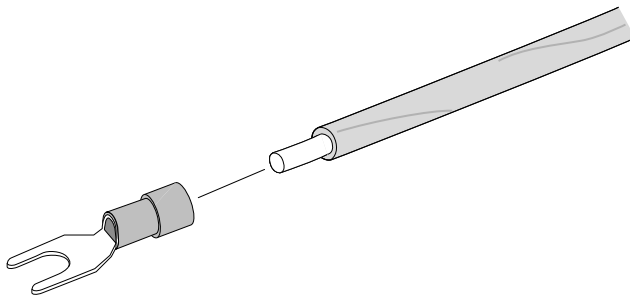
Figure 263: Attaching a Terminal to a Cable

Installing the Power Supply

To install a 450 W or 550 W DC power supply:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
2 If you are installing the power supply in a Summit X670 series switch:
   a Verify that the switch chassis has been grounded (see step 6 on page 302).
   b Verify that the airflow direction for the power supply is the same as the airflow direction of the installed fan modules in the switch.

3 If necessary, remove a blank panel from the back of the Summit X480 or X670 series switch.
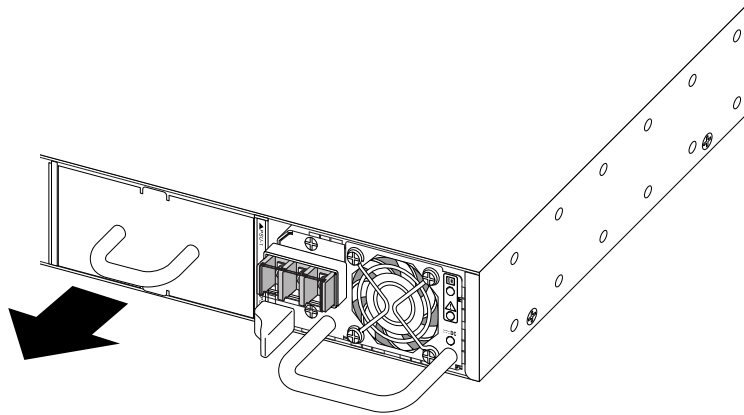
SH_157

Figure 264: Removing a Blank Panel

4 Verify that the power supply is right side up (see Figure 265: Installing a DC Power Supply on page 279).

5 Carefully slide the power supply all the way into the power supply bay (seeFigure 265: Installing a DC Power Supply on page 279).

6 Push the power supply in until the latch snaps into place.

> ⚠️ **Caution**
> Do not slam the power supply into the switch.
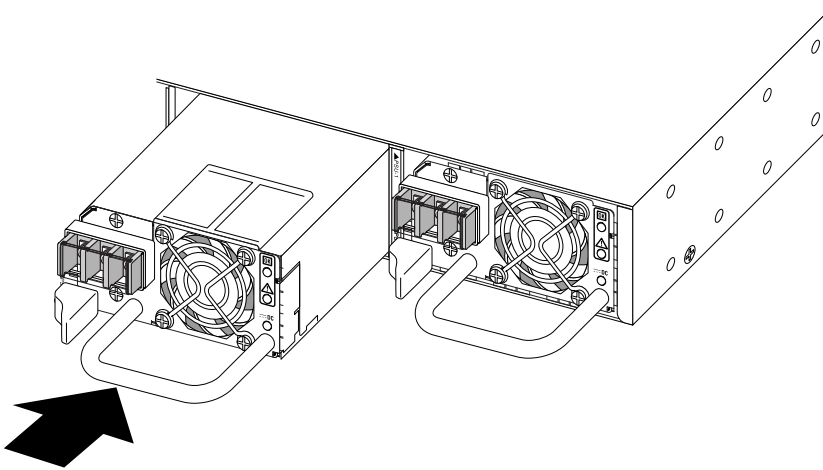
Figure 265: Installing a DC Power Supply

7 To install a second power supply, repeat steps 3 through 6.

Connecting the Ground Wire

> ⚠️ **Warning**
>
> Be sure to connect the chassis ground wire before you connect any power cables.

> ⚠️ **Warning**
>
> Be sure to disconnect the ground wire after you disconnect all power cables.

You need a #1 Phillips screwdriver to secure the ground wire to the power supply.

To connect the ground wire:

1   Verify that the DC circuit is de-energized.
2   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3   Pull the cover off the terminal block.
4   Identify the grounding point at the left of the terminal block.
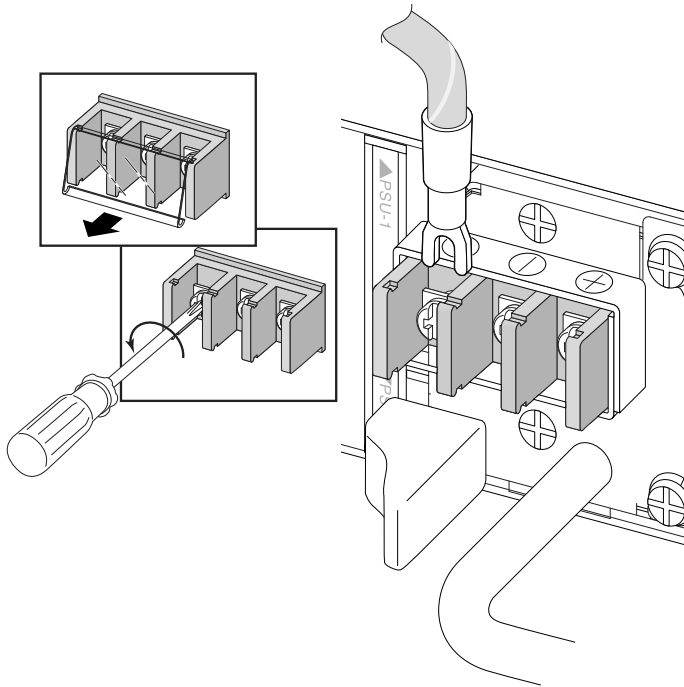
Figure 266: Connecting the Ground Wire

5   Connect the ground wire to the grounding point as follows:

a   Loosen the screw enough to allow the spade terminal to slide underneath the captive square washer (see Figure 267: Securing the Ground Wire on page 281).
b   Slide the spade terminal of the ground wire under the captive square washer.

c   Tighten the screw to 7 inch-pounds (0.99 Newton meters) (see Figure 267: Securing the Ground Wire on page 281).
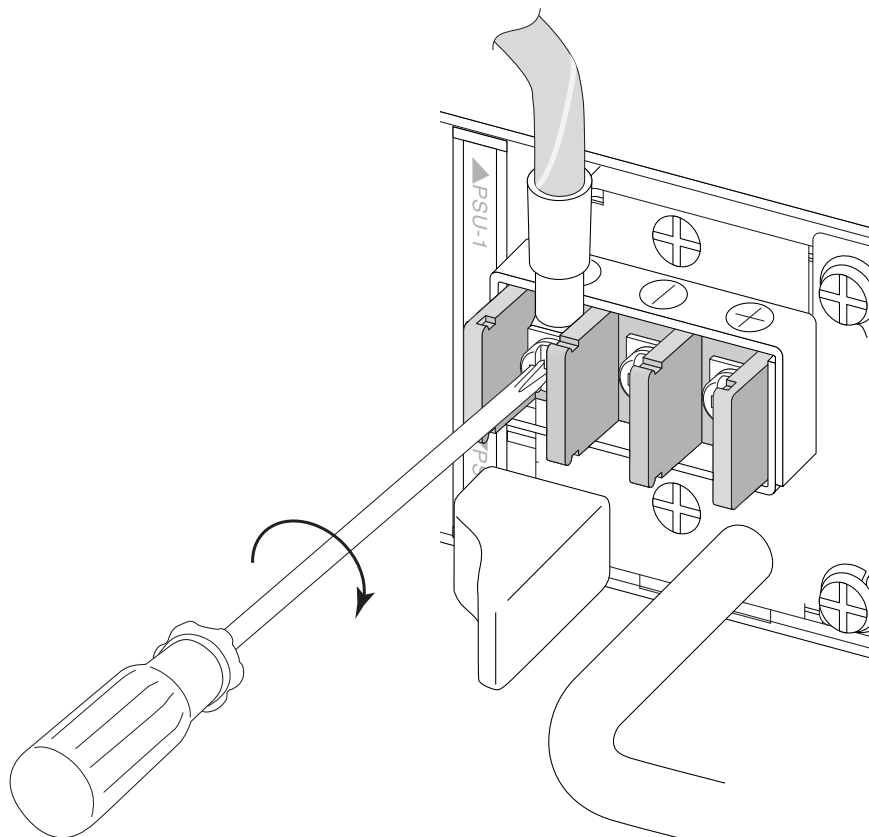
Figure 267: Securing the Ground Wire

6   Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the Power Supply to the DC Source Voltage

The DC power connection at your facility must be made by a qualified electrician, following the instructions in this section.

> **Warning**
>
> Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the Summit 450 W or 550 W DC power supply.

> **Caution**
>
> Provide proper connection and strain relief on the DC power cables in accordance with all local and national electrical codes.

To connect the DC power input cables:

1   Verify that the DC circuit is de-energized.
2   Connect the DC power input cables as follows:

a On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer (see).

b Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled **–**).

c Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on the **positive** terminal (labeled **+**).

SH_161

Figure 268: Connecting the DC Power Cables (Part 1)

d Tighten both screws on the terminal block to 7 inch-pounds (0.99 Newton meters).

SH_162
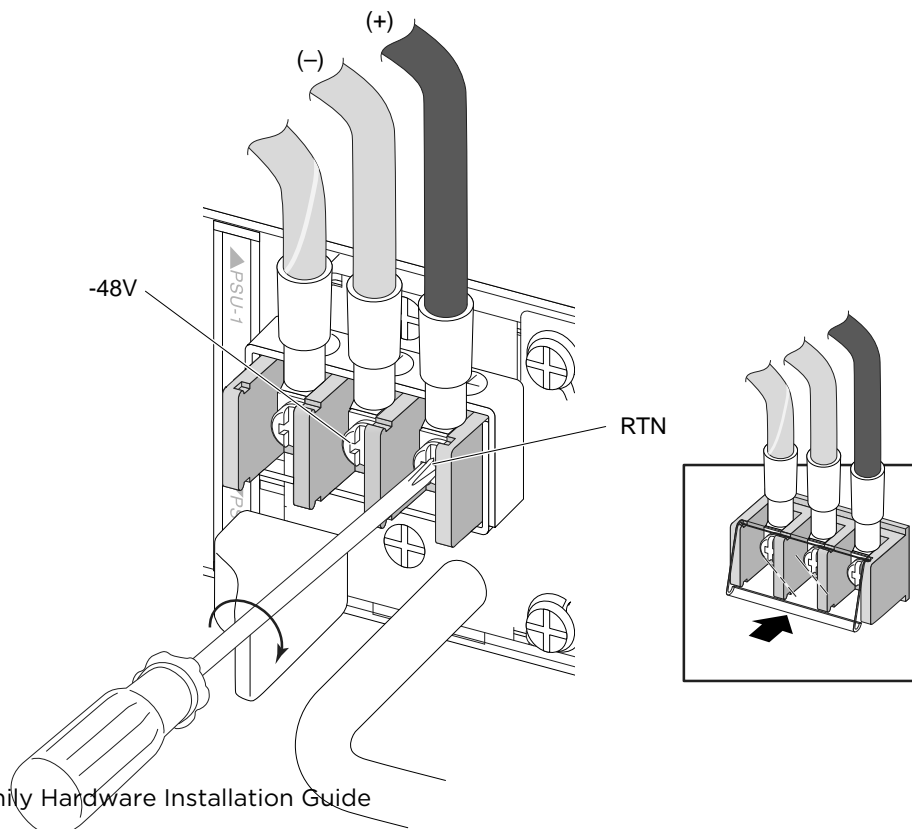
3 Snap the cover into place over the terminal block.

4 Connect the cables to the DC source voltage, using hardware appropriate to the installation site and following local and national electrical codes.

5 Energize the DC circuit.

Installing a Summit X650 Series Switch

The Summit X650 series switch fits into a standard 19-inch equipment rack.

The provided rack-mounting brackets are adaptable to either two-post or four-post (cabinet) mounting.

The installation process includes the following tasks:

1 Install the switch in the rack.

2 Install one or two power supplies and connect power cables.

3 Connect network interface cables.

If you are installing Summit X650 series switches for use in a SummitStack configuration, read Summit Family Switches before you install the switches.

> **Note**
>
> Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom and work up.

Pre-installation Requirements

Installing the Summit X650 switch requires two people to maneuver the switch and attach mounting hardware.

To allow safe handling of the switch during the installation process, make sure you have the following available space around the rack:

• Back: Minimum 30 inches behind the rack posts or back of the cabinet.

• Sides: For a two-post rack installation, allow adequate space for access to the sides of the switch so that the front mounting brackets can be attached to the switch.

The following items are provided with the Summit X650 series switch:

• 2 front mounting brackets

• 16 screws for attaching the front brackets to the switch enclosure

• 2 pairs of rear mounting brackets, one shorter and one longer

You need the following additional tools and materials:

• Four rack 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

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

- AC power cord for each installed AC power supply

  An AC power cord is not included with the Summit X460 series switch. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
- ESD-preventive wrist strap for installing optional ports at the back of the switch

Selecting Rear Mounting Brackets

To allow installation of the switch in cabinets of different depths, the Summit X650 series switch has two sets of rear mounting brackets.

Use the bracket that best suits the cabinet depth or rack depth where the switch will be installed:

- Shorter brackets—cabinets or racks 25 inches to 31 inches (63.5 cm to 76.7 cm) deep
- Longer brackets—cabinets or racks 25 inches to 36 inches (63.5 cm to 91.4 cm) deep

For a two-post rack installation, the shorter brackets are recommended.

Installing the Switch in a Two-Post Rack

To install the switch in a two-post rack:

1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.
2 Using rack-mounting screws suitable for your rack, attach a rear mounting bracket to the back of each rack post.

   Do not tighten the screws all the way. You should be able to move the brackets against the rack post.
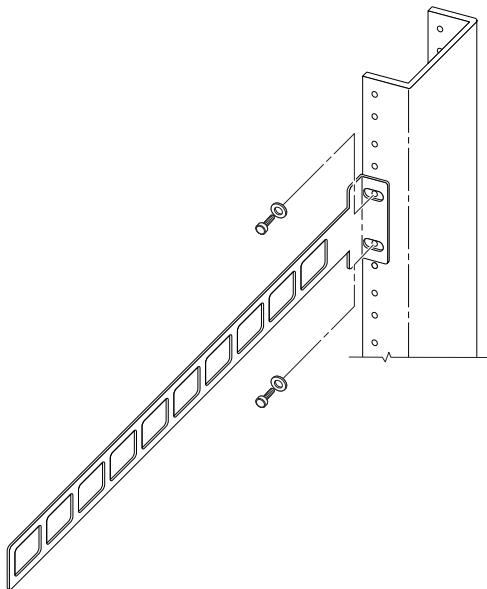
Figure 270: Attaching a Rear Mounting Bracket—Two-Post Rack Installation

3   From the back of the equipment rack, slide the switch into place over the mounting brackets.

Make sure the brackets slide between the support pegs on both sides of the switch.
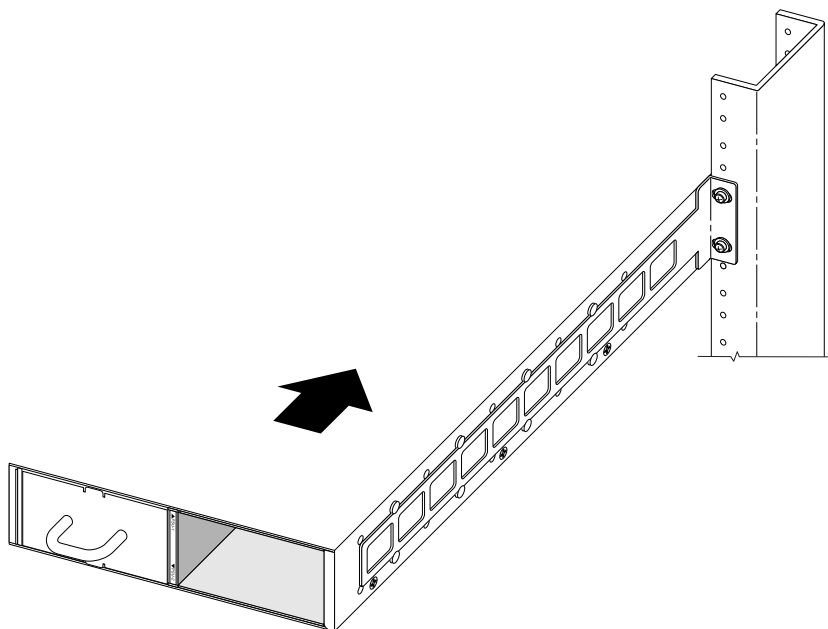
Figure 271: Sliding the Switch onto the Rear Mounting Brackets

4   Push the switch forward as far as it will go, until the bracket support pegs are against the T of the mounting bracket (see).

a   Securely tighten the rack mounting screws.

Figure 272: Fastening the Rear Mounting Brackets—Two-Post Rack

5   At the front of the switch, place a front mounting bracket against each side of the switch, in front of the ventilation openings in the side of the switch.

Make sure there is space between the bracket and the ventilation openings.
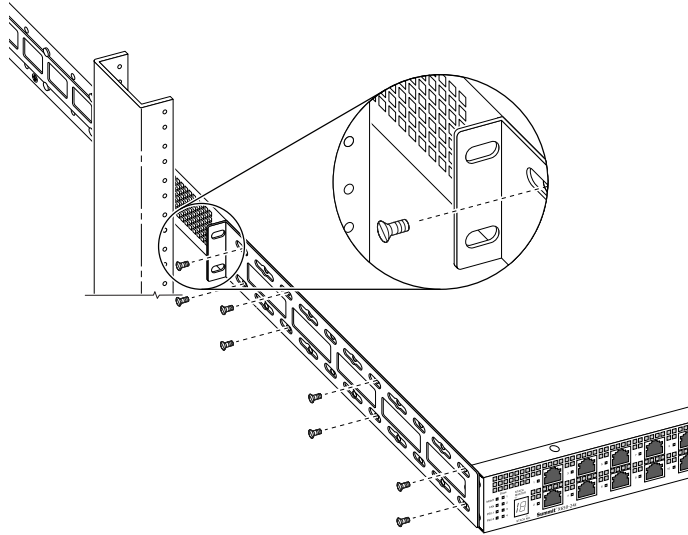
Figure 273: Positioning the Front Mounting Brackets—Two-Post Rack

6   Using the provided screws, attach each front bracket to the switch (see Figure 273: Positioning the Front Mounting Brackets—Two-Post Rack on page 287).

7   Slide the switch back in the rack until the front mounting brackets are against the front of the rack post.

Make sure that the ventilation holes in the side of the switch are within the open channel of the rack post.
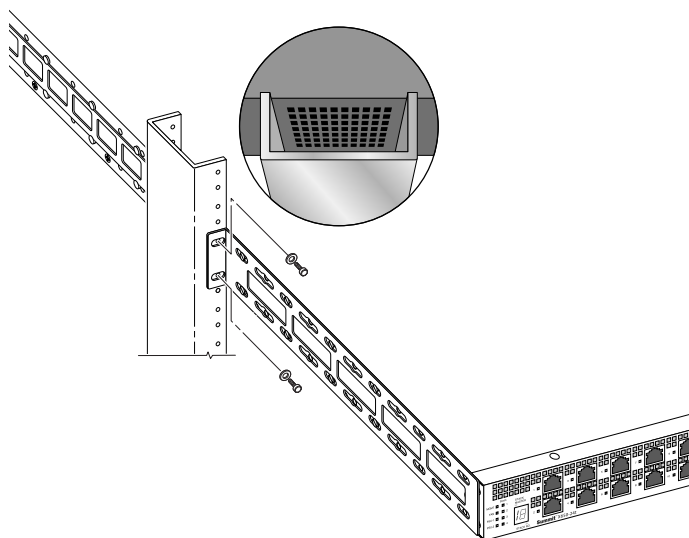
Figure 274: Securing the Front Mounting Brackets to the Rack

8   Using mounting screws suitable for your equipment rack, secure the mounting brackets to the front of the rack post.

After the switch is secured to the rack, install and connect power supplies as described in Installing an 850 W AC Power Supply in a Summit X650 Series Switch or Installing an 850 W DC Power Supply in a Summit X650 Series Switch.

Installing the X650 Switch in a Cabinet or Four-Post Rack

To install the switch in a cabinet or four-post rack:

1   At the back of the cabinet, attach a rear mounting bracket to each rear post.
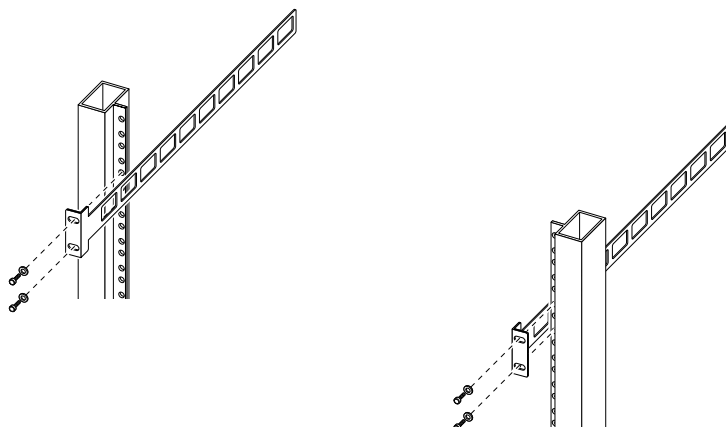
Figure 275: Attaching Rear Mounting Brackets—Cabinet Installation

2   Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.

3   Set the switch on a secure work surface.

4   At the front of the switch, attach a rack-mounting bracket to each side (see Figure 276: Attaching the Front Mounting Brackets—Cabinet Installation on page 289).

a   Position the bracket with the flange at the front edge of the switch.
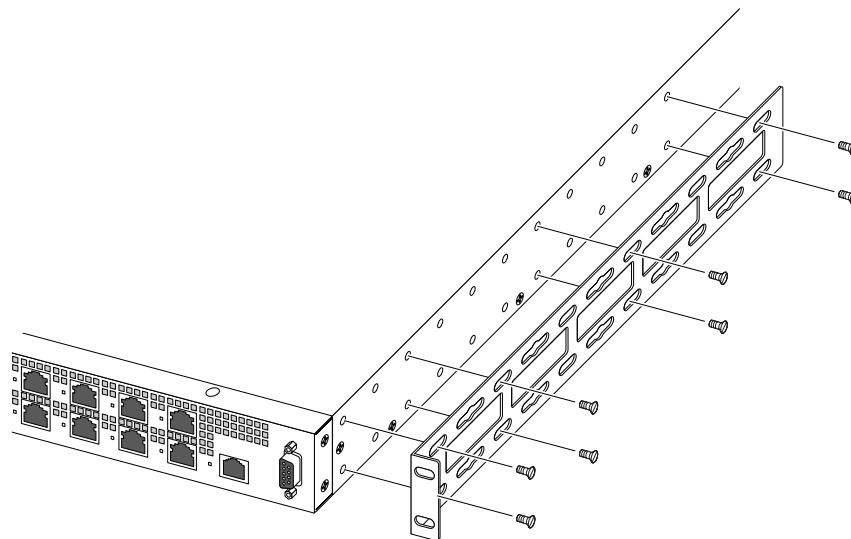
Figure 276: Attaching the Front Mounting Brackets—Cabinet Installation

5 From the front of the cabinet, slide the switch onto the rear mounting brackets.
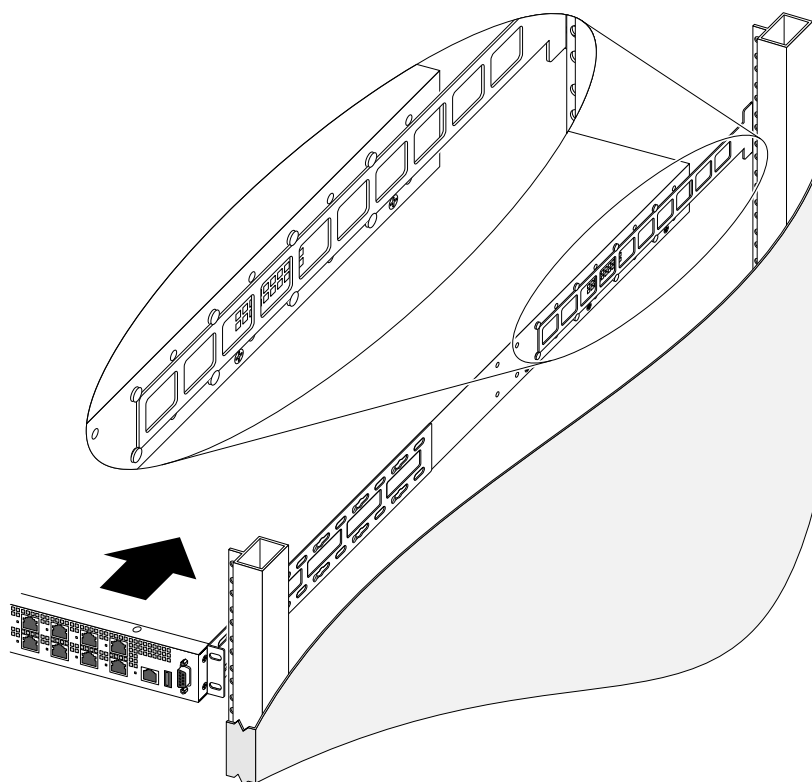
Figure 277: Installing the Switch—Cabinet Installation

6   Slide the switch all the way into the cabinet and secure the mounting brackets to the front rack posts using suitable screws.
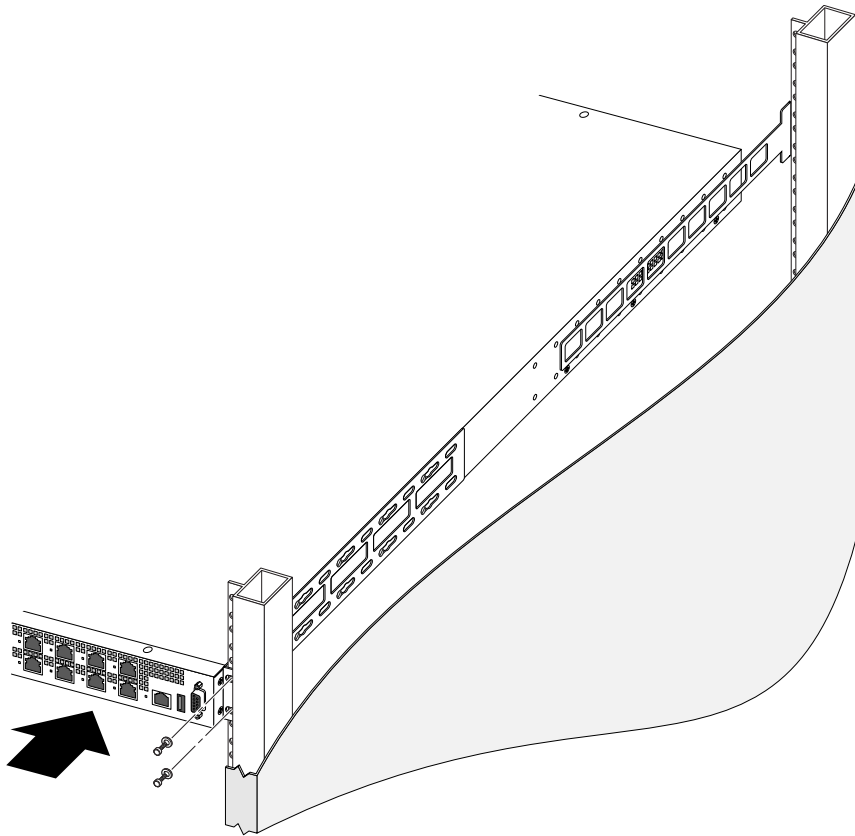
Figure 278: Securing the Switch to the Front Rack Posts—Cabinet Installation

After the switch is secured to the rack, install and connect power supplies as described in Installing an 850 W AC Power Supply in a Summit X650 Series Switch or Installing an 850 W DC Power Supply in a Summit X650 Series Switch.

Installing Summit X650 Power Supplies

The Summit X650 series switch is shipped without installed power supplies.

The switch accommodates one or two Summit 850 W power supply units.

AC Power Supply Cords

An AC power cord is not included with the Summit 850 W AC power supply.

You can purchase AC power cords for use in the US and Canada from Extreme Networks or from your local supplier. The cord must meet the following requirements listed in Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Installing an 850 W AC Power Supply in a Summit X650 Series Switch

> **Caution**
> Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

To install an 850 W AC power supply in a Summit X650 series switch:

1   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate grounding point.
2   If necessary, remove a blank panel from the back of the Summit X650 series switch.
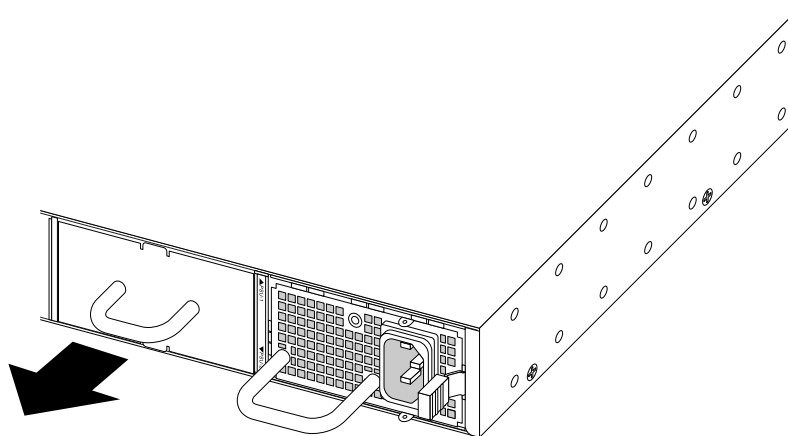
Figure 279: Removing a Blank Panel

3   Verify that the power supply is right side up, with the latching tab at the right of the unit (see Figure 280: Installing a Power Supply on page 293).
4   Carefully slide the power supply all the way into the power supply bay (see Figure 280: Installing a Power Supply on page 293).

5   Push the power supply in until the latch snaps into place.

Caution
Do not slam the power supply into the switch.
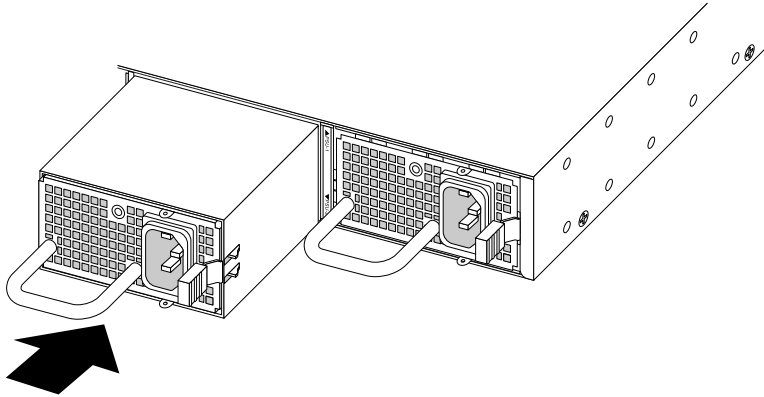
Figure 280: Installing a Power Supply

6   To install a second power supply, repeat steps 5 on page 355 and 6 on page 355.

Note
If power supplies are not installed in both power supply bays, be sure to install a cover over the unoccupied bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

7   Connect an appropriate AC power cord to the power input socket; connect the other end of the power cord to a grounded AC power outlet.

Warning
Always be sure that the source outlet is properly grounded before plugging the AC power cord into the unit.

Installing an 850 W DC Power Supply in a Summit X650 Series Switch

Caution
Make sure that the DC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions. You may use up to a 30-Amp breaker.

To install the 850 W DC power supply, perform the following tasks in the order listed:

1   Prepare the power cables and ground cable by attaching the provided connection lugs to the cables (see next section).

2   Insert the power supply into the Summit X650 series switch (see Installing the Power Supply.

3   Connect the ground (see Connecting the Ground Cable).

4   Have a qualified licensed electrician connect the power supply to the DC source voltage (see Connecting the Power Supply to the DC Source Voltage).

5   Energize the DC circuit.

Required Tools and Materials

You need the following tools and materials to install an 850 W DC power supply:

* Two spade terminals (Tyco part number 130496 or equivalent) for connecting the input power cables (provided)
* One ring terminal (Tyco part number 130496 or equivalent) and screw with captive lock washer (type M3.5) for connecting the ground wire (both provided)
* #12 AWG stranded copper cable for grounding the power supply and connecting the power supply to the DC power source

    A DC power cord is not included with the Summit X650 DC power supply. You must provide the #12 AWG stranded copper cable. Recommended insulation colors are:

* Red for the –48V connection (–)
* Black for the –48V RTN connection (+)
* Green or green with yellow stripe for the ground connection

* Connection hardware appropriate to the installation site:
    * Hardware for connecting the power wires to the DC source
    * Hardware for connecting the ground wire to the site grounding point
* Stripping tool
* Crimping tool for attaching the lug to the ground wire
* #1 Phillips screwdriver
* Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts

Connection lugs for power and ground and a screw for connecting the ground wire are shipped with the power supply.

Preparing the Cables

A ring terminal and two spade terminals are provided with the power supply. You need a crimping tool to attach the terminals to the power and ground cables.

To prepare the cables:

1   On each wire, strip 0.25 inch of insulation from one end.

2   Insert the stripped wire end all the way into the barrel of the terminal and crimp the terminal securely to the wire.
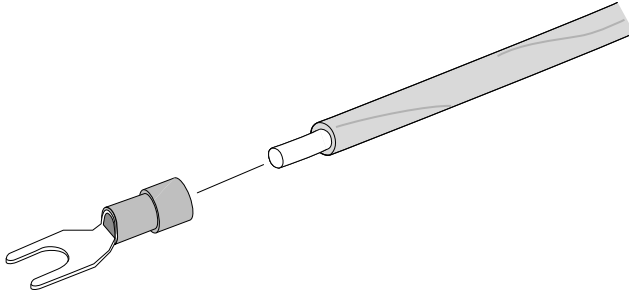
Figure 281: Attaching Power Connection Terminals to Cables
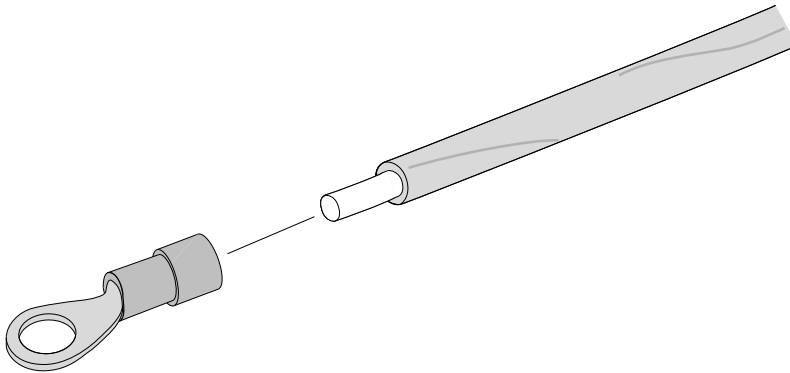
Figure 282: Attaching ground terminal to cable

Installing the Power Supply

> ⚠️ Caution
>
> The handle on the Summit X650 DC power supply is not designed to be used to lift or carry the Summit X650 series switch.

To install an 850 W DC power supply in a Summit X650 series switch:

1 If necessary, remove a blank panel from the back of the Summit X650 series switch (see).

SH_106

Figure 283: Removing a Blank Panel

2 Verify that the power supply is right side up (see).

3 Carefully slide the power supply all the way into the power supply bay (see Figure 284: Installing an 850 W DC Power Supply on page 296).

4 Push the power supply in until the latch snaps into place.

⚠ **Caution**
Do not slam the power supply into the switch.
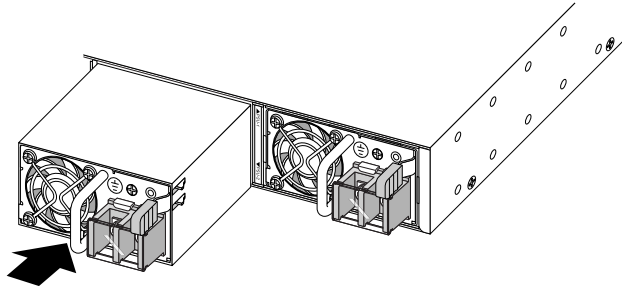
SH_107

Figure 284: Installing an 850 W DC Power Supply

5 To install more power supplies, repeat steps 2 though 4.

Connecting the Ground Cable

⚠ **Warning**
Be sure to connect the chassis ground wire before you connect any power cables.

⚠ **Warning**
Be sure to disconnect the ground wire after you disconnect all power cables.

To connect the ground wire:

1 Verify that the DC circuit is de-energized.

2 Identify the grounding point on the front panel of the power supply.
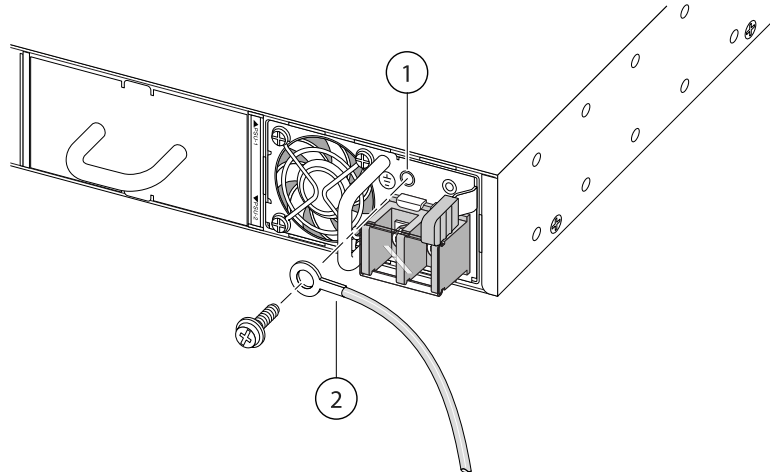
Figure 285: Connecting the Ground Wire

1 = Grounding point	2 = Ground wire

3   Insert an M3.5 screw (provided) through the ring terminal and into the grounding point on the power supply.

4   Tighten the screw to 12.6 inch-pounds.

5   Connect the other end of the wire to a known reliable earth ground point at your site.

Connecting the Power Supply to the DC Source Voltage

The DC power connection at your facility must be made by a qualified electrician, following the instructions in this section.

Warning

Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the Summit X650 DC power supply.

Caution

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

To connect the DC power input cables:

1   Verify that the DC circuit is de-energized.

2   Slide the cover off the terminal block (Figure 286: Connecting the DC Power Cables (Part 1) on page 298).

3   Connect the DC power input cables as follows:

  a   On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.

  b   Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled –48V).

c   Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on the **positive** terminal (labeled RTN).

RTN

-48V

(+)

(−)

SH_111

Figure 286: Connecting the DC Power Cables (Part 1)

d   Tighten both screws on the terminal block to 11 inch-pounds (1.2 Newton-meters).

4   Slide the cover into place over the terminal block.
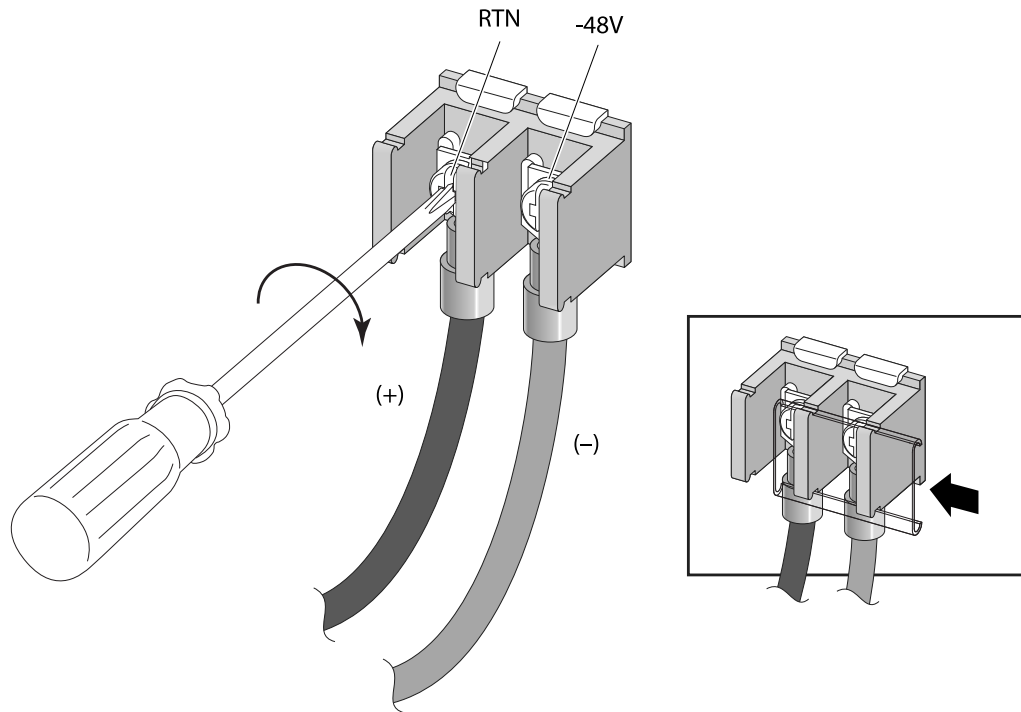
Figure 287: Connecting the DC Power Cables (Part 2)

5   Connect the cables to the DC source voltage, using hardware appropriate to the installation site and following local and national electrical codes.
6   Energize the DC circuit.

Installing a Summit X670 or X770 Series Switch

The Summit X670 and X770 series switch fits into a standard 19-inch equipment rack.

The provided rack-mounting brackets attach to the front of the switch unit and are adaptable to either a front-mount or mid-mount installation. Optional rear-mounting brackets are also included for four-post racks or cabinets.

The overall installation process includes the following tasks:

1   Install the switch in the rack.
2   Ground the switch via the grounding lug (if present).
3   Install the first power supply.
4   (Optional for X670 series switches) Install a second power supply.
5   (Optional for Summit X670V-48x switch) Install a VIM4-40G4X module.
6   Connect power cables.
7   For a stacked configuration, connect stacking cables.
8   Connect network interface cables.

If you are installing Summit X670 or X770 series switches for use in a SummitStack configuration, read Summit Family Switches before you install the switches.

Note

Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom of the rack and work up.

X670 and X770 Pre-installation Requirements

Installing the Summit X670 or X770 series switch requires two people to maneuver the switch and attach mounting hardware.

Make sure there is adequate space behind the rack to provide access for installing power supplies and port option cards or modules.

Summit X670 and X770 series switches are available in models with either front-to-back or back-to-front ventilation airflow. Make sure that the power supplies for your switch have the same airflow direction as the fans in the sw

The following items are provided with the Summit X670 and X770 series switches:
- Two rack mounting brackets adaptable for either a front-mount or mid-mount installation
- Two long mounting brackets (rails) for rear mounting in four-post or cabinet installation
- Twelve screws for attaching the brackets to the switch enclosure
- Ring terminal (equivalent to Panduit PV14-8R-E) and M4 screw with captive washer for grounding the switch if it has a grounding lug (X670 series switches only).

You need the following additional tools and equipment:
- #1 Phillips screwdriver
- Four (or eight for four-post) rack 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

  The screwdriver size will vary based on the requirements of your organization's rack system.
- AC power cord for each installed AC power supply

  An AC power cord is not included with the Summit X670 and X770 series switches. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
- #14 AWG copper cable for grounding the switch

  The recommended insulation color is green or green with yellow stripe
- Stripping tool
- Crimping tool for attaching the ring terminal to the ground wire
- ESD-preventive wrist strap for installing optional ports at the back of the switch

Mid-Mounting a X670 or X770 Switch in a Two-Post Rack

1 On one side of the switch, set a mounting bracket against the switch housing, with the flange toward the back of the switch (see Figure 288: Attaching a Rack-mounting Bracket (X670 shown) on page 301).

2 Use six of the provided screws to secure the bracket to the switch housing.

3 Repeat these steps to attach the other bracket to the other side of the switch.
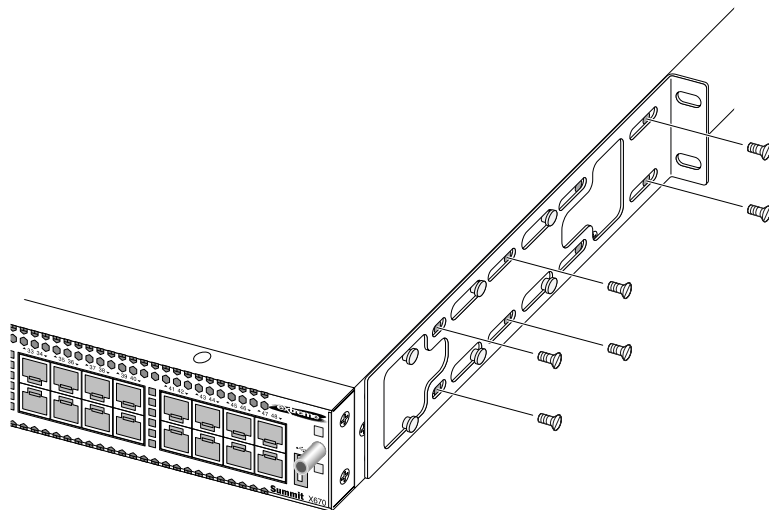
Figure 288: Attaching a Rack-mounting Bracket (X670 shown)

4 Slide the switch into the equipment rack.
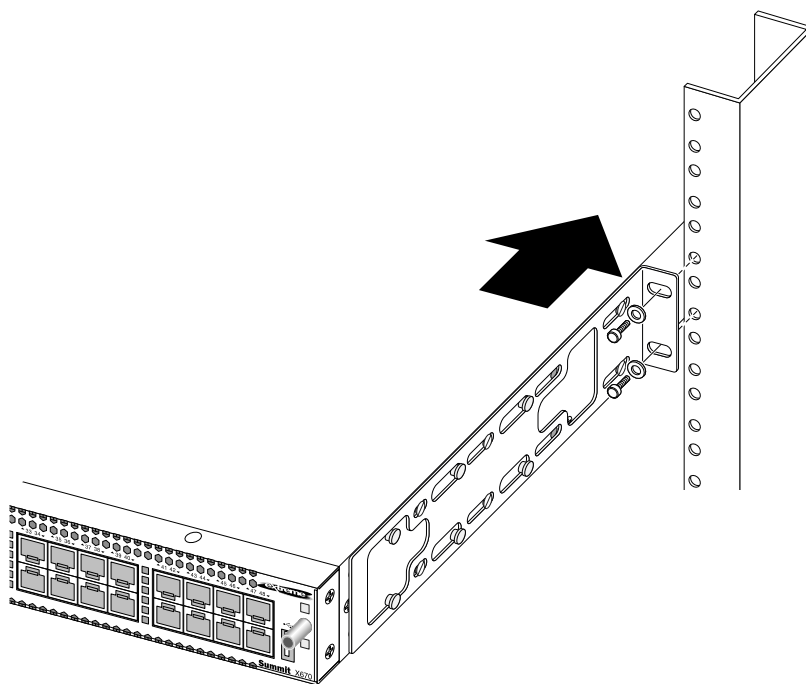
Figure 289: Installing the Summit X670 or X770 Series Switch

5 Secure the mounting bracket flanges to the rack, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

6 Ground the switch if grounding lug is present (X670 series switches).

   a Strip 0.25 inch from the end of the AWG # 14 copper wire.

   b Securely crimp the provided ring terminal onto the stripped wire.

   c Insert the provided M4 screw through the ring terminal and into the grounding stud on the front of the switch (see Figure 290: Grounding a Summit X670 Series Switch on page 302).

   d Securely tighten the screw.

Figure 290: Grounding a Summit X670 Series Switch

The Summit X670 and X770 series switches are shipped without installed power supplies. You can install one or two power supplies. After the switch is secured to the rack, install the necessary power supplies for your configuration. For instructions, see the following pages:

• Installing a Summit 450 W or 550 W AC Power Supply

• Installing a Summit 450 W or 550 W DC Power Supply

> **Note**
>
> If you are installing a VIM4 module in the Summit X670V-48x switch, install it in the switch before you connect the switch to power (see Installing a Versatile Interface Module in a Summit X480, X650, or X670 Series Switch).

Front-Mounting a Switch in a Two-Post Rack

To front-mount a Summit X670 or X770 series switch in a two-post rack:

1 Attach each mounting bracket as follows:

   a Set the bracket against the switch housing, with the flange even with the front panel of the switch (see Figure 291: Attaching a Rack-mounting Bracket (X670 shown) on page 303).

   b Use six of the provided screws to secure the bracket to the switch housing.

    c   Repeat steps a and b to attach the other bracket to the other side of the switch.
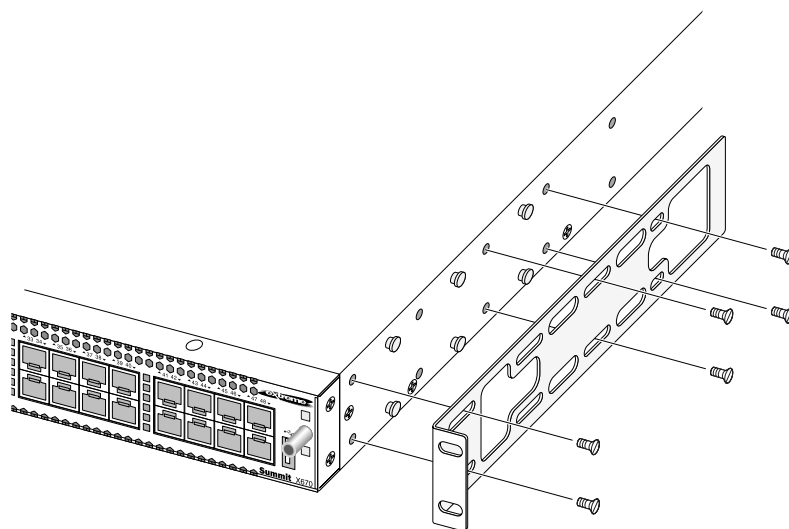
Figure 291: Attaching a Rack-mounting Bracket (X670 shown)

2   Slide the switch into the equipment rack.
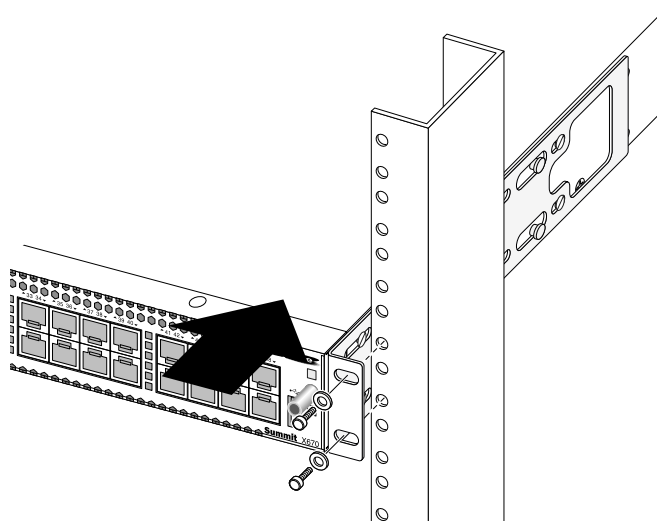
Figure 292: Installing the Summit X670 or X770 Series Switch (X670 shown)

3   Secure the mounting bracket flanges to the rack, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

4   Ground the switch if grounding lug is present (X670 series switches).

    a   Strip 0.25 inch from the end of the AWG # 14 copper wire.

    b   Securely crimp the provided ring terminal onto the stripped wire.

c   Insert the provided M4 screw through the ring terminal and into the grounding stud on the front of the switch (Figure 293: Grounding a Summit X670 Series Switch on page 304).

d   Securely tighten the screw.
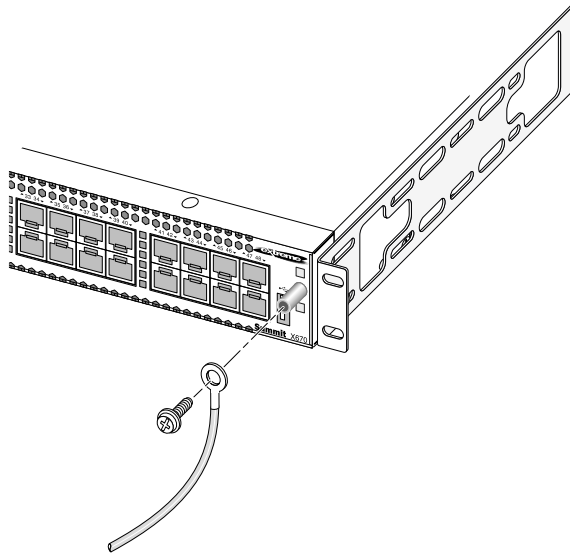
Figure 293: Grounding a Summit X670 Series Switch

The Summit X670 and X770 series switches are shipped without installed power supplies. You can install two power supplies for a redundant power configuration. After the switch is secured to the rack, install the necessary power supplies for your configuration. For instructions, see the following pages:

- Installing a Summit 450 W or 550 W AC Power Supply
- Installing a Summit 450 W or 550 W DC Power Supply

> **Note**
>
> If you are installing a VIM4 module in the Summit X670V-48x switch, install it in the switch before you connect the switch to power (see Installing a Versatile Interface Module in a Summit X480, X650, or X670 Series Switch).

Installing the X670 or X770 Switch in a Cabinet or Four-Post Rack

To install the Summit X670 or X770 series switch in a cabinet or four-post rack:

1   Attach each front-mounting bracket as follows:

a   Set the bracket against the switch housing, with the flange even with the front panel of the switch (see Installing the X670 or X770 Switch in a Cabinet or Four-Post Rack on page 304).

b   Use six of the provided screws to secure the bracket to the switch housing.

c Repeat steps a and b to attach the other bracket to the other side of the switch.
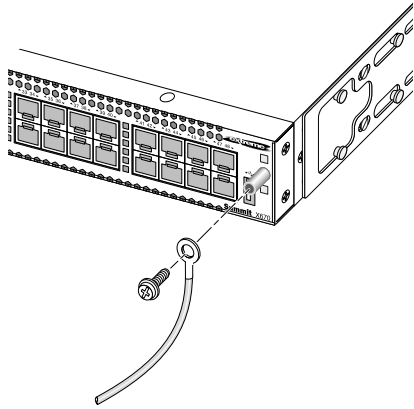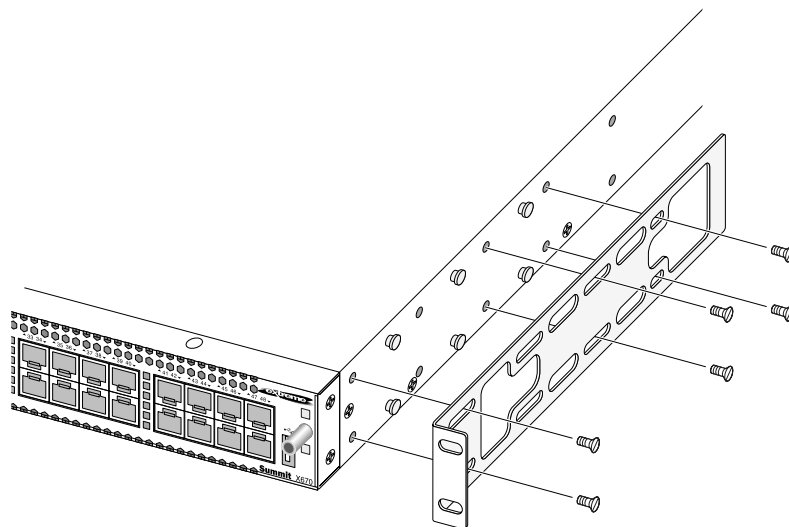

Figure 294: Attaching a Rack-mounting Bracket (X670 shown)

2 From the front of the rack, slide the switch into the equipment rack.
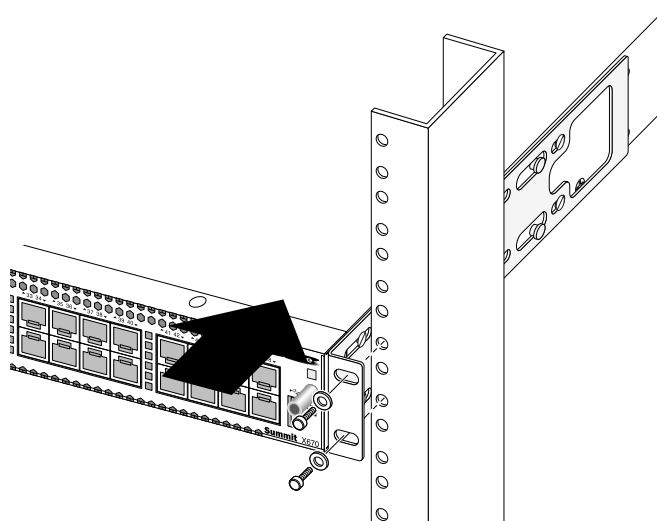
Figure 295: Installing the Summit X670 or X770 Series Switch (X670 shown)

3 Secure the front-mounting bracket flanges to the rack, using screws that are appropriate for the rack. (Rack-mounting screws are not provided.)

4   At the rear of the rack or cabinet, for each side, slide the rear mounting brackets (rails) between the two rows of pegs on either side of the switch.
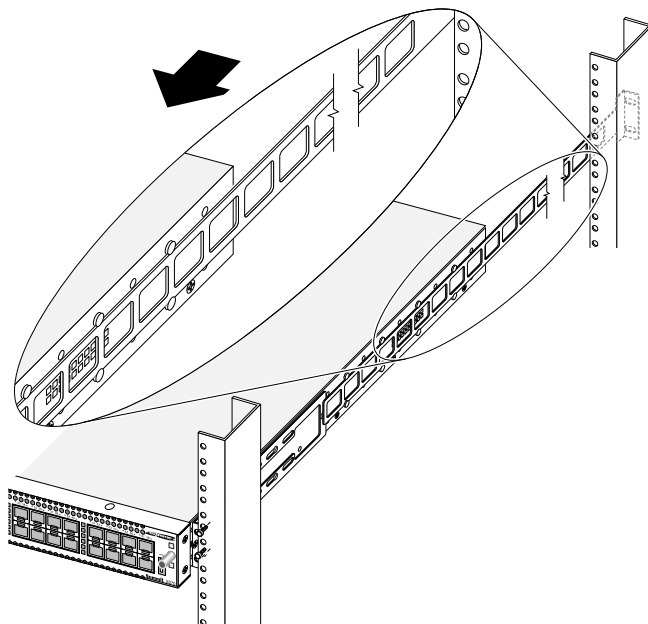
Figure 296: Inserting the Rear Mounting Brackets Between the Pegs on the Side of the Switch

5   Secure the rear mounting brackets to the rack posts using suitable screws. Be sure that the switch is level.

6   Ground the switch if grounding lug is present (X670 series switches).

   a   Strip 0.25 inch from the end of the AWG # 14 copper wire.

   b   Securely crimp the provided ring terminal onto the stripped wire.

c Insert the provided M4 screw through the ring terminal and into the grounding stud on the front of the switch.

d Securely tighten the screw.
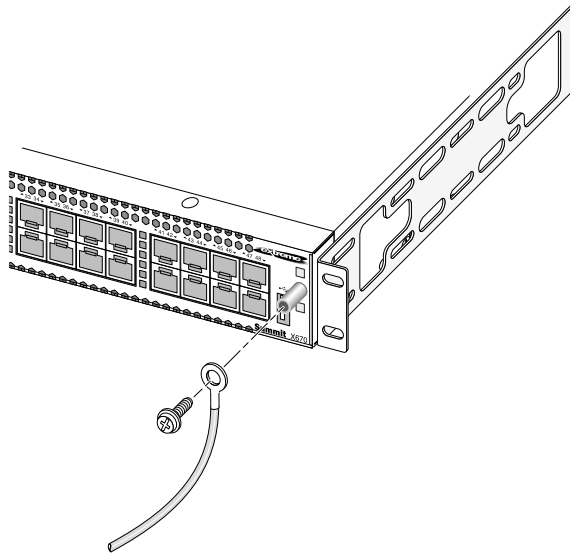
Figure 297: Grounding a Summit X670 Series Switch

The Summit X670 and X770 series switches are shipped without installed power supplies. After the switch is secured to the rack, install the necessary power supplies for your configuration. For instructions, see the following sections:

- Installing a Summit 450 W or 550 W AC Power Supply on page 275
- Installing a Summit 450 W or 550 W DC Power Supply on page 277

> **Note**
>
> If you are installing a VIM4 module in the Summit X670V-48x switch, install it in the switch before you connect the switch to power (see Installing a Versatile Interface Module in a Summit X460, X480, X650, or X670 Series Switch on page 344).

Connecting Network Interface Cables

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

For connections to the 10GBASE-T ports on the Summit X650-24t switch, see the following table for cable types and distances.

Cable Type	Maximum Distance
CAT5E	55 meters
CAT6	55 meters
CAT6A	100 meters

Note

Cables used for connection to the 10GBASE-T ports on the Summit X650-24t switch must meet the minimum requirements of the IEEE 802.3an standard.

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.

Initial Management Access

When you take your switch from the box and set it up for the first time, you must connect to the console to access the switch and perform initial security configuration.

At this time you can also manually configure an IP address for the management VLAN.

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. For connector pinouts associated with the console port, see Console Connector 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 management VLAN (named mgmt).

> **Note**
> The management port is part of the management VLAN by default.

To manually configure the IP settings:

1 Connect a terminal or PC with terminal-emulation software to the console port on the Summit switch.
2 At the terminal, press [Enter] 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.

   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.

4 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 Concepts Guide*.

5 At the password prompt, press [Enter].

   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, SummitX650>) in its prompt.

> **Note**
> For more information about how to assign a specific system name, see the *ExtremeXOS Concepts Guide*.

6 Assign an IP address and subnetwork mask for VLAN default by typing:

   ```
   configure vlan mgmt 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 switch.

    > **Note**
    >
    > For more information about saving configuration changes, see the *ExtremeXOS Concepts Guide*.

8   When you are finished with these tasks, log out of the switch by typing:

    `logout`

7 Installing Summit External Power Supplies

Read the information in the following sections thoroughly before you start to install or remove an external power supply.

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 Technical Specifications for additional information regarding regulatory compliance certifications.

Caution

Before installing or removing any components of the system, or before carrying out any maintenance procedures, read the safety information provided in Safety Information of this guide. Not following these precautions can result in equipment damage or shock.

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

Extreme Networks AC power supplies 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 AC power supply. Make sure that this connection is easily accessible.

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

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.

Pre-installation Requirements

You need the following tools and equipment to install an external power supply:

- # 1 Phillips screwdriver
- Rack mount screws suitable for your organization's equipment rack
- Screwdriver suitable for use with your rack-mount screws
- AC power cord

  An AC power cord is not included with the external power supply. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

Note

When you connect an external power supply, 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 should be plugged into separate branch circuits to provide redundancy.

Installing an EPS-160 External Power Module (with EPS-T)

You can order the EPS-T chassis with one or two EPS-160 power supplies already installed. You can also order an additional power supply from your Extreme Networks reseller.

The EPS-T can be mounted in a rack or placed free-standing on a table.

Rack-mount the EPS-T

> **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 stable surface, with the front facing you.
2   Remove the mounting bracket kit from the packaging.
3   Attach the mounting brackets as follows:

   a   Place a mounting bracket over the mounting holes on one side of the EPS-T (see the figure below).

   b   Insert the screws and fully tighten them using a screwdriver.
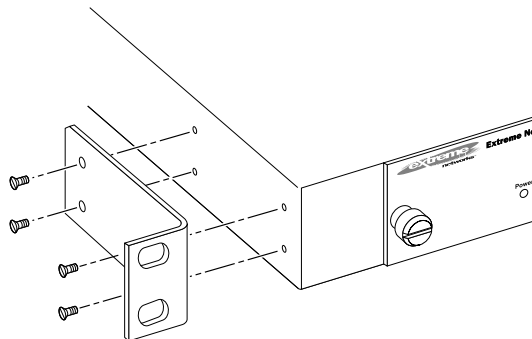
Figure 298: Attaching the Mounting Bracket

   c   Repeat steps 2 and 3 for the other side of the EPS-T.
4   Slide the EPS-T into a 19-inch rack and secure it using appropriate rack-mount screws.

Installing an EPS-160 Power Supply 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 an empty slot on the EPS-T.
3   Insert the power supply into the empty slot on the EPS-T.
4   Tighten the captive thumbscrews to secure the power supply to the EPS-T.

Connect the EPS-160 power supply to the Summit switch, following the instructions in Connecting the EPS-160 Power Supply to the Switch.

Connecting the EPS-160 Power Supply to the Switch

One end of the EPS-160 redundant power cord has a keyed connector to ensure correct alignment of the connector.

The key is a plastic tab on the cord connector housing that fits into the EPS-160 unit.
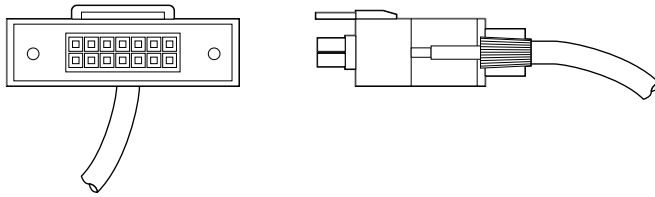
Figure 299: Redundant Power Cord Connector

> **Caution**
>
> Always connect the redundant power supply cord before you attach the AC power cord to the EPS-160 power supply.

To connect the EPS-160 power supply to the switch:

1   Connect the keyed end of the redundant power supply cord to the EPS-160 power supply (see Redundant Power Connections).

2   Connect the other end of the redundant power supply cord to the Extreme switch (see Redundant Power Connections).

This connector end can only be inserted into the switch with the end marked TOP facing up.

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.
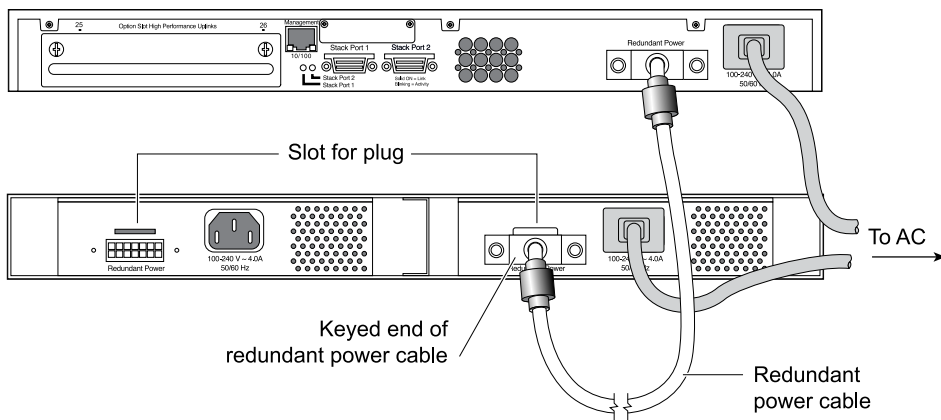
Figure 300: Redundant Power Connections

3   Connect an appropriate AC power cord to the AC connector on each unit.

Note

An AC power cord is not provided with the EPS-160 unit. For information about selecting a power cord, see Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

The Power LED on the front of the EPS-160 should light solid green to indicate that it is ready.

Installing an EPS-LD External Power Supply

The EPS-LD power supply can be mounted in a rack or placed free-standing on a table.

You can position the EPS-LD 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 position the

EPS-LD so that the power output connectors on the EPS-LD unit 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.

> **Note**
>
> An AC power cord is not provided with the EPS-LD power supply. See Power Cord Requirements for AC-Powered Switches and AC Power Supplies for information about selecting a power cord.

Rack-mount the EPS-LD Power Supply

> **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 rack-mount each EPS-LD unit:

1   Place the EPS-LD unit upright on a stable 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   Attach the mounting brackets as follows:

a   Place a mounting bracket over the mounting holes on one side of the unit (see the figure below)).

b   Insert the provided screws and fully tighten them using a screwdriver.
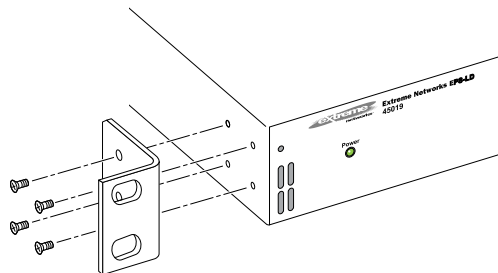
Figure 301: Attaching the Mounting Bracket

c   Repeat steps a and b for the other side of the EPS-LD unit.

4   Slide the EPS-LD into a 19-inch rack and secure it using appropriate rack-mount screws.

> **Note**
>
> Extreme Networks recommends that you position 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 from the Summit 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.

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. The key is a plastic tab on the cord connector housing that fits into the EPS-LD unit.
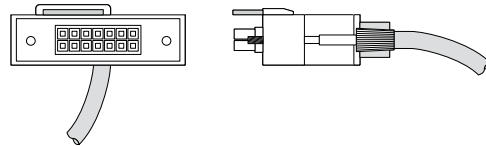
Figure 302: EPS-LD Connector with Key

To connect the EPS-LD to the switch:

1   Connect the keyed end of the cord to the power supply unit (see).
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 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.
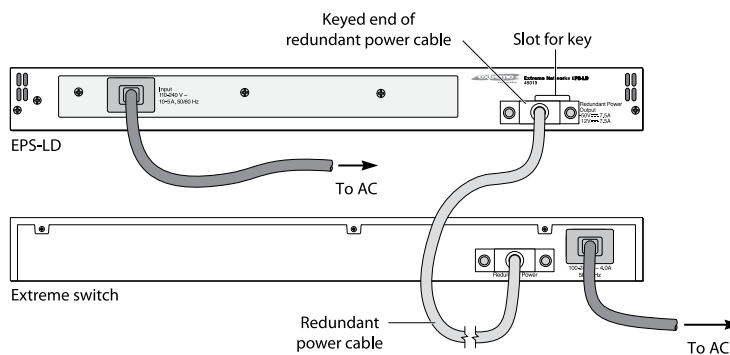
Figure 303: Connecting an EPS-LD Unit to a Switch

Connecting the EPS-LD to Power

An AC input power cord is not provided with the EPS-LD.

Make sure the EPS-LD is connected to the switch before you connect the AC power.

> **Caution**
> The EPS-LD does not have a switch for turning the unit on and off. You disconnect power to the EPS-LD by removing the plug from the electrical outlet. Make sure that this connection is easily accessible.

To connect the EPS-LD to power:

1 Connect the AC input power cord to the AC connector on the EPS-LD.
2 Connect the other end of the AC cord to the electrical outlet.

 a Make sure the electrical outlet is properly grounded.

 The Power LED on the front of the EPS-LD lights solid green to indicate that it is ready.

Installing an EPS-500 External Power Supply Unit

You can position 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 position 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.

The EPS-500 unit can be mounted in a rack or placed free-standing on a table.

> **Note**
>
> An AC power cord is not provided with the EPS-500 unit. See Power Cord Requirements for AC-Powered Switches and AC Power Supplies for information about selecting a power cord.

Rack-mount an EPS-500 Power Supply

> **Caution**
>
> When you install an EPS-500 in an equipment rack, 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 equipment rack.

> **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 rack-mount each EPS-500:

1 Place the EPS-500 upright on a stable 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 Attach the mounting brackets as follows:

a Place a mounting bracket over the mounting holes on one side of the EPS-500 (see Figure 304: Attaching a Mounting Bracket on page 319).
b Insert the provided screws and fully tighten the screws using a screwdriver.
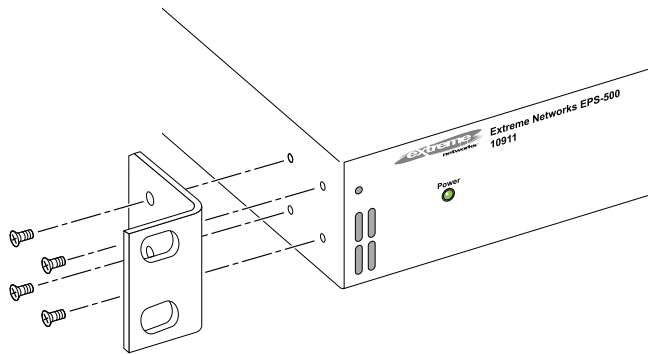
Figure 304: Attaching a Mounting Bracket

c Repeat steps 2 and 3 on the opposite side of the EPS-500.

4   Slide the EPS-500 into a 19-inch rack and secure it using appropriate rack-mount screws.

> **Note**
>
> Extreme Networks recommends that you position the EPS-500 so that the output connectors are on the same side as the external connector on the connecting switch. If you position the EPS-500 with the connectors facing in the opposite direction from the Summit 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.

Connecting the EPS-500 Power Supply

> **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.

One end of the EPS-500 cord has a keyed connector to ensure correct alignment of the connector. The key is a plastic tab on the connector housing that fits into the EPS-500 unit.
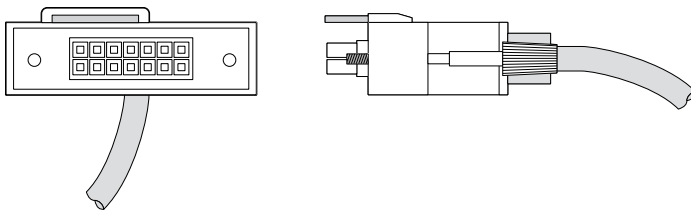
Figure 305: EPS-500 Redundant Power Cord with Connector Key

1   Connect the keyed end of the EPS-500 redundant power cord to the power supply unit (see Connecting an EPS-500 Unit to a 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.
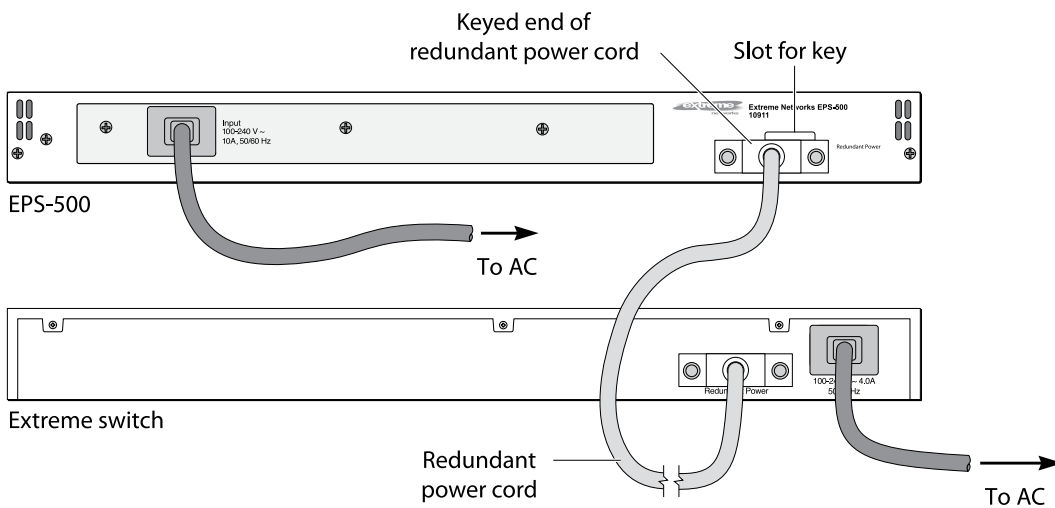
Figure 306: Connecting an EPS-500 Unit to a Switch

3   Connect an appropriate AC input power cord to the AC connector on the EPS-500 unit.

> **Note**
>
> An AC power cord is not provided with the EPS-500 unit. See Power Cord Requirements for AC-Powered Switches and AC Power Supplies for information about selecting a power cord.

> **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 where you can easily reach it.

4   Connect the other end of the AC power cord to the electrical outlet.

Be sure that the electrical outlet is properly grounded.

The Power LED on the front of the EPS-500 unit should light solid green to indicate that it is ready.

Installing an EPS-600LS External Power Module

Install one, two, or three EPS-600LS power modules (model 10913) in the EPS-C chassis (Model No. 10912) to build an external redundant power system for a Summit PoE-capable switch.

A redundant power cable shipped with the EPS-C chassis provides the connection between the external power system and the redundant power input connector on the back of the switch.

> **Note**
>
> An AC power cord is not provided with the EPS-600LS power module. See Power Cord Requirements for AC-Powered Switches and AC Power Supplies for information about selecting a power cord.
>
> Each EPS-C chassis is shipped with a special redundant power supply cord for connection to the Summit switch. Make sure that the EPS-C chassis is installed in the rack system before installing an EPS-600LS unit.

Installing an EPS-C Chassis

> **Caution**
>
> Do not use the rack-mount brackets to suspend the EPS-C from under a table or desk, or to attach the EPS-C unit to a wall.

The EPS-C is intended for use only with a Summit X450e-48p or X250e-48p switch. You can install the EPS-C above or below the Summit switch.
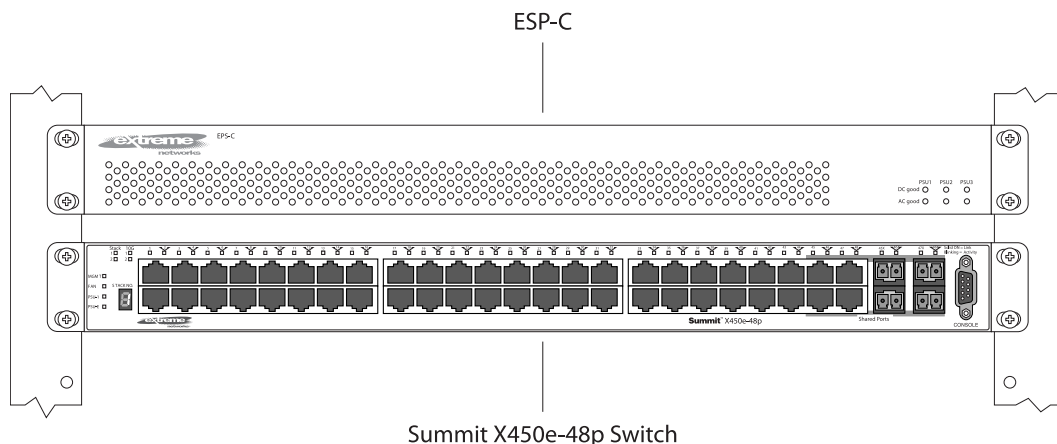
Figure 307: EPS-C and Summit Switch

To rack-mount the EPS-C:

1 Place the EPS-C upright on a secure work surface.
2 Remove the mounting bracket kit from the packaging.
3 Attach the mounting brackets as follows:

 a Place a rack-mount bracket over the mounting holes on one side of the unit.

b   Insert the provided screws and tighten them securely.
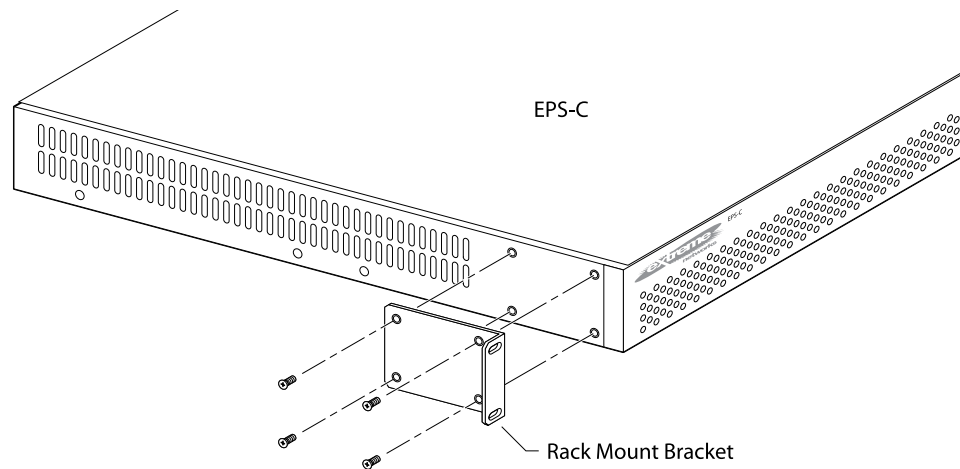
Figure 308: Attaching the Mounting Bracket

c   Repeat steps 2 and 3 for the other side of the EPS-C.

4   Slide the EPS-C into a 19-inch rack and secure it using appropriate rack-mount screws.

5   Connect the keyed end of the redundant power cord to the EPS-C (see Figure 309: Installing the Redundant Power Cord on page 323). 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 EPS-C to ensure correct alignment of the connector.

6   Connect the other end of the redundant power cord to the Summit X450e-48p or X250e-48p switch (see Figure 309: Installing the Redundant Power Cord on page 323). Be sure that the side of the connector marked TOP is facing up.
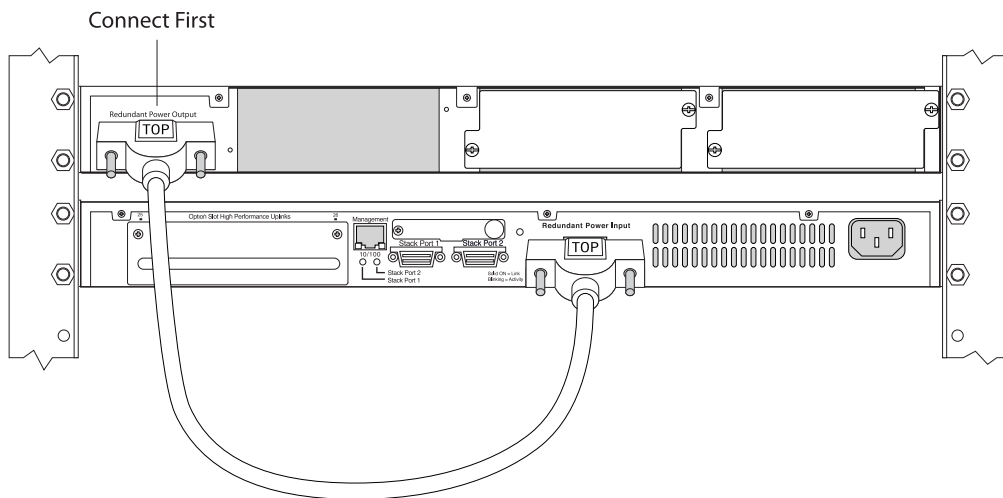
Figure 309: Installing the Redundant Power Cord

Installing an EPS-600LS Power Supply

To install an EPS-600LS unit into an EPS-C:

1   If necessary, remove a cover plate from a slot in the EPS-C.

2   Slide the EPS-600LS into an empty slot in the EPS-C.

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 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.
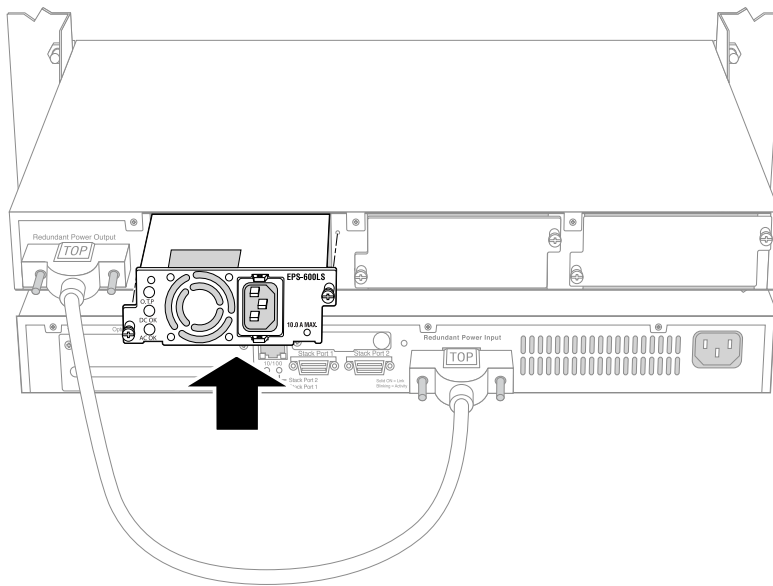
Figure 310: Installing the EPS-600LS Unit in the EPS-C Chassis

3   Slide the unit completely into the chassis until the front of the EPS-600LS is flush with the surface of the EPS-C (see).

4 Align and tighten the captive screws to secure the EPS-600LS unit in place in the EPS-C (see Figure 311: Securing the EPS-600LS to the EPS-C Chassis on page 325).
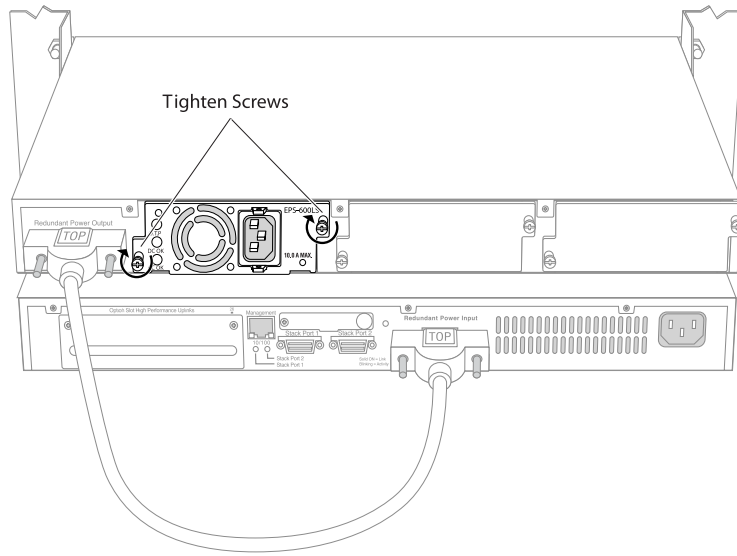
Figure 311: Securing the EPS-600LS to the EPS-C Chassis

5   Connect an appropriate AC power cord to the AC connector on the EPS-600LS unit (see Figure 312: Connecting the AC Power Cord on page 326).

Use the cable clip on the EPS-600LS unit to hold the AC power cord in place (see Figure 312: Connecting the AC Power Cord on page 326).

Note

An AC power cord is not provided with the EPS-600LS unit. See Power Cord Requirements for AC-Powered Switches and AC Power Supplies for information about selecting a power cord.

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.
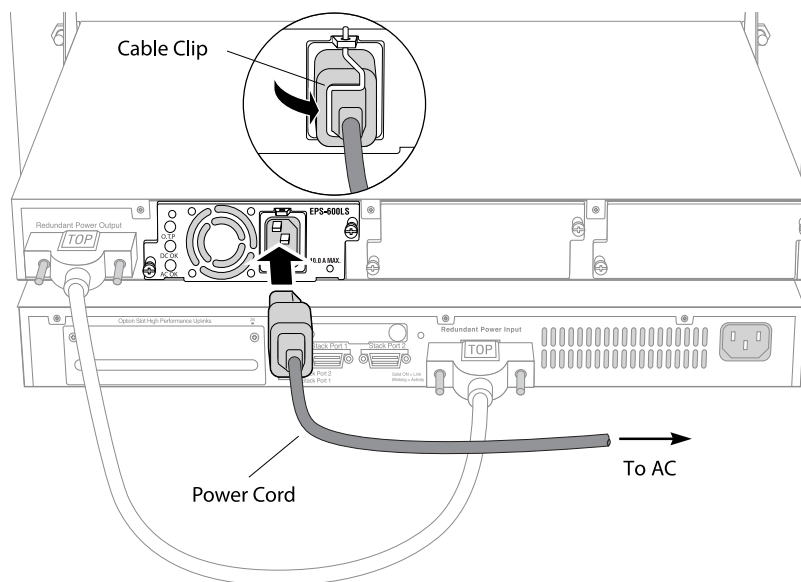
Figure 312: Connecting the AC Power Cord

6   Connect the other end of the AC power cord to the electrical outlet (see the figure above).

Be sure that the electrical outlet is properly grounded.

7   Repeat steps 1 through 6 for each EPS-600LS unit.

Installing an EPS-150DC External Power Module (with EPS-T2)

The EPS-150DC power supply is a modular power supply for use in the EPS-T2 External Power System Tray.

The EPS-T2 is a rack-mountable chassis or tray that holds one or two EPS-150DC power supplies. Each EPS-150DC provides one-to-one redundancy to an attached Extreme Networks switch. You must install the EPS-150DC power supply in the EPS-T2 tray.

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.

Caution

Do not use the rack-mount brackets to suspend the EPS-T2 from under a table or desk, or to attach the EPS-T2 to a wall.

Rack-mount the EPS-T2

To install the EPS-T2:

1 Place the EPS-T2 upright on a secure surface, with the front facing you.

2 Remove the mounting bracket kit from the packaging.

3 Attach the mounting brackets:

  a Place a mounting bracket over the mounting holes on one side of the EPS-T2 (see Figure 313: Attaching the Mounting Bracket on page 327).

  b Insert the provided screws and fully tighten with a screwdriver.
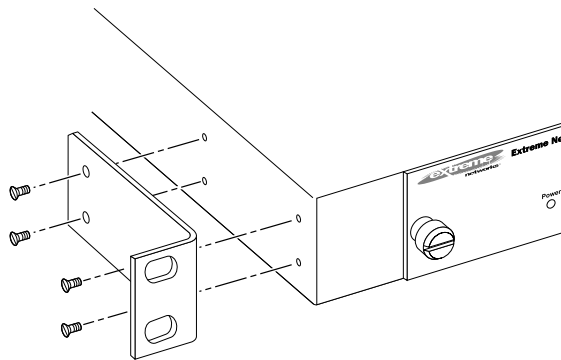
Figure 313: Attaching the Mounting Bracket

  c Repeat steps 2 and 3 for the other side of the EPS-T2.

4 Slide the EPS-T2 into a 19-inch rack and secure it using appropriate rack-mounting screws.

Installing an EPS-150DC Power Supply

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 consists of the following tasks:

- Connecting the DC wiring harness to the DC source voltage (see the next section).

This task must be performed by a licensed, qualified electrician.

- Installing an EPS-150DC unit in an EPS-T2 (see Install an EPS-150DC Unit into an EPS-T2)
- Connecting the DC wiring harness to the DC power socket on the EPS-150DC (see Connect the DC Wiring Harness to the DC Power Socket on the EPS-150DC)
- Connecting the EPS-150DC to a switch (see Connect the EPS-150DC to a Switch)

Perform these four tasks in the order they are described.

Connecting the DC Wiring Harness to the DC Source Voltage

A three-wire, 6-foot long DC wiring harness (Figure 314: Three-wire Cable Harness on page 329) is included with the EPS-150DC unit. 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. See Technical Specifications for information about connector pinouts and for 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 ESP-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.

Provide proper connection and strain relief on the DC wiring harness in accordance with all local and national electrical codes.
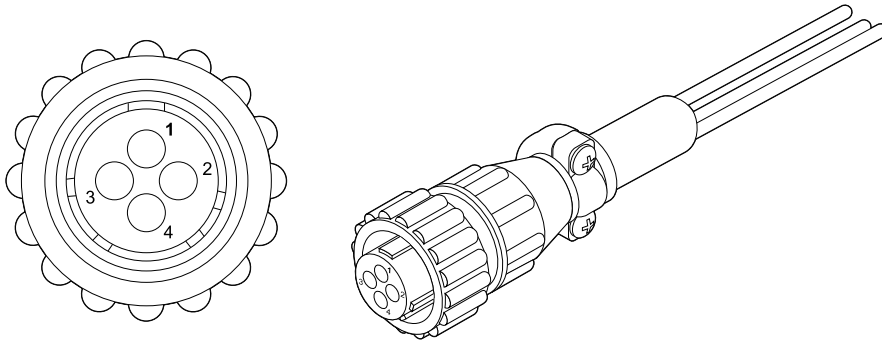
Figure 314: Three-wire Cable Harness

> **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.

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 unit into an EPS-T2:

1 Remove the EPS-150DC unit from the packing material.
2 Insert the EPS-150DC unit into the front of the EPS-T2.
3 Tighten the captive 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 Verify that the DC power is turned off at the source.

2   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 Three-wire Cable Harness for the DC wiring harness connector and to Figure 315: Connecting the Input Cable to the EPS-150DC Unit on page 330 for the DC power socket location on the rear of the EPS-150DC unit.
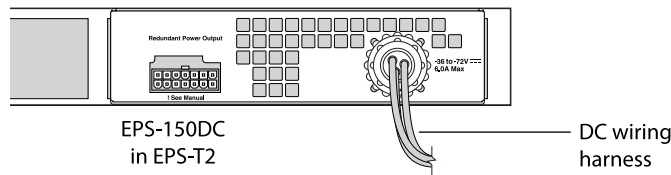
Figure 315: Connecting the Input Cable to the EPS-150DC Unit

3   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 a Summit DC-Powered Switch.

> ⚠ **Warning**
> Always be sure that the DC circuit is de-energized before connecting the EPS-150DC to the switch.

One end of the EPS-150DC cord has a keyed connector to ensure correct alignment of the connector. The key is a plastic tab on the connector housing that fits into the EPS-150DC unit.
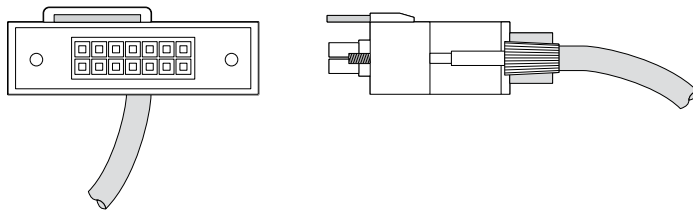
Figure 316: EPS-150DC Redundant Power Cord with Connector Key

To connect the EPS-150DC to a switch:

1   Verify that the DC power is turned off at the source.

2   Identify the keyed end of the redundant power cable.

3   Holding the keyed connector so that the side labeled "Top" is facing up, connect the EPS-150DC redundant power cable to the power supply unit (see Figure 317: Connecting an EPS-150DC Unit to a Switch on page 331).

4   Align and tighten the connector retaining screws to secure the cable connector to the power supply unit.

5   Connect the other end of the redundant power cord to the Extreme switch.

The connector fits the slot in only one direction.

6 Align and tighten the captive retaining screws to secure the cable connector to the switch.
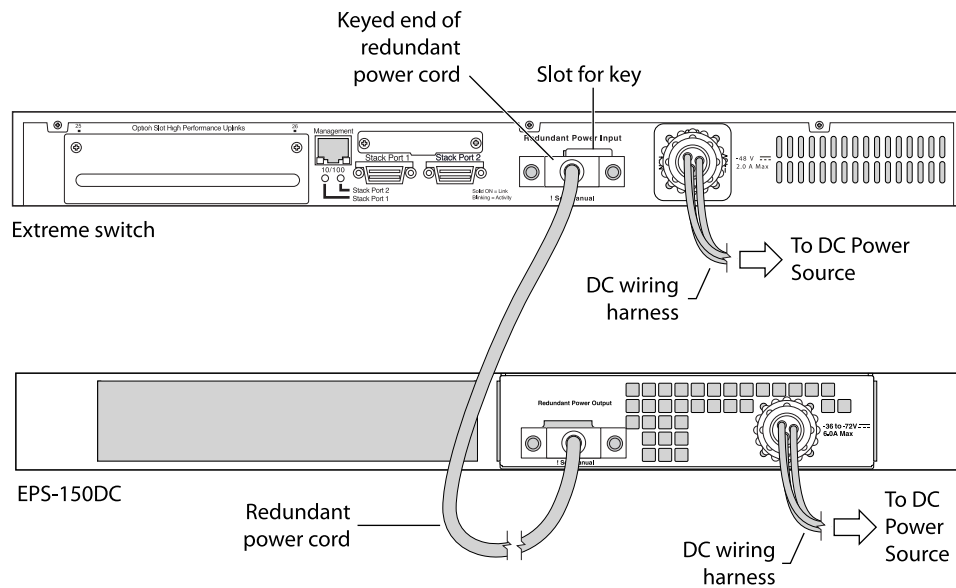
Figure 317: Connecting an EPS-150DC Unit to a Switch

7 Energize the DC circuit.

The Power LED on the front of the EPS-150DC unit turns solid green to indicate that it is ready.

Installing an EPS-C2 Chassis

Install one, two, or three Summit 750 W AC power supplies (model 10931) in the EPS-C2 chassis (model 10936) to build an external redundant power system for one or more compatible Summit switches

One redundant power cable is shipped with the EPS-C2 chassis to provide the connection between the external power system and the redundant power input connector on the back of a Summit X440 series switch. Additional redundant power cables are available from Extreme Networks.

When installing an EPS-C2 chassis at the same time as a Summit switch, install the components in the following order:

1 Install Switch into rack.
2 Install EPS-C2 chassis into rack.
3 Install power supplies into the EPS-C2 chassis.
4 Attach redundant power cable from EPS-C2 chassis to switch.
5 Attach AC power cord to internal power supply of switch, and then plug into AC power source.
6 Install AC power cords to internal power supplies of the EPS-C2 chassis, and then plug power cords into AC power source.

> **Warning**
>
> Be sure to attach power to components in the order listed in this section. If you attach power out of the order listed, you can damage your equipment.

The following sections describe the specific steps for installing the EPS-C2 chassis.

> **Note**
>
> An AC power cord is not provided with the Summit 750 W AC power supply. See Selecting Power Supply Cords for information about selecting a power cord.

Installing an EPS-C2 Chassis
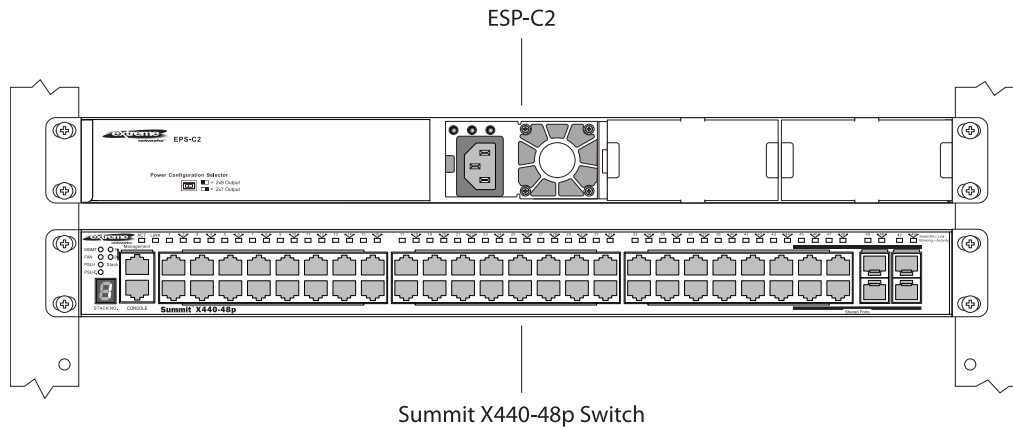
Figure 318: EPS-C2 Power System and Summit Switch

To mount the EPS-C2 chassis in a rack:

1 Place the EPS-C2 chassis upright on a secure work surface.
2 Remove the mounting bracket kit from the packaging.
3 On each side, attach a rack mounting bracket:

  a Place a rack mounting bracket over the mounting holes.

b   Insert the provided screws and tighten them securely.
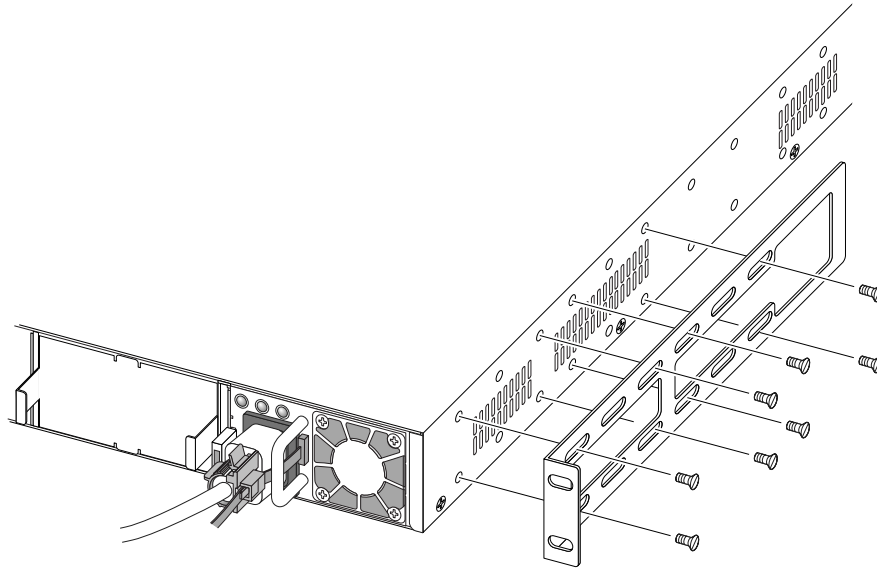
Figure 319: Attaching the Mounting Bracket to the EPS-C2 Chassis

4   Slide the EPS-C2 into a 19-inch rack and secure it using appropriate rack-mount screws.
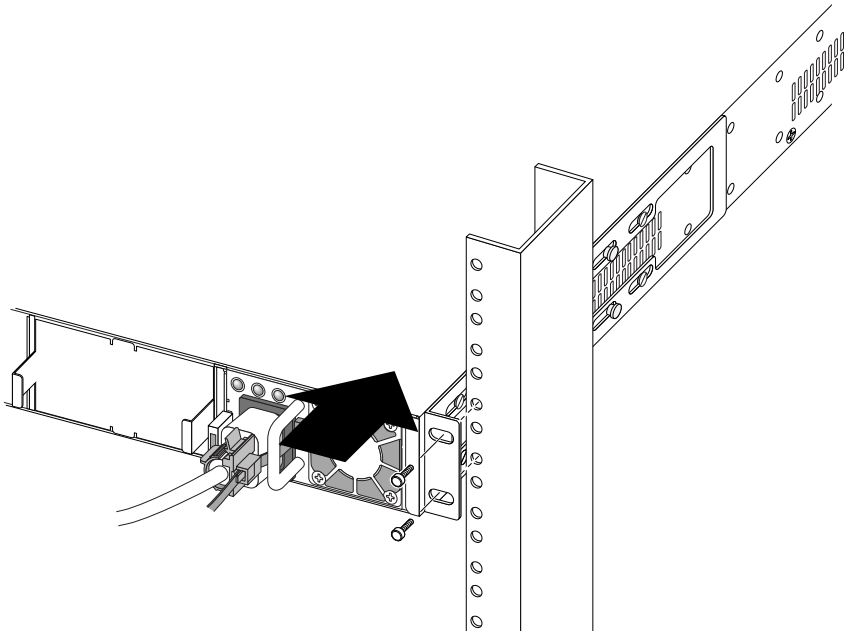
Figure 320: Sliding the EPS-C2 into the Rack and Securing it

Installing a Summit 750 W AC Power Supply into the EPS-C2

The EPS-C2 chassis is shipped with slots 2 and 3 covered and slot 1 open.

Extreme Networks recommends that you install a power supply first in slot 1, but this is not required. You can install power supplies into any of the slots in the EPS-C2 chassis. The installation sequence does not affect the performance of the power supply units, but empty slots must be covered at all times.

> **Warning**
>
> To prevent an electrical hazard, make sure that the AC power cord is not connected to the power supply before you install the power supply in the power supply bay.

After the EPS-C2 has been installed in a rack, do the following to install a 750 W AC power supply in an EPS-C2 chassis:

1 If necessary, grasp the two tabs on either side of the slot cover and pull gently to remove it from the front of the EPS-C2 chassis.
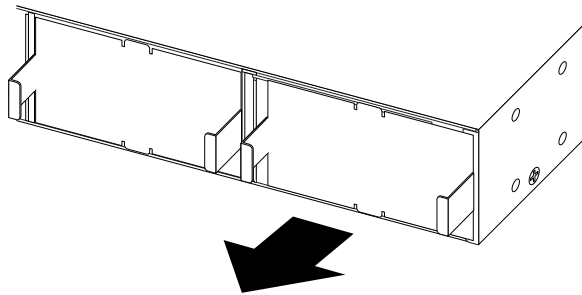
Figure 321: Removing a Blank Panel from the EPS-C2 Chassis

2 Verify that the power supply is right side up (there is a sticker labeled "This Side Up").
3 Carefully slide the power supply all the way into the slot in the EPS-C2 chassis (see Figure 322: Installing a 750 W AC Power Supply in an EPS-C2 Chassis on page 335).

4   Push the power supply in until the latch snaps into place.

> **Caution**
> Do not slam the power supply into the switch.
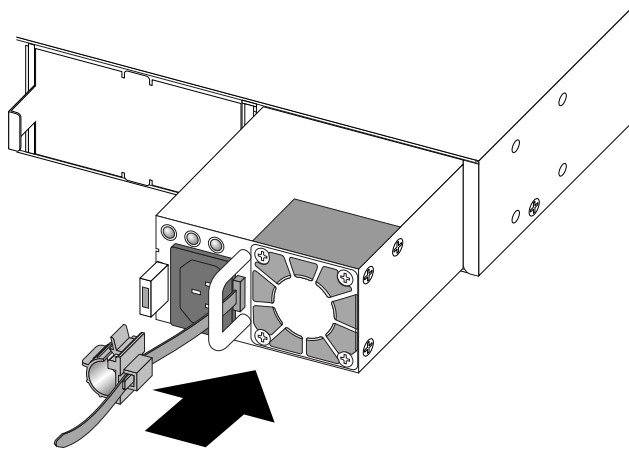
Figure 322: Installing a 750 W AC Power Supply in an EPS-C2 Chassis

> **Note**
> If power supplies are not installed in all three slots, be sure to install a cover over each unoccupied slot. Unoccupied slots must always be covered to maintain proper system ventilation and EMI levels.

To install each additional power supply, repeat steps 1 through 3.

Connecting Redundant Power Cables for the EPS-C2 Chassis

The EPS-C2 chassis can use the following types of redundant power connectors (See Figure 323: EPS-C2 2x9 Pin Redundant Power Cable with Connector Key Tab on page 336 and Figure 324: EPS-C2 2x7 Pin Redundant Power Cable with Connector Key Tab on page 336):

• One 2X9-pin connector

  This connector is compatible with the Summit X450e-48p or Summit X250e-48p switch.

> **Warning**
> The 2x9 cable is not hot-pluggable. Do not attach a powered EPS-C2 to any Summit switch using the 2x9 connector.
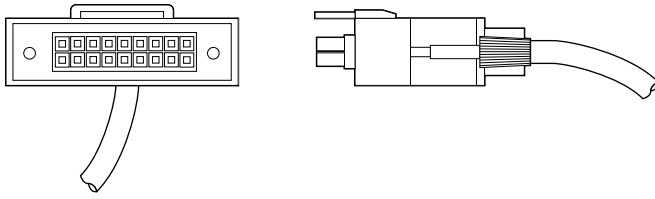
Figure 323: EPS-C2 2x9 Pin Redundant Power Cable with Connector Key Tab

• Five 2X7-pin connectors

These connectors are compatible with the Summit X440 series switches.
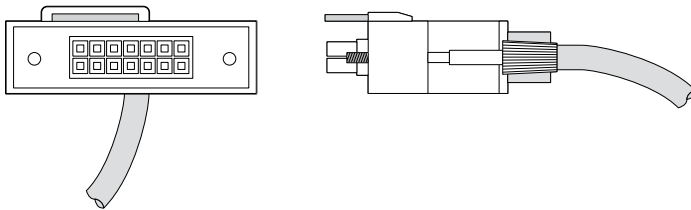
Figure 324: EPS-C2 2x7 Pin Redundant Power Cable with Connector Key Tab

The redundant power cable has keyed ends. The key is a plastic tab on the cable connector housing to ensure correct alignment of the connector. The keyed ends of the 2x7 cable are not symmetrical; one end of the cable will fit into the EPS-C2 chassis and the other end will fit into the summit x440 switch.

A switch on the front of the EPS-C2 chassis (see the figure below) selects which connector type is active for the power system.
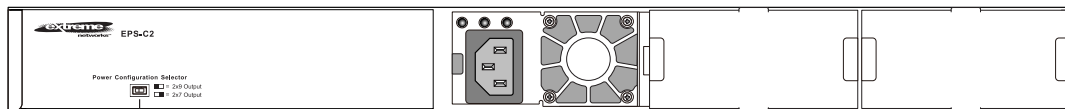
Connector selector switch

Figure 325: EPS-C2 Connector Selector Switch

After the EPS-C2 has been installed in a rack and the power supplies have been installed, do the following to connect the redundant power cables:

1   Set the connector selection switch for either the 2X9 or 2X7 connectors.
2   Connect the keyed end (for the 2x7 connector cable, the end with the tab offset from the edge of the connector pins) of the redundant power cord to the EPS-C2 chassis (see).
3   Verify that the side of the connector marked TOP is facing up.

4 Connect the other end of the redundant power cable (for the 2x7 connector cable, the end with the key flush with the edge of the connector pins) to the Summit switch (see Figure 326: Installing the Redundant Power Cord on page 337).

Be sure that the side of the connector marked TOP is facing up.
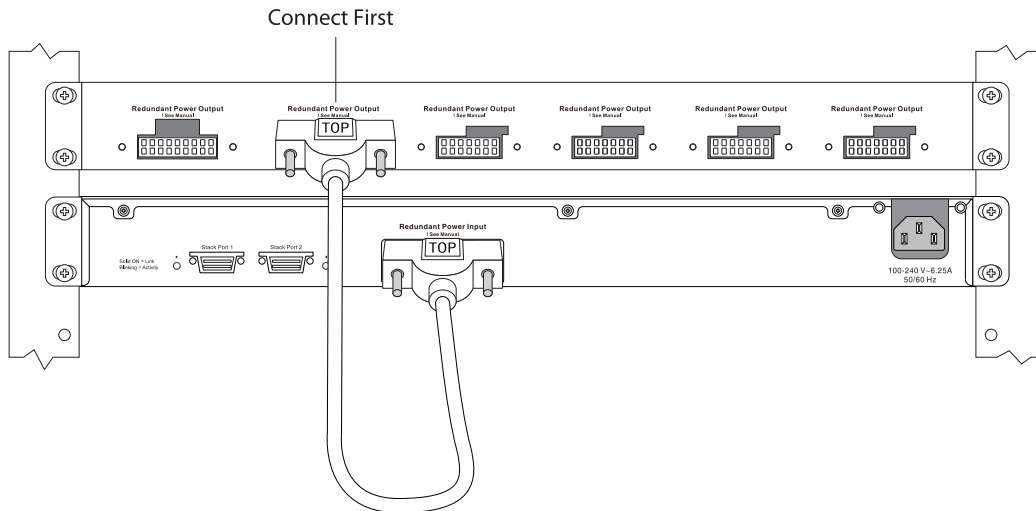
Figure 326: Installing the Redundant Power Cord

5 Repeat steps 2 through 4 to connect any additional redundant power cords.

Connecting the AC Power cord to the EPS-C2

After the redundant power cord is connected between the EPS-C2 and the switch, and an AC power cord to the internal power supply of the switch is attached to a power source (see Summit Family Switches), install the AC power cord to the power supplies in the EPS-C2 as follows:

1 If necessary, slide the plastic cord retainer farther away from the back of the power supply (see Figure 327: Moving the Power Cord Retainer on the 750 W AC Power Supply on page 338).
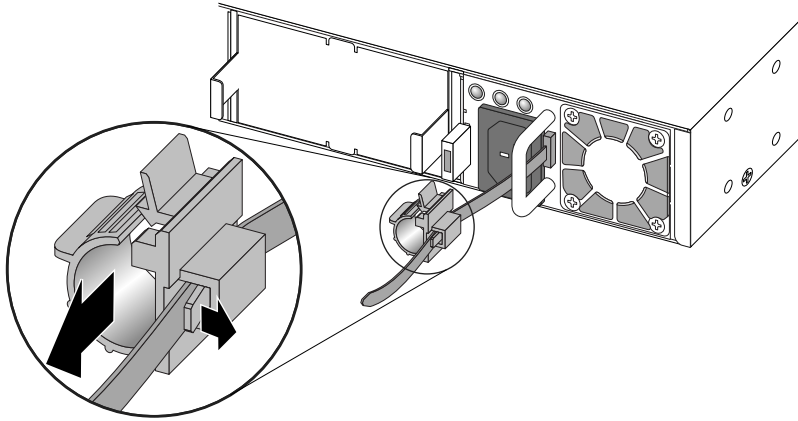
Figure 327: Moving the Power Cord Retainer on the 750 W AC Power Supply

2 Connect the AC power cord to the input connector.
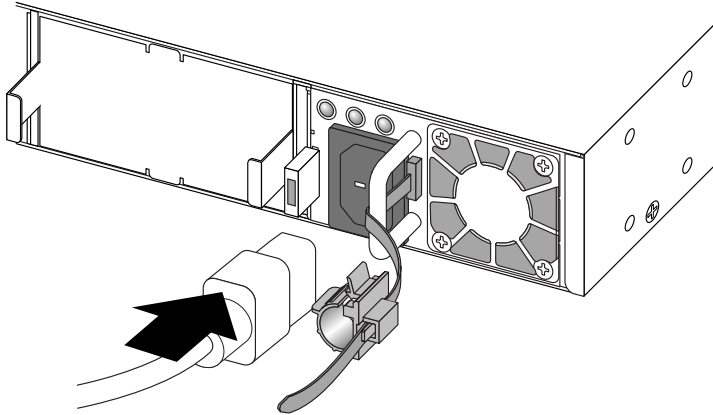
Figure 328: Connecting the Power Cord on the 750 W AC Power Supply

3 Open the clip and slip it over the barrel of the connector.
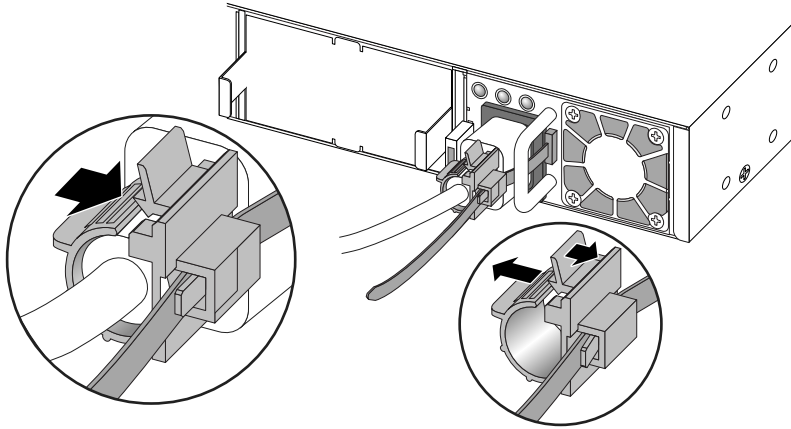
Figure 329: Attaching the Power Cord Retainer on the 750 W AC Power Supply

4 Snap the clip firmly around the connector.
5 Connect the other end of the power cord to an AC power outlet.

> **Warning**
>
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

> **Caution**
>
> Make sure that the AC power supply circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

8 Installing Optional Ports

Installing a Summit Port Option Card
Installing an Option Card in Slot B of a Summit X460 Series Switch
Installing a Versatile Interface Module in a Summit X460, X480, X650, or X670 Series Switch
Installing a Versatile Interface Module or Clock Module in a Summit X460-G2 Series Switch

This chapter describes how to install Summit port option cards, versatile interface modules, and stacking modules.

> **Note**
> Read the information in this chapter thoroughly before trying install or remove a Summit option card.

Installing a Summit Port Option Card

You need the following tools and equipment to install a Summit option card:

- ESD-preventive wrist strap
- # 1 Phillips screwdriver
- Straight-tip screwdriver for the XGM3-2sf option card

> **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.
>
> Pluggable optical modules may become very hot after prolonged use. Take care when removing a pluggable optical module from the option card. If the pluggable optical module is too hot to touch, disengage the module and allow it to cool before removing it completely.
>
> Summit port option cards are not hot-swappable. Disconnect power to the switch before installing or removing any option card. After the Summit port option card is installed in a compatible switch, you can hot-swap the pluggable optical modules. Use only optical modules approved by Extreme Networks.

Installing XGM and XGM2 Series Port Option Cards

All Summit XGM and XGM2 series port option cards are installed the same way. The instructions in this section apply to all option cards for the Summit X350, X450a, and X450e series switches.

To install a Summit XGM or XGM2 series port option card:

1 Disconnect the AC power and any redundant power supply from the Summit switch.

2   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the equipment rack.

3   Remove the screws holding the filler panel over the option slot on the back of the switch (see the figure below).

4   Remove the filler panel and set it aside.

   a   Save the screws for re-use.
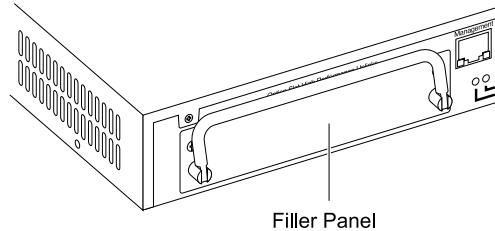
Filler Panel

Figure 330: Option Slot Filler Panel

5   Align the sheet metal edges on the option card with the card guides in the switch housing.

6   Carefully slide the option card into the switch housing until the connectors engage and the card is flush with the back panel of the switch.
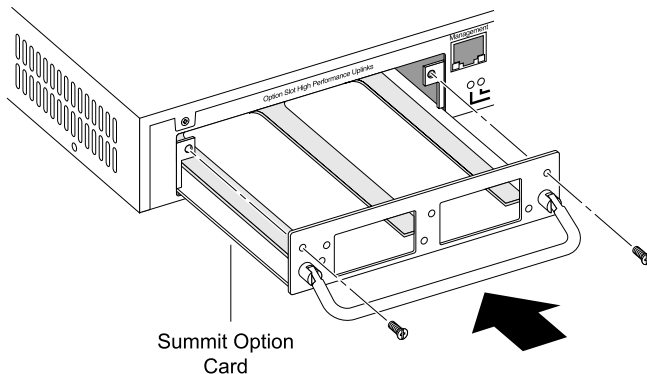
Summit Option
Card

Figure 331: Installing a Summit Port Option Card (XGM-2xn Shown)

7   Using the screws from the cover plate, secure the option card to the back panel of the switch.

If you install only one pluggable optical module in the Summit option card, attach the appropriate cover plate or dust cover over the remaining open optical module slot or cage.

> **Note**
>
> Be sure that the switch 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.

For information about installing or replacing the pluggable optical modules in the Summit option card, refer to the *Extreme Networks Pluggable Interface Modules Installation Manual*.

Installing a Summit XGM3 Series Port Option Card

The XGM3 series port option cards can be installed only in a Summit X460 series switch; they are not mechanically compatible with any other Summit switch series.

To install an XGM3 series port option card:

1   Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2   At the back of the switch, remove the blank cover over slot A.
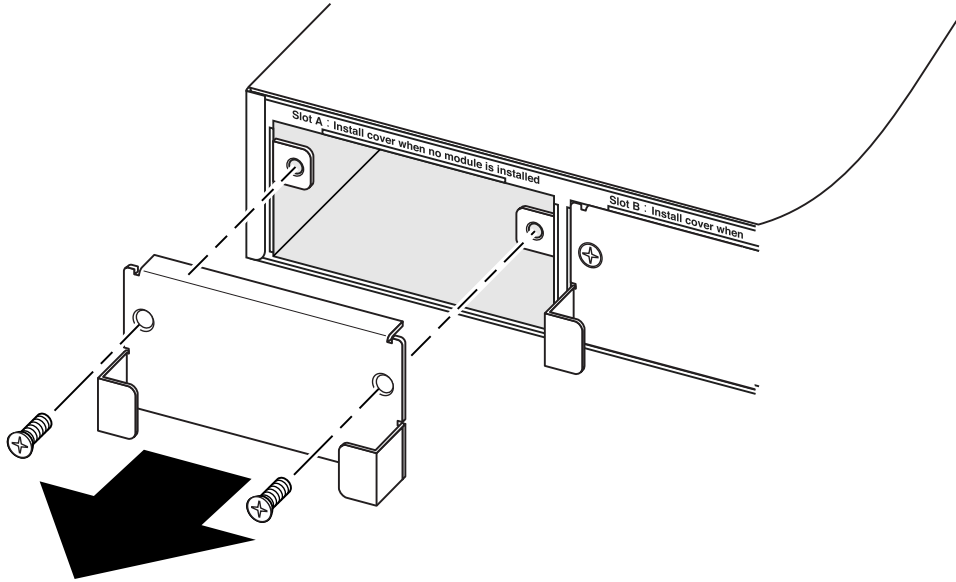
Figure 332: Removing the Slot A Cover

3   Carefully slide the XGM3 series port option card all the way into the slot (see the figure below).

4   Align and fully tighten the captive retaining screws.
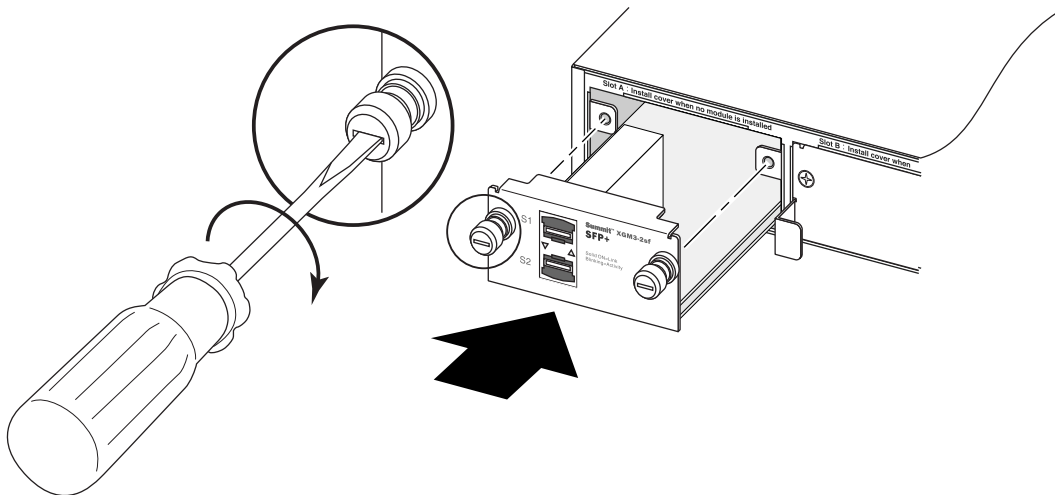
Figure 333: Installing an XGM3-2sf Port Option Card

Installing an Option Card in Slot B of a Summit X460 Series Switch

Slot B of a Summit X460 series switch accommodates either a Summit X460 stacking module or an XGM3SB-4sf port option card

In the Summit X460 series switch, a stacking module or XGM3SB-4sf option card can be installed in Slot B on the back panel of the switch.

To install an option card in Slot B:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
2 At the back of the switch, remove the cover from Slot B.
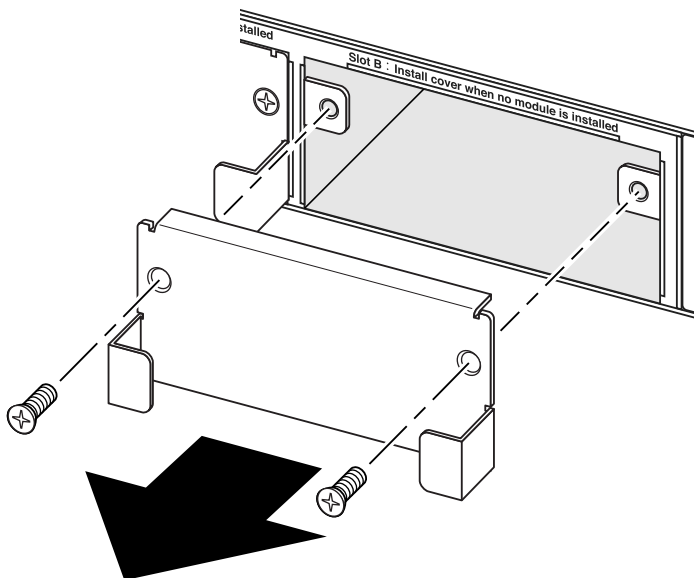
Figure 334: Removing the Slot B Cover

3 Carefully slide the stacking module or option card all the way into the slot (see the figure below).
4 Align and fully tighten the captive retaining screws.
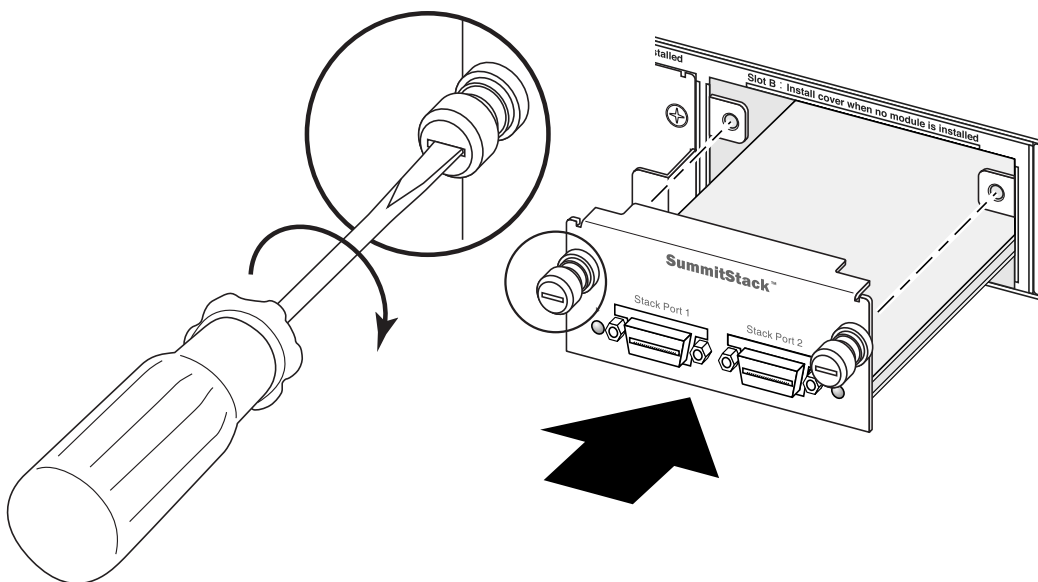
Figure 335: Installing a Stacking Module (SummitStack module shown)

Installing a Versatile Interface Module in a Summit X460, X480, X650, or X670 Series Switch

This section describes how to install versatile interface modules (VIMs).

You need the following tools and materials to install a VIM:

- ESD-preventive wrist strap
- #1 Phillips screwdriver

> ⚠️ **Caution**
>
> Summit VIMs are not hot-swappable. Disconnect power to the switch before removing an installed VIM or installing a new VIM.

The installation procedure is the same for all VIMs in Summit X480, X650, and X670 series switches.

To install a versatile interface module:

1 Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.

2 Disconnect the switch power.

3 Remove the cover plate from the VIM slot:

  a Remove the retaining screws at the top corners of the cover plate or module, and set the screws aside in a safe place.

  b Save the retaining screws to secure the new module in the switch.

  c Pull the cover plate away from the module slot.
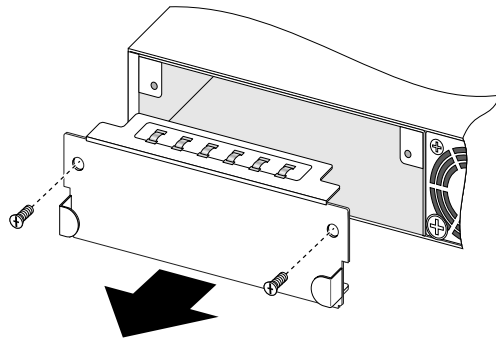
Figure 336: Removing a VIM Cover Plate

4 Remove the new VIM from its anti-static packaging.

5 Install the VIM in the switch (see):

  a Make sure the inserter/ejector levers are rotated down.

  b Carefully slide the module into the switch until the inserter/ejector levers begin to rotate upward.

c   Simultaneously rotate both levers upward to seat the module internal connectors.

d   Insert and tighten the retaining screws you removed earlier.

Figure 337: Installing a Versatile Interface Module

Installing a Versatile Interface Module or Clock Module in a Summit X460-G2 Series Switch

This section describes how to install versatile interface modules (VIMs) or a clock module in the rear slot of a Summit X460-G2 swiitch..

> **Note**
> Clock module ports are output ports; clock module ports are not to be used as input ports.

You need the following tools and materials to install a VIM or clock module:

- ESD-preventive wrist strap
- #1 Phillips screwdriver (for clock module) or flat-bladed screwdriver (for all other VIM modules)

> **Caution**
> Summit VIMs and clock modules are not hot-swappable. Disconnect power to the switch before removing an installed VIM or clock module or installing a new VIM or clock module.

The installation procedure is the same for all X460-G2 VIMs and clock modules, with the exception that the VIMs use slotted retaining screws and the clock module uses Phillips retaining screws.

To install a versatile interface module or clock module:

1   Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.

2   Disconnect the switch power.

3   Remove the cover plate from the VIM or clock module slot:

a   Remove the retaining screws at the top corners of the slot cover plate, and set the screws aside in a safe place.

b   Save the retaining screws to secure the new module in the switch.

c   Pull the cover plate away from the module slot.
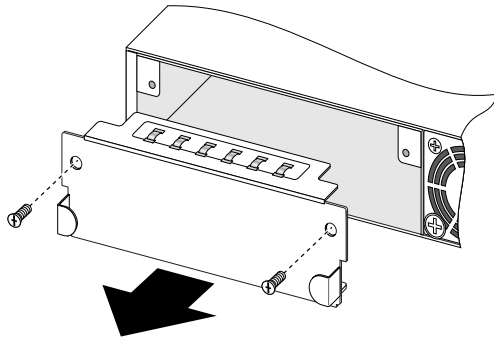
Figure 338: Removing a slot Cover Plate (VIM slot cover shown)

4   Remove the new VIM or clock module from its anti-static packaging.

5   Install the VIM or clock module in the switch:

a   Carefully slide the module into the switch.

b   Insert and tighten the retaining screws you removed in Step 3. The clock module uses phillips screws and the VIM modules use slotted screws.
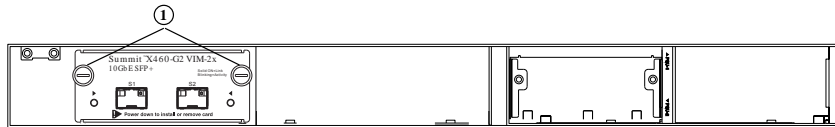
Figure 339: Tighten Screws on the Inserted VIM Module

1 = VIM module retaining screw locations
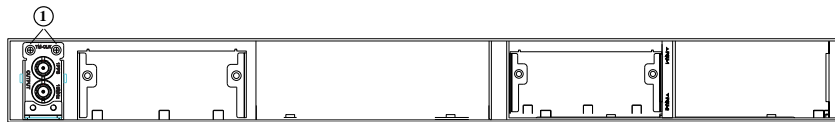
Figure 340: Tighten Screws on the Inserted Clock Module

1= clock module retaining screw locations

9 Replacing AC Power Supplies in Summit Family Switches

Replacing a Summit 300 W AC Power Supply
Replacing a Summit 450 W or 550 W AC Power Supply
Replacing a Summit 750 W AC Power Supply
Replacing a Summit X850 W AC Power Supply
Removing EPS Series AC Redundant Power Supplies

This chapter describes how to replace AC power supplies in a Summit X460, X480, X650, or X670 series switch and how to remove EPS series AC redundant power supplies

Note

Read the information in this chapter thoroughly before attempting to replace one of the listed SummitX650components.

Replacing a Summit 300 W AC Power Supply

The Summit 300 W AC power supplies are compatible with the Summit X460 series non-PoE switches.

You need the following tools and materials to replace a Summit 300 W AC power supply:

* Thermal protective gloves
* AC power cord, if you will not be re-using the cord from the removed power supply

  An AC power cord is not included with a Summit AC power supply. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one Summit AC power supply without powering down the switch. To replace a Summit 300 W AC power supply:

1 Disconnect the AC power cord from the wall outlet and from the power supply.
2 Note the orientation of the installed power supply.

3   Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors.
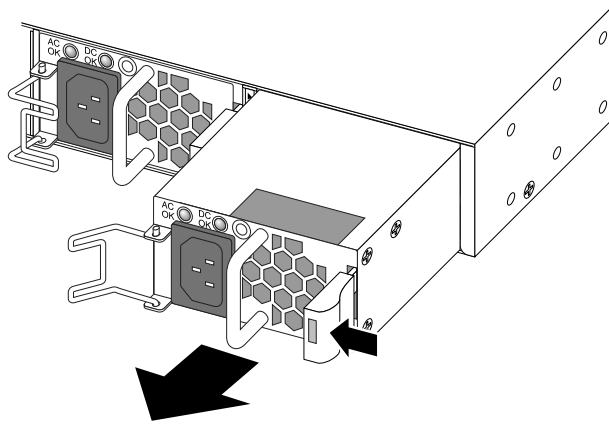
Figure 341: Removing a Summit 300 W AC Power Supply

4   Carefully slide the power supply the rest of the way out of the switch.

> ⚠ **Caution**
>
> Power supplies may become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.

> 📝 **Note**
>
> If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5   Verify that the replacement power supply is oriented the same way as the unit you removed.
6   Carefully slide the power supply all the way into the power supply bay (see the figure below).

7   Push the power supply in until the latch snaps into place.

Figure 342: Installing a Summit X460 300 W AC Power Supply

> ⚠ **Caution**
> Do not slam the power supply into the switch.

8   Connect the AC power cord to the input connector on the power supply and rotate the wire clip into place over the power cord connector.

9   Connect the other end of the power cord to an AC power outlet.

> ⚠ **Warning**
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

Replacing a Summit 450 W or 550 W AC Power Supply

Summit 450 W AC power supplies are compatible with the Summit X480 series switches and with Summit X670 series switches that have front-to-back ventilation airflow.

You need the following tools and materials to replace a Summit 450 W or 550 W AC power supply:

- Thermal protective gloves
- AC power cord, if you will not be re-using the cord from the removed power supply

  An AC power cord is not included with the Summit AC power supply. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

The Summit 550 W AC power supplies are compatible only with Summit X670 series switches. The 550W AC power supplies are available in versions for switches with either front-to-back or back-to-front airflow.

The Summit X480 and X670 switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one Summit AC power supply without powering down the switch.

> **Note**
> You cannot combine 450 W power supplies and 550 W power supplies in the same Summit X670seriesswitch.

To replace a Summit 450 W or 550 W AC power supply:

1 Disconnect the AC power cord from the wall outlet and from the power supply.
2 Note the orientation of the installed power supply.
3 For a Summit X670 series switch, note the direction of ventilation airflow, and verify that the power supply airflow direction is the same as that of the switch.

   In a switch with front-to-back airflow, the fan modules are labeled Air Out.

   In a switch with back-to-front, the fan modules are labeled **Air In**.
4 Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors (see the figure below).
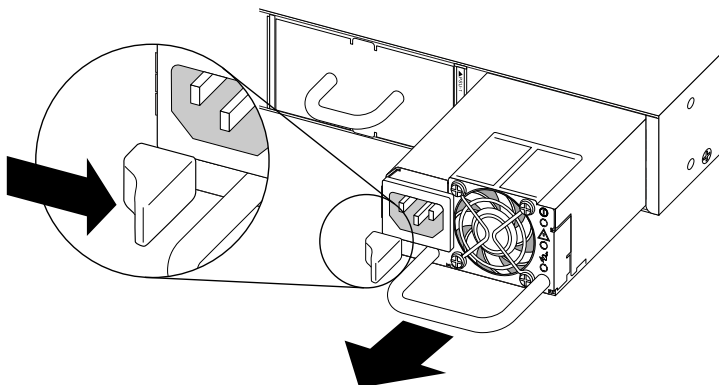
Figure 343: Removing a Summit 450 W or 550 W AC Power Supply

5 Carefully slide the power supply the rest of the way out of the switch.

> **Caution**
> Power supplies may become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.

> **Note**
> If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

6 Verify that the replacement power supply is oriented the same way as the unit you removed.

   a For a Summit X670 series switch, verify that the airflow direction of the power supply matches the airflow direction of the switch.

7   Carefully slide the power supply all the way into the power supply bay (see the figure below).

8   Push the power supply in until the latch snaps into place.
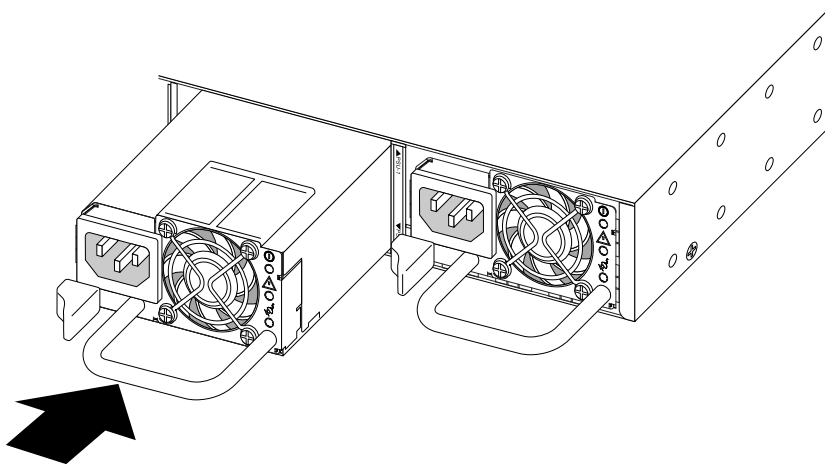
Figure 344: Installing a Summit 450 W or 550 W AC Power Supply

> ⚠ Caution
>
> Do not slam the power supply into the switch.

9   Connect the power cord to the power supply and to a grounded AC power outlet.

> ⚡ Warning
>
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

10 If the power supply is equipped with a power cord retainer, use the retainer to secure the power cord to the power supply.

Replacing a Summit 750 W AC Power Supply

The Summit 750 W AC power supply is compatible with the Summit X460 series PoE-capable switches.

You need the following tools and materials to replace a Summit 750 W AC power supply:

• Thermal protective gloves

• AC power cord, if you will not be re-using the cord from the removed power supply

    An AC power cord is not included with a Summit AC power supply. You must obtain a power supply cord that meets the requirements listed under Power Cord Requirements for AC-Powered Switches and AC Power Supplies.

These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one Summit AC power supply without powering down the switch.

To replace a Summit 750 W AC power supply:

1   Disconnect the AC power cord from the wall outlet and from the power supply.

2   Note the orientation of the installed power supply (see the figure below).

3   Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors.
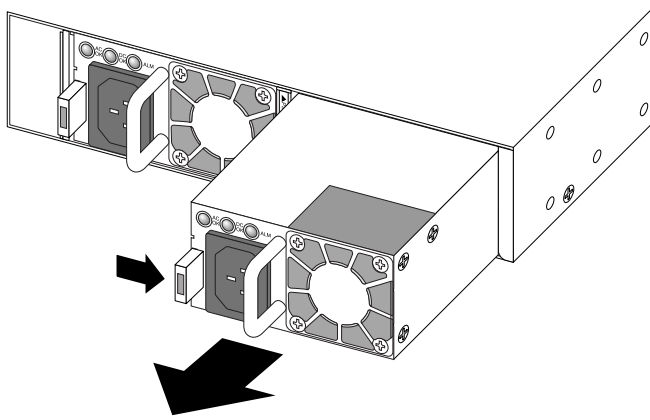
Figure 345: Removing a Summit 750 W AC Power Supply

4   Carefully slide the power supply the rest of the way out of the switch.

> **Caution**
>
> Power supplies may become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.

> **Note**
>
> If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5   Verify that the replacement power supply is oriented the same way as the unit you removed.

6   Carefully slide the power supply all the way into the power supply bay (see the figure below).

7 Push the power supply in until the latch snaps into place.

Figure 346: Installing a Summit 750 W AC Power Supply

> **Caution**
> Do not slam the power supply into the switch.

8 If necessary, slide the plastic cord retainer farther away from the back of the switch (see the figure below).
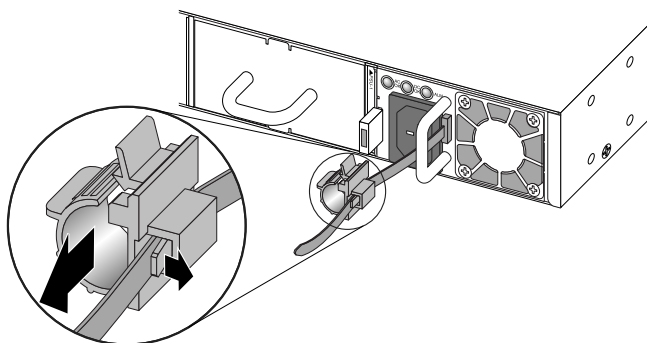
Figure 347: Moving the Power Cord Retainer

9   Connect the AC power cord to the input connector (see the figure below).
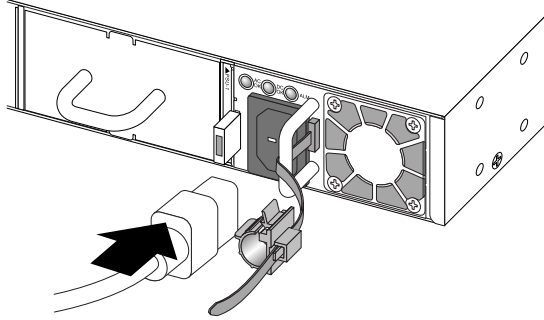
Figure 348: Connecting the Power Cord

10 Open the clip and slip it over the barrel of the connector (see the figure below).
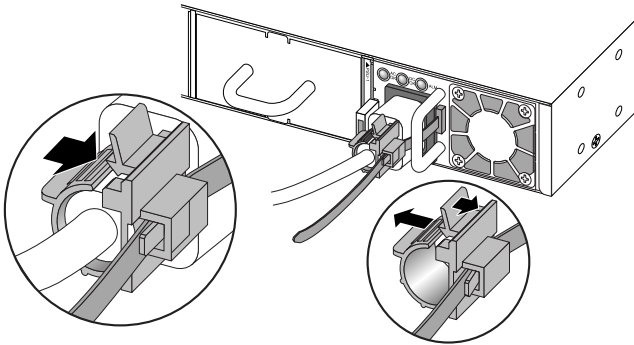
Figure 349: Attaching the Power Cord Retainer

11 Snap the clip firmly around the connector.
12 Connect the other end of the power cord to an AC power outlet.

Replacing a Summit X850 W AC Power Supply

The Summit 850 W AC power supplies are compatible with the Summit X650 series switches.

You need the following tools and materials to replace a Summit X850 W AC power supply:

• Thermal protective gloves
• AC power cord, if you will not be re-using the cord from the removed power supply

These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one Summit AC power supply without powering down the switch.

To replace a Summit X850 W AC power supply:

1 Disconnect the AC power cord from the wall outlet and from the power supply.
2 Note the orientation of the installed power supply, and the location of the latching tab at the right of the unit.
3 Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors (see Figure 350: Removing a Summit X650 AC Power Supply on page 355).

Figure 350: Removing a Summit X650 AC Power Supply

4 Carefully slide the power supply the rest of the way out of the switch.

> **Caution**
> Power supplies may become very hot during operation. Wear thermal protective gloves when you remove a power supply from an operating switch.
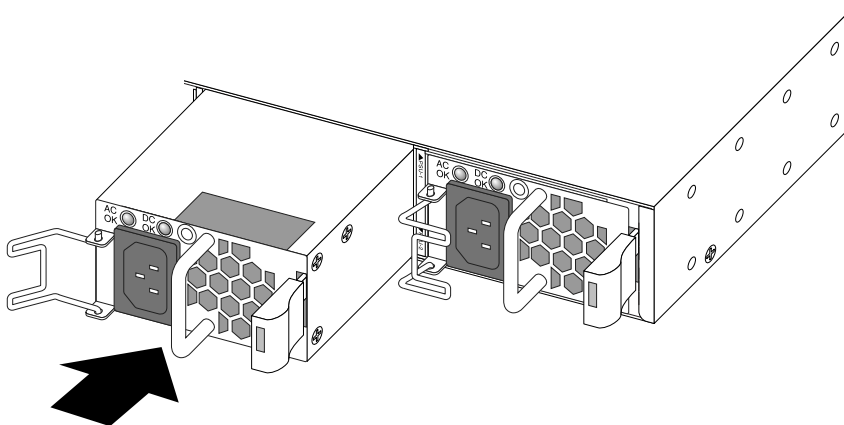
> **Note**
> If you are not installing a replacement power supply, install a cover over the unoccupied power supply bay. Unoccupied bays must always be covered to maintain proper system ventilation and EMI levels.

5 Verify that the replacement power supply is oriented the same way as the unit you removed.
6 Carefully slide the power supply all the way into the power supply bay (see the figure below).

7   Push the power supply in until the latch snaps into place.

Figure 351: Installing A Summit X650 AC Power Supply

> ⚠️ **Caution**
> Do not slam the power supply into the switch.

8   Connect the power cord to the power supply and to a grounded AC power outlet.

> ⚠️ **Warning**
> Always be sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

9   If the power supply is equipped with a power cord retainer, use the retainer to secure the power cord to the power supply.

Removing EPS Series AC Redundant Power Supplies

Removing an EPS-LD or EPS-500 Power Supply

To remove an EPS-LD or EPS-500 power supply:

1   Disconnect the AC power by removing the plug from the wall.
2   Disconnect the AC power cord from the power supply.
3   Disconnect the redundant power cord that connects the switch to the power supply.
4   Remove the mounting screws securing the power supply to the rack.
5   Slide the power supply out of the rack.

Removing an EPS-160 Power Supply 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.
3 Disconnect the redundant power cord from the EPS-160.
4 Loosen the captive retaining screws on the front of the EPS-160 and slide it out of the EPS-T.

Removing an EPS-600LS Power Module

This enables a graceful power transition from the external power supplies to the internal power supply.

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 chassis.
5 Slide the EPS-600LS unit out of the EPS-C chassis.

10 Replacing DC Power Supplies in Summit Family Switches

Replacing a Summit 300 W DC Power Supply
Replacing a Summit 450 W or 550 W DC Power Supply
Replacing a Summit 850 W DC Power Supply
Removing an EPS-150DC Power Module from an EPS-T2 Tray

This chapter describes how to replace DC power supplies in a Summit X460, X480, X650, or X670 series switch. These switches have two bays for hot-swappable power supplies. In a switch with a redundant power configuration, you can replace one Summit DC power supply without powering down the switch.

Note
Read the information in this chapter thoroughly before attempting to replace one of the listed Summit X650 components.

Replacing a Summit 300 W DC Power Supply

These switches have two bays for hot-swappable power supplies. In a redundant power configuration, you can replace one Summit DC power supply without powering down the switch.

The following instructions apply to both the Model 10933 and 10934A 300 W DC power supplies.

You need the following tools and materials to replace a Summit 300 W DC power supply:
- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- Thermal protective gloves (required for removal of a power supply)

Warning
Be sure to disconnect all power cables before you disconnect the chassis ground wire.

Removing the Power Supply

To remove an installed Summit 300 W DC power supply:

1 De-energize the DC circuit.
2 Disconnect the DC power cables as follows:
   a Slide the cover off the terminal block.
   b Loosen the screws that secure the cable terminals to the terminal block.
   c Slide the wires out from under the captive washers.

3   Disconnect the ground wire as follows:

    a   Remove the screw that secures the ground wire to the power supply.

    b   Move the wire away from the power supply.

4   Push the latching tab to the left as you pull outward on the handle to disengage the power supply internal connectors (see the figures below).
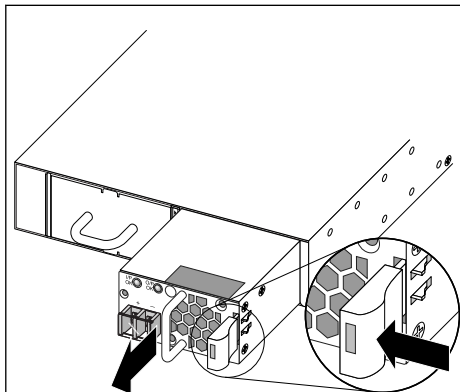
Figure 352: Removing a Summit 300 W DC Power Supply (Model 10934A)
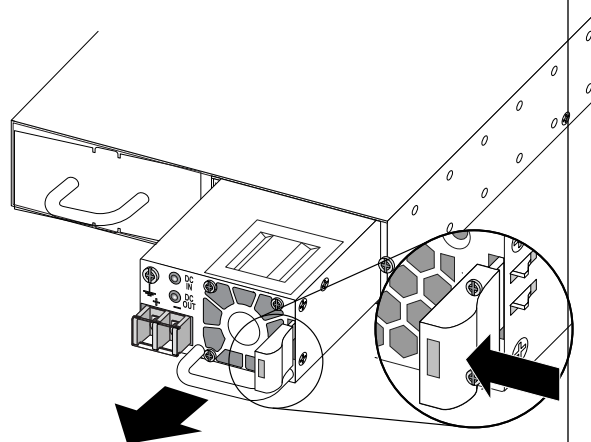
Figure 353: Removing a Summit 300 W DC Power Supply (Model 10933)

5   Carefully slide the power supply the rest of the way out of the switch.

Install the Replacement Power Supply

To install a replacement Summit 300 W DC power supply:

1   Verify that the power supply is right side up. See Figure 354: Installing a Summit 300 W DC Power Supply (Model 10934A) on page 360 and Figure 355: Installing a Summit 300 W DC Power Supply (Model 10933) on page 360.

2   Carefully slide the power supply all the way into the power supply bay. See Figure 354: Installing a Summit 300 W DC Power Supply (Model 10934A) on page 360 and Figure 355: Installing a Summit 300 W DC Power Supply (Model 10933) on page 360.

3   Push the power supply in until the latch snaps into place.

> ⚠️ **Caution**
> Do not slam the power supply into the switch.

Figure 354: Installing a Summit 300 W DC Power Supply (Model 10934A)

Figure 355: Installing a Summit 300 W DC Power Supply (Model 10933)
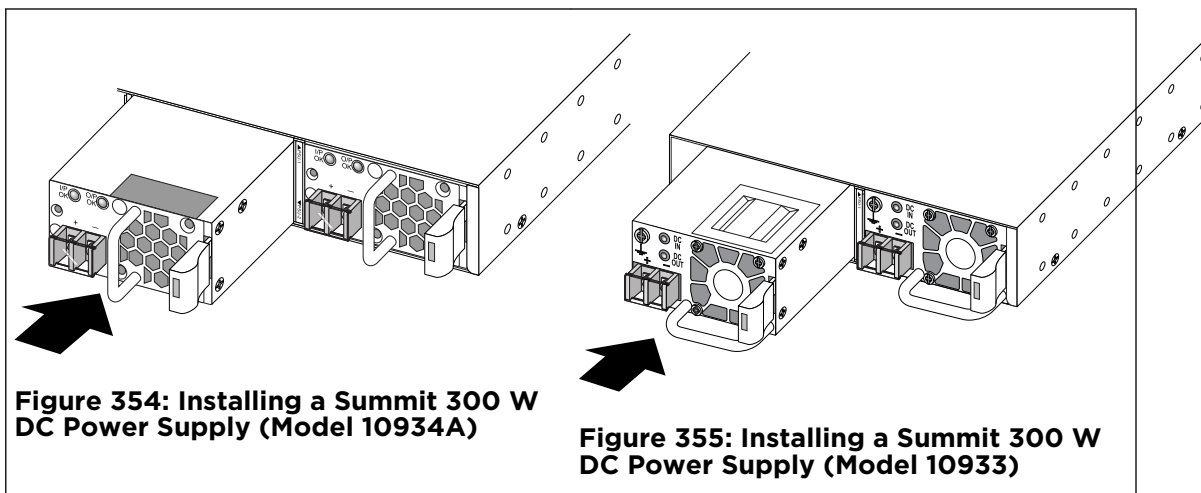
Connecting the Ground Wire

To connect the ground wire to the Summit 300 W DC power supply:

1 Verify that the DC circuit is de-energized.
2 Identify the grounding point on the front panel of the power supply (see Figure 356: Connecting the Ground Wire (Model 10934A) on page 360).
3 Insert an M3.5 screw (provided) through the ring terminal on the ground wire and into the grounding point on the power supply.
4 Tighten the screw to 12.6 inch-pounds.
5 Connect the other end of the wire to a known reliable earth ground point at your site.
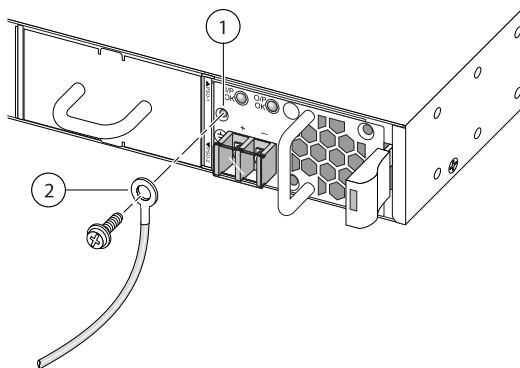
Figure 356: Connecting the Ground Wire (Model 10934A)

1 = Grounding point	2 = Ground wire
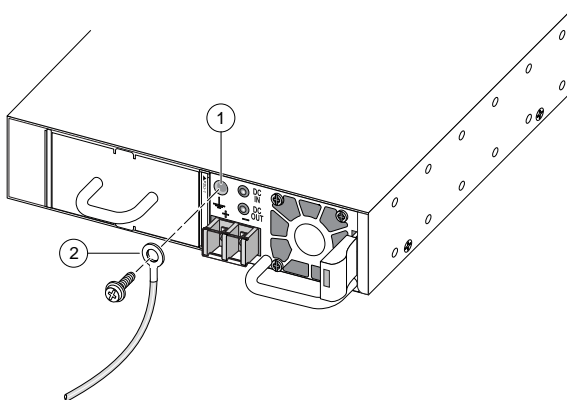
Figure 357: Connecting the Ground Wire (Model 10933)

1 = Grounding point	2 = Ground wire

Connecting the DC Power Cables

The model 10933 connects to both +24V and -48V power supplies, while the model 10934A connects to -48V power supplies only.

> **Note**
>
> The connection instructions are different depending upon which type of power source you are connecting to. The model 10933 can connect to both +24V and -48V sources, while the 10934A can connect to only -48V sources.

Connecting the DC Power Cables on the Model 10933 DC Power Supply to a +24V Source

> **Caution**
>
> These instructions are for the Model 10933 DC power supply only. Do not connect a Model 10934A DC power supply to a +24V source.

To connect the DC power cables to the Model 10933 Summit DC power supply to a 24V source:

1 Verify that the DC circuit is de-energized.
2 Slide the cover off the terminal block (see).
3 Connect the DC power input cables as follows:

   a On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.
   b Slide the spade terminal of the **negative** wire (–24V) under the captive square washer on the **negative** terminal (labeled –24V).

c   Slide the spade terminal of the **positive** wire (+24V) under the captive square washer on the **positive** terminal (labeled +24V).

Figure 358: Connecting the DC Power Cables (Part 1)

d   Tighten both screws on the terminal block to 11 inch-pounds (see Figure 359: Connecting the DC Power Cables (Part 2) on page 363).

4   Slide the cover into place over the terminal block (see Figure 359: Connecting the DC Power Cables (Part 2) on page 363).

Figure 359: Connecting the DC Power Cables (Part 2)

5   Energize the DC circuit.

Connecting the DC Power Cables on the Model 10933 or 10934A 300W DC Power Supply to a -48V power source

1   Verify that the DC circuit is de-energized.
2   Slide the cover off the terminal block (see Figure 360: Connecting the DC Power Cables (Part 1) on page 364).
3   Connect the DC power input cables as follows:

   a   On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.
   b   Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled –48V).

c   Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on the **positive** terminal (labeled RTN).

Figure 360: Connecting the DC Power Cables (Part 1)

d   Tighten both screws on the terminal block to 11 inch-pounds (see).

4   Slide the cover into place over the terminal block (see).

RTN   -48V

(+)

(−)

Figure 361: Connecting the DC Power Cables (Part 2)

5   Energize the DC circuit.

Replacing a Summit 450 W or 550 W DC Power Supply

The Summit 550 W DC power supplies are compatible only with Summit X670 series switches. The 550 W DC power supplies are available in versions for switches with either front-to-back or back-to-front airflow.

The Summit X480 and X670 switches have two bays for hot-swappable power supplies. In a redundant power configuration, you can replace one Summit X480 DC power supply without powering down the switch.

You need the following tools and materials to replace a Summit 450 W DC power supply:
- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- Thermal protective gloves (required for removal of a power supply)

Note

You cannot combine 450 W power supplies and 550 W power supplies in the same Summit X670 series switch.

Removing the Power Supply

> **Caution**
>
> The DC power supply may be hot to the touch; use thermal protective gloves when handling the power supply during removal.

To remove an installed Summit 450 W OR 550 W DC power supply:

1 De-energize the DC circuit.
2 Disconnect the DC power cables as follows:

   a Pull the cover off the terminal block.
   b Loosen the screws that secure the cable terminals to the terminal block.
   c Slide the wires out from under the captive washers.

   > **Warning**
   >
   > Be sure to disconnect all power cables before you disconnect the chassis ground wire.

3 Disconnect the ground wire as follows:

   a Loosen the screw that secures the ground wire to the terminal block.
   b Slide the wire out from under the captive washer.
4 Note the orientation of the installed power supply.
5 For a Summit X670 series switch, note the direction of ventilation airflow, and verify that the power supply airflow direction is the same as that of the switch.

   In a switch with front-to-back airflow, the fan modules are labeled **Air Out**.

   In a switch with back-to-front, the fan modules are labeled **Air In**.
6 Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors.
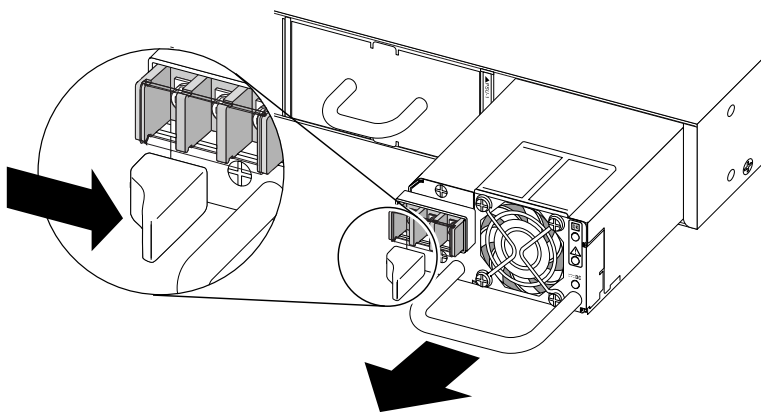
Figure 362: Removing a Summit 450 W or 550 W DC Power Supply

7 Carefully slide the power supply the rest of the way out of the switch.

8 If a replacement power supply will not be installed, install a cover over the unoccupied power supply bay.

> **Note**
>
> Unoccupied power supply bays must always be covered to maintain proper system ventilation and EMI levels.

Installing the Replacement Power Supply

To install a replacement Summit 450 W or 550 W DC power supply:

1 Verify that the replacement power supply is oriented the same as the unit you removed (see Figure 363: Installing a Summit 450 W or 550 W DC Power Supply on page 367). For a Summit X670 series switch, verify that the airflow direction of the power supply matches the airflow direction of the switch.
2 Carefully slide the power supply all the way into the power supply bay (see Figure 363: Installing a Summit 450 W or 550 W DC Power Supply on page 367).
3 Push the power supply in until the latch snaps into place.

> **Caution**
>
> Do not slam the power supply into the switch.
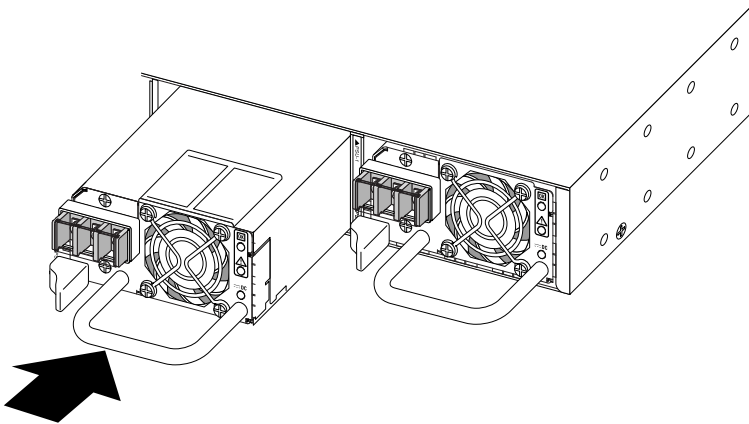
Figure 363: Installing a Summit 450 W or 550 W DC Power Supply

4 Reconnect the ground wire as described in the next section.

Connect the Ground Wire

> **Warning**
>
> Be sure to connect the chassis ground wire before you connect any power cables.

To connect the ground wire to the Summit 450 W or 550 W DC power supply:

1 Verify that the DC circuit is de-energized.

2 Pull the cover off the terminal block (Connecting the Ground Wire).

3 Identify the grounding point at the left of the terminal block (Connecting the Ground Wire).
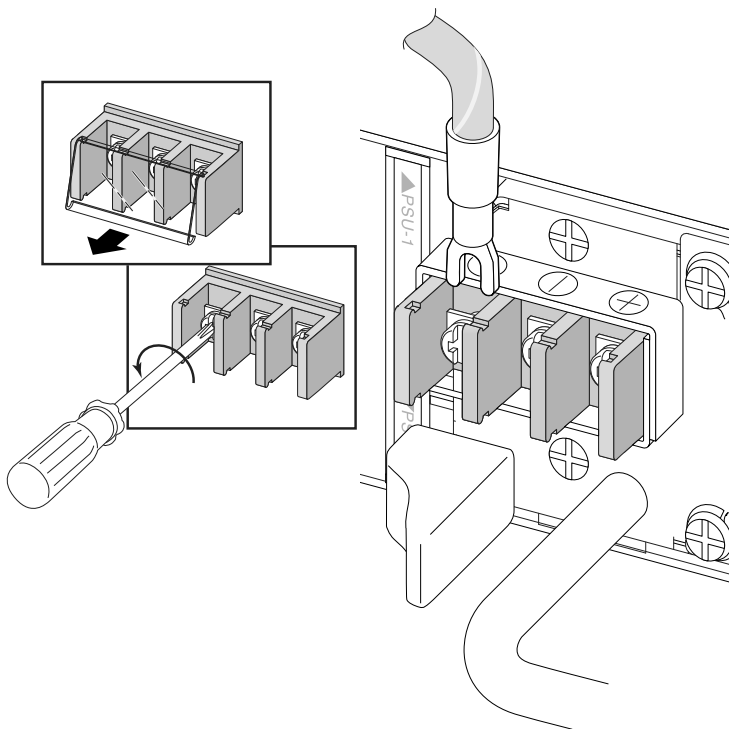
Figure 364: Connecting the Ground Wire

4 Connect the ground wire to the grounding point as follows:

a Loosen the screw enough to allow the spade terminal to slide underneath the captive square washer (Securing the Ground Wire).

b Slide the spade terminal of the ground wire under the captive square washer.

c   Tighten the screw to 7 inch-pounds (0.99 Newton meters) ().
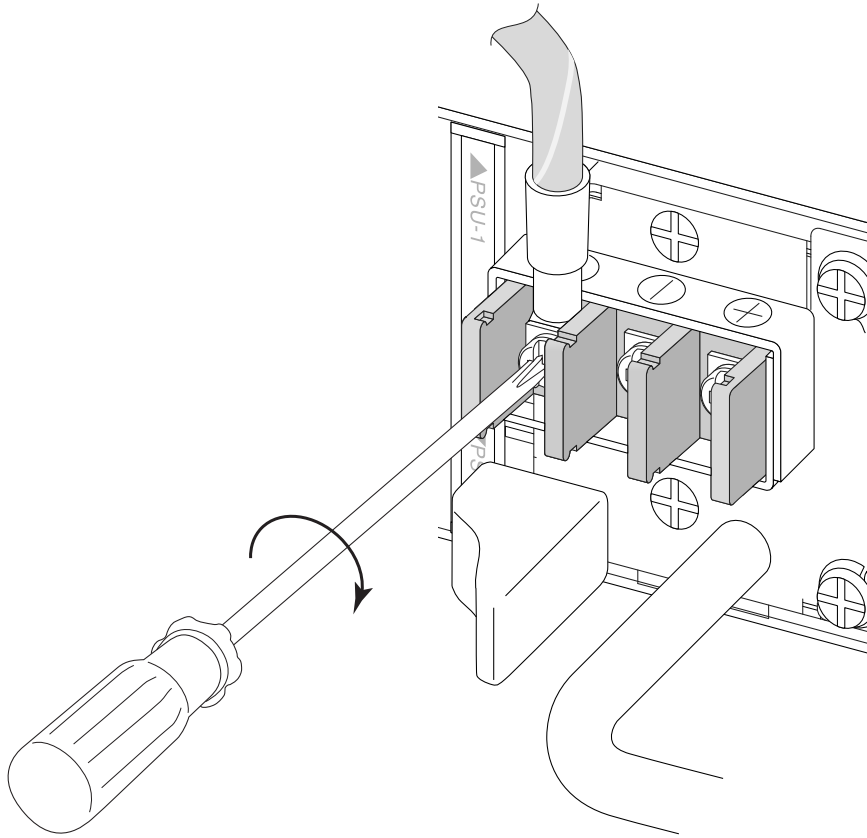
Figure 365: Securing the Ground Wire

5   Connect the other end of the wire to a known reliable earth ground point at your site.

Connect the DC Power Cables

Warning

Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the Summit 450 W or 550 W DC power supply.

Caution

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

To connect the DC power cables to the Summit 450 W DC power supply:

1   Verify that the DC circuit is de-energized.

2   Connect the DC power input cables as follows:

a   On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer (Connecting the DC Power Cables (Part 1)).

b   Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled **–**).

c   Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on the **positive** terminal (labeled **+**).
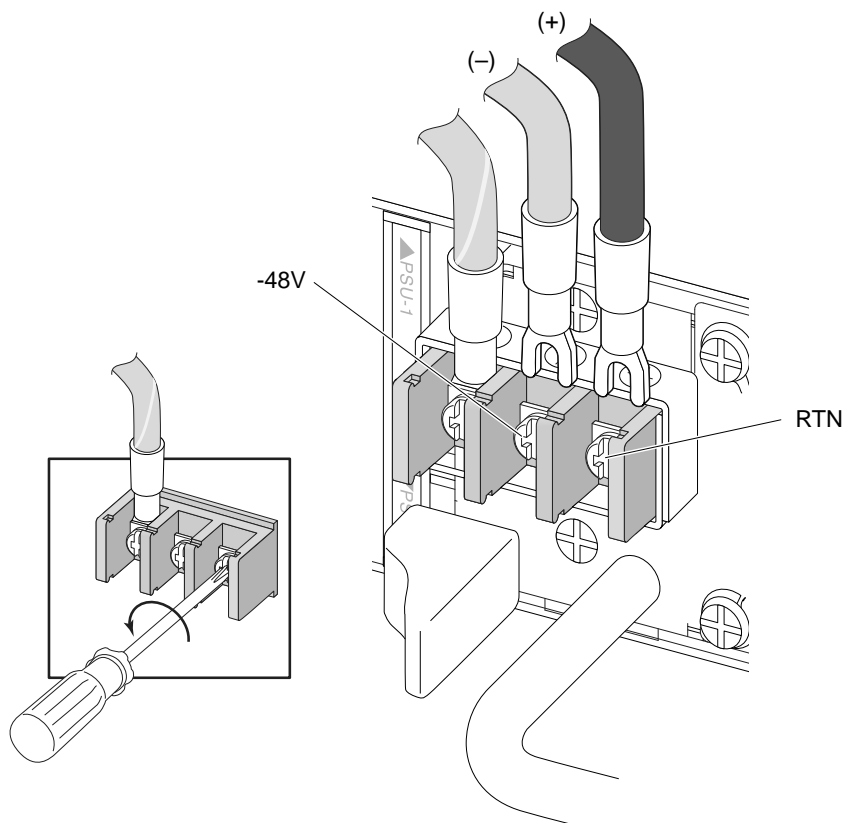
Figure 366: Connecting the DC Power Cables (Part 1)

d   Tighten both screws on the terminal block to 7 inch-pounds (0.99 Newton meters) (Connecting the DC Power Cables (Part 2)).

3   Snap the cover into place over the terminal block ().
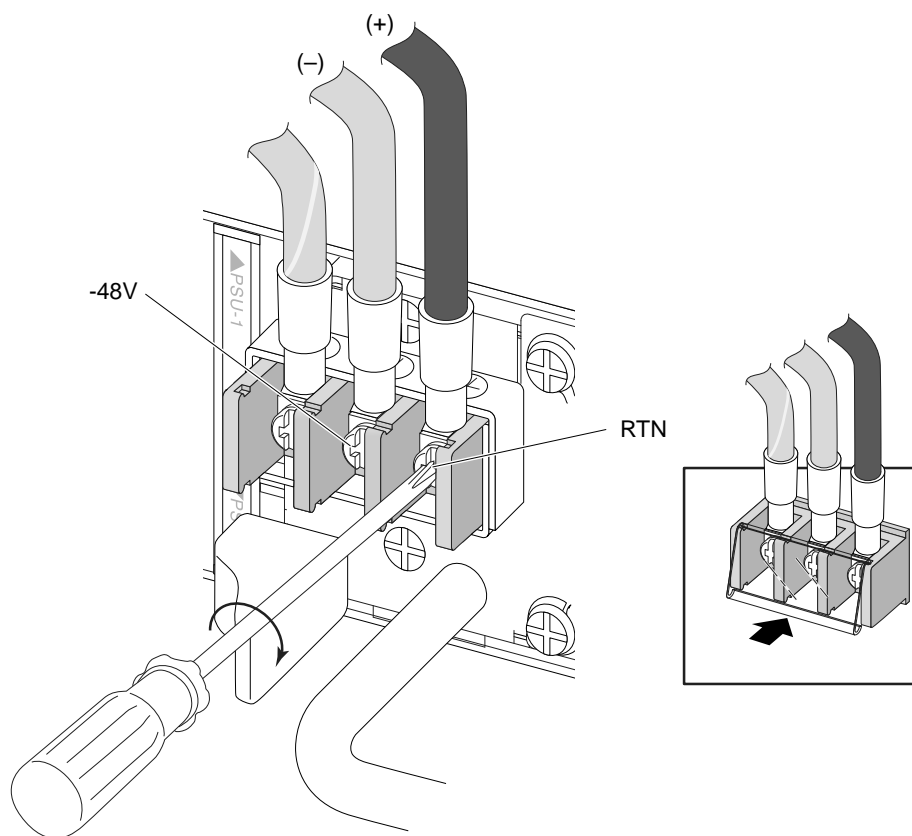
Figure 367: Connecting the DC Power Cables (Part 2)

4   Energize the DC circuit.

Replacing a Summit 850 W DC Power Supply

You need the following tools and materials to replace a Summit 850 W DC power supply:

- #1 Phillips screwdriver
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts
- Thermal protective gloves (required for removal of a power supply)

> ⚠ **Warning**
>
> Be sure to disconnect all power cables before you disconnect the chassis ground wire.

Remove the Power Supply

To remove an installed Summit 850 W DC power supply:

1   De-energize the DC circuit.
2   Disconnect the DC power cables as follows:

    a   Slide the cover off the terminal block.

    b   Loosen the screws that secure the cable terminals to the terminal block.

    c   Slide the wires out from under the captive washers.

3   Disconnect the ground wire as follows:

    a   Remove the screw that secures the ground wire to the power supply.

    b   Move the wire away from the power supply.

4   Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors.
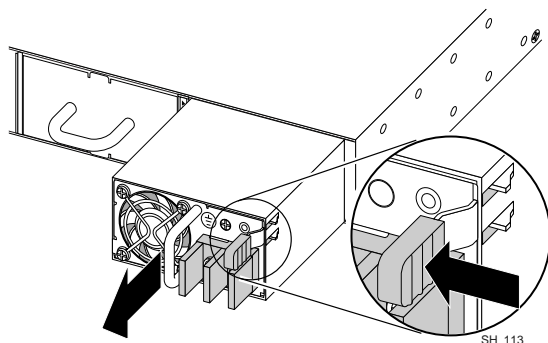
Figure 368: Removing a Summit 850 W DC Power Supply

Installing the Replacement Power Supply

To install a replacement Summit 850 W DC power supply:

1   Verify that the power supply is right side up. Carefully slide the power supply all the way into the power supply bay.

2   Push the power supply in until the latch snaps into place.

Caution

Do not slam the power supply into the switch.
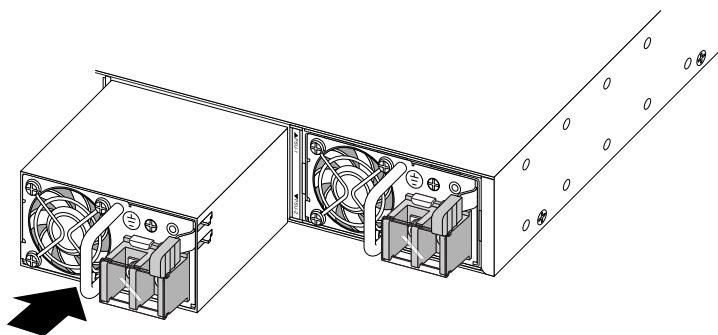
Figure 369: Installing a Summit 850 W DC Power Supply

Connecting the Ground Wire

To connect the ground wire to the Summit 850 W DC power supply:

1 Verify that the DC circuit is de-energized.
2 Identify the grounding point on the front panel of the power supply (see Figure 370: Connecting the Ground Wire on page 373).
3 Insert an M3.5 screw (provided) through the ring terminal and into the grounding point on the power supply.
4 Tighten the screw to 12.6 inch-pounds.
5 Connect the other end of the wire to a known reliable earth ground point at your site.
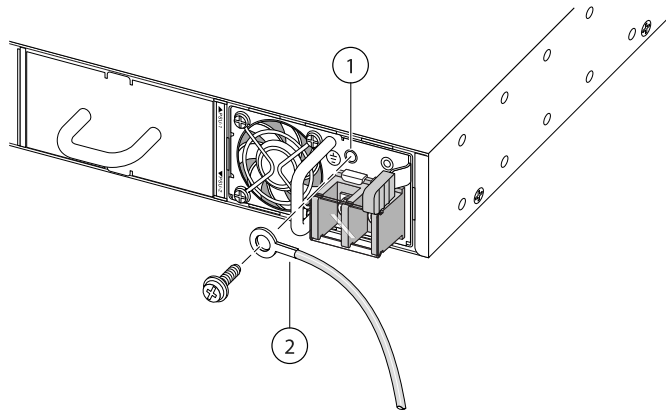
Figure 370: Connecting the Ground Wire

1 = Grounding point	2 = Ground wire

Connecting the DC Power Cables

1 Verify that the DC circuit is de-energized.
2 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.
3 Slide the cover off the terminal block.
4 Connect the DC power input cables as follows:

   a On each terminal, loosen the screw enough to allow the spade terminal to slide underneath the captive square washer.
   b Slide the spade terminal of the **negative** wire (–48 V) under the captive square washer on the **negative** terminal (labeled –48V).
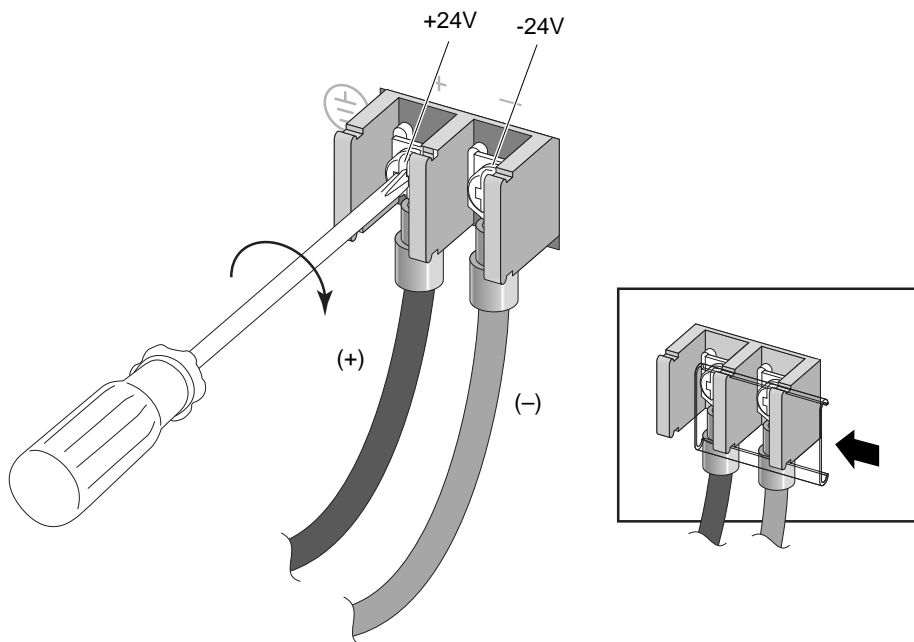
c Slide the spade terminal of the **positive** wire (–48 V RTN) under the captive square washer on the **positive** terminal (labeled RTN).

Figure 371: Connecting the DC Power Cables (Part 1)

d Tighten both screws on the terminal block to 11 inch-pounds.

5 Slide the cover into place over the terminal block .

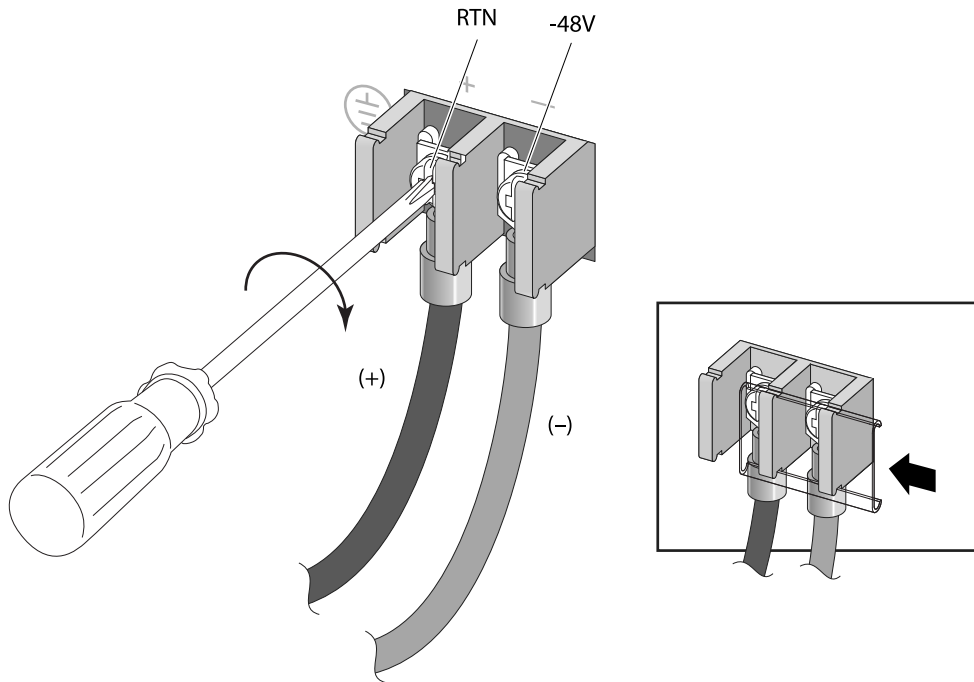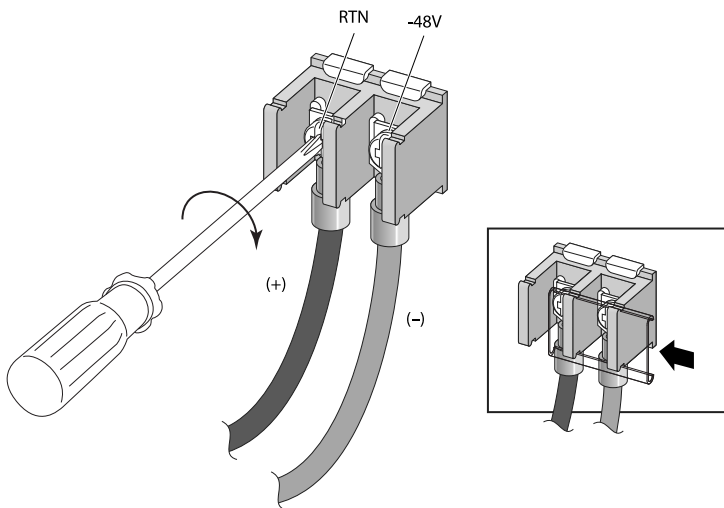**Figure 372: Connecting the DC Power Cables (Part 2)**

6 Energize the DC circuit.

Removing an EPS-150DC Power Module from an EPS-T2 Tray

Warning

Always be sure that the DC circuit is de-energized before disconnecting any cables and attempting to remove an EPS-150DC power module.

Warning

Removing the DC wiring harness from your facilities DC source voltage must be done by a qualified, licensed electrician.

To disconnect and remove an EPS-150DC power module:

1   Attach an ESD-preventive strap to your bare wrist and connect the metal end to the an appropriate ground point on the equipment rack.
2   De-energize the DC circuit.
3   At the back of the system, remove power from the EPS-150DC power module by unplugging the DC connector from the DC power supply socket on the rear of the EPS-150DC unit.

    a   Loosen the retainer nut on the DC power connector and unplug the connector from the back of the power unit.
4   At each end of the redundant power cable, unscrew the captive retaining screws on the power connector and disconnect the cable from the switch and the EPS-150DC unit.
5   Loosen the thumbscrews on the front of the EPS-150DC unit until they are completely free of the EPS-T tray, and slide the EPS-150 unit out of the tray.

11 Replacing Fan Modules in Summit Family Switches

This section describes how to replace fan modules in a Summit X460, X480, X650, X670, or X770 series switch.

The procedure for replacing a fan module is the same for all switch series. Illustrations in this chapter show the Summit X460 and X650 series switches.

> **Note**
> Read the information in this chapter thoroughly before attempting to replace a fan module.

Pre-Installation Requirements

You need a 1/4-inch flat-blade screwdriver to replace a fan module in a Summit family switch.

> **Caution**
> Be sure to finish the replacement procedure promptly. The switch may overheat if it is left without cooling for an extended period.

Airflow Direction Requirements in Summit X670 and X770 Series Switches

The Summit X670 and X770 switches are available in models with the following ventilation airflow direction:

- The air flows from front to back. In these switch models, the fan modules are labeled **Air Out**.
- The air flows from back to front. In these switch models, the fan modules are labeled **Air In**.

All installed fan modules must blow air in the same direction and must match the airflow direction of the installed power supplies.

Replacing a Summit Fan Module

To replace the fan module:

1   Completely loosen the captive retaining screws on the fan module.

    On the Summit X460, X480, and X650 series switches, the fan module has two retaining screws at the bottom corners of the module Figure 373: Removing a Summit Fan Module (Summit X460 Series Switch Shown) on page 377.

    On the Summit X670 and X770 series switches, the fan module has a single retaining screw at the top right corner of the module.

2   Slide the fan module out of the switch and set it aside.
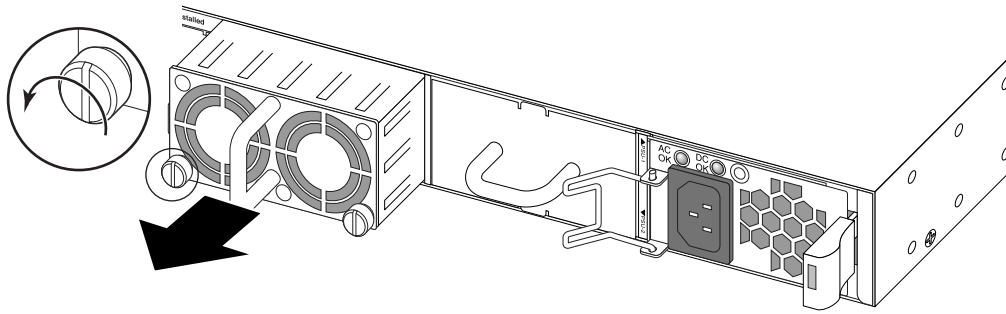
Figure 373: Removing a Summit Fan Module (Summit X460 Series Switch Shown)

3   For a Summit X670 and X770 series switch, verify that the airflow direction on the replacement fan module matches that of the installed fan modules.

    Fans with front-to-back airflow are labeled **Air Out**.

    Fans with back-to-front airflow are labeled **Air In**.

4   Carefully slide the replacement fan module into the switch.
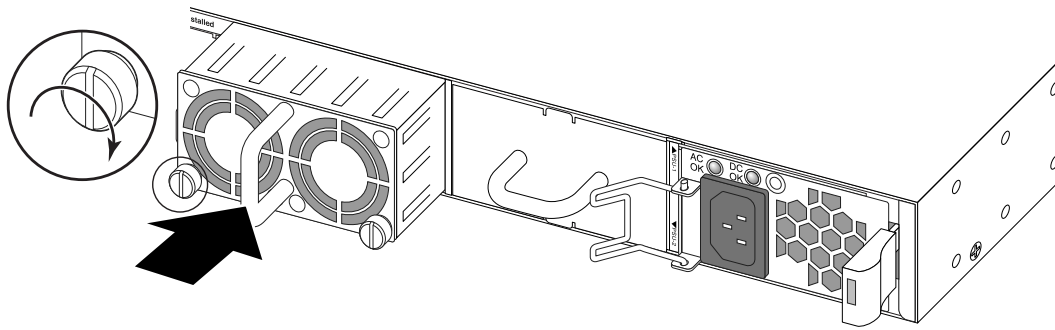
Figure 374: Installing a Summit Fan Module (Summit X460 Series Switch Shown)

5   Align and fully tighten the captive retaining screws.

12 Replacing Port Option Cards and VIMs

Replacing a Stacking Module or Option Card in Slot B of a Summit X460 Series Switch
Replacing an XGM3/XGM3S Series Port Option Card in a Summit X460 Series Switch
Replacing a Versatile Interface Module (VIM) in a Summit X480, X650 or X670 Series Switch
Replacing XGM and XGM2 Series Port Option Cards

This section describes how to replace port option cards, stacking modules, and versatile interface modules (VIMs) in a Summit X460, X480, X650, or X670 series switch.

> **Note**
> Read the information in this chapter thoroughly before attempting to replace one of the listed Summit X650 components.

Replacing a Stacking Module or Option Card in Slot B of a Summit X460 Series Switch

Slot B on the back of a Summit X460 series switch accommodates a SummitStack or a SummitStack-V80 stacking module, or an XGM3SB-4sf port option card. The replacement process is the same for either of these options.

You need the following tools to replace a stacking module:
- ESD-preventive wrist strap
- Screwdriver

To replace a stacking module or option card in Slot B:

1   Attach an ESD-preventive wrist strap to your wrist and connect the metal end to an appropriate ground point on the rack.

2 Completely loosen the captive retaining screws and slide the installed option card or stacking module out of the switch.
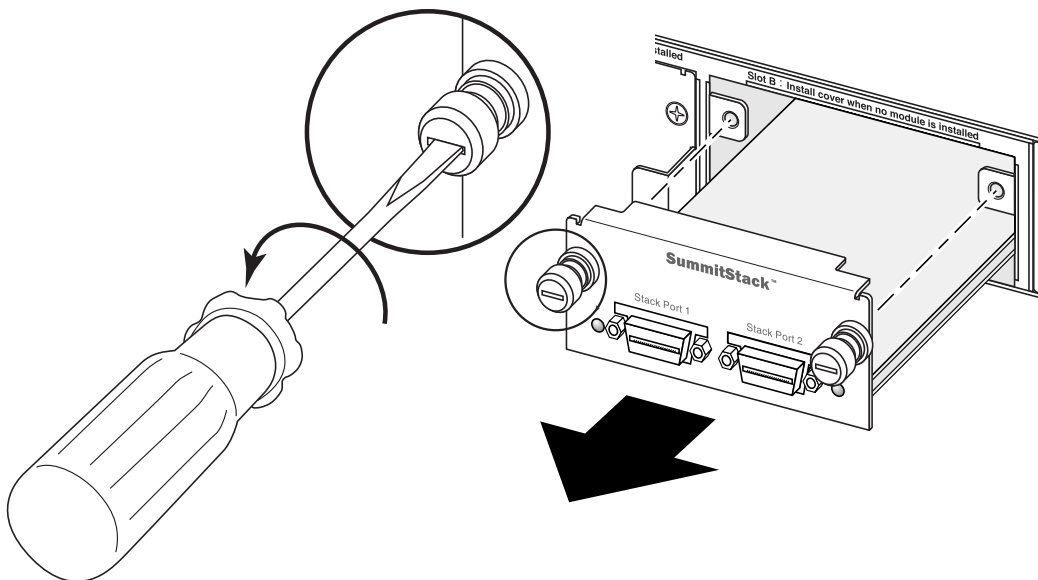
Figure 375: Removing a SummitStack Module

3 Carefully slide the replacement module or card into the switch (see Figure 376: Installing a SummitStack Module on page 379).

4 Align and tighten the captive retaining screws.
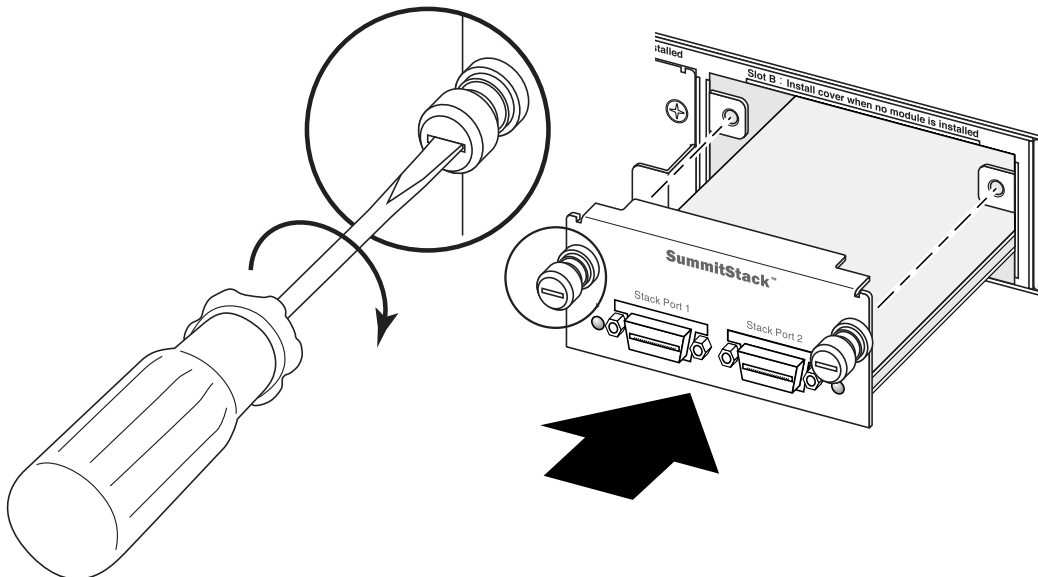
Figure 376: Installing a SummitStack Module

Replacing an XGM3/XGM3S Series Port Option Card in a Summit X460 Series Switch

Note

After you replace an XGM3-2sf port option card, you must reboot the switch before the ports on the card will become operational.

To replace an XGM3/XGM3S series port option card:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2 Loosen the captive retaining screws on the option card until they are completely loose (see Figure 377: Removing an XGM3-2sf Port Option Card on page 380).

3 Carefully slide the option card out of the slot.
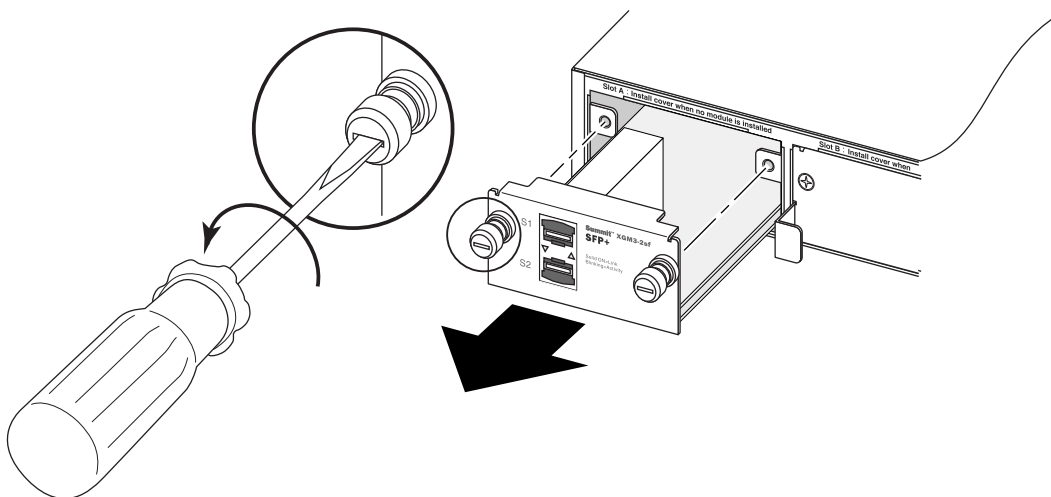
Figure 377: Removing an XGM3-2sf Port Option Card

4 Carefully slide the replacement option card into the switch.
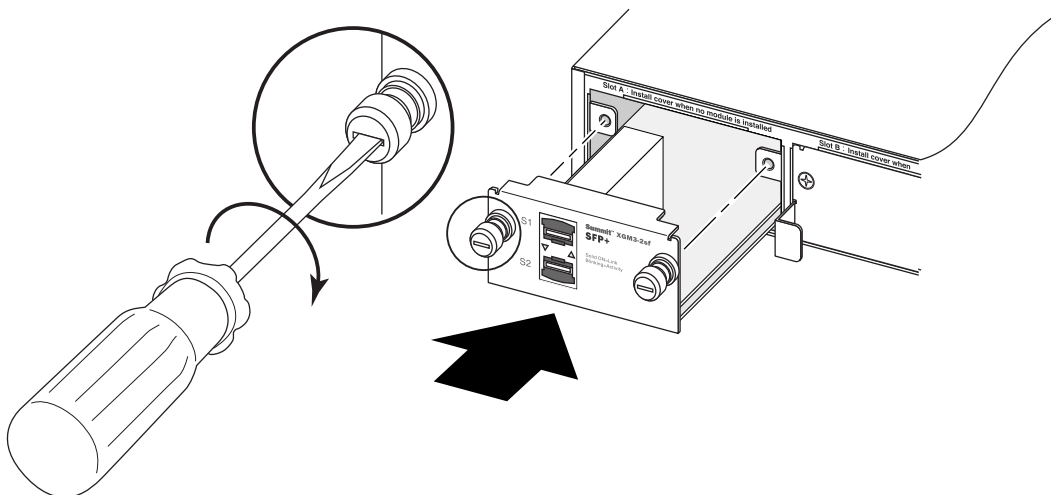
Figure 378: Installing an XGM3-2sf Port Option Card

5 Align and tighten the captive retaining screws.

Replacing a Versatile Interface Module (VIM) in a Summit X480, X650 or X670 Series Switch

You need the following tools and materials to replace a VIM:

- ESD-preventive wrist strap
- #2 Phillips screwdriver

> **Caution**
>
> Summit VIMs are not hot-swappable. Disconnect power to the switch before removing an installed VIM. After a VIM is installed in a compatible switch, you can hot-swap the installed SFP, SFP+, and QSFP+ modules. Use only SFP, SFP+, and QSFP+ modules approved by Extreme Networks.

> **Note**
>
> VIM1 modules must be installed in Summit X650 series switches, VIM2 modules must be installed in Summit X480 series switches, and VIM4 modules must be installed in Summit X670 series switches. VIM3 modules can be installed in X480, X650, and X670 series switches. AVIM will not operate if it is installed in the wrong switch series.

To replace a VIM:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the rack.

2 Disconnect the switch power.

3 Remove the installed VIM (see Figure 379: Removing a VIM (VIM1-SummitStack Module Shown) on page 381):

a Remove the retaining screws at the top corners of the module, and set the screws aside in a safeplace.

b Save the retaining screws to secure the new module in the switch.

c Rotate the inserter/extractor levers downward to disconnect the internal module connectors.

d Carefully slide the module out of the switch and set it on an anti-static surface.
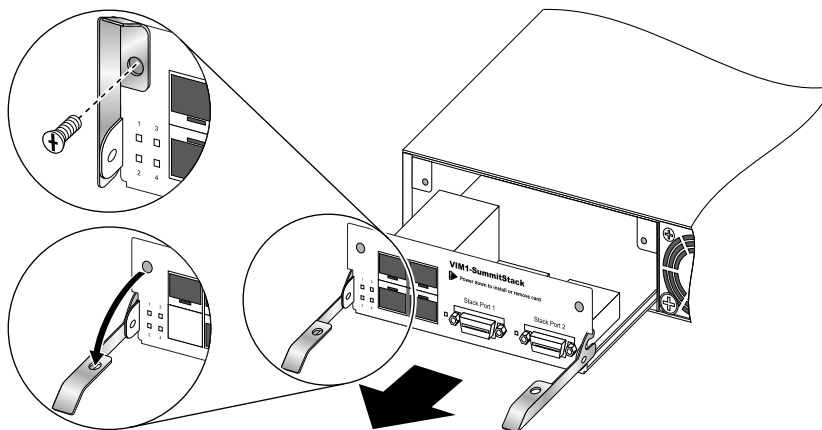
Figure 379: Removing a VIM (VIM1-SummitStack Module Shown)

4 Remove the replacement VIM from its anti-static packaging.

5 Install the replacement VIM in the switch (see):

 a Make sure the inserter/ejector levers are rotated down.

 b Carefully slide the module into the switch until the inserter/ejector levers begin to rotate upward.

 c Simultaneously rotate both levers upward to seat the module internal connectors.

 d Insert and tighten the retaining screws you removed earlier.

Figure 380: Installing a VIM

VIM2-SummitStack module	VIM4-40G4X module

Replacing XGM and XGM2 Series Port Option Cards

This section describes how to replace XGM and XGM2 series port option cards in Summit X350, X450a, and X450e series switches.

Caution

Pluggable optical modules may become very hot after prolonged use. Take care when removing a pluggable optical module from the option card. If the pluggable optical module is too hot to touch, disengage the module and allow it to cool before removing it completely.

Caution

Summit port option cards are not hot-swappable. Disconnect power to the switch before installing or removing a Summit XGM or XGM2 series option card. After the Summit port option card is installed in a compatible switch, you can hot-swap pluggable optical modules. Use only optical modules approved by Extreme Networks.

To replace a port option card:

1 Disconnect the AC power and any redundant power supply from the Summit switch.

2 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to an appropriate ground point on the equipment rack.

3 Remove the screws that secure the option card to the switch.

 a Save the screws for re-use.

4 Pull the option card out of the switch and set it on an ESD-preventive surface.

5 Align the sheet metal edges on the new option card with the card guides in the switch housing.

6 Carefully slide the option card into the switch housing until the connectors engage and the card is flush with the back panel of the switch.
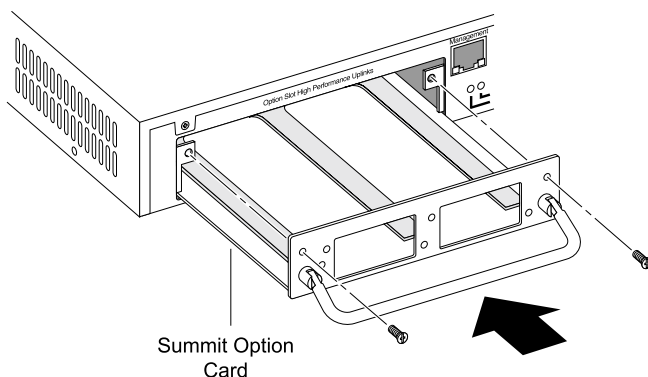
Figure 381: Installing a Summit Port Option Card (XGM-2xn Shown)

7 Use the screws you removed from the old option card to secure the new option card to the back panel of the switch.

> **Note**
>
> If you remove a Summit option card without installing a replacement, you must install a faceplate over the opening. An open slot could divert air from the switch and cause overheating.

13 Removing a Summit Family Switch from a Rack

This section describes how to remove a Summit family switch from an equipment rack.

> **Note**
>
> Read the information in this section and subsections thoroughly before attempting to remove a Summit family switch from a rack.

Overview

Depending on the switch model, the type of rack, and the position in the rack, a Summit family switch may be installed using simple front-attached mounting brackets or a combinations of front and back mounting brackets.

The following lists the locations of the removal instructions for each type of switch installation.

Table 98: Summit Switch Removal Instructions

Switch Series	Rack Type, Position	Section
Summit X150 series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X250e series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X350 series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X440 series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X450 series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X450a series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)
Summit X450e series	N/A	Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)

Table 98: Summit Switch Removal Instructions (continued)

Switch Series	Rack Type, Position	Section
Summit X460 series	Two-post, front-mount or mid-mount	Removing a Summit X460 Series Switch
Summit X480 series	Two-post, mid-mount	Removing a Mid-Mounted Switch from a Two-Post Rack
	Two-post, front-mount,	Removing a Front-Mounted Switch from a Two-Post Rack
	Four-post rack	Removing a Switch from a Four-Post Rack
Summit X650 series	Two-post rack, mid-mount	Removing a Summit X650 Series Switch from a Two-Post Rack
	Four-post rack	Removing a Summit X650 Series Switch from a Cabinet or Four-Post Rack
Summit X670 series	Two-post rack, front-mount or mid-mount	Removing the Switch from the Rack

Removing a Summit Family Switch (Models Other than Summit X460, X480, X650, and X670 Series)

To remove a Summit switch from a rack:

1 Remove power from the switch in one of the following ways:

AC-powered switch: Unplug the power cables from the from the wall outlets first and then from the switch.

DC-powered switch: De-energize the DC circuit for all power connections. Loosen the retainer nut and unplug the DC power connector from the DC power socket on the rear of the switch.

2 Disconnect the Summit switch from the redundant power supply (if applicable).

3 For a DC-powered switch, disconnect the ground:

a At the back of the switch, loosen the retaining screw on the ground lug.

a Pull the ground wire out of the lug and move the ground wire out of the way.

4 Loosen and remove the four screws holding the switch in place in the equipment rack.

5 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 must be performed by a qualified, licensed electrician.

Removing a Summit X460 Series Switch

Before you remove a Summit X460 series switch from an equipment rack, remove all installed power supplies as described in one of the following sections:

- Removing a Summit X460 AC Power Supply
- Removing a Summit X460 DC Power Supply

Removing a Summit X460 AC Power Supply

⚠️ **Caution**

The power supply may be hot to the touch; wear thermal protective gloves when handling the power supply during removal.

To remove a Summit X460 AC power supply:

1 Disconnect the AC power cord from the wall outlet and from the power supply.
2 Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors.
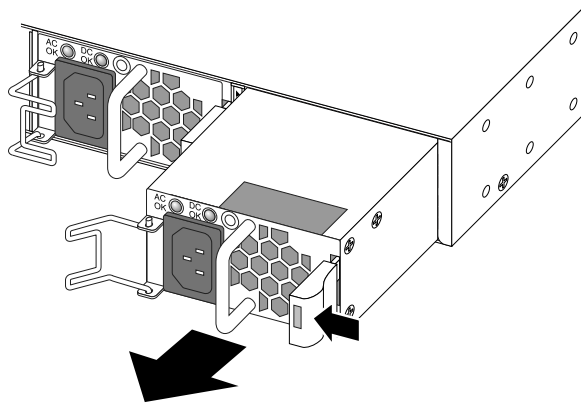
Figure 382: Removing a Summit X460 AC Power Supply

750 W AC Power Supply	300 W AC Power Supply

3 Carefully slide the power supply the rest of the way out of the switch.

Removing a Summit X460 DC Power Supply

To remove an installed Summit X460 DC power supply:

1 De-energize the DC circuit.
2 Disconnect the DC power cables as follows:
   a Slide the cover off the terminal block.
   b Loosen the screws that secure the cable terminals to the terminal block.
   c Slide the wires out from under the captive washers.
3 Disconnect the ground wire as follows:
   a Remove the screw that secures the ground wire to the power supply.
   b Move the wire away from the power supply.

4   Push the latching tab to the left as you pull outward on the handle to disengage the power supply internal connectors.
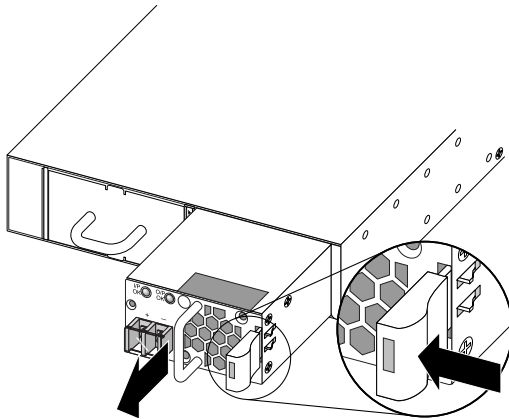
Figure 383: Removing a Summit X460 DC Power Supply

5   Carefully slide the power supply the rest of the way out of the switch.

Removing the Summit X460 Series Switch from the Rack

To remove a Summit X460 series switch from the equipment rack:

1   Verify that the power supplies have been removed from the switch.
2   Support the switch as you remove the screws that hold the switch to the rack.
3   Slide the switch out of the rack.

Removing a Summit X480 Series Switch

This section provides procedures for removing a Summit X480 series switch from a two-post or four-post equipment rack.

Before you remove a Summit X480 series switch from the rack, remove all installed power supplies.

Removing a Summit 450 W or 550 W AC Power Supply

Summit 450 W AC power supplies are used in Summit X480 series and X670 series switches.

Summit 550 W AC power supplies are used only in Summit X670 series switches.

⚠️ **Caution**

The power supply may be hot to the touch; wear thermal protective gloves when handling the power supply during removal.

To remove a Summit 450 W or 550 W AC power supply:

1   Disconnect the AC power cord from the wall outlet and from the power input connector on the power supply.

2   Push the latching tab to the right as you pull outward on the handle to disengage the power supply internal connectors.
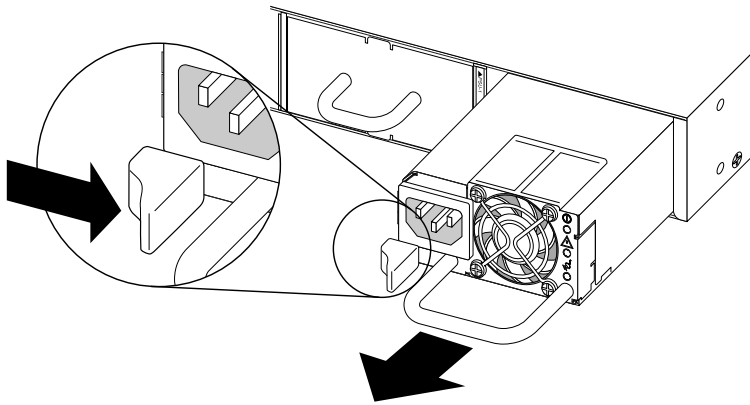
Figure 384: Removing a 450 W or 550 W AC Power Supply

3   Carefully slide the power supply the rest of the way out of the switch.

Removing a Summit 450 W or 550 W DC Power Supply

Summit 450 W DC power supplies are used in Summit X480 series and X670 series switches.

Summit 550 W DC power supplies are used only in Summit X670 series switches.

> **Warning**
>
> Be sure to disconnect all power cables before you disconnect the chassis ground wire.

> **Caution**
>
> The DC power supply may be hot to the touch; use thermal protective gloves when handling the power supply during removal.

To remove a Summit 450 W or 550 W DC power supply:

1   De-energize the DC circuit.
2   Disconnect the DC power cables as follows:
    a   Pull the cover off the terminal block.
    b   Loosen the screws that secure the cable terminals to the terminal block.
    c   Slide the wires out from under the captive washers.
3   Disconnect the ground wire as follows:
    a   Loosen the screw that secures the ground wire to the terminal block.
    b   Slide the wire out from under the captive washer.

4   Push the latching tab to the right as you pull outward on the handle to disengage the power supply internal connectors.
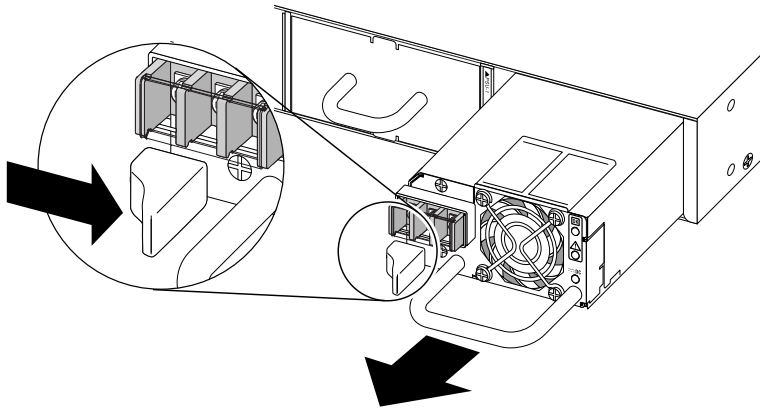
Figure 385: Removing a 450 W or 550 W DC Power Supply

5   Carefully slide the power supply the rest of the way out of the switch.

Removing a Mid-Mounted Switch from a Two-Post Rack

Removing a mid-mounted Summit X480 switch from a rack requires two people to maneuver the switch and disconnect the mounting hardware.

To remove a mid-mounted Summit X480 series switch from a two-post rack:

1   Verify that the power supplies have been removed from the switch.
2   At the front of the equipment rack, support the switch while you remove the rack-mounting screws holding the front mounting brackets in place against the rack post.
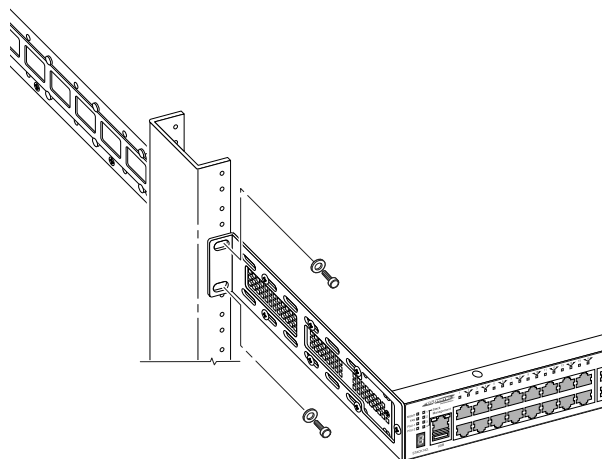
Figure 386: Removing the Front Mounting Screws from a Mid-Mount Installation

3   Remove the screws holding the front mounting brackets to the sides of the switch, and set the mounting brackets aside.

4   Support the front and back of the switch as you slide the switch back, off the rear mounting brackets, and out of the rack.

5   Set the switch on a secure work surface.
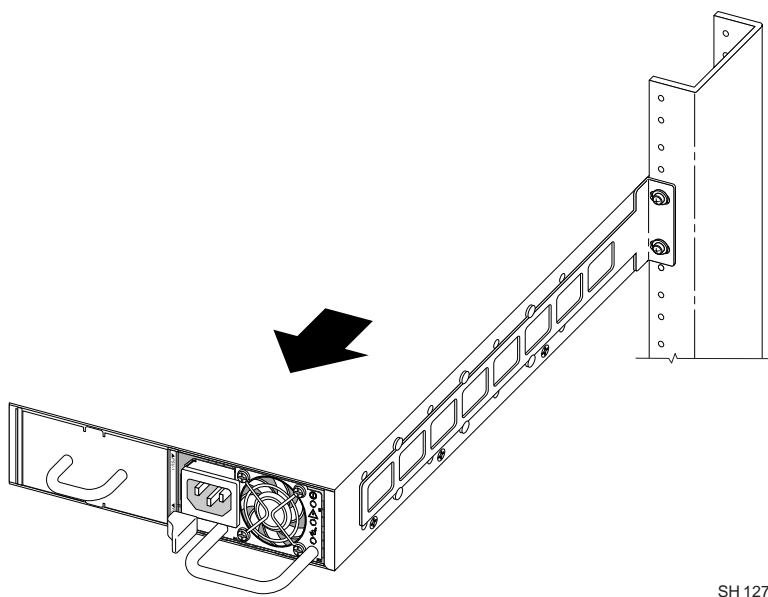
Figure 387: Removing a Mid-Mounted Switch from a Two-Post Rack

6   Remove the rack-mounting screws and detach the rear mounting brackets from the rack post.
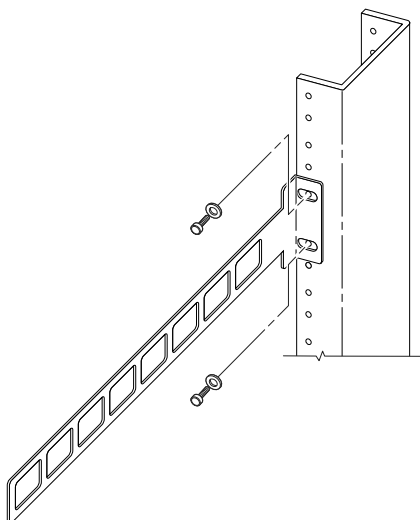
Figure 388: Removing the Rear Mounting Brackets

Removing a Front-Mounted Switch from a Two-Post Rack

Removing a front-mounted Summit X480 switch from a rack requires two people to maneuver the switch and disconnect the mounting hardware.

To remove a front-mounted switch:

1. Verify that all power supplies have been removed from the switch.
2. Support the switch while you remove the rack-mounting screws holding the front mounting brackets in place against the rack post.
3. Slide the switch out of the rack.
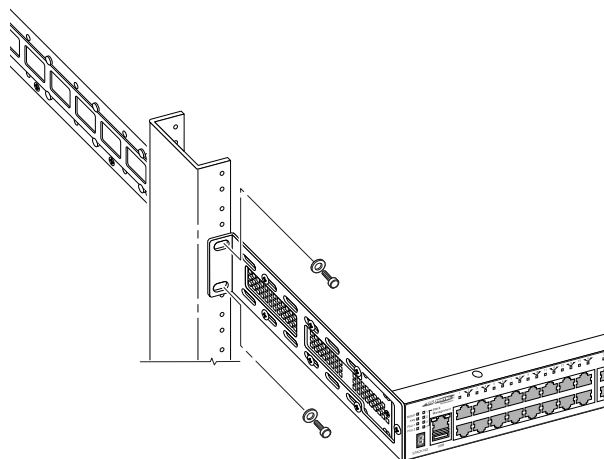
Figure 389: Removing a Front-Mounted Switch from a Two-Post Rack

Removing a Switch from a Four-Post Rack

Removing the Summit X480 switch from a cabinet or four-post rack requires two people to maneuver the switch and disconnect the mounting hardware.

To remove the Summit X480 series switch from a cabinet or four-post rack:

1. Verify that all power supplies have been removed from the switch.
2. Support the front of the switch while you remove the front rack mounting screws.

3   Carefully slide the switch forward out of the cabinet and off the rear mounting brackets.
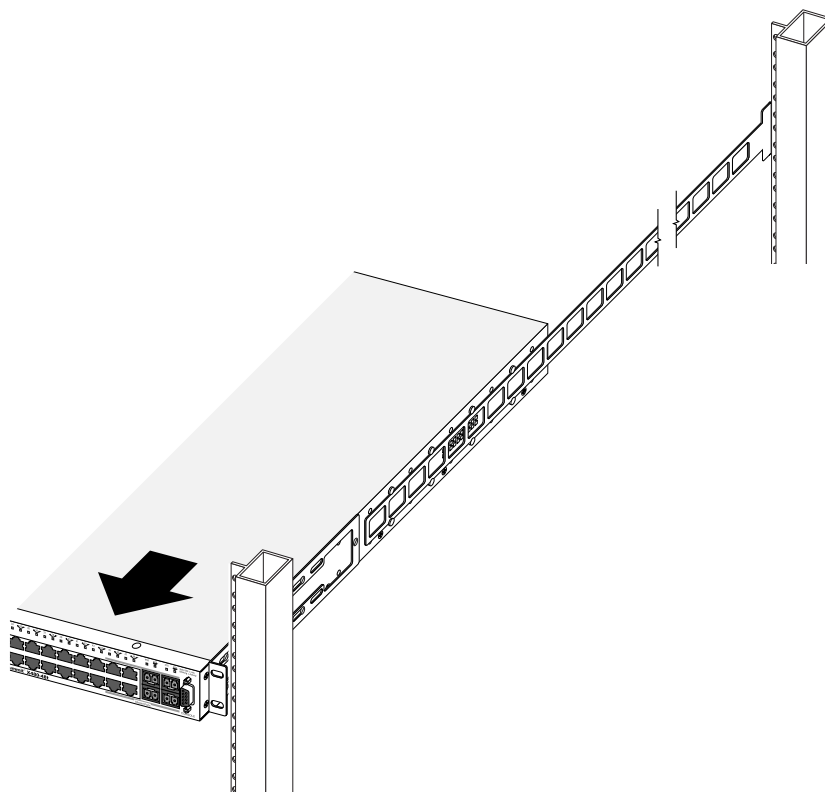
Figure 390: Removing the Switch from a Four-Post Rack

4   Set the switch on a secure work surface.

5   Using a #1 Phillips screwdriver, remove the front mounting brackets from the sides of the switch.

6   Remove the rear mounting brackets from the rear rack posts.

Removing a Summit X650 Series Switch

This section provides procedures for removing a Summit X650 series switch from a two-post or four-post equipment rack.

Before you remove a Summit X650 series switch from the rack, remove all installed power supplies, as described in one of the following sections.

Removing a Summit X650 AC Power Supply

To remove a Summit X650 AC power supply:

1   Disconnect the power cord from the wall outlet and from the power input connector on the power supply.

2   Push the latching tab to the left as you pull the handle to disengage the power supply from its internal connectors.

3   Carefully slide the power supply out of the switch and set it aside.
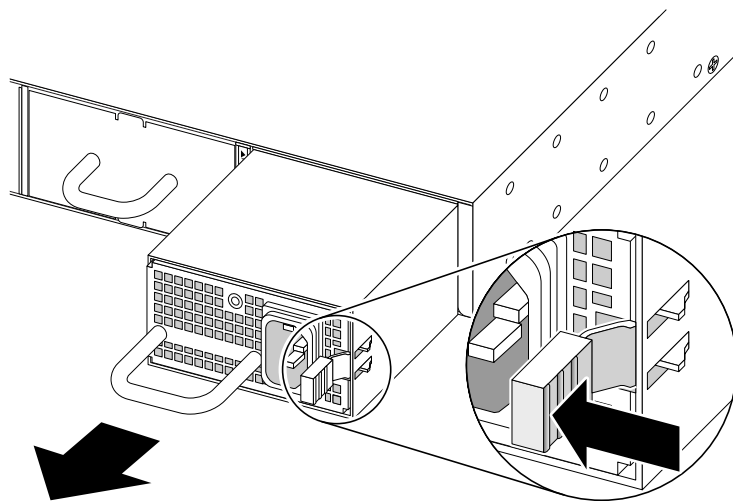
Figure 391: Removing a Summit X650 AC Power Supply

Removing a Summit X650 DC Power Supply

⚠ **Warning**
Be sure to disconnect all power cables before you disconnect the chassis ground wire.

⚠ **Caution**
The DC power supply may be hot to the touch; use thermal protective gloves when handling the power supply during removal.

To remove a Summit X650 DC power supply:

1   De-energize the DC circuit.
2   Disconnect the DC power cables:
    a   Slide the cover off the terminal block.
    b   Loosen the screws that secure the cable terminals to the terminal block.
    c   Slide the wires out from under the captive washers.
3   Disconnect the ground wire:
    a   Remove the screw that secures the ground wire to the power supply.
    b   Move the wire away from the power supply.

4   Push the latching tab to the left as you pull outward on the handle to disengage the power supply internal connectors.
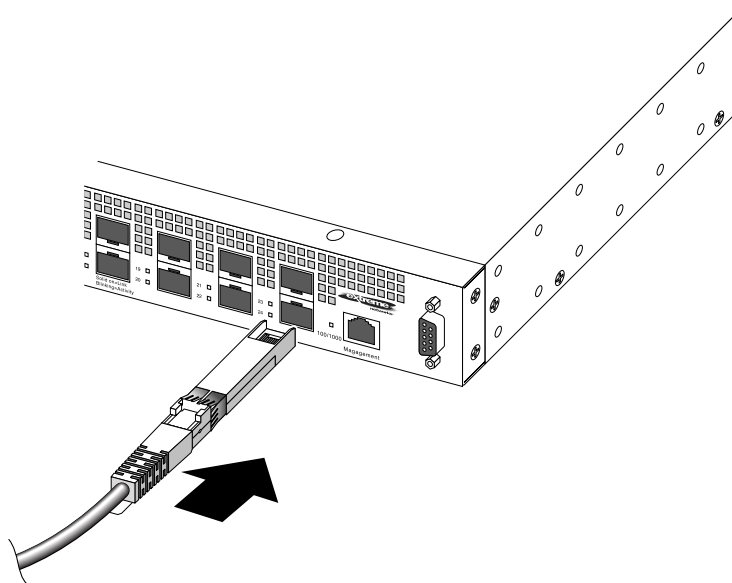
Figure 392: Removing a Summit X650 DC Power Supply

Removing a Summit X650 Series Switch from a Two-Post Rack

Removing the Summit X650 switch from a rack requires two people to maneuver the switch and disconnect the mounting hardware.

> **Caution**
>
> Make sure that proper ESD controls are in use before maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch chassis and earth grounds.

To remove the Summit X650 series switch from a two-post rack:

1   Verify that the power supplies have been removed from the switch.

2 At the front of the equipment rack, support the switch while you remove the rack-mounting screws holding the front mounting brackets in place against the rack post.
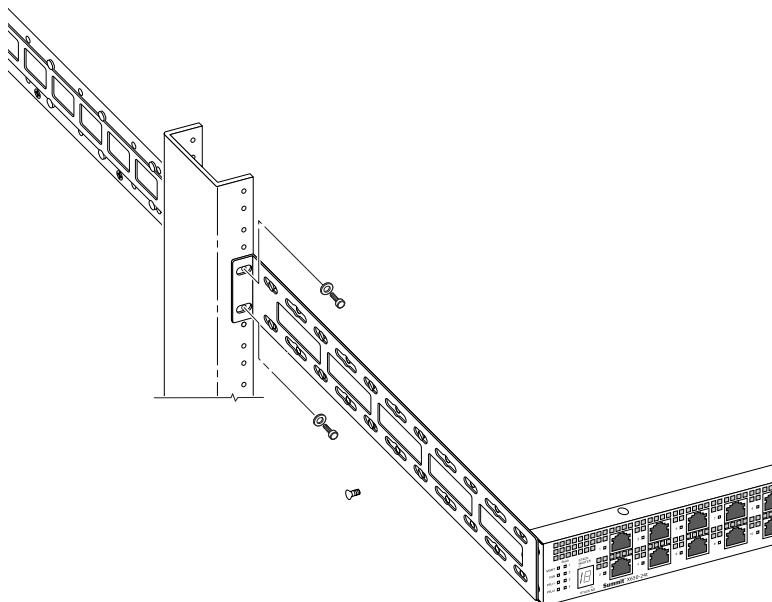
Figure 393: Removing the Front Mounting Screws from a Two-Post Rack

3 Remove the screws holding the front mounting brackets to the sides of the switch, and set the mounting brackets aside.

4 Support the front and back of the switch as you slide the switch back, off the rear mounting brackets, and out of the rack (see the figure below).

5 Set the switch on a secure work surface.
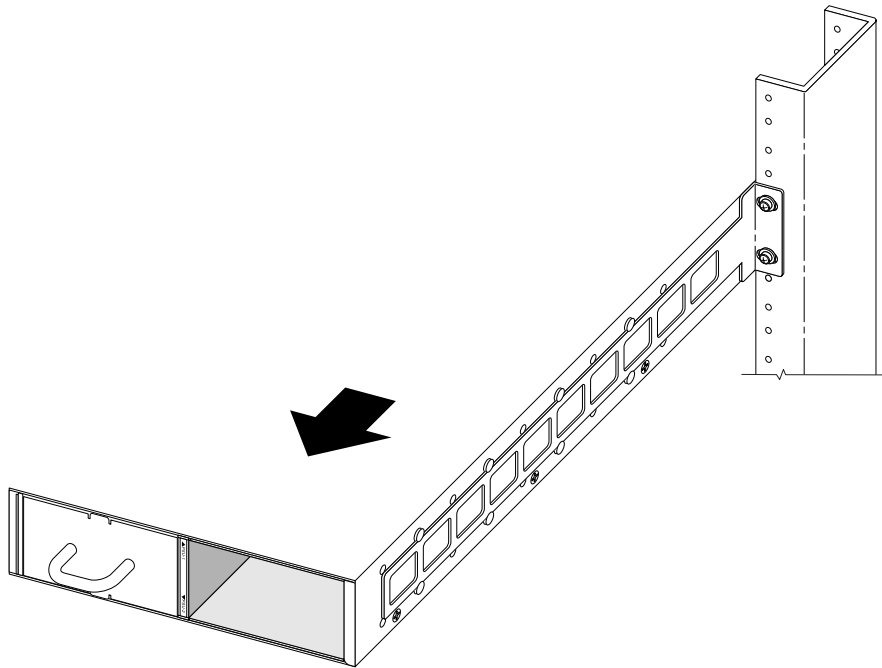
Figure 394: Removing the Switch from a Two-Post Rack

6 Remove the rack-mounting screws and detach the rear mounting brackets from the rack post.
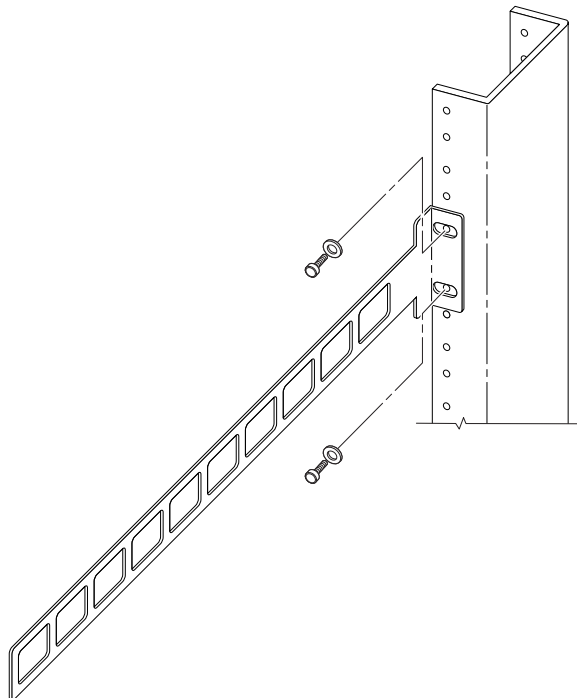
Figure 395: Removing the Rear Mounting Brackets—Two-Post Rack

Removing a Summit X650 Series Switch from a Cabinet or Four-Post Rack

Removing the Summit X650 switch from a cabinet or rack requires two people to maneuver the switch and disconnect the mounting hardware.

To remove the Summit X650 series switch from a cabinet or four-post rack:

1 Disconnect all power cords from the back of the switch.
2 Remove all installed power supplies:
   a Push the latching tab to the left as you pull the handle to disengage the power supply from its internal connectors.
   b Carefully slide the power supply out of the switch and set it aside.
3 Support the front of the switch while you remove the front rack mounting screws.
4 Carefully slide the switch forward out of the cabinet and off the rear mounting brackets.
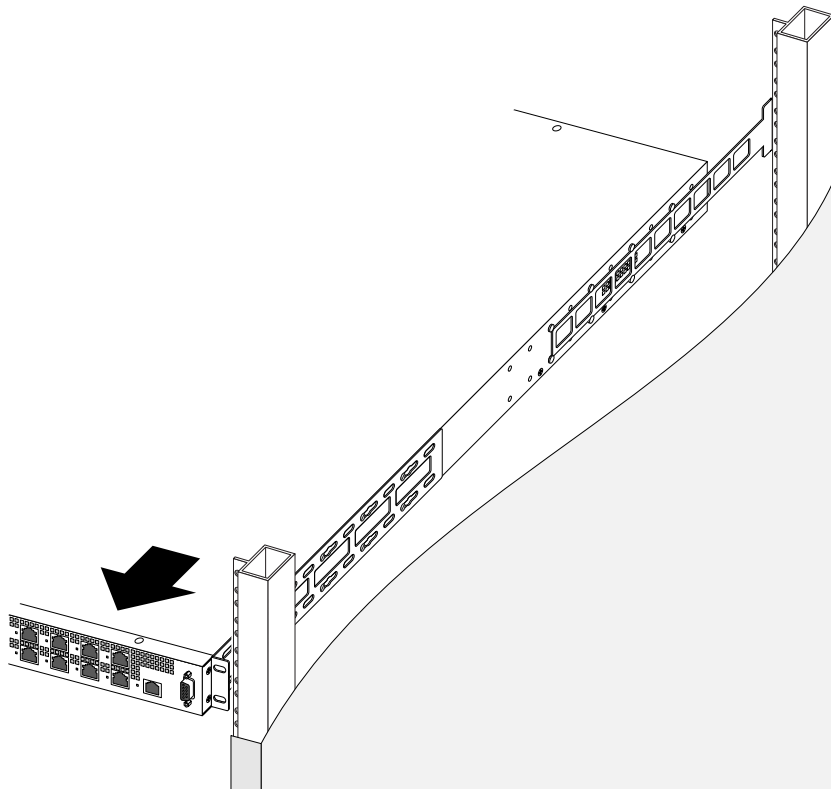
Figure 396: Removing the Switch from a Cabinet

5 Set the switch on a secure work surface.
6 Using a #1 Phillips screwdriver, remove the front mounting brackets from the sides of the switch.
7 Remove the rear mounting brackets from the rear rack posts.

Removing a Summit X670 and X770 Series Switch

Before you remove a Summit X670 or X770 series switch from a rack, remove all installed power supplies.

Removing the Switch from the Rack

To remove a Summit X670 series switch from an equipment rack:

1 Verify that the power supplies have been removed from the switch.
2 Support the switch as you remove the screws that hold the switch to the rack.
3 Slide the switch out of the rack.

A Safety Information

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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 and qualified service personnel (as defined in IEC 60950-1 and AS/NZS 3260) should install, replace, or perform service to Extreme Networks switches and their components. Qualified 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.

If you are in the USA, install the system in accordance with the U.S. National Electrical Code (NEC).

Considerations Before Installing

Consider the following items before you install equipment.

- For equipment designed to operate in a typical Telco environment that is environmentally controlled, choose a site that has the following characteristics:

- Temperature-controlled and humidity-controlled, such that the maximum ambient room temperature shall not exceed 40ºC (104ºF).
- 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.
- For equipment designed to be installed in environments that are not environmentally controlled, such as outdoor enclosures, see the product data sheet or Appendix B of this guide for environmental conditions, temperature, and humidity.
- 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 DC power or AC power requirements of all the network equipment.
- Racks for Extreme Networks equipment must be permanently attached to the floor. Failure to stabilize the rack can cause the rack to tip over when the equipment is removed for servicing.
- Do not operate the system unless all modules, faceplates, front covers, and rear covers are in place. Blank faceplates and cover panels are required for the following functions:
  - Preventing exposure to hazardous voltages and currents inside the equipment
  - Containing electromagnetic interference (EMI) that might disrupt other equipment
  - Directing the flow of cooling air through the equipment
- Ultimate disposal of this product should be handled according to all national laws and regulations.

General Safety Precautions

Follow these guidelines:

- Do not try to lift objects that you think are too heavy for you.
- When you install equipment in a rack, load heavier devices in the lower half of the rack first to avoid making the rack top-heavy.
- Use only tools and equipment that are in perfect condition. Do not use equipment with visible damage.
- Route cables in a manner that prevents possible damage to the cables and avoids causing accidents, such as tripping.
- Do not place a monitor or other objects on top of the equipment. The chassis cover is not designed to support weight.
- To reduce the risk of fire, use only #26 AWG or larger telecommunications line cord. Use only copper conductors.
- Do not work on the system or connect or disconnect cables during periods of lightning activity.
- This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor.

Maintenance Safety

When you perform maintenance procedures on Extreme Networks equipment, follow these recommendations:

- Use only authorized accessories or components approved for use with this system. Failure to follow these instructions may damage the equipment or violate required safety and EMC regulations.
- This system contains no customer serviceable components. Do not attempt to repair a chassis, power supply, module, or other component. In the event of failure, return the defective unit to Extreme Networks for repair or replacement, unless otherwise instructed by an Extreme Networks representative.
- 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 cords before working near power supplies, unless otherwise instructed by a product-specific maintenance procedure.
- Replace a power cord immediately if it shows any signs of damage.
- When you work with optical devices, power supplies, or other modular accessories, put on an ESD-preventive wrist strap to reduce the risk of electronic damage to the equipment. Connect the other end of the strap to an appropriate grounding point on the equipment rack or to an ESD jack on the chassis if one is provided. Leave the ESD-preventive wrist strap permanently attached to the equipment rack or chassis so that it is always available when you need to handle components that are sensitive to ESD.
- Install all cables in a manner that avoids strain. Use tie wraps or other strain relief devices.

Cable Routing for LAN Systems

Extreme Networks equipment meets the requirements for LAN system equipment.

LAN systems are designed for intra-building installations; that is, cable runs between devices must be in the same building as the connected units, except under the conditions listed in the next paragraph.

As allowed in the USA by the National Electrical Code (NEC), this equipment can be connected between buildings if any one of the following conditions is true:
- 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.

> **Caution**
>
> Failure to follow these requirements for cable routing conditions may expose the user to electrical shock and expose the unit to damage that can cause errors.

> **Warning**
>
> The Ethernet ports of the equipment and its sub-assemblies are suitable only for intra-building connections (within the same building) or for connections to unexposed wiring or cabling. (See the conditions listed above.) The Ethernet ports of this equipment or its sub-assemblies must not be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. Ethernet interfaces are designed for use only as intra-building interfaces (described as Type 2 or Type 4 ports in GR-1089-CORE, Issue 6) and require isolation from the exposed OSP wiring. The addition of Primary Protectors is not sufficient protection to connect these interfaces metallically to OSPwiring.
>
> This warning does not apply to T1/E1 ports because T1/E1 ports have built-in isolation and surge protection that allows them to be connected to OSP wiring.

Installing Power Supply Units and Connecting Power

For the ratings and power input requirements of each power supply unit, see Appendix B of this guide or the data sheet for the power supply at www.extremenetworks.com.

> **Warning**
>
> Be sure to satisfy the requirements listed in this section when you install Extreme Networks power supplies or connect power.

When you install any power supply:

- Do not use excessive force when you insert a power supply into the bay.
- Do not attempt to open the power supply enclosure for any reason; the power supply does not contain user-serviceable parts. In the event of failure, return the defective power supply to Extreme Networks for repair or replacement.
- Do not put your hand into an open power supply bay when a power supply is not present.
- Before you work on equipment that is connected to power lines, remove all jewelry, including watches. Metal objects heat up when they are connected to power and ground and can cause serious burns or weld the metal object to the terminals.
- An electrical arc can occur when you connect or disconnect the power with power applied. This could cause an explosion in hazardous area installations. Be sure that power is removed from the device.
- When you install or replace equipment, always make the ground connection first and disconnect the ground connection last.

When you install AC power supplies:

- For switches with field-replaceable power supplies, do not connect the power supply to an electrical source when the power supply is not installed in the switch; doing so would expose a hazardous energy and poses a potential shock and fire hazard.
- Plug power supplies only into properly grounded electrical outlets to help prevent electrical shock and to 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.
- Make sure that the voltage and frequency of your power outlet match the system electrical ratings for the equipment. 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.
- When multiple power supplies are used with a system, connect each power supply to a different, independent over-current protection device, such as a circuit breaker. If a single power source fails, it will affect only that power supply to which it is connected. See the data sheet of the power supply for proper sizing of the circuit breaker.
- Extreme Networks AC power supplies do not have switches for turning the unit on and off. Remove all wall plugs from the electrical outlets to disconnect the power. Make sure that these connections are easily accessible.

When you install DC power supplies or connect DC power:

- Making the connection to your facility DC source voltage must be performed by a qualified, licensed electrician.
- Extreme Networks DC power supplies 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 input power socket.
- Do not connect a DC power supply to the DC source power when the power supply is not installed in the chassis; doing so would expose a hazardous energy and poses a potential shock and fire hazard.
- Connect the system or power supply only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950-based safety standards.
- DC-powered equipment must be installed in a restricted-access area to ensure that only trained and qualified service personnel have access to the equipment. A restricted-access area can be entered only through the use of a special tool, lock and key, or other means of security.

Note

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

Warning

Extreme Networks power supplies do not have switches for turning the unit on and off. Disconnect all power cords to remove power from the device. Make sure that these connections are easily accessible.

Extreme Networks alimentations n'ont pas de contact pour mettre l'appareil sous et hors tension . Débranchez tous les cordons d'alimentation pour couper l'alimentation de l'appareil. Assurez-vous que ces connexions sont facilement accessibles.

Selecting Power Supply Cords

Extreme Networks does not include power input cords in the product box.

You can purchase a power cord for your product and for your specific country from your local Extreme Networks Channel Account Manager or Sales Manager, or you can purchase a cord from your local supplier. Requirements for the power cord are listed in Appendix B of this guide.

To locate a Sales Manager or Partner in your region visit:www.extremenetworks.com/how-to-buy/how-to-buy.aspx

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 exceed240VAC.

All installations should confirm that the product is reliably grounded according to the country's local electrical codes.

Battery Replacement and Disposal

Batteries included with Extreme products are encapsulated and must be replaced only by qualified Extreme Service personnel.

Contact your Extreme Networks 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:

- Replace with the same or equivalent battery type as recommended by the battery manufacturer.
- Dispose of the battery in accordance with the battery manufacturer's recommendation.

Battery Warning - Taiwan

警告

如果更換不正確之電池型式會有爆炸的風險

請依製造商說明書處理用過之電池

Fiber Optic Ports and Optical Safety

The following safety warnings apply to all optical devices used in Extreme Networks equipment that are removable or directly installed in an I/O module or chassis system.

Such devices include but are not limited to gigabit interface converters (GBICs), small form factor pluggable (SFP) modules (or mini-GBICs), QSFP+ modules, XENPAK transceivers, and XFP laser optic modules.

> **Warning**
>
> Laser optic modules become very hot after prolonged use. Take care when removing a laser optic module from the module 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.
>
> When working with laser optic modules, always take the precautions listed below to avoid exposure to hazardous radiation.

- Never look at the transmit LED/laser through a magnifying device while the transmit LED 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, SFP (Mini-GBIC), QSFP+, XENPAK, and XFP Regulatory Compliance

Extreme Networks pluggable optical modules and direct-attach cables meet the following regulatory requirements:

- Class 1 or Class 1M Laser Product
- EN60825-1:2007 2nd Ed. or later, European standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 2004/108/EEC EMC Directive and the 2006/95/EC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products

Sicherheitshinweise

> **Warning**
>
> Lesen Sie die folgenden Sicherheitshinweise aufmerksam durch, ehe Sie Extreme Networks-Produkte installieren. Eine Missachtung dieser Sicherheitshinweise kann zu Verletzungen oder zu einer Beschädigung des/r Geräte/s führen.

Extreme Networks-Geräte und deren Komponenten dürfen nur durch geschulte und qualifizierte Wartungstechniker (wie in IEC 60950-1 und AS/NZS 3260 definiert) installiert, ausgetauscht oder gewartet werden. Dieses qualifizierte Personal muss den Inhalt aller zugehörigen Installationsanleitungen kennen sowie über die technische Ausbildung und Erfahrung verfügen, um die Gefahren, die mit der Ausführung einer Aufgabe assoziiert sind, zu kennen und zu wissen, wie sie diese Gefahren für sich selbst und Dritte minimieren können.

In den USA muss das System gemäß dem US National Electrical Code (NEC) installiert werden.

Überlegungen vor der Installation

Berücksichtigen Sie vor der Installation der Geräte folgende Punkte.

- Wählen Sie für Geräte, die in einer typischen Telekommunikationsumgebung mit kontrollierten Umweltbedingungen eingesetzt werden, einen Ort mit folgenden Merkmalen:
  - Temperatur und Feuchtigkeit werden kontrolliert, und die maximale Raumtemperatur liegt nicht über 40 ºC.
  - Sauber und frei von in der Luft enthaltenen Stoffen, die Elektrizität übertragen können.
  - Gut belüftet und fern von Wärmequellen inklusive direkter Sonneneinstrahlung.
  - Fern von Quellen für Erschütterungen oder mechanische Einwirkungen.
  - Getrennt von starken elektromagnetischen Feldern, die von elektrischen Geräten erzeugt werden.
- Bei Geräten, die nicht für eine Installation in Umgebungen mit kontrollieren Umweltbedingungen vorgesehen sind, wie z. B. Gehäuse im Freien, beachten Sie bitte das Produktdatenblatt oder Anhang B dieser Anleitung mit den Spezifikationen für Umgebungsbedingungen, Temperatur und Feuchtigkeit.
- Lassen Sie auf allen Seiten mindestens 3 Zoll Platz, um eine ausreichende Luftzirkulation zu gewährleisten. Die Lüftungsschlitze an der Vorder- oder Rückseite und an den Seiten dürfen nicht blockiert werden. Stellen Sie das System nicht in der Nähe von Wärmequellen auf.
- Versichern Sie sich, dass Ihre Geräte in einem Bereich aufgestellt werden, der für den Stromverbrauch und die damit verbundene Wärmestrahlung der Komponenten geeignet ist.
- Versichern Sie sich, dass Ihre Netzteile den Gleichstrom- bzw. Wechselstrombedarf aller Netzwerkgeräte decken können.
- Racks für Extreme Networks-Geräte müssen fest am Boden verankert werden. Bei nicht vorschriftsmäßiger Fixierung des Racks besteht die Gefahr, dass das Rack bei Wartungsarbeiten umkippt.
- Voraussetzung für den Betrieb des Systems ist die vollständige Anbringung aller Module, Blenden, Frontabdeckungen und rückseitigen Abdeckungen. Blenden und Abdeckplatten erfüllen folgende Funktionen:
  - Schutz vor gefährlich hohen Spannungen und Strömen im Inneren des Gerätes
  - Eindämmung von elektromagnetischen Interferenzen (EMI), die andere Geräte stören könnten
  - Vorgabe der Luftströmungsrichtung durch das Gerät
- Bei der Entsorgung des Gerätes sind alle nationalen Gesetze und Vorschriften zu beachten.

Allgemeine Sicherheitshinweise

Befolgen Sie die Richtlinien:

- Heben Sie keine Gegenstände, die zu schwer für Sie sind.
- Bei der Installation von Geräten in einem Rack platzieren Sie die schwereren Geräte in der unteren Hälfte, damit das Rack nicht kopflastig wird.
- Verwenden Sie nur Werkzeuge und Geräte, die sich in einem einwandfreien Zustand befinden. Werkzeuge, die sichtbar beschädigt sind, dürfen nicht benutzt werden.
- Achten Sie bei der Verlegung von Kabeln darauf, mögliche Beschädigungen der Kabel zu vermeiden und Risiken, z. B. Stolpergefahren, auszuschalten.
- Stellen Sie keinen Bildschirm oder anderen Gegenstände auf die Geräte. Die Chassisabdeckung ist keine Abstellfläche.

- Zum Schutz vor Selbstentzündung verwenden Sie nur Datenübertragungskabel der Größe 26 AWG oder größer. Verwenden Sie nur Kupferleiter.
- Arbeiten Sie während eines Gewitters nicht an dem System und stecken Sie keine Kabel an oder ab.
- Das Gerät muss geerdet werden. Der Schutzleiter darf nicht manipuliert oder umgangen werden und das Gerät darf auf keinen Fall ohne einen entsprechend installierten Schutzleiter betrieben werden.

Sicherheit bei Wartungsarbeiten

Befolgen Sie bei allen Wartungsarbeiten an Extreme Networks-Geräten folgende Empfehlungen:

- Verwenden Sie nur zugelassene Zubehörteile oder Komponenten, die für den Einsatz mit diesem System genehmigt sind. Eine Missachtung dieser Hinweise kann zu einer Beschädigung des/r Geräte/s führen und die einschlägigen Sicherheits- und EMV-Vorschriften verletzen.
- Das System enthält keinerlei Teile, die vom Benutzer zu warten sind. Versuchen Sie nicht, Chassis, Netzteil, Modul oder andere Komponenten eigenmächtig zu reparieren. Senden Sie im Falle einer Störung das defekte Teil zur Reparatur oder zum Austausch an Extreme Networks ein, sofern ein Extreme Networks-Vertreter nicht etwas anderes angibt.
- Um das System spannungslos zu machen, müssen Sie alle Netzkabel aus den Netzsteckdosen ziehen. Das Netzkabel ist der "Trennschalter" für die Netzspannungsquelle.
- Trennen Sie vor allen Arbeiten in der unmittelbaren Nähe von Netzteilen alle Netzkabel von der Spannungsquelle, sofern die produktspezifische Wartungsanleitung nicht etwas anderes angibt.
- Legen Sie für alle Arbeiten an optischen Geräten, Netzteilen oder sonstigen modularen Zubehörteilen ein geerdetes Massearmband an, um das Risiko einer Beschädigung des Gerätes durch elektrostatische Aufladung zu reduzieren. Schließen Sie das eine Ende des Armbands an einem geeigneten Erdungspunkt am Rack oder an einer ESD-Buchse am Chassis (sofern vorhanden) an. Lassen Sie das geerdete Massearmband am Rack oder am Chassis angeschlossen, damit Sie es jederzeit parat haben, wenn Sie mit Komponenten umgehen, die empfindlich gegenüber elektrostatischer Aufladung sind.
- Die Kabel sind spannungsfrei zu installieren. Verwenden Sie Kabelbinder oder sonstige Zugentlastungsvorrichtungen.

Kabelverlegung für LAN-Systeme

Extreme Networks-Geräte erfüllen die Anforderungen für Geräte für LAN-Systeme. LAN-Systeme sind für gebäudeinterne Installationen konzipiert, das heißt, die Kabel zwischen den einzelnen Einheiten müssen im gleichen Gebäude verlaufen, in dem auch die Geräte untergebracht. Hiervon ausgenommen sind nur die unten aufgeführten Bedingungen.

Laut dem US-amerikanischen National Electrical Code (NEC) darf diese Ausrüstung zwischen Gebäuden verbunden werden, sofern eine der folgenden Bedingungen erfüllt ist:

- Die Länge der zwischen Gebäuden verlegten Kabel beträgt höchsten 140 Fuß.
- Die Kabel sind zwischen den Gebäuden direkt erdverlegt.

- Die Kabel zwischen den Gebäuden sind in einem unterirdischen Kanal verlegt, wobei ein durchgehender metallischer Kabelschirm oder eine durchgehende Metallleitung, die das Kabel umschließt, an den Erdungselektrodensystemen der einzelnen Gebäude angeschlossen ist.

> **Caution**
>
> Eine Missachtung dieser Bedingungen für die Kabelverlegung kann Nutzer der Gefahr eines elektrischen Stromschlages aussetzen und das Gerät so beschädigen, dass es nicht mehr einwandfrei arbeitet.

> **Warning**
>
> Die Ethernet-Anschlüsse des Gerätes und der zugehörigen Baugruppen sind nur für gebäudeinterne (innerhalb ein und desselben Gebäudes) Verbindungen oder für Anschlüsse an nicht exponierte Verdrahtungen oder Verkabelungen geeignet (siehe die oben aufgeführten Bedingungen). Die Ethernet-Anschlüsse des Gerätes und der zugehörigen Baugruppen dürfen nicht mit Metallkontakt an Schnittstellen angeschlossen werden, die mit einer externen Anlage (Outside Plant, OSP) oder deren Verdrahtung verbunden sind. Ethernet-Schnittstellen sind nur für eine Verwendung als gebäudeinterne Schnittstellen konzipiert (sog. Ports vom Typ 2 oder Typ 4 gemäß GR-1089-CORE, Ausgabe 6) und müssen durch Isolierung von exponierter OSP-Verdrahtung getrennt werden. Primäre Protektoren sind kein ausreichender Schutz für den Anschluss dieser Schnittstellen über einen Metallkontakt mit OSP-Verdrahtung.
>
> Diese Warnung gilt nicht für Ports vom Typ T1/E1, weil diese Ports über eine integrierte Isolierung und einen Schutz vor Spannungsspitzen verfügen, der den Anschluss an OSP-Verdrahtung gestattet.

Installation der Netzteile und Netzanschluss

Die Leistungsdaten und die Anforderung der einzelnen Netzteile an den Leistungseingang entnehmen Sie bitte Anhang B dieser Anleitung oder dem Datenblatt für die Netzversorgung unter http://www.extremenetworks.com.

> **Warning**
>
> Die in diesem Abschnitt aufgeführten Anforderungen müssen bei der Installation von Extreme Networks-Netzteilen und beim Netzanschluss unbedingt erfüllt werden.

Bei Installation eines Netzteils:

- Schieben Sie das Netzteil nicht mit Gewalt in den Einschub.
- Versuchen Sie nicht, das Gehäuse des Netzteils zu öffnen; das Netzteil enthält keinerlei Teile, die vom Nutzer zu warten sind. Senden Sie im Falle einer Störung das defekte Netzteil zur Reparatur oder zum Austausch an Extreme Networks ein.
- Fassen Sie nicht mit der Hand in einen offenen Netzteileinschub, wenn das Netzteil entfernt wurde.
- Legen Sie vor allen Arbeiten an einem an Leistungskabeln angeschlossenen Gerät sämtlichen Schmuck sowie Ihre Armbanduhr ab. Im Falle eines Kurzschlusses (Kontakt mit Leistung und Erde) erwärmen sich Metallgegenstände, was zu ernsthaften Verbrennungen führen oder den Metallgegenstand mit den Anschlüssen verschweißen kann.
- Legen Sie vor allen Arbeiten an einem an Leistungskabeln angeschlossenen Gerät sämtlichen Schmuck sowie Ihre Armbanduhr ab. Metallgegenstände erwärmen sich, wenn sie an Leistung und

an Erde angeschlossen werden, was zu ernsthaften Verbrennungen führen oder den Metallgegenstand mit den Anschlüssen verschweißen kann.

- Wenn das Netz bei angeschlossener Netzversorgung angeschlossen oder getrennt wird, kann ein elektrischer Lichtbogen entstehen. Dies kann bei Installationen in Gefahrenbereichen zu einer Explosion führen. Achten Sie unbedingt darauf, dass das Gerät nicht mit der Netzversorgung verbunden ist.
- Achten Sie bei der Installation oder beim Austausch von Geräten darauf, dass Sie zuerst den Erdungsanschluss herstellen bzw. den Erdungsanschluss zuletzt trennen.

Bei Installation von AC-Netzteilen:

- Schließen Sie bei Switches mit einem vor Ort austauschbaren Netzteil die Spannungsversorgung nicht an einer elektrischen Spannungsquelle an, wenn das Netzteil nicht im Switch eingebaut ist; andernfalls kann gefährliche Energie freigesetzt werden und es besteht potenzielle Stromschlag- und Brandgefahr.
- Stecken Sie Netzteile nur an vorschriftsmäßig geerdete Netzsteckdosen an, um die Gefahr eines elektrischen Stromschlages zu vermeiden und internationale Sicherheitsstandards zu erfüllen.
- Verwenden Sie nur Netzkabel, die in dem jeweiligen Einsatzland zugelassen sind. Versuchen Sie nicht, modifizierte AC-Netzkabel zu verwenden
- Versichern Sie sich, dass Spannung und Frequenz Ihrer Steckdose mit den elektrischen Daten Ihres Gerätes übereinstimmen. Das Gebäude und/oder die Spannungsquelle muss gegen Überlast geschützt sein.
- Verwenden Sie einen Überspannungsschutz, einen Netzfilter oder eine unterbrechungsfreie Spannungsversorgung, um das System plötzlichen Spannungsschwankungen zu schützen.
- Bei Systemen mit mehreren Netzteilen schließen Sie jedes Netzteil an einer anderen, unabhängigen Überstromschutzvorrichtung an, z. B. an einem Schütz. Bei Ausfall einer Spannungsquelle ist nur das daran angeschlossene Netzteil betroffen. Für die korrekte Auslegung des Schützes siehe das Datenblatt des Netzteils.
- AC-Netzteile von Extreme Networks haben keinen Ein-/Ausschalter. Trennen Sie alle Netzstecker von den elektrischen Steckdosen, um die Spannungsversorgung zu unterbrechen. Achten Sie auf gute Zugänglichkeit der Steckdosen.

Installation von DC-Netzteilen und Anschluss von Gleichspannung:

- Der Anschluss an die Gleichspannungsquelle Ihrer Einrichtung muss von einem qualifizierten, geprüften Elektriker vorgenommen werden.
- DC-Netzteile von Extreme Networks haben keinen Ein-/Ausschalter. Versichern Sie sich, dass der DC-Kreis spannungslos ist, ehe Sie das Gleichstromkabel an einer Gleichstromeingangsbuchse an- oder abstecken.
- Schließen Sie eine Gleichstromversorgung nicht an die DC-Quelle an, wenn das Netzteil nicht im Chassis eingebaut ist; andernfalls kann gefährliche Energie freigesetzt werden und es besteht potenzielle Stromschlag- und Brandgefahr.
- Schließen Sie das System oder das Netzteil nur an eine DC-Spannungsquelle an, die die Bestimmungen für Sicherheitskleinspannung (SELV) in den IEC 60950-basierten Sicherheitsstandards erfüllt.
- DC-Geräte müssen in einem zugangsbeschränkten Bereich installiert werden, damit gewährleistet ist, dass nur geschultes und qualifiziertes Wartungspersonal Zugang zu den Geräten hat. Ein

zugangsbeschränkter Bereich kann beispielsweise nur mithilfe eines Spezialwerkzeugs, Schloss und Schlüssel oder einer anderen Sicherheitsvorrichtung geöffnet werden.

> **Note**
>
> Da die Gebäudevorschriften in aller Welt unterschiedlich sind, empfiehlt Extreme Networks dringend, sich bezüglich der korrekten Erdung und Spannungsverteilung für Ihre Installation in Ihrem Land an einen Elektrofachbetrieb zu wenden.

Auswahl der Netzkabel

Im Lieferumfang von Extreme Networks-Produkten sind keine Netzkabel enthalten.

Ein für Ihr Produkt und Land passendes Netzkabel erhalten Sie entweder von Ihrem zuständigen Extreme Networks Channel Account Manager oder Sales Manager oder im örtlichen Fachhandel. Die Anforderungen an das Netzkabel entnehmen Sie Anhang B zu dieser Anleitung.

Hier finden Sie Ihren zuständigen Sales Manager oder Fachhändler: http://www.extremenetworks.com/how-to-buy/how-to-buy.aspx

> **Note**
>
> Dieses Gerät ist nicht für eine direkte Versorgung von einem Spannungsverteilungssystem vorgesehen, wo die Leiter-Leiter-Spannung den Wert von 240 V AC (2 Phasen+Schutzerde), wie zum Beispiel in Norwegen, Frankreich und anderen Ländern. Für derartige Anwendungen wird ein Transformator empfohlen, um die Spannung auf einen Wert unter < 240 V AC (Leiter-Leiter) herunterzutransformieren oder ein Anschluss an eine (P+N+Schutzerde) Spannungsverteilung, wo die Spannung 240 V AC nicht überschreitet.
>
> Alle Installationen müssen eine zuverlässige Erdung gemäß den nationalen Elektrovorschriften vorsehen.

Wechseln und Entsorgen der Batterie

Die Batterien in Extreme Produkten sind gekapselt und dürfen nur durch qualifiziertes Extreme-Wartungspersonal ausgewechselt werden.

Wenden Sie sich für den Austausch eines Produktes an das Wartungspersonal von Extreme Networks. Versuchen Sie nicht, die Batterie selbst auszuwechseln. Bei einer Missachtung dieser Anweisungen und dem Versuch, die Batterien eigenmächtig zu wechseln, müssen folgende Richtlinien eingehalten werden, um eine mögliche Explosion zu vermeiden:

- Tauschen Sie die Batterie nur gegen eine Batterie des gleichen Typs (wie vom Hersteller empfohlen)aus.
- Entsorgen Sie die Batterie gemäß den Empfehlungen des Batterieherstellers.

LWL-Ports und optische Sicherheit

Folgende Sicherheitswarnung gilt für alle optischen Geräte, die in Extreme Networks-Geräten eingesetzt werden und entweder herausnehmbar sind oder direkt in einem E/A-Modul oder im Chassissystem eingebaut sind.

Solche Geräte sind nicht nur Gigabit-Interface-Konverter (GBICs), steckbare Kleinformfaktormodule (SFP) (oder Mini-GBICs), QSFP+ Module, XENPAK Sendeempfänger und laseroptische XFP-Module.

> **Warning**
>
> Laseroptische Module können bei längerem Gebrauch sehr heiß werden. Seien Sie beim Ausbau eines laseroptischen Moduls aus dem Modul oder der Optionskarte äußerst vorsichtig. Wenn das laseroptische Modul zum Anfassen zu heiß ist, trennen Sie das laseroptische Modul und lassen Sie es abkühlen, ehe Sie es komplett ausbauen.
>
> Ergreifen Sie beim Arbeiten mit laseroptischen Modulen die nachfolgenden Vorsichtsmaßnahmen, um eine Aussetzung gegenüber gefährlicher Strahlung zu vermeiden.

- Blicken Sie auf keinen Fall durch ein Vergrößerungsglas in die Sendediode/den Laser, solange die Sendediode aktiv ist.
- Blicken Sie auf keinen Fall in den LWL-Port am Switch oder auf die Stirnflächen eines aktiven LWL-Kabels.
- Bei offenen Anschlüssen kann unsichtbare Laserstrahlung abgegeben werden. Vermeiden Sie eine direkte Aussetzung der Augen gegenüber dem Strahl, wenn die optischen Anschlüsse offen (ohne Stecker) sind.
- Optische Geräte dürfen auf keine andere Weise als in diesem Dokument empfohlen verändert, modifiziert oder umgebaut werden.

Konformität von GBIC, SFP (Mini-GBIC), QSFP+, XENPAK undXFP

Steckbare optische Module von Extreme Networks und direkt angeschlossene Kabel erfüllen folgende gesetzliche Vorschriften:

- Laserprodukt der Klasse 1 oder Klasse 1M
- EN60825-1:2007 2. Ausgabe oder später, Europäische Norm
- FCC 21 CFR Kapitel 1, Paragraph J in Übereinstimmung mit FDA- und CDRH-Bestimmungen
- Anwendung des CE-Zeichens gemäß der EMV-Richtlinie 2004/108/EEC und der Niederspannungsrichtlinie 2006/95/EC
- UL und/oder CSA-geprüfte Komponente für Nordamerika
- 47 CFR Teil 15, Klasse A bei Einbau in Extreme-Produkte

Mögliche Netzanschlussgerät- und Lüftereinsatz-Konfigurationen für X770-32q

Table 99: Mögliche Netzanschlussgerät- und Lüftereinsatz-Konfigurationen für X770-32q

Konfiguration Nr.	Anzahl d. Netzanschlussgeräte	Artikelnummer d. Netzanschlussgeräts	Beschreibung d. Spannungsversorgung	Anzahl d. Lüftereinsätze	Artikelnummer Lüftereinsatz	Beschreibung Lüftereinsatz
1	1	10927z	Netzanschlussgerät Summit 550W AC Luftstrom von hinten nach vorne (DS550HE-3)	5	17112z	Lüftermodul Summit X670 Luftstrom von hinten nach vorne (JDD0405612UB3A01)
2	1	10925z	Netzanschlussgerät Summit 550W AC Luftstrom von vorne nach hinten (DS550HE-3)	5	17111z	Lüftermodul X670 Luftstrom von vorne nach hinten (AS04012UB565300)
3	2	10927z	Netzanschlussgerät Summit 550W AC Luftstrom von hinten nach vorne (DS550HE-3)	5	17112z	Lüftermodul Summit X670 Luftstrom von hinten nach vorne (JDD0405612UB3A01)
4	2	10925z	Netzanschlussgerät Summit 550W AC Luftstrom von vorne nach hinten (DS550HE-3)	5	17111z	Lüftermodul X670 Luftstrom von vorne nach hinten (AS04012UB565300)
5	1	10928z	Netzanschlussgerät Summit 550W DC Luftstrom von hinten nach vorne (DS550DC-3-003)	5	17112z	Lüftermodul Summit X670 Luftstrom von hinten nach vorne (JDD0405612UB3A01)
6	1	10926z	Netzanschlussgerät Summit 550W DC Luftstrom von vorne nach hinten (DS550DC-3)	5	17111z	Lüftermodul X670 Luftstrom von vorne nach hinten (AS04012UB565300)
7	2	10928z	Netzanschlussgerät Summit 550W DC Luftstrom von hinten nach vorne (DS550DC-3-003)	5	17112z	Lüftermodul Summit X670 Luftstrom von hinten nach vorne (JDD0405612UB3A01)
8	2	10926z	Netzanschlussgerät Summit 550W DC Luftstrom von vorne nach hinten (DS550DC-3)	5	17111z	Lüftermodul X670 Luftstrom von vorne nach hinten (AS04012UB565300)

Table 99: Mögliche Netzanschlussgerät- und Lüftereinsatz-Konfigurationen für X770-32q (continued)

Konfiguration Nr.	Anzahl d. Netzanschlussgeräte	Artikelnummer d. Netzanschlussgeräts	Beschreibung d. Spannungsversorgung	Anzahl d. Lüftereinsätze	Artikelnummer Lüftereinsatz	Beschreibung Lüftereinsatz
9	1	10927z	Netzanschlussgerät Summit 550W AC PSU Luftstrom von hinten nach vorne (DS550HE-3)	5	17112z	Lüftermodul Summit X670 Luftstrom von hinten nach vorne (JDD0405612UB3A01)
	1	10928z	Netzanschlussgerät Summit 550W DC Luftstrom von hinten nach vorne (DS550DC-3-003)			
10	1	10925z	Netzanschlussgerät Summit 550W AC Luftstrom von vorne nach hinten (DS550HE-3)	5	17111z	Lüftermodul X670 Luftstrom von vorne nach hinten (AS04012UB565300)
	1	10926z	Netzanschlussgerät Summit 550W DC Luftstrom von vorne nach hinten (DS550DC-3)			

B Technical Specifications

Summit X150 Series Switches
Summit X250e Series Switches
Summit X350 Series Switches
Summit X430 Series Switches
Summit X440 Series Switches
Summit X450 Series Switches
Summit X450a Series Switches
Summit X450e Series Switches
Summit X460 Series Switches
Summit X460-G2 Series Switches
Summit X650 series switches:
Summit X670 Series Switches
Summit X670-G2 Series Switches
Summit X770 Series Switches
Summit 300 W Power Supplies
Summit 450 W Power Supplies
Summit 550 W Power Supplies
Summit 715W Power Supplies
Summit 750 W AC Power Supply
Summit 850 W Power Supplies
Summit 1100 W Power Supplies
Summit External Power Supplies
Power Cord Requirements for AC-Powered Switches and AC Power Supplies
Console Connector Pinouts
Taiwan Warnings
Japan (VCCI Class A)
Korea EMC Statement

Note

In this section, all references to specific switch model numbers also apply to the equivalent TAA-compliant switch versions.

Summit X150 Series Switches

- Summit X150-24t switch
- Summit X150-24p switch

- Summit X150-48t switch

Table 100: Physical Dimensions

Summit X150-24t switch Summit X150-24p switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 12.13 inches (30.8 cm)
Summit X150-48t switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.28 inches (38.8 cm)

Table 101: Weight

Summit X150-24t switch	12.01 lb (5.46 kg)
Summit X150-24p switch	14.9 lb (6.8 kg)
Summit X150-48t switch	15.1 lb (6.9 kg)

Table 102: Packaged Dimensions

Summit X150-24t switch Summit X150-24p switch	Height: 12.6 inches (32 cm) Width: 23.6 inches (60 cm) Depth: 18.5 inches (47 cm)
Summit X150-48t switch	Height: 12.2 inches (31 cm) Width: 22.8 inches (58 cm) Depth: 22 inches (56 cm)

Table 103: Packaged Weight

Summit X150-24t switch	10.5 lb (4.8 kg)
Summit X150-24p switch	12.1 lb (5.5 kg)
Summit X150-48t switch	12.1 lb (5.5 kg)

Table 104: Summit X150-24t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.0 A
Input current	0.5 A @ 115 V∼ (low-line) 0.25 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.

Table 104: Summit X150-24t Power (continued)

Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	83% with 60% to 100% load
Heat dissipation (Watts, BTU)	36 W (122.8 BTU/hr)
Power consumption (Watts, BTU)	36 W (122.8 BTU/hr)

Table 105: Summit X150-24p Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 5.5 A
Input current (without PoE	0.75 A @ 115 V∼ (low-line) 0.5 A @ 230 V∼ (high-line)
Input current (with PoE full load)	4.4 A @ 115 V∼ (low-line) 2.2 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	81% with 60% to 100% load
Heat dissipation (Watts, BTU)	60 W (204.7 BTU/hr
Power consumption (Watts, BTU)	500 W (1706 BTU/hr)

Table 106: Summit X150-48t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.0 A
Input current	0.5 A @ 115 V∼ (low-line) 0.25 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

Table 106: Summit X150-48t Power (continued)

Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	83% with 60% to 100% load
Heat dissipation (Watts, BTU)	36 W (123 BTU/hr)
Power consumption (Watts, BTU)	36 W (123 BTU/hr)

Table 107: 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)

Table 108: 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 (Korea)

Table 109: Telecom Standards

ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)

Table 110: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T

Table 111: Environmental Data

Environmental Standards	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	Temperature range: 0° C to 40° C (32° F to 104° F) Humidity: 95% 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 vibration: 3 to 500 MHz @ 1.5 G rms
Storage & transportation conditions (packaged)	Temperature: –40° C to 70° C (–40° F to 158° F) Humidity: 10% 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 inches (<15 kg box)
Acoustic noise (in dBA per ISO 7779)	Summit X150-24t: 45 (high fan speed) 37 (low fan speed) Summit X150-24p: 44 (high fan speed) 39 (low fan speed) Summit X150-48t: 45 (high fan speed) 37 (low fan speed)

Summit X250e Series Switches

The Summit X250e series includes the following switches:

- Summit X250e-24t switch
- Summit X250e-24tDC switch
- Summit X250e-24p switch
- Summit X250e-24x switch
- Summit X250e-24xDC switch
- Summit X250e-48t switch
- Summit X250e-48tDC switch
- Summit X250e-48p switch

Table 112: Physical Dimensions

Summit X250e-24t switch Summit X250e-24tDC switch Summit X250e-24p switch Summit X250e-24x switch Summit X250e-24xDC switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 12.13 inches (30.8 cm)
Summit X250e-48t switch Summit X250e-48tDC Summit X250e-48p switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.28 inches (38.8 cm)

Table 113: Weight

Summit X250e-24t switch	10.5 lb (4.8 kg)
Summit X250e-24tDC	9.9 lb (4.5 kg)
Summit X250e-24p switch	121.1 lb (5.5 kg)
Summit X250e-24x	10.2 lb (4.6 kg)
Summit X250e-24xDC	10 lb (4.6 kg)
Summit X250e-48t switch	12.1 lb (5.5 kg)
Summit X250e-48tDC switch	12.1 lb (5.5 kg)
Summit X250e-48p switch	12.1 lb (5.5 kg)

Table 114: Packaged Dimensions

Summit X250e-24t switch Summit X250e-24tDC switch Summit X250e-24p switch Summit X250e-24x switch Summit X250e-24xDC switch	Height: 12.6 inches (32 cm) Width: 23.6 inches (60 cm) Depth: 18.5 inches (47 cm)
Summit X250e-48t switch Summit X250e-48tDC switch Summit X250e-48p switch	Height: 12.2 inches (31 cm) Width: 22.8 inches (58 cm) Depth: 22 inches (56 cm)

Table 115: Packaged Weight

Summit X250e-24t switch Summit X250e-24x switch	13.2 lb (6.0 kg)
Summit X250e-24tDC switch	13.1 lb (6.0 kg)
Summit X250e-24xDC 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-48tDC switch	15.5 lb (7.0 kg)
Summit X250e-48p switch	17.0 lb (7.7 kg)

Table 116: Summit X250e-24t Power

Operational voltage range	90 to 264 V$\sim$
Nominal input ratings	100 to 240 V$\sim$, 50/60 Hz, 1.0 A
Input current	0.5 A @ 115 V$\sim$ (low-line) 0.25 A @ 230 V$\sim$ (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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	83% at 60% to 100% load
Heat dissipation (Watts, BTU)	36 W (122.8 BTU/hr)
Power consumption (Watts, BTU)	36 W (122.8 BTU/hr)

Table 117: Summit X250e-24p Power

Operational voltage range	90 to 264 V$\sim$
Nominal input ratings	100 to 240 V$\sim$, 50/60 Hz, 5.25 A
Input current (without PoE\)	0.75 A @ 115 V$\sim$ (low-line) 0.5 A @ 230 V$\sim$ (high-line)
Input current (with PoE full load)	4.4 A @ 115 V$\sim$ (low-line) 2.2 A @ 230 V$\sim$ (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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	81% with 60% to 100% load
Heat dissipation (without PoE)	75W (256 BTU/hr)

Table 117: Summit X250e-24p Power (continued)

Power consumption (without PoE)	75 W (256 BTU/hr)
Heat dissipation (with PoE full load)	130 W (444 BTU/hr)
Power consumption (with PoE full load)	525 W (1,791 BTU/hr)

Table 118: Summit X250e-24x Power

Operational voltage range	90 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	49 W (167.2 BTU/hr)
Power consumption	49 W (167.2 BTU/hr)

Table 119: Summit X250e-24xDC Power

Operational voltage range	-40 to -72 V⎓
Nominal input ratings	-48 V⎓, 2.0 A
Input current	1.25 A at -40 V⎓ (low-line) 0.75 A at -72 V⎓ (high-line)
Inrush current	20 A at -48 V⎓ 30 A at -72 V⎓
Power supply cord type	DC
Power supply input socket	TYCO 206061-1
Power cord input plug	TYCO 206060-1
Power cord wall plug	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Efficiency	83%

Table 119: Summit X250e-24xDC Power (continued)

Heat dissipation	42 W (143.3 BTU/hr)
Power consumption (Watts)	47 W (160.4 BTU/hr)

Table 120: Summit X250e-24tDC Power

Operational voltage range	-40 to -72 V⎓
Nominal input ratings	-48 V⎓, 2.0 A
Input current	0.8 A at -40 V⎓ (low-line) 0.5 A at -72 V⎓ (high-line)
Inrush current	20 A at 48 V⎓, 30 A at V⎓
Power supply cord type	DC
Power supply input socket	TYCO 206061-1
Power cord input plug	TYCO 206060-1
Power cord wall plug	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Efficiency	78%
Heat dissipation	31 W (105.8 BTU/hr)
Power consumption (Watts)	31 W (105.8 BTU/hr)

Table 121: Summit X250e-48t Power

Operational voltage range	90 to 264 V∿
Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.0 A
Input current	0.6 A @ 115 V∿ (low-line) 0.3 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	83% with 60% to 100% load
Heat dissipation (Watts)	51 W (174 BTU/hr)
Power consumption (Watts)	51 W (174 BTU/hr)

Table 122: Summit X250e-48p Power

Operational voltage range	90 to 264 V∿
Nominal input ratings	100 to 240 V∿, 50/60 Hz, 5.5 A
Input current with PoE full load	4.5 A @ 115 V∿ (low-line) 2.25 A @ 230 V∿ (high-line)
Input current without PoE	0.75 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	78% with 60% to 100% load
Heat dissipation with PoE full load	130 W (444 BTU/hr)
Heat dissipation without PoE	75 W (256 BTU/hr)
Power consumption with PoE full load	525 W (1791.4 BTU/hr)
Power consumption without PoE	75 W (256 BTU/hr)

Table 123: Summit X250e-48tDC Power

Operational voltage range	-40 to -72 V⎓
Nominal input ratings	-48 V⎓, 2.0 A
Input current	1.25 A at -40 V⎓ (low-line) 0.75 A at -57.6 V⎓ (high-line)
Inrush current	20 A @ 48 V⎓, 30 A @ 72 V⎓
Power supply cord type	DC
Power supply input socket	TYCO 206061-1
Power cord input plug	TYCO 206060-1
Power cord wall plug	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Efficiency	78%
Heat dissipation	47 W (160.4 BTU/hr)
Power consumption	47 W (160.4 BTU/hr)

Table 124: 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)

Table 125: 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 (South Korea)

Table 126: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications)
	ETSI EN 300 019 (Environmental for Telecommunications)

Table 127: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T

Table 128: Environmental Data

Environmental Standards	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	Temperature range: 0° C to 40° C (32° F to 104° F) Humidity: 95% 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 vibration: 3 to 500 Hz @ 1.5 G rms
Storage & transportation conditions (packaged)	Storage temperature: –40° C to 85° C (–40° F to 185° F) Storage and transportation humidity: 10% 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 inches (<15 kg box)
Acoustic noise (in dBA per ISO 7779)	Summit X250e-24t: 45 (high fan speed) 37 (low fan speed) Summit X250e-24p: 44 (high fan speed) 39 (low fan speed) Summit X250e-24x: 45 (high fan speed) 37 (low fan speed) Summit X250e-24xDC: 47 (high fan speed) 37 (low fan speed) Summit X250e-24tDC: 45 (high fan speed) 37 (low fan speed) Summit X250e-48t: 47 (high fan speed) 37 (low fan speed) Summit X250e-48p: 46 (high fan speed) 39 (low fan speed) Summit X250e-48tDC: 47 (high fan speed) 37 (low fan speed)

Summit X350 Series Switches

The Summit X350 series includes the following switches:

- Summit X350-24t
- Summit X350-48t

Table 129: Physical Dimensions

Summit X350-24t switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.3 inches (38.7 cm)
Summit X350-48t switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 17.0 inches (43.2 cm)

Table 130: Weight

Summit X350-24t switch	13.75 lb (6.24 kg)
Summit X350-48t switch	15.75 lb (7.14 kg)

Table 131: Packaged Dimensions

Summit X350-24t switch Summit X350-48t switch	Height: 5.9 inches (15 cm) Width: 22.4 inches (57cm) Depth: 21.7 inches (55 cm)

Table 132: Packaged Weight

Summit X350-24t switch	18.7 lb (8.5 kg)
Summit X350-48t switch	20.4 lb (9.3 kg)

Table 133: Summit X350-24t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.0 A
Input current	0.75 A @ 115 V∼ (low-line) 0.4A @ 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) (up to 6 feet or 2 meters) or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	75 W (256 BTU/hr)
Power consumption	75 W (256 BTU/hr)

Table 134: Summit X350-48t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.0 A
Input current	1.45 A @ 100 V∼ (low-line) 0.65 A @ 230 V∼ (high-line)
Line frequency range	47 to 63 Hz

Table 134: Summit X350-48t Power (continued)

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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	115W (393 BTU/hr)
Power consumption	115W (393 BTU/hr)

Table 135: 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)

Table 136: 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 136: EMI/EMC Standards (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 (Korea)

Table 137: Telecom Standards

ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)

Table 138: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T

Table 139: Environmental Data

Environmental Standards	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	Temperature range: 0° C to 40° C (32° F to 104° F) Humidity: 95% 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 vibration: 3 to 500 MHz @ 1.5 G rms

Table 139: Environmental Data (continued)

Storage & transportation conditions (packaged)	Storage 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): 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 inches (<15 kg box)
Acoustic noise	Sound power in accordance with EN 300 753 (10-1997): Summit X350-24t: 48.7 dBa Summit X350-48t: 49.9 dBa Declared sound power: 6.4 belsA per ISO 7779 & ISO 9296 Bystander sound pressure in accordance with NEBS GR-63 Issue 2: Summit X350-24t: 38.9 dBa Summit X350-48t: 39.7 dBa

Summit X430 Series Switches

The Summit X430 series includes the following switches:

- Summit X430-8p
- Summit X430-24t
- Summit X430-24p
- Summit X430-48t

Table 140: Physical Dimensions

Summit X430-8p switch	Height: 1.75 inches (4.4 cm) Width: 8.25 inches (21.0 cm) Depth: 10.31 inches (26.2 cm)
Summit X430-24t switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 8.2 inches (20.8 cm)
Summit X430-24p switch	Height: 1.75 inches (4.4 cm) Width: 17.31 inches (44.0 cm) Depth: 10.25 inches (26.0 cm)
Summit X430-48t switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 10.0 inches (25.4 cm)

Table 141: Weight

Summit X430-8p switch	3.1 lbs (1.4 kg)
Summit X430-24t switch	6.0 lbs (2.72 kg)
Summit X430-24p switch	9.9 lbs (4.5 kg)
Summit X430-48t switch	9.1 lb (4.13 kg)

Table 142: Packaged Dimensions

Summit X430-8p switch	Height: 5.9 inches (15.2 cm) Width 13.79 inches (35.0 cm) Depth: 13.32 inches (33.8 cm)
Summit X430-24t switch	Height: 3.7 inches (9.4 cm) Width 22.0 inches (55.9 cm) Depth: 12.1 inches (30.7 cm)
Summit X430-24tp switch	Height: 6.0 inches (15.3 cm) Width 22.26 inches (56.5 cm) Depth: 13.79 inches (35.0 cm)
Summit X430-48t switch	Height: 5.1 inches (13.0 cm) Width 22.3 inches (56.6 cm) Depth: 14.0 inches (35.6 cm)

Table 143: Packaged Weight

Summit X430-8p switch	6.0 lb (2.7 kg)
Summit X430-24t switch	11.1 lb (5.05 kg)
Summit X430-24p switch	13.2 lb (6.0 kg)
Summit X430-48t switch	11.7 lb (5.31 kg)

Table 144: Sound Pressure (LpA)

Summit X430-8p switch	0 dB(A) (No fan)
Summit X430-24t switch	Fans low speed: 41 dB(A) Fans high speed 49 dB(A)
Summit X430-24p switch	Fans low speed: 41 dB(A) Fans high speed 53 dB(A)
Summit X430-48t switch	Fans low speed: 38 dB(A) Fans High speed 50 dB(A)

> **Note**
> *Sound pressure is measured in accordance with ISO 7779:2010(E).*

Table 145: Declared Sound Power (L$_{WAd}$)

Summit X430-8p switch	0 bels (No Fan)
Summit X430-24t switch	Fans low speed: 5.7 bels Fans high speed: 6.6 bels
Summit X430-24p switch	Fans low speed: 5.6 bels Fans high speed: 6.8 bels

Table 145: Declared Sound Power (L$_{WAd}$) (continued)

Summit X430-48t switch	Fans low speed: 5.3 bels Fans High speed: 6.5 bels

> **Note**
>
> *Declared Sound Power is presented in accordance with ISO-7779, ISO 9296:2010 per ETSI/EN 300 753:2012-01.*

Table 146: Power: Summit X430-8p

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.75 A
Heat dissipation	24.2 W, 82.6 BTU/hr
Power consumption	24.2 W, 82.6 BTU/hr

Table 147: Power: Summit X430-24t

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 0.75 A
Heat dissipation	28.7 W, 97.9 BTU/hr
Power consumption	28.7 W, 97.9 BTU/hr

Table 148: Power: Summit X430-24p

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 5.75 A
Heat dissipation	55 W, 188 BTU/hr
Power consumption	55 W, 188 BTU/hr

Table 149: Power: Summit X430-48t

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.25 A
Heat dissipation	55.9 W, 191 BTU/hr
Power consumption	55.9 W, 191 BTU/hr

Table 150: Power Cords

Extreme Networks equipment does not ship with power cords. Click the following link for locating the correct power cord for purchase and use on specific Extreme Networks equipment. Specifications for power cords in each country are also provided within this link allowing end user to purchase cords locally. http://www.extremenetworks.com/product/powercords/

Table 151: Safety Standards

North American Safety of ITE	UL 60950-1 2nd Ed., Listed Device (US) CSA 22.2 #60950-1-03 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2007 2nd Ed. EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1 2nd Ed. + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 152: EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada) 2004/108/EC EMC Directive EN 55022:2010 Class A (Emissions for ITE Equipment) EN 55024:2010 Class A includes EN 61000-4-2, 3, 4, 5, 6, 11 EN 55011 :2009+A1:2010 (Emissions for Industrial, Scientific & Medical Radio Frequency Equipment) EN 61000-3-2: 2006+A2 2009 (Harmonics) EN 61000-3-3:2008 (Flicker) EN 61000-6-4: 2007+A1: 2011 (General Emissions for Industrial, Scientific & Medical) EN 61000-6-2:2005 (General Immunity for Industrial, Scientific & Medical) EN 50121-4:2006 (Emission and immunity of the signaling and telecommunications apparatus)

Table 152: EMI/EMC Standards (continued)

International EMC certifications	CISPR 22:2008 Class A (International Emissions for ITE Equipment) CISPR 24:2010 Class A (International Immunity for ITE Equipment) IEC 61000-4-2:2008/EN 61000-4-2:2009 (Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A) IEC 61000-4-3:2010/EN 61000-4-3:2006+A12008 +A2:2010 Radiated Immunity 20V/m, 80-960MHz, Criteria A Radiated Immunity 10V/m, 960-2100MHz, Criteria A Radiated Immunity 5V/m, 2100-2700MHz, Criteria A IEC 61000-4-4:2011/EN 61000-4-4: 2004+A1: 2010 Transient Burst, Power AC, ± 2.0kV, Criteria A Power DC, ± 2.0kV CM, 1kV DM, Criteria A I/O Cables, ± 2.0kV for all I/O longer than 3m IEC 61000-4-5:2005/EN 61000-4-5:2006 Surge, Test to 2/4kV, Level 3 AC Power, 1kV DM, 2kV CM, Criteria A DC Power 1kV DM, 2kV CM, Criteria A I/O 1kV L-G, Criteria A IEC 61000-4-6:2008/EN 61000-4-6:2009 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC 61000-4-8:2009/EN 61000-4-8:2010 Magnetic Immunity, Not applicable to Extreme's equipment IEC 61000-4-11:2004/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark KCC Mark, EMC Approval (Korea)

Table 153: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications) MEF 9 complian MEF 14 compliant

Table 154: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3at PoE Plus

Table 155: Environmental Data

Environmental standards	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	Temperature: X430-8p: 0° C to 40° C (32° F to 104° F) X430-24t, X430-24p, X430-48t: 0° C to 45° C (32° F to 113° F) Humidity: 10% to 95% relative humidity, non-condensing Altitude: X430-8p: 0 to 3,048 meters (10,000 feet) X430-24t: 0 to 4,000 meters (13,123 feet) X430-24p: 0 to 2,000 meters (6,567 feet) X430-48t: 0 to 3,000 meters (9,850 feet) Shock (half sine): 30 m/s^2 (3 G), 11 ms, 60 shocks Random vibration: 3 to 500 Hz at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)

Summit X440 Series Switches

The Summit X440 series includes the following switches:

- Summit X440-8t
- Summit X440-8p
- Summit X440-24t
- Summit X440-24tDC
- Summit X440-24x
- Summit X440-L2-24t
- Summit X440-24p
- Summit X440-24t-10G
- Summit X440-24p-10G
- Summit X440-24x-10G
- Summit X440-48t
- Summit X440-48tDC
- Summit X440-L2-48t
- Summit X440-48p
- Summit X440-48t-10G switch
- Summit X440-48p-10G switch

Table 156: Physical Dimensions

Summit X440-8t switch Summit X440-8p switch	Height: 1.73 inches (4.4 cm) Width: 12.0 inches (30.5 cm) Depth: 10.3 inches (26.1 cm)
Summit X440-24t switch Summit X440-24tDC switch Summit X440-L2-24t switch Summit X440-24p switch Summit X440-24x switch Summit X440-24t-10G switch Summit X440-24p-10G switch Summit X440-24x-10G switch Summit X440-48t switch Summit X440-48tDC switch Summit X440-L2-48t switch Summit X440-48p switch Summit X440-48t-10G switch Summit X440-48p-10G switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 10.0 inches (25.4 cm)

Table 157: Weight

Summit X440-8t switch	5.8 lb (2.64 kg)
Summit X440-8p switch	6.7 lb (3.04 kg)
Summit X440-24t switch Summit X440-L2-24t switch	8.4 lb (3.83 kg)
Summit X440-24tDC	8.47 lb (3.84)
Summit X440-24p switch Summit X440-24x switch	9.8 lb (4.47 kg)
Summit X440-24t-10G switch	8.5 lb (3.87 kg)
Summit X440-24p-10G switch Summit X440-24x-10G switch	9.8 lb (4.48 kg)
Summit X440-48t switch Summit X440-L2-48t switch	9.1 lb (4.13 kg)
Summit X440-48tDC	9.13 lb (4.14 kg)
Summit X440-48p switch	10.7 lb (4.85 kg)
Summit X440-48t-10G switch	9.1 lb (4.13 kg)
Summit X440-48p-10G switch	10.6 lb (4.83 kg)

Table 158: Packaged Dimensions

Summit X440-8t switch Summit X440-8p switch	Height: 3.31 inches (8.4 cm) Width 14.8 inches (37.5 cm) Depth: 24.1 inches (61.2 cm)
Summit X440-24t switch Summit X440-24tDC switch Summit X440-L2-24t switch Summit X440-24p switch Summit X440-24x switch Summit X440-24t-10G switch Summit X440-24p-10G switch Summit X440-24x-10G switch Summit X440-48t switch Summit X440-48t DC switch Summit X440-L2-48t switch Summit X440-48p switch Summit X440-48t-10G switch Summit X440-48p-10G switch	Height: 5.12 inches (13.2 cm) Width: 22.13 inches (56.2 cm) Depth: 15.16 inches (38.5 cm)

Table 159: Packaged Weight

Summit X440-8t switch	8.29 lb (3.76 kg)
Summit X440-8p switch	9.17 lb (4.16 kg)
Summit X440-24t switch Summit X440-L2-24t switch Summit X440-24x switch	11.1 lb (5.05 kg)
Summit X440-24tDC	10.3 (4.69 kg)
Summit X440-24p switch	12.5 lb (5.65 kg)
Summit X440-24t-10G switch	11.1 lb (5.02 kg)
Summit X440-24p-10G switch Summit X440-24x-10G switch	12.5 lb (5.68 kg)
Summit X440-48t switch Summit X440-L2-48t switch	11.7 lb (5.31 kg)
Summit X440-48tDC	11.0 lb (4.99 kg)
Summit X440-48p switch	13.3 lb (6.02 kg)
Summit X440-48t-10G switch	11.7 lb (5.30 kg)
Summit X440-48p-10G switch	13.3 lb (6.02 kg)

Table 160: Fan Speed

	Note Summit fans have the ability to change speeds depending upon operating conditions.
Summit X440-8t switch	Low speed: 0 RPM, High speed: 0 RPM (No fan)
Summit X440-8p switch	Low speed: 6800 RPM, High speed: 11000 RPM

Table 160: Fan Speed (continued)

Summit X440-24t switch	Low speed: 0 RPM, High speed 11000 RPM
Summit X440-24tDC switch	Low speed: 0 RPM, High speed 11000 RPM
Summit X440-L2-24t switch	Low speed: 0 RPM, High speed 11000 RPM
Summit X440-24x switch	Low speed: 0 RPM, High speed 11000 RPM
Summit X440-24p switch	Low speed: 5900 RPM, High speed: 11000 RPM
Summit X440-24t-10G switch	Low speed: 0 RPM, High speed: 11000 RPM
Summit X440-24p-10G switch	Low speed: 5900 RPM, High speed: 11000 RPM
Summit X440-24x-10G	Low speed: 0 RPM, High speed 11000 RPM
Summit X440-48t switch	Low speed: 5900 RPM, High speed 11000 RPM
Summit X440-48tDC switch	Low speed: 5900 RPM, High speed 11000 RPM
Summit X440-L2-48t switch	Low speed: 5900 RPM, High speed 11000 RPM
Summit X440-48p switch	Low speed: 5900 RPM, High speed 11000 RPM
Summit X440-48t-10G switch	Low speed: 5900 RPM, High speed 11000 RPM
Summit X440-48p-10G switch	Low speed: 5900 RPM, High speed 11000 RPM

Table 161: Acoustic Sound

Summit X440-8t switch	Low speed: 0 dB(A), High speed: 0 dB(A) (No fan)
Summit X440-8p switch	Low speed: 44 dB(A), High speed: 55 dB(A)
Summit X440-24t switch Summit X440-L2-24t switch Summit X440-24tDC switch	Low speed: 0 dB(A) (fan not on), High speed: 51.6 dB(A)
Summit X440-24x	Low speed: 0 bels, High speed: 6.5 bels, Declared Sound Power (LWAd) Low speed: 0 dB(A), High speed: 62.4 dB(A), Sound Power (LWAm) Low speed: 0 dB(A), High speed: 51.7 dB(A), Sound Pressure (LpA)
Summit X440-24p switch	Low speed: 46.3 dB(A), High speed: 56.1 dB(A)
Summit X440-24t-10G switch	Low speed: 0 dB(A) (fan not on), High speed: 51.6 dB(A)
Summit X440-24x-10G	Low speed: 5.5 bels, High speed: 6.6 bels, Declared Sound Power (LWAd) Low speed: 51.6 dB(A), High speed: 62.9 dB(A), Sound Power (LWAm) Low speed: 41.2 dB(A), High speed: 52.4 dB(A), Sound Pressure (LpA)
Summit X440-24p-10G switch	Low speed: 42 dB(A), High speed: 57 dB(A)
Summit X440-48t switch Summit X440-L2-48t switch	Low speed: 39 dB(A), High speed: 55 dB(A)
Summit X440-48tDC switch	Low speed: 39 dB(A), High speed: 52.1 dB(A)
Summit X440-48p switch	Low speed: 42 dB(A), High speed: 57 dB(A)
Summit X440-48t-10G switch	Low speed: 39 dB(A), High speed: 55 dB(A)
Summit X440-48p-10G switch	Low speed: 42 dB(A), High speed: 57 dB(A)

Table 162: PSUs and X440 Models

60W	100W	250W POE	525 W POE
X440-8t	X440-24t	X440-8p	X440-24p
	X440-24t-10G		X440-24p-10G
	X440-24x		X440-48p
	X440-24x-10G		X440-48p-10G
	X440-48t		
	X440-48t-10G		

Table 163: Power: Summit X440-8t

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 0.50 A
Input current	0.35 A @ 110 V∼ (low-line) 0.23 A @ 220 V∼ (high-line)
Maximum inrush current	60 A @ 230VAC (25C)
Heat dissipation	39 W, 133 BTU/hr
Power consumption	39 W, 133 BTU/hr

Table 164: Power: Summit X440-8p

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 3.0 A
Input current	2.2 A @ 110 V∼ (low-line) 1.1A @ 220 V∼ (high-line)
Maximum inrush current	40 A @ 115VAC 60Hz (25C) 70 A @ 230VAC 50Hz (25C)
Heat dissipation	81 W, 276 BTU/hr
Power consumption	251 W, 856 BTU/hr

Table 165: Power: Summit X440-24t and X440-L2-24t

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 0.75 A
Input current	0.40 A @ 110 V∼ (low-line) 0.20 A @ 220 V∼ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	37 W, 126 BTU/hr
Power consumption	37 W, 126 BTU/hr

Table 166: Power: Summit X440-24tDC

Nominal input ratings	-48V, 1.25A
Heat dissipation	38 W, 129 BTU/hr
Power consumption	38 W, 129 BTU/hr

Table 167: Power: Summit X440-24p

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 6.0 A
Input current	5.3 A @ 110 V∼ (low-line) 2.65 A @ 220 V∼ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 60 A @ 230VAC 50Hz (25C)
With PoE	
Heat dissipation	205 W, 700 BTU/hr
Power consumption	585 W, 2000 BTU/hr
Without PoE	
Heat dissipation	37 W, 126 BTU/hr
Power consumption	37 W, 126 BTU/hr

Table 168: Power: Summit X440-24x

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 0.75 A
Input current	0.48 A @ 110 V∼ (low-line) 0.27 A @ 220 V∼ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	54 W, 184 BTU/hr
Power consumption	54 W, 184 BTU/hr

Table 169: Power: Summit X440-24t-10G

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 0.75 A
Input current	0.4 A @ 110 V∼ (low-line) 0.2 A @ 220 V∼ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	44 W, 150 BTU/hr
Power consumption	44 W, 150 BTU/hr

Table 170: Power: Summit X440-24p-10G

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 6.0 A
Input current	5.3 A @ 110 V∿ (low-line) 2.65 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 60 A @ 230VAC 50Hz (25C)
Heat dissipation	205 W, 700 BTU/hr
Power consumption	585 W, 2000 BTU/hr

Table 171: Power: Summit X440-24x-10G

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 0.75 A
Input current	0.5 A @ 110 V∿ (low-line) 0.3 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	56 W, 191 BTU/hr
Power consumption	56 W, 191 BTU/hr

Table 172: Power: Summit X440-48t and X440-L2-48t

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.0 A
Input current	0.85 A @ 110 V∿ (low-line) 0.50 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	57 W, 194 BTU/hr
Power consumption	57 W, 194 BTU/hr

Table 173: Power: Summit X440-48tDC

Nominal input ratings	-48V, 2.0 A
Heat dissipation	57 W, 195 BTU/hr
Power consumption	57 W, 195 BTU/hr

Table 174: Power: Summit X440-48p

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 6.25 A
Input current	5.5 A @ 110 V∿ (low-line) 2.75 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 60 A @ 230VAC 50Hz (25C)

Table 174: Power: Summit X440-48p (continued)

With PoE	
Heat dissipation	220 W, 750 BTU/hr
Power consumption	600 W, 2050 BTU/hr
Without PoE	
Heat dissipation	78 W, 266 BTU/hr
Power consumption	78 W, 266 BTU/hr

Table 175: Power: Summit X440-48t-10G

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.0 A
Input current	0.85 A @ 110 V∿ (low-line) 0.5 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 40 A @ 230VAC 50Hz (25C)
Heat dissipation	95 W, 325 BTU/hr
Power consumption	95 W, 325 BTU/hr

Table 176: Power: Summit X440-48p-10G

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 6.25 A
Input current	5.5 A @ 110 V∿ (low-line) 2.75 A @ 220 V∿ (high-line)
Maximum inrush current	30 A @ 115VAC 60Hz (25C) 60 A @ 230VAC 50Hz (25C)
Heat dissipation	220 W, 750 BTU/hr
Power consumption	600 W, 2050 BTU/hr

Table 177: Safety Standards

North American Safety of ITE	UL 60950-1 2nd Ed., Listed Device (US) CSA 22.2 #60950-1-03 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2007 2nd Ed. EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1 2nd Ed. + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 178: EMI/EMC Standards

North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada)
European EMC standards	FCC CFR 47 part 15 Class A (USA) ICES-003 Class A (Canada) 2004/108/EC EMC Directive EN 55022:2010 Class A (Emissions for ITE Equipment) EN 55024:2010 Class A includes EN 61000-4-2, 3, 4, 5, 6, 11 EN 55011 :2009+A1:2010 (Emissions for Industrial, Scientific & Medical Radio Frequency Equipment) EN 61000-3-2: 2006+A2 2009 (Harmonics) EN 61000-3-3:2008 (Flicker) EN 61000-6-4: 2007+A1: 2011 (General Emissions for Industrial, Scientific & Medical) EN 61000-6-2:2005 (General Immunity for Industrial, Scientific & Medical) EN 50121-4:2006 (Emission and immunity of the signaling and telecommunications apparatus)
International EMC certifications	CISPR 22:2008 Class A (International Emissions for ITE Equipment) CISPR 24:2010 Class A (International Immunity for ITE Equipment) IEC 61000-4-2:2008/EN 61000-4-2:2009 (Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A) IEC 61000-4-3:2010/EN 61000-4-3:2006+A12008 +A2:2010 Radiated Immunity 20V/m, 80-960MHz, Criteria A Radiated Immunity 10V/m, 960-2100MHz, Criteria A Radiated Immunity 5V/m, 2100-2700MHz, Criteria A IEC 61000-4-4:2011/EN 61000-4-4: 2004+A1: 2010 Transient Burst, Power AC, ± 2.0kV, Criteria A Power DC, ± 2.0kV CM, 1kV DM, Criteria A I/O Cables, ± 2.0kV for all I/O longer than 3m IEC 61000-4-5:2005/EN 61000-4-5:2006 Surge, Test to 2/4kV, Level 3 AC Power, 1kV DM, 2kV CM, Criteria A DC Power 1kV DM, 2kV CM, Criteria A I/O 1kV L-G, Criteria A IEC 61000-4-6:2008/EN 61000-4-6:2009 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC 61000-4-8:2009/EN 61000-4-8:2010 Magnetic Immunity, Not applicable to Extreme's equipment IEC 61000-4-11:2004/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark KCC Mark, EMC Approval (Korea)

Table 179: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications) MEF 9 complian MEF 14 compliant

Table 180: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T
IEEE 802.3z 1000BASE-X
IEEE 802.3at PoE Plus
IEEE 802.3i 10BASE-T
IEEE 802.3u 100BASE-TX
IEEE 802.3ae 10GBASE-T

Table 181: Environmental Data

Environmental standards	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	Temperature: 0° C to 45° C (32° F to 113° F)
	Humidity: 10% to 95% 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 vibration: 3 to 500 Hz at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks
	Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G
	Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz
	14 drops minimum on sides and corners at 42 inches (<15 kg box)

Summit X450 Series Switches

The Summit X450 series includes the following switches:

- Summit X450-24t switch
- Summit X450-24x switch

Summit X450 Series Switch Technical Specifications

Table 182: 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)

Table 183: Weight

Summit X450-24t switch	14 lb (6.35 kg)
Summit X450-24x switch	13.8 lb (6.26 kg)

Table 184: 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.

Table 185: 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)

Table 186: 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 186: EMI/EMC Standards (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 (South Korea)

Table 187: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)

Table 188: Environmental Data

Environmental standards	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	Temperature range 0 °C to 40 °C (32 °F to 104 °F) Humidity:10% to 95% relative humidity, non-condensing Shock (half sine): 30 m/s^2 (3 G), 11ms, 18 shocks 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 inches (<15 kg box)

Table 189: Acoustic Sound

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 190: Physical Dimensions

Summit X450a-24t switch Summit X450a-24tDC switch Summit X450a-24x switch Summit X450a-24xDC switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 15.3 inches (38.9 cm)
Summit X450a-48t switch Summit X450a-48tDC switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 17.0 inches (43.2 cm)

Table 191: Weight

Summit X450a-24t switch	13.8 lb (6.24 kg)
Summit X450a-24tDC switch	12.3 lb (5.56 kg)
Summit X450a-24x switch	13.0 lb (5.9 kg)
Summit X450a-24xDC switch	12.50 lb (5.67 kg)
Summit X450a-48t switch	15.8 lb (7.14 kg)
Summit X450a-48tDC switch	15.5 lb (7.03 kg)

Table 192: Packaged Dimensions

Summit X450a-24t switch Summit X450a-24tDC switch Summit X450a-24x switch Summit X450a-24xDC switch Summit X450a-48t switch Summit X450a-48tDC switch	Height: 5.9 inches (15 cm) Width: 22.4 inches (57 cm) Depth: 21.7 inches (55 cm)

Table 193: 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)

Table 194: Fan Speed

Delta Blower	2900 RPM/11.3 CFM
Sunon Fan	7200 RPM/8.9 CFM

Table 195: Summit X450a-24t Power

Operational voltage range	90 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	100 W (341.2 BTU/hr)
Power consumption	100 W (341.2 BTU/hr)

Table 196: 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)
Inrush current	20 A @ 48 V, 30 A @ 72 V
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	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Heat dissipation, Watts, BTU	75 W, 255.9 BTU/hr
Power consumption, Watts, BTU	75 W, 255.9 BTU/hr

Table 197: Summit X450a-48t Power

Operational voltage range	90 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
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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	160 W (512 BTU/hr)
Power consumption, Watts, BTU	160 W (512 BTU/hr)

Table 198: Summit X450a-48tDC Power

Operational voltage range	–36 to –72 V⎓
Nominal input voltage	–48 V⎓, 4.5 A
Input current	4.0 A @ –36 V DC (low-line) 2.0 A @ –72 V DC (high-line)
Inrush current	29 A @ 48 V, 30 A @ 72 V
Input wire harness	Extreme part number 250088
Power supply cord gauge	14 AWG (2.0 mm^2)
Power cord input plug	TYCO PN 206060-1
Power supply input socket	TYCO PN 206061-1

Table 199: Summit X450a-24x Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.5 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
Inrush current	30 A @ 115 V, 60 A @ 230 V

Table 199: Summit X450a-24x Power (continued)

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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation	80 W (273 BTU/hr)
Power consumption	80 W (273 BTU/hr)

Table 200: Summit X450a-24xDC Power

Operational voltage range	–36 to –72 V⎓
Nominal input ratings	–48 V⎓, 2.5 A
Input current	2.5 A @ -36 V⎓ (low-line) 1.25 A @ -72 V⎓ (high-line)
Inrush current	40 A peak maximum
Input wire harness	Extreme Networks PN 250088
Power supply input socket	TYCO PN 206061-1
Power cord input plug	TYCO PN 206060-1
Power cord wall plug	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Heat dissipation	98 W (334 BTU/hr)
Power consumption	98 W (334 BTU/hr)

Table 201: 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)

Table 202: 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 (South Korea)

Table 203: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)

Table 204: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T

Table 205: Environmental Data

Environmental standards	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	Temperature range: 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 vibration: 3 to 500 Hz @ 1.5 G rms

Table 205: Environmental Data (continued)

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): 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 inches (<15 kg box)
Sound power in accordance with EN 300 753 (10-1997) Summit X450a-24t and X450a-48t	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 Summit X450a-24t and X450a-48t	Bystander sound pressure: 54 dBA right side @ 0.6m

Summit X450e Series Switches

The Summit X450e series includes the following switches:

* Summit X450e-24p switch
* Summit X450e-48p switch
* Summit X450e-24t switch
* Summit X450e-48t switch

Table 206: Physical Dimensions

Summit X450e-24p switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.30 inches (38.7 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)
Summit X450e-24t switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 15.3 inches (38.9 cm)
Summit X450e-48t switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 17.0 inches (43.2 cm)

Table 207: Weight

Summit X450e-24p switch	14 lb (6.4 kg)
Summit X450e-48p switch	16.25 lb (7.4 kg)
Summit X450e-24t switch	11.8 lb (5.4 kg)
Summit X450e-48t switch	15.75 lb (7.14 kg)

Table 208: Packaged Dimensions

Summit X450e-24p switch Summit X450e-48p switch	Height: 5.9 inches (15 cm) Width: 22.4 inches (57 cm) Depth: 21.7 inches (55 cm)

Table 209: Packaged Weight

Summit X450e-24p switch	18.9 lb (8.6 kg)
Summit X450e-48p switch	21 lb (9.6 kg)
Summit X450e-24t switch	26.8 lb (12.16 kg)
Summit X450e-48t switch	29.9 lb (13.6 kg)

Table 210: Summit X450e-24p Power

Operational voltage range	90 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation with PoE full load	120 W (410 BTU/hr)
Power consumption with PoE full load	488 W (1,665 BTU/hr)
Heat dissipation without PoE	54 W (184 BTU/hr)
Power consumption without PoE	54 W (184 BTU/hr)

Table 211: Summit X450e-48p Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 6.0 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

Table 211: Summit X450e-48p Power (continued)

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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load
Heat dissipation with PoE full load	180 W (614 BTU/hr)
Power consumption with PoE full load	507 W (1,730 BTU/hr)
Heat dissipation without PoE	73 W (250 BTU/hr)
Power consumption without PoE	73 W (250 BTU/hr)

Table 212: Summit X450e-24t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.0 A
Nominal input current	0.52 A @ 100 V∼ (low-line) 0.31 A @ 240 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Heat dissipation, Watts, BTU	52 W (178 BTU/hr)
Power consumption, Watts, BTU	52 W (178 BTU/hr)

Table 213: Summit X450e-48t Power

Operational voltage range	90 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50/60 Hz, 6 A

Table 213: Summit X450e-48t Power (continued)

Nominal input current	0.94 A @ 100 V~ (low-line) 0.43 A @ 240 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Heat dissipation	94 W (321 BTU/hr)
Power consumption	94 W (321 BTU/hr)

Table 214: 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)

Table 215: 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 215: EMI/EMC Standards (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 (South Korea)

Table 216: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications)
	ETSI EN 300 019 (Environmental for Telecommunications)

Table 217: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T

Table 218: Environmental Data

Environmental standards	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	Temperature range: 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 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): 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 inches (<15 kg box)
Acoustic sound	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

Summit X460 Series Switches

The Summit X460 series includes the following switches:

- Summit X460-24t switch
- Summit X460-48t switch
- Summit X460-24x switch
- Summit X460-48x switch
- Summit X460-24p switch
- Summit X460-48p switch

Table 219: Physical Dimensions

Summit X460-24t switch Summit X460-48t switch Summit X460-24x switch Summit X460-48x switch Summit X460-24p switch Summit X460-48p switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 17.0 inches (43.2 cm)
SummitStack module SummitStack-V80 module XGM3SB-4sf option card	Height: 1.4 inches (3.55 cm) Width: 3.4 inches (8.6 cm) Depth: 4.9 inches (12.5 cm)
XGM3-2sf option card XGM3S-2sf option card XGM3S-2xsf option card	Height: 1.4 inches (3.55 cm) Width: 2.9 inches (7.4 cm) Depth: 4.9 inches (12.5 cm)
Summit X460 fan module	Height: 1.6 inches (4.15 cm) Width: 3.25 inches (8.26 cm) Depth: 4.9 inches (12.53 cm)

Table 220: Weight

Summit X460-24t switch	12.8 lb (5.81 kg)
Summit X460-48t switch	13.6 lb (6.15 kg)
Summit X460-24x switch	13.2 lb (6.01 kg)
Summit X460-48x switch	14.1 lb (6.4 kg)
Summit X460-24p switch	13.1 lb (5.94 kg)
Summit X460-48p switch	13.9 lb (6.3 kg) **Note** Switch weights include installed fan module. They do not include installed VIM2 modules or power supplies
SummitStack module	0.42 lb (0.19 kg)
SummitStack-V80 module	0.53 lb (0.24 kg)
XGM3-2sf module	0.46 lb (0.21 kg)
XGM3S-2sf option card	0.5 lb (0.23 kg)
XGM3S-2xf option card	0.5 lb (0.23 kg)

Table 220: Weight (continued)

XGM3SB-4sf option card	0.5 lb (0.23 kg)
Summit X460 fan module	0.66 lb (0.30 kg)

Table 221: Packaged Dimensions

Summit X460-24t switch Summit X460-48t switch Summit X460-24x switch Summit X460-48x switch Summit X460-24p switch Summit X460-48p switch	Height: 6.5 inches (16.5 cm) Width: 23.4 inches (59.3 cm) Depth: 26.2 inches (66.5 cm)

Table 222: Packaged Weight

Summit X460-24t switch	23.6 lb (10.7 kg)
Summit X460-48t switch	24.3 lb (11.0 kg)
Summit X460-24x switch	24.0 lb (10.9 kg)
Summit X460-48x switch	24.9 lb (11.3 kg)
Summit X460-24p switch	23.8 lb (10.8 kg)
Summit X460-48p switch	24.6 lb (11.2 kg)
XGM3-2sf module	0.79 lb (0.36 kg)
XGM3S-2sf option card	1.0 lb (0.45 kg)
XGM3S-2xf option card	1.0 lb (0.45 kg)
XGM3SB-4sf option card	1.0 lb (0.45 kg)
SummitStack module	0.74 lb (0.34 kg)
SummitStack-V80 module	0.85 lb (0.39kg)
Summit X460 fan module	0.79 lb (0.36 kg)

Table 223: Fan Speed

Minimum speed	2500 RPM
Maximum speed	15900 RPM
Acoustic sound	44 dB at low fan speed, 64 dB at high fan speed
Average Latency	

Power: Summit X460-24t

Table 224: Summit X460-24t with No Installed Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1 A
Input current	0.9 A @ 100 V∿ (low-line) 0.45 A @ 240 V∿ (high-line)
Minimum power consumption	83 W
Minimum heat dissipation	284 BTU/hr
Maximum power consumption	103 W
Maximum heat dissipation	351 BTU/hr

Table 225: Summit X460-24t with No Option Card or Stacking Module (DC Power Supply)

Nominal input ratings	48 V⎓, 2 A
Input current	1.3 A @ 48 V⎓ (low-line) 1.15 A @ 60 V⎓ (high-line)
Minimum power consumption	67.8 W
Minimum heat dissipation	231 BTU/hr
Maximum power consumption	85 W
Maximum heat dissipation	290 BTU/hr

Power: Summit X460-24x

Table 226: Summit X460-24x with No Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1 A
Input current	0.9 A @ 100 V∿ (low-line) 0.45 A @ 240 V∿ (high-line)
Minimum power consumption	89 W
Minimum heat dissipation	304 BTU/hr
Maximum power consumption	107 W
Maximum heat dissipation	365 BTU/hr

Table 227: Summit X460-24x with No Option Card or Stacking Module (DC Power Supply)

Nominal input ratings	48 V⎓, 1.75 A
Input current	1.5 A @ 48 V⎓ (low-line) 1.3 A @ 60 V⎓ (high-line)
Minimum power consumption	74 W
Minimum heat dissipation	253 BTU/hr
Maximum power consumption	93 W
Maximum heat dissipation	317 BTU/hr

Power: Summit X460-24p

Table 228: Summit X460-24p with No Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 5.25 A (per power supply)
Input current	4.9 A @ 100 V∿ (low-line) (per power supply) 2.0 A @ 240 V∿ (high-line) (per power supply)
Minimum power consumption	481 W 962 W (power supply * 2 units)
Minimum heat dissipation	1,640 BTU/hr (per power supply) 3,280 BTU/hr (power supply * 2 units)
Maximum power consumption	493 W 986 W (power supply * 2 units)
Maximum heat dissipation	1,681 BTU/hr 3,362 BTU/hr

Power: Summit X460-48t

Table 229: Summit X460-48t with No Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∿, 50/60 Hz, 1.25 A
Input current	1.1 A @ 100 V∿ (low-line) 0.5 A @ 240 V∿ (high-line)
Minimum power consumption	105 W
Minimum heat dissipation	359 BTU/hr
Maximum power consumption	129 W
Maximum heat dissipation	440 BTU/hr

Table 230: Summit X460-48t with No Option Card or Stacking Module (DC Power Supply)

Nominal input ratings	48 V⎓, 2 A
Input current	1.9 A @ 48 V⎓ (low-line) 1.6 A @ 60 V⎓ (high-line)
Minimum power consumption	107 W
Minimum heat dissipation	365 BTU/hr
Maximum power consumption	121 W
Maximum heat dissipation	413 BTU/hr

Power: Summit X460-48x

Table 231: Summit X460-48x with No Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 1.25 A
Input current	1.1 A @ 100 V∼ (low-line) 0.5 A @ 240 V∼ (high-line)
Minimum power consumption	101 W
Minimum heat dissipation	345 BTU/hr
Maximum power consumption	119 W
Maximum heat dissipation	406 BTU/hr

Table 232: Summit X460-48x with No Installed Option Card or Stacking Module (DC Power Supply)

Nominal input ratings	48 V⎓, 2.25 A
Input current	2.1 A @ 48 V⎓ (low-line) 1.8 A @ 60 V⎓ (high-line)
Minimum power consumption	107 W
Minimum heat dissipation	365 BTU/hr
Maximum power consumption	121 W
Maximum heat dissipation	413 BTU/hr

Power: Summit X460-48p

Table 233: Summit X460-48p with No Option Card or Stacking Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 5.5 A (per power supply)
Input current	5.0 A @ 100 V∼ (low-line) 2.1 A @ 240 V∼ (high-line)
Minimum power consumption	493 W 966 W (power supply * 2 units)
Minimum heat dissipation	1,682 BTU/hr (per power supply) 3,364 BTU/hr (power supply * 2 units)
Maximum power consumption	505 W 1010 W (power supply * 2 units)
Maximum heat dissipation	1,722 BTU/hr 3,444 BTU/hr

Table 234: Safety Standards

North American Safety of ITE	UL 60950-1 2nd Ed., Listed Device (US) CSA 22.2 #60950-1-03 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2007 2nd Ed. EN 60825-1+A2:2001 (Lasers Safety) TUV-R GS Mark by German Notified Body 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1 2nd Ed. + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 235: 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 55022:2006+A1:2007 Class A EN 55024:A2-2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11 EN 61000-3-2,8-2006 (Harmonics) EN 61000-3-3 2008 (Flicker) ETSI EN 300 386 v1.4.1, 2008-04 (EMC Telecommunications) 2004/108/EC EMC Directive EN 50121-4:2006 (Emission and immunity of the signaling and telecommunications apparatus)

Table 235: EMI/EMC Standards (continued)

International EMC certifications	CISPR 22: 2006 Ed 5.2, Class A (International Emissions)
	CISPR 24:A2:2003 Class A (International Immunity)
	IEC 61000-4-2:2008/EN 61000-4-2:2009
	Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A
	IEC 61000-4-3:2008/EN 61000-4-3:2006+A1:2008
	Radiated Immunity 10V/m, Criteria A
	IEC 61000-4-4:2004 am1 ed.2./EN 61000-4-4:2004/A1:2010
	Transient Burst, 1 kV, Criteria A
	IEC 61000-4-5:2005 /EN 61000-4-5:2006
	Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A
	IEC 61000-4-6:2008/EN 61000-4-6:2009
	Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A
	EC/EN 61000-4-11:2004
	Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions)
	ACMA (C-Tick) (Australia Emissions)
	CCC Mark
	KCC Mark, EMC Approval (Korea)

Table 236: Telecom Standards

ETSI EN 300 386:2001 (EMC Telecommunications)
ETSI EN 300 019 (Environmental for Telecommunications)

Table 237: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T

Table 238: Environmental Data

Environmental standards	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	Temperature range: Summit X460-24t, X460-48t, X460-24x, and X460-48x 0° C to 45° C (32° F to 113° F) Summit X460-24p, X460-48p 0° C to 40° C (32° F to 104° F) Humidity: 10% to 95% 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 vibration: 3 to 500 Hz at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)

> **Note**
>
> For the technical specifications of power supplies for the Summit X460 series switches, see Summit 300 W Power Supplies and Summit 750 W AC Power Supply.

Summit X460-G2 Series Switches

The Summit X460-G2 series includes the following switches:

- Summit X460-G2-24t-GE4
- Summit X460-G2-24t-10GE4
- Summit X460-G2-48t-GE4
- Summit X460-G2-48t-10GE4
- Summit X460-G2-24p-GE4
- Summit X460-G2-24p-10GE4
- Summit X460-G2-48p-GE4
- Summit X460-G2-48p-10GE4
- Summit X460-G2-24x-10GE4
- Summit X460-G2-48x-10GE4

X460-G2 Unpackaged Physical Dimensions and Weight

Physical Dimensions

Summit X460-G2-24t-GE4 switch Summit X460-G2-24t-10GE4 switch Summit X460-G2-48t-GE4 switch Summit X460-G2-48t-10GE4 switch Summit X460-G2-24x-10GE4 switch Summit X460-G2-48x-10GE4 switch	Height: 1.73 inches (4.4 cm) Width: 17.38 inches (44.1 cm) Length: 16.94 inches (43.0 cm)
Summit X460-G2-24p-GE4 switch Summit X460-G2-24p-10GE4 switch Summit X460-G2-48p-GE4 switch Summit X460-G2-48p-10GE4 switch	Height: 1.73 inches (4.4 cm) Width: 17.38 inches (44.1 cm) Length: 19.11 inches (48.5 cm)

Weight (with blanks, no PS or fan)

Summit X460-G2-24t-GE4 switch Summit X460-G2-24t-10GE4 switch	12.92 lb (5.86 kg)
Summit X460-G2-48t-GE4 switch Summit X460-G2-48t-10GE4 switch	13.27 lb (6.02 kg))
Summit X460-G2-24p-GE4 switch Summit X460-G2-24p-10GE4 switch	14.68 lb (6.66 kg)
Summit X460-G2-48p-GE4 switch Summit X460-G2-48p-10GE4 switch	15.21 lb (6.90 kg)
Summit X460-G2-24x-10GE4 switch	13.14 lb (5.96 kg)
Summit X460-G2-48x-10GE4 switch	13.62 lb (6.18 kg)

X460-G2 Packaged Physical Dimensions and Weight

Packaged Dimensions

Summit X460-G2-24t-GE4 switch Summit X460-G2-24t-10GE4 switch Summit X460-G2-48t-GE4 switch Summit X460-G2-48t-10GE4 switch Summit X460-G2-24x-10GE4 switch Summit X460-G2-48x-10GE4 switch	Height: 6.70 inches (17.0 cm) Width: 21.87 inches (55.5 cm) Length: 22.85 inches (58.0 cm)
Summit X460-G2-24p-GE4 switch Summit X460-G2-24p-10GE4 switch Summit X460-G2-48p-GE4 switch Summit X460-G2-48p-10GE4 switch	Height: 6.70 inches (17.0 cm) Width: 22.85 inches (58.0 cm) Length: 24.03 inches (6.10 cm)

Packaged Weight (no PSU or fan module)

Summit X460-G2-24t-GE4 switch Summit X460-G2-24t-10GE4 switch	18.83 lb (8.56 kg)
Summit X460-G2-48t-GE4 switch Summit X460-G2-48t-10GE4 switch	19.27 lb (8.76 kg)
Summit X460-G2-24p-GE4 switch Summit X460-G2-24p-10GE4 switch	21.83 lb (9.92 kg)
Summit X460-G2-48p-GE4 switch Summit X460-G2-48p-10GE4 switch	22.4 lb (10.2 kg)
Summit X460-G2-24x-10GE4 switch	18.70 lb (8.50 kg)
Summit X460-G2-48x-10GE4 switch	18.96 lb (8.62 kg)

Table 239: VIM and Clock Module Weights and Dimensions

VIM/Module	Weight	Dimensions
Summit X460-G2 VIM-2x	0.5 lb (0.23 kg)	Height: 1.4 inches (3.55 cm) Width: 3.4 inches (8.6 cm) Length: 5.5 inches (13.9 cm)
Summit X460-G2 VIM-2t	0.5 lb (0.23 kg)	Height: 1.4 inches (3.55 cm) Width: 3.4 inches (8.6 cm) Length 5.5 inches (13.9 cm)
Summit X460-G2 VIM-2ss	0.5 lb (0.23 kg)	Height: 1.4 inches (3.55 cm) Width: 3.4 inches (8.6 cm) Length: 5.5 inches (13.9 cm)
Summit X460-G2 VIM-2q	0.5 lb (0.23 kg)	Height: 1.4 inches (3.55 cm) Width: 3.4 inches (8.6 cm) Length: 5.5 inches (13.9 cm)
Summit X460-G2 TM-CLK	0.25 lb (0.12 kg)	Height: 1.4 inches (3.55 cm) Width: 1.0 inches (2.54 cm) Length: 6.5 inches (16.6 cm)

Fan and Acoustic Noise

Switch Model	Acoustic Information	
Summit X460-G2-24t-10GE4 Summit X460-G2-24t-GE4	Dual 300W AC or DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 49.1 dB(A), 0C to 45C 54.9 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 6.0 bels, 0C to 45C 6.6 bels @ 50C
	Dual 300W AC or DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 48.9 dB(A), 0C to 35C 59.5 dB(A), 45C 65.6 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 5.9 bels, 0C to 35C 7.2 bels, 45C 7.8 bels, 50C
Summit X460-G2-48t-10GE4 Summit X460-G2-48t-GE4	Dual 300W AC or DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 47.6 dB(A), 0C to 45C 64.5 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 5.9 bels, 0C to 45C 7.7 bels, 50C
	Dual 300W AC or DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 47.7 dB(A), 0C to 35C 58.7 dB(A), 45C 65.3 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 5.9 bels, 0C to 35C 7.2 bels, 45C 7.8 bels, 50C
Summit X460-G2-48p-10GE4 Summit X460-G2-48p-GE4	Dual 715W or 1100W AC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 52.2 dB(A), 0C to 45C 64.3 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 6.9 bels, 0C to 45C 7.6 bels, 50C
	Dual 715W or 1100W AC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 50.9 dB(A), 0C to 31C 64.2 dB(A), 35C 70.8 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 7.2 bels, 0C to 31C 7.6 bels, 35C 7.9 bels 50C
Summit X460-G2-24p-10GE4 Summit X460-G2-24p-GE4	Dual 715W or 1100W AC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 52.2 dB(A), 0C to 45C 61.8 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 7.3 bels, 0C to 45C 7.4 bels, 50C
	Dual 715W or 1100W AC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 50.8 dB(A), 0C to 35C 69.8 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 7.3 bels, 0C to 35C 8.1 bels, 50C
Summit X460-G2-24x-10GE4	Dual 300W AC or DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 48.8 dB(A), 0C to 45C 61.9 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 6.0 bels, 0C to 45C 7.5 bels, 50C
	Dual 300W AC or DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 48.8 dB(A), 0C to 35C 58.7 dB(A), 45C 66.7 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 6.0 bels, 0C to 35C 6.9 bels, 45C 7.8 bels, 50C
Summit X460-G2-48x-10GE4	Dual 300W AC or DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 48.9 dB(A), 0C to 45C 60.5 dB(A) @ 50C	Declared Sound Power (L$_{WAd}$)** 6.0 bels, 0C to 45C 7.4 bels, 50C
	Dual 300W AC or DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 48.8 dB(A), 0C to 35C 57.5 dB(A), 45C 66.1 dB(A), 50C	Declared Sound Power (L$_{WAd}$)** 6.0 bels, 0C to 35C 6.9 bels, 45C 7.8 bels, 50C

* Bystander Sound Pressure is presented for comparison to other products measured using Bystander Sound Pressure.

**Declared Sound Power is presented in accordance with ISO-7779:2010(E), ISO 9296:2010 per ETSI/EN 300 753:2012-01

Note

Acoustic noise levels below represent noise emitted by the switch at room ambient temperatures. Values are based on a fully configured system consisting of two PSU, two I/O modules operating under full load.Normal operating temperature range: 0C to 50C.

Power Options

Summit X460-G2 Power Supply Options

X460-G2-24t-GE4 (Part # 16716)
X460-G2-24t-10GE4 (Part # 16701)
X460-G2-24x-10GE4 (Part # 16705)

300W AC Front to Back and Back to Front Power Supply

Part #: 10930A 300W AC PS FB (front to back),
Part #: 10943 300W AC PS BF (back to front)

Model: EDPS-300AB CA

100-240V~50/60 Hz, 1.25A max per PS

300W DC Front to Back and Back to Front Power Supply

Part #: 10933 300W DC PS FB (front to back),
Part #: 10944 300W DC PS BF (back to front)

Model: PSSW301201A

+24VDC or -48VDC, 4.75A max per PS

X460-G2-48t-GE4 (Part # 16717)
X460-G2-48t-10GE4 (Part # 16702)
X460-G2-48x-10GE4 (Part # 16706)

300W AC Front to Back and Back to Front Power Supply

Part #: 10930A 300W AC PS FB (front to back)
Part #: 10943 300W AC PS BF (back to front)

Model: EDPS-300AB CA

100-240V~50/60 Hz, 1.25A max per PS

300W DC Front to Back and Back to Front Power Supply

Part #: 10933 300W DC PS FB (front to back)
Part #: 10944 300W DC PS BF (back to front)

Model: PSSW301201A

+24VDC or -48VDC, 5.25A max per PS

X460-G2-24p-GE4 (Part # 16718)
X460-G2-24p-10GE4 (Part # 16703)

1100W AC Front to Back and Back to Front Power Supply

Part #: 10941 1100W AC PS FB (front to back),
Model: PSSF112101A
Part #: 10942 1100W AC PS BF (back to front),
Model: PSSF112102A

100-127V 200-240V~50-60 Hz, 10.5A/5.0 A max per PS

715W AC Front to Back and Back to Front Power Supply

Part #: 10951 715W AC PS FB (front to back),
Model: PSSF711101A
Part #: 10952 715W AC PS BF (back to front),
Model: PSSF711102A

100-127V 200-240V~50-60 Hz, 5.75A/2.75A max per PS

X460-G2-48p-GE4 (Part # 16719)
X460-G2-48p-10GE4 (Part # 16704)

1100W AC Front to Back and Back to Front Power Supply.

Part #: 10941 1100W AC PS FB (front to back),
Model: PSSF112101A
Part #: 10942 1100W AC PS BF (back to front),
Model: PSSF112102A

100-127V 200-240V~50-60 Hz, 10.75A/5.0A max per PS

715W AC Front to Back and Back to Front Power Supply

Part #: 10951 715W AC PS FB (front to back),
Model: PSSF711101A
Part #: 10952 715W AC PS BF (back to front),
Model: PSSF711102A

100-127V 200-240V~50-60 Hz, 7.5A/3.75 A max per PS

X460-G2 Power Consumption

SWITCH MODEL	MINIMUM HEAT DISSIPATION	MINIMUM POWER CONSUMPTION	MAXIMUM HEAT DISSIPATION	MAXIMUM POWER CONSUMPTION
Summit X460-G2-24t-10GE4	229 BTU/hr	67 W	427 BTU/hr	125 W
Summit X460-G2-24p-10GE4	260 BTU/hr	76 W	1475 BTU/hr	204 W
Summit X460-G2-48t-10GE4	250 BTU/hr	73 W	427 BTU/hr	125 W
Summit X460-G2-48p-10GE4	287 BTU/hr	84 W	1645 BTU/hr	334 W
Summit X460-G2-24x-10GE4	209 BTU/hr	61 W	427 BTU/hr	125 W
Summit X460-G2-48x-10GE4	202 BTU/hr	59 W	427 BTU/hr	125 W
Summit X460-G2-24t-GE4	215 BTU/hr	63 W	427 BTU/hr	125 W
Summit X460-G2-24p-GE4	250 BTU/hr	73 W	1475 BTU/hr	204 W
Summit X460-G2-48t-GE4	243 BTU/hr	71 W	427 BTU/hr	127 W
Summit X460-G2-48p-GE4	284 BTU/hr	83 W	1645 BTU/hr	334 W

X460-G2 POE Power Budget

SWITCH MODEL	1 PSU OF 715W	1 PSU OF 1100W	2 PSUS OF 715W	1 PSU OF 715W AND 1 PSU OF 1100W	2 PSUS OF 1100W
Summit X460-G2-24p-10GE4	500 W	850 W	1031 W	1350 W	1668 W
Summit X460-G2-48p-10GE4	500 W	850 W	1031 W	1350 W	1668 W
Summit X460-G2-24p-GE4	500 W	850 W	1031 W	1350 W	1668 W
Summit X460-G2-48p-GE4	500 W	850 W	1031 W	1350 W	1668 W
Summit X460-G2-24p-10GE4	16 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W
Summit X460-G2-48p-10GE4	16 ports @ 30W 32 ports @ 15.4W	28 ports @ 30W 48 ports @ 15.4W	34 ports @ 30W 48 ports @ 15.4W	45 ports @ 30W 48 ports @ 15.4W	48 ports @ 30W 48 ports @ 15.4W
Summit X460-G2-24p-GE4	16 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W	24 ports @ 30W 24 ports @ 15.4W
Summit X460-G2-48p-GE4	16 ports @ 30W 32 ports @ 15.4W	28 ports @ 30W 48 ports @ 15.4W	34 ports @ 30W 48 ports @ 15.4W	45 ports @ 30W 48 ports @ 15.4W	48 ports @ 30W 48 ports @ 15.4W

Standards and Environmental Data

Table 240: Safety Standards

North American Safety of ITE	UL 60950-1 1st Ed., Listed Device (US) CSA 22.2 #60950-1-07 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2006 2nd Ed. TUV-R GS EN 60825-1:2007 (Lasers Safety) 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2005 2nd Ed., + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 241: 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 55022:2006+A1:2007 Class A EN 55024:1998+A1:2001+A2:2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11 EN 61000-3-2: 2006+A2:2009 (Harmonics) EN 61000-3-3:2008 (Flicker) ETSI EN 300 386: v1.4.1 (2008-04) (EMC Telecommunications) 2004/108/EC EMC Directive

Table 241: EMI/EMC Standards (continued)

International EMC certifications	CISPR 22: 2008 (Ed 6.0), Class A (International Emissions) EN 55024:1998+A1:2001+A2:2003 Class A (International Immunity) IEC/EN 61000-4-2:2008 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A IEC/EN 61000-4-3:2008 Radiated Immunity 10V/m, Criteria IEC/EN 61000-4-4:2004 Transient Burst, 1 kV, Criteria A IEC/EN 61000-4-5:2005 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A IEC/EN 61000-4-6:2008 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) BSMI (Taiwan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark (China) KCC Mark, EMC Approval (Korea)

Table 242: Telecom Standards

	EN/ETSI 300 386:2008 (EMC Telecommunications) EN/ETSI 300 019 (Environmental for Telecommunications) MEF9 and MEF14 certified for EPL, EVPL, and ELAN

Table 243: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3ae 10GBASE-X IEEE 802.3ba 40GBASE-X IEEE 802.3at PoE Plus IEEE 802.3az (EEE)

Table 244: Environmental Data

Environmental standards	EN/ETSI 300 019-2-1 v2.1.2 (2000 - 2009) - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 (1999 - 09) - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 (2003 - 04) - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Temperature range: 0° C to 50° C (32° F to 122° F) Humidity: 10% to 95% relative humidity, non-condensing 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 at 1.5 G rms

Table 244: Environmental Data (continued)

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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)

Summit X650 series switches:

- Summit X650-24t switch
- Summit X650-24x switch

Table 245: Physical Dimensions

Summit X650-24t switch Summit X650-24x switch	Height: 1.73 inches (4.4 cm) Width: 17.35 inches (44.1 cm) Depth: 25.8 inches (65.5 cm)
VIM1-SummitStack module VIM1-10G8X module VIM1-SummitStack512 module VIM1-SummitStack256 module VIM3-40G4X module	Height: 1.7 inches (4.3 cm) Width: 5.2 inches (13.2 cm) Depth: 9.9 inches (25.2cm)

Table 246: Weight

Summit X650-24t switch	24.1 lb (11.6 kg)
Summit X650-24x switch	20.4 lb (10.1kg)
VIM1-SummitStack module	1.5 lb (0.66 kg)
VIM1-10G8X module	2.0 lb (0.9 kg)
VIM3-40G4X module	2.40 lb (1.09 kg)

Table 247: Packaged Dimensions

Summit X650-24t switch Summit X650-24x switch	Height: 10.4 inches (25.5 cm) Width: 23.3 inches (59.2 cm) Depth: 32.8 inches (83.4 cm)

Table 248: Packaged Weight

Summit X650-24t switch	35.5 lb (16.1 kg)
Summit X650-24x switch	32.2 lb (14.6 kg)
VIM3-40G4X module	3.46 lb (1.57 kg)

Table 249: Fan Speed

Minimum speed	4500 RPM
Maximum speed	18000 RPM

Table 250: Acoustic Noise

61 db at low fan speed, 66 db at high fan speed

Power: Summit X650-24t (Manufacturing part number 800246-00)

Table 251: Summit X650-24t with VIM1-SummitStack Module (AC Power Supply)

Nominal input ratings	100 to 240 V~, 50/60 Hz, 8.0 A
Input current	6.9 A @ 100 V~ (low-line) 2.9 A @ 240 V~ (high-line)
Heat dissipation	689 W, 2,351 BTU/hr
Power consumption	689 W, 2,351 BTU/hr

Table 252: Summit X650-24t with VIM1-10G8X Module (AC Power Supply)

Nominal input ratings	100 to 240 V~, 50/60 Hz, 8.0 A
Input current	7.8 A @ 100 V~ (low-line) 3.8 A @ 240 V~ (high-line)
Heat dissipation	780 W, 2,661 BTU/hr
Power consumption	780 W, 2,661 BTU/hr

Table 253: Summit X650-24t with VIM1-SummitStack512 Module (AC Power Supply)

Nominal input ratings	100 to 240 V~, 50/60 Hz, 8.0 A
Input current	8.0 A @ 100 V~ (low-line) 3.8 A @ 240 V~ (high-line)
Heat dissipation	798 W, 2,723 BTU/hr
Power consumption	798 W, 2,723 BTU/hr

Table 254: Summit X650-24t with VIM1-SummitStack256 Module (AC Power Supply

Nominal input ratings	100 to 240 V~, 50/60 Hz, 8.0 A
Input current	2.9 A @ 100 V~ (low-line) 4.8 A @ 240 V~ (high-line)
Heat dissipation	285 W, 973 BTU/hr
Power consumption	285 W, 973 BTU/hr

Table 255: Summit X650-24t with VIM1-SummitStack Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	12.9 A @ 48 V⎓ (low-line) 10.6 A @ 60 V⎓ (high-line)
Heat dissipation	617 W, 2,105 BTU/hr
Power consumption	617 W, 2,105 BTU/hr

Table 256: Summit X650-24t with VIM1-10G8X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	14.6 A @ 48 V⎓ (low-line) 12.3 A @ 60 V⎓ (high-line)
Heat dissipation	701 W, 2,393 BTU/hr
Power consumption	701 W, 2,393 BTU/hr

Table 257: Summit X650-24t with VIM1-SummitStack512 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	14.8 A @ 48 V⎓ (low-line) 12.5 A @ 60 V⎓ (high-line)
Heat dissipation	708 W, 2,416 BTU/hr
Power consumption	708 W, 2,416 BTU/hr

Table 258: Summit X650-24t with VIM1-SummitStack256 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	xx A @ 48 V⎓ (low-line) xx A @ 60 V⎓ (high-line)
Heat dissipation	xx W, 2,416 BTU/hr
Power consumption	xx W, 2,416 BTU/hr

Power: Summit X650-24t (Manufacturing part number 800320-00)

Table 259: Summit X650-24t with VIM1-SummitStack Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 8.0 A
Input current	4.6 A @ 100 V∼ (low-line) 1.6 A @ 240 V∼ (high-line)
Heat dissipation	463 W, 1,580 BTU/hr
Power consumption	463 W, 1,580 BTU/hr

Table 260: Summit X650-24t with VIM1-10G8X Module (AC Power Supply)

Nominal input ratings	100 to 240 V⁓, 50/60 Hz, 8.0 A
Input current	5.5 A @ 100 V⁓ (low-line)
	2.5 A @ 240 V⁓ (high-line)
Heat dissipation	552 W, 1,884 BTU/hr
Power consumption	552 W, 1,884 BTU/hr

Table 261: Summit X650-24t with VIM1-SummitStack512 Module (AC Power Supply)

Nominal input ratings	100 to 240 V⁓, 50/60 Hz, 8.0 A
Input current	5.7 A @ 100 V⁓ (low-line)
	2.7 A @ 240 V⁓ (high-line)
Heat dissipation	565 W, 1,928 BTU/hr

Table 262: Summit X650-24t with VIM3-40G4X Module (AC Power Supply)

Nominal input ratings	100 to 240 V⁓, 50/60 Hz, 8.0 A
Input current	6.2 A @ 100 V⁓ (low-line)
	2.6 A @ 240 V⁓ (high-line)
Heat dissipation	615 W, 2,099 BTU/hr
Power consumption	615 W, 2,099BTU/hr

Table 263: Summit X650-24t with VIM1-SummitStack256 Module (AC Power Supply)

Nominal input ratings	100 to 240 V⁓, 50/60 Hz, 8.0 A
Input current	xx A @ 100 V⁓ (low-line)
	xx A @ 240 V⁓ (high-line)
Heat dissipation	xx W, xx BTU/hr
Power consumption	xx W, xx BTU/hr

Table 264: Summit X650-24t with VIM1-SummitStack Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	8.7 A @ 48 V⎓ (low-line)
	7.1 A @ 60 V⎓ (high-line)
Heat dissipation	418 W, 1,426 BTU/hr
Power consumption	418 W, 1,426 BTU/hr

Table 265: Summit X650-24t with VIM1-10G8X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	10.4 A @ 48 V⎓ (low-line) 8.8 A @ 60 V⎓ (high-line)
Heat dissipation	500 W, 1,706 BTU/hr
Power consumption	500 W, 1,706 BTU/hr

Table 266: Summit X650-24t with VIM1-SummitStack512 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	10.4 A @ 48 V⎓ (low-line) 8.8 A @ 60 V⎓ (high-line)
Heat dissipation	501 W, 1,709 BTU/hr
Power consumption	501 W, 1,709 BTU/hr

Table 267: Summit X650-24t with VIM3-40G4X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	12.7 A @ 48 V⎓ (low-line) 9.95 A @ 60 V⎓ (high-line)
Heat dissipation	612 W, 2088 BTU/hr
Power consumption	612 W, 2088 BTU/hr

Table 268: Summit X650-24t with VIM1-SummitStack256 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 24 A
Input current	xx A @ 48 V⎓ (low-line) xx A @ 60 V⎓ (high-line)
Heat dissipation	xx W, xx BTU/hr
Power consumption	xx W, xx BTU/hr

Power: Summit X650-24x (all manufacturing part numbers)

Table 269: Summit X650-24x with VIM1-SummitStack Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.75 A
Input current	2.9 A @ 100 V∼ (low-line) 1.2 A @ 240 V∼ (high-line)
Heat dissipation	291 W, 992 BTU/hr
Power consumption	291 W, 992 BTU/hr

Table 270: Summit X650-24x with VIM1-10G8X Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.75 A
Input current	3.7 A @ 100 V∼ (low-line) 1.5 A @ 240 V∼ (high-line)
Heat dissipation	371 W, 1,402 BTU/hr
Power consumption	371 W, 1,402 BTU/hr

Table 271: Summit X650-24x with VIM1-SummitStack512 Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.75 A
Input current	3.8 A @ 100 V∼ (low-line) 1.6 A @ 240 V∼ (high-line)
Heat dissipation	383 W, 1,307 BTU/hr
Power consumption	383 W, 1,307 BTU/hr

Table 272: Summit X650-24x with VIM1-SummitStack256 Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.75 A
Input current	2.9 A @ 100 V∼ (low-line) 4.8 A @ 240 V∼ (high-line)
Heat dissipation	285 W, 973 BTU/hr
Power consumption	285 W, 973 BTU/hr

Table 273: Summit X650-24x with VIM3-40G4X Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.75 A
Input current	3.8 A @ 100 V∼ (low-line) 1.6 A @ 240 V∼ (high-line)
Heat dissipation	385 W, 1,314 BTU/hr
Power consumption	385 W, 1,314 BTU/hr

Table 274: Summit X650-24x with VIM1-SummitStack Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 9 A
Input current	5.9 A @ 48 V⎓ (low-line) 4.8 A @ 60 V⎓ (high-line)
Heat dissipation	287 W, 979 BTU/hr
Power consumption	287 W, 979 BTU/hr

Table 275: Summit X650-24x with VIM1-10G8X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 9 A
Input current	7.5 A @ 48 V⎓ (low-line) 6.1 A @ 60 V⎓ (high-line)
Heat dissipation	364 W, 1,242 BTU/hr
Power consumption	364 W, 1,242 BTU/hr

Table 276: Summit X650-24x with VIM1-SummitStack512 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 9 A
Input current	7.7 A @ 48 V⎓ (low-line) 6.2 A @ 60 V⎓ (high-line)
Heat dissipation	372 W, 1,269 BTU/hr
Power consumption	372 W, 1,269 BTU/hr

Table 277: Summit X650-24x with VIM3-40G4X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 9 A
Input current	7.9 A @ 48 V⎓ (low-line) 6.3 A @ 60 V⎓ (high-line)
Heat dissipation	385 W, 1,314 BTU/hr
Power consumption	385 W, 1,314 BTU/hr

Table 278: Summit X650-24x with VIM1-SummitStack256 Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 9 A
Input current	xx A @ 48 V⎓ (low-line) xx A @ 60 V⎓ (high-line)
Heat dissipation	xx W, xx BTU/hr
Power consumption	xx W, xx BTU/hr

Table 279: 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)

Table 280: 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 (South Korea)

Table 281: Telecom Standards

	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)

Table 282: IEEE 802.3 Media Access Standards

	IEEE 802.3ab 1000BASE-T

Table 283: Environmental Data

Environmental standards	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	Temperature range: 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 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): 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 inches (<15 kg box)

Note

For the technical specifications of power supplies for the Summit X650 series switches, see Summit 850 W Power Supplies.

Summit X670 Series Switches

The Summit X670 series includes the following switches:

- Summit X670-48x switch
- Summit X670V-48x switch
- Summit X670V-48t switch

Table 284: Physical Dimensions

Summit X670-48x switch Summit X670V-48x switch Summit X670V-48t switch	Height: 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 19.25 inches (48.9 cm)
VIM4-40G4X module	Height: 1.6 inches (4.1 cm) Width: 4.1 inches (10.3 cm) Depth: 6.5 inches (16.6 cm)
Summit X670 fan module	Height: 1.65 inches (4.2 cm) Width: 1.65 inches (4.2 cm) Depth: 3.98 inches (10.1 cm)

Table 285: Weight

Summit X670-48x switch	16.0 lb (7.3 kg)
Summit X670V-48x switch Summit X670V-48t switch	15.3 lb (7.0 kg)
Note NOTE: Switch weights include installed fan module. They do not include installed VIM4 modules or power supplies.	
VIM4-40G4X module	0.99 lb (0.45 kg)
Summit X670 fan module	0.36 lb (0.16 kg)

Table 286: Packaged Dimensions

Summit X670-48x switch Summit X670V-48x switch Summit X670V-48t switch	Height: 6.5 inches (16.5 cm)
	Width: 23.4 inches (59.3 cm)
	Depth: 26.2 inches (66.5 cm)
VVIM4-40G4X module	Height: 3.9 inches (10 cm)
	Width: 9.4 inches (24.0 cm)
	Depth: 15.4 inches (39 cm)

Table 287: Packaged Weight

Summit X670-48x switch	22.7 lb (10.3 kg)
Summit X670V-48x switch Summit X670V-48t switch	21.2 lb (9.6 kg)
VIM4-40G4X module	2.75 lb (1.25 kg)
Summit X670 fan module	1.27 lb (0.58 kg)

Table 288: Fan Speed

Minimum speed	4500 RPM
Maximum speed	18000 RPM

Power: Summit X670-48x

Table 289: Summit X670-48x (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 2.5 A
Input current	2.25 A @ 100 V∼ (low-line)
	0.9 A @ 240 V∼ (high-line)
Heat dissipation	225 W, 768 BTU/hr
Power consumption	225 W, 768 BTU/hr

Table 290: Summit X670-48x (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 5.0 A
Input current	4.25 A @ 48 V⎓ (low-line)
	3.35 A @ 60 V⎓ (high-line)
Heat dissipation	210 W, 717 BTU/hr
Power consumption	210 W, 717 BTU/hr

Power: Summit X670V-48x

Table 291: Summit X670V-48x with No Installed VIM (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 3.75 A
Input current	3.0 A @ 100 V∼ (low-line)
	1.2 A @ 240 V∼ (high-line)
Heat dissipation	300 W, 1,024 BTU/hr
Power consumption	300 W, 1,024 BTU/hr

Table 292: Summit X670V-48x with VIM4-40G4X Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 3.75 A
Input current	3.4 A @ 100 V∼ (low-line)
	1.4 A @ 240 V∼ (high-line)
Heat dissipation	340 W, 1,161 BTU/hr
Power consumption	340 W, 1,161 BTU/hr

Table 293: Summit X670V-48x with No Installed VIM (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 7.5 A
Input current	5.7 A @ 48 V⎓ (low-line)
	4.6 A @ 60 V⎓ (high-line)

Table 293: Summit X670V-48x with No Installed VIM (DC Power Supply) (continued)

Heat dissipation	280 W, 956 BTU/hr
Power consumption	280 W, 956 BTU/hr

Table 294: Summit X670V-48x with VIM4-40G4X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 7.5 A
Input current	6.85 A @ 48 V⎓ (low-line) 5.45 A @ 60 V⎓ (high-line)
Heat dissipation	330 W, 1,126 BTU/hr
Power consumption	330 W, 1,126 BTU/hr

Power: Summit X670V-48t

Table 295: Summit X670V-48t with No Installed VIM (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.0 A
Input current	3.3 A @ 100 V∼ (low-line) 1.41 A @ 240 V∼ (high-line)
Heat dissipation	323 W, 1,102 BTU/hr
Power consumption	323 W, 1,102 BTU/hr

Table 296: Summit X670V-48t with VIM4-40G4X Module (AC Power Supply)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 4.0 A
Input current	3.5 A @ 100 V∼ (low-line) 1.52 A @ 230 V∼ (high-line)
Heat dissipation	350 W, 1,194 BTU/hr
Power consumption	350 W, 1,194 BTU/hr

Table 297: Summit X670V-48t with No Installed VIM (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 7.5 A
Input current	8.4 A @ 40 V⎓ (low-line) 5.4 A @ 60 V⎓ (high-line)
Heat dissipation	336 W, 1147 BTU/hr
Power consumption	336 W, 1147 BTU/hr

Table 298: Summit X670V-48t with VIM4-40G4X Module (DC Power Supply)

Nominal input ratings	48 to 60 V⎓, 8.0 A
Input current	9.13 A @ 48 V⎓ (low-line) 5.88 A @ 60 V⎓ (high-line)
Heat dissipation	365W, 1,245 BTU/hr
Power consumption	365 W, 1,245 BTU/hr

Table 299: Safety Standards

North American Safety of ITE	UL 60950-1 1st Ed., Listed Device (US) CSA 22.2 #60950-1-07 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2006 2nd Ed. TUV-R GS EN 60825-1:2007 (Lasers Safety) 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2005 2nd Ed., + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 300: 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 55022:2006+A1:2007 Class A EN 55024:1998+A1:2001+A2:2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11 EN 61000-3-2: 2006+A2:2009 (Harmonics) EN 61000-3-3:2008 (Flicker) ETSI EN 300 386: v1.4.1 (2008-04) (EMC Telecommunications) 2004/108/EC EMC Directive
International EMC certifications	CISPR 22: 2008 (Ed 6.0), Class A (International Emissions) EN 55024:1998+A1:2001+A2:2003 Class A (International Immunity) IEC/EN 61000-4-2:2008 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A IEC/EN 61000-4-3:2008 Radiated Immunity 10V/m, Criteria IEC/EN 61000-4-4:2004 Transient Burst, 1 kV, Criteria A IEC/EN 61000-4-5:2005 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A IEC/EN 61000-4-6:2008 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) BSMI (Taiwan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark (China) KCC Mark, EMC Approval (Korea)

Table 301: Telecom Standards

EN/ETSI 300 386:2008 (EMC Telecommunications) EN/ETSI 300 019 (Environmental for Telecommunications) MEF9 and MEF14 certified for EPL, EVPL, and ELAN

Table 302: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3ae 10GBASE-X IEEE 802.3ba 40GBASE-X

Table 303: Environmental Data

Environmental standards	EN/ETSI 300 019-2-1 v2.1.2 (2000 - 2009) - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 (1999 - 09) - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 (2003 - 04) - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Temperature range: 0° C to 45° C (32° F to 113° F) Humidity: 10% to 95% relative humidity, non-condensing 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 at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)
Acoustic noise	
Summit X670V-48x	56.6 dB(A) min

> **Note**
>
> For the technical specifications of power supplies for the Summit X670 series switches, see Summit 450 W Power Supplies.

Summit X670-G2 Series Switches

The Summit X670-G2 series includes the following switches:

- X670-G2-670-48x-4q
- X670-G2-670-72x

Physical Dimensions and Weight

Physical Dimensions

Summit X670-G2-48x-4q switch	Height: 1.73 inches (4.4 cm) Width: 17.38 inches (44.1 cm) Length: 19.20 inches (48.7 cm)
Summit X670-G2-72x switch	Height: 1.73 inches (4.4 cm) Width: 17.38 inches (44.1 cm) Length: 19.20 inches (48.7 cm)

Weight

Summit X670-G2-48x-4q switch	14.7 lb (6.7 kg)
Summit X670-G2-72x switch	15.42 lb (7.0 kg)

Packaged Dimensions

Summit X670-G2-48x-4q switch	Height: 13.99 inches (35.5 cm) Width: 24.23 inches (61.5 cm) Length: 27.58 inches (70.0 cm)
Summit X670-G2-72x switch	Height: 13.99 inches (35.5 cm) Width: 24.23 inches (61.5 cm) Length: 27.58 inches (70.0 cm)

Packaged Weight

Summit X670-G2-48x-4q switch	20.1 lb (9.1 kg)
Summit X670-G2-72x switch	20.7 lb (9.4 kg)

Fan and Acoustic Noise

Switch Model	Acoustic Information	
Summit X670-G2-48x-4q	Dual 550W AC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 60.2 dB(A), 0C to 45C	Declared Sound Power (L_{WAd})** 7.3 bels, 0C to 45C
	Dual 550W DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 61.3 dB(A), 0C to 45C	Declared Sound Power (L_{WAd})** 7.4 bels, 0C to 45C
	Dual 550W AC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 58.3 dB(A), 0C to 35C 70.1 dB(A), 45C	Declared Sound Power (L_{WAd})** 7.0 bels, 0C to 35C 8.4 bels, 45C
	Dual 550W DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 55.0 dB(A), 0C to 35C 68.8 dB(A), 45C	Declared Sound Power (L_{WAd})** 6.5 bels, 0C to 35C 8.1 bels, 45C
Summit X670-G2-72x	Dual 550W AC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 58.9 dB(A), 0C to 35C 62.5 dB(A), 45C	Declared Sound Power (L_{WAd})** 7.3 bels, 0C to 35C 7.6 bels, 45C
	Dual 550W DC PS with Front to Back (FB) air flow	
	Bystander Sound Pressure* 58.5 dB(A), 0C to 35C 62.4 dB(A), 45C	Declared Sound Power (L_{WAd})** 7.3 bels, 0C to 35C 7.6 bels, 45C
	Dual 550W AC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 59.8 dB(A), 0C to 35C 72.6 dB(A), 45C	Declared Sound Power (L_{WAd})** 7.3 bels, 0C to 35C 8.2 bels, 45C
	Dual 550W DC PS with Back to Front (BF) air flow	
	Bystander Sound Pressure* 56.4 dB(A), 0C to 35C 73.0 dB(A), 45C	Declared Sound Power (L_{WAd})** 6.7 bels, 0C to 35C 8.3 bels, 45C

* Bystander Sound Pressure is presented for comparison to other products measured using Bystander Sound Pressure.

**Declared Sound Power is presented in accordance with ISO-7779:2010(E), ISO 9296:2010 per ETSI/EN 300 753:2012-01

Power Options

Power Options	
X670-G2-72x (Part # 17300)	
550 W AC Front to Back and Back to Front Power Supply	**550 W DC Front to Back and Back to Front Power Supply**
Part #: 10925 550W AC PS FB (front to back), Model #: DS550HE-3	Part #: 10926 550W DC PS FB (front to back), Model #: DS550DC-3
Part #: 10927 550W AC PS BF (back to front) Model #:DS550HE-3-002	Part #: 10928 550 W DC PS BF (back to front) Model #: DS550DC-3-003
100-240V-50/60 Hz, 2.75A, max per PS	-48VDC, 6.75A max per PS
X670-G2-48x-4q (Part # 17310)	
550 W AC Front to Back and Back to Front Power Supply	**550 W DC Front to Back and Back to Front Power Supply**
Part #: 10925 550W AC PS FB (front to back), Model #: DS550HE-3	Part #: 10926 550W DC PS FB (front to back), Model #: DS550DC-3
Part #: 10927 550W AC PS BF (back to front) Model #:DS550HE-3-002	Part #: 10928 550 W DC PS BF (back to front) Model #: DS550DC-3-003
100-240V-50/60 Hz, 2.25A max per PS	-48VDC, 5.75A max per PS

Table 304: Power Consumption

Switch Model	Minimum Heat Dissipation	Minimum Power Consumption	Maximum Heat Dissipation	Maximum Power Consumption
Summit X670-G2-48x-4q	325 BTU/hr	95 W	768 BTU/hr	225 W
Summit-G2-72x	325 BTU/hr	95 W	939 BTU/hr	275 W

Standards and Environmental Data

Table 305: Safety Standards

North American Safety of ITE	UL 60950-1 1st Ed., Listed Device (US) CSA 22.2 #60950-1-07 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2006 2nd Ed. TUV-R GS EN 60825-1:2007 (Lasers Safety) 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2005 2nd Ed., + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 306: 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 55022:2006+A1:2007 Class A EN 55024:1998+A1:2001+A2:2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11 EN 61000-3-2: 2006+A2:2009 (Harmonics) EN 61000-3-3:2008 (Flicker) ETSI EN 300 386: v1.4.1 (2008-04) (EMC Telecommunications) 2004/108/EC EMC Directive

Table 306: EMI/EMC Standards (continued)

International EMC certifications	CISPR 22: 2008 (Ed 6.0), Class A (International Emissions) EN 55024:1998+A1:2001+A2:2003 Class A (International Immunity) IEC/EN 61000-4-2:2008 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A IEC/EN 61000-4-3:2008 Radiated Immunity 10V/m, Criteria IEC/EN 61000-4-4:2004 Transient Burst, 1 kV, Criteria A IEC/EN 61000-4-5:2005 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A IEC/EN 61000-4-6:2008 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) BSMI (Taiwan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark (China) KCC Mark, EMC Approval (Korea)

Table 307: Telecom Standards

EN/ETSI 300 386:2008 (EMC Telecommunications) EN/ETSI 300 019 (Environmental for Telecommunications) MEF9 and MEF14 certified for EPL, EVPL, and ELAN

Table 308: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3ae 10GBASE-X IEEE 802.3ba 40GBASE-X

Table 309: Environmental Data

Environmental standards	EN/ETSI 300 019-2-1 v2.1.2 (2000 - 2009) - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 (1999 - 09) - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 (2003 - 04) - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Temperature range: 0° C to 45° C (32° F to 113° F) Humidity: 10% to 95% relative humidity, non-condensing 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 at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/−3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)

Table 309: Environmental Data (continued)

Summit X770 Series Switches

The Summit X770 series includes the following switch:

- Summit X770-32q switch

Table 310: Physical Dimensions

Summit X770-32q switch	Height: 1.73 inches (4.4 cm) Width: 17.6 inches (44.8 cm) Depth: 20.4 inches (51.9 cm) including the PSU and installed fan modules.

Table 311: Weight

Summit X770-32q switch	18.0 lb (8.2 kg)
Note NOTE: Switch weights include installed fan module. They do not include power supplies.	
Summit X770 fan module	0.36 lb (0.16 kg)
550W AC PSU	2.75 lb (1.2 kg)
550W DC PSU	2.50 lb (1.1 kg)

Table 312: Packaged Dimensions

Summit X770-32q switch	Height: 6.5 inches (16.5 cm)
	Width: 23.4 inches (59.3 cm)
	Depth: 26.2 inches (66.5 cm)

Table 313: Packaged Weight

Summit X770-32q switch	23.2 lb (10.5 kg)
Summit X770 fan module	0.50 lb (0.20 kg)

Table 314: Fan Speed

Minimum speed	4500 RPM
Maximum speed	18000 RPM

Power: Summit X770-32q

Table 315: Summit X770-32q (AC Power supply values for each of the two installed power supplies)

Nominal input ratings	100 to 240 V∼, 50/60 Hz, 2.5 A
Input current	2.25 A @ 100 V∼ (low-line) 0.9 A @ 240 V∼ (high-line)
Heat dissipation	225 W, 768 BTU/hr
Power consumption	225 W, 768 BTU/hr

Table 316: Summit X770-32q (DC Power supply values for each of the two installed power supplies)

Nominal input ratings	48 to 60 V⎓, 5.0 A
Input current	4.25 A @ 48 V⎓ (low-line) 3.35 A @ 60 V⎓ (high-line)
Heat dissipation	210 W, 717 BTU/hr
Power consumption	210 W, 717 BTU/hr

Standards and Environmental Data

Table 317: Safety Standards

North American Safety of ITE	UL 60950-1 1st Ed., Listed Device (US) CSA 22.2 #60950-1-07 2nd Ed.(Canada) Complies with FCC 21CFR 1040.10 (US Laser Safety) CDRH Letter of Approval (US FDA Approval)
European Safety of ITE	EN 60950-1:2006 2nd Ed. TUV-R GS EN 60825-1:2007 (Lasers Safety) 2006/95/EC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2005 2nd Ed., + National Differences AS/NZX 60950-1 (Australia /New Zealand)

Table 318: 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 55022:2006+A1:2007 Class A EN 55024:1998+A1:2001+A2:2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11 EN 61000-3-2: 2006+A2:2009 (Harmonics) EN 61000-3-3:2008 (Flicker) ETSI EN 300 386: v1.4.1 (2008-04) (EMC Telecommunications) 2004/108/EC EMC Directive

Table 318: EMI/EMC Standards (continued)

International EMC certifications	CISPR 22: 2008 (Ed 6.0), Class A (International Emissions) EN 55024:1998+A1:2001+A2:2003 Class A (International Immunity) IEC/EN 61000-4-2:2008 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A IEC/EN 61000-4-3:2008 Radiated Immunity 10V/m, Criteria IEC/EN 61000-4-4:2004 Transient Burst, 1 kV, Criteria A IEC/EN 61000-4-5:2005 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A IEC/EN 61000-4-6:2008 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C
Country-specific	VCCI Class A (Japan Emissions) BSMI (Taiwan Emissions) ACMA (C-Tick) (Australia Emissions) CCC Mark (China) KCC Mark, EMC Approval (Korea)

Table 319: Telecom Standards

EN/ETSI 300 386:2008 (EMC Telecommunications) EN/ETSI 300 019 (Environmental for Telecommunications) MEF9 and MEF14 certified for EPL, EVPL, and ELAN

Table 320: IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T IEEE 802.3z 1000BASE-X IEEE 802.3ae 10GBASE-X IEEE 802.3ba 40GBASE-X

Table 321: Environmental Data

Environmental standards	EN/ETSI 300 019-2-1 v2.1.2 (2000 - 2009) - Class 1.2 Storage EN/ETSI 300 019-2-2 v2.1.2 (1999 - 09) - Class 2.3 Transportation EN/ETSI 300 019-2-3 v2.1.2 (2003 - 04) - Class 3.1e Operational EN/ETSI 300 753 (1997-10) - Acoustic Noise ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Temperature range: 0° C to 45° C (32° F to 113° F) Humidity: 10% to 95% relative humidity, non-condensing 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 at 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): 180 m/s^2 (18 G), 6 ms, 600 shocks Packaged sine vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G Packaged random vibration: 5 to 20 Hz at 1.0 ASD w/−3 dB/oct. from 20 to 200 Hz 14 drops minimum on sides and corners at 42 inches (<15 kg box)

Table 321: Environmental Data (continued)

Acoustic noise	
Summit X770-32q	56.6 dB(A) min

Summit X770 Power Supply Unit (PSU) and Fan Tray Configurations

Table 322: X770-32q PSU and Fan Tray Configurations

Configuration No.	Quantity PSU	PSU Part No.	Power Supply Description	Quantity Fan Tray	Fan Tray Part No.	Fan Tray Description
1	1	10927z	Summit 550W AC PSU Back to Front air flow (DS550HE-3)	5	17112z	Summit X670 fan module Back to Front air flow (JDD0405612UB3A01)
2	1	10925z	Summit 550W AC PSU Front to Back air flow (DS550HE-3)	5	17111z	Summit X670 fan module Front to Back air flow (AS04012UB565300)
3	2	10927z	Summit 550W AC PSU Back to Front air flow (DS550HE-3)	5	17112z	Summit X670 fan module Back to Front air flow (JDD0405612UB3A01)
4	2	10925z	Summit 550W AC PSU Front to Back air flow (DS550HE-3)	5	17111z	Summit X670 fan module Front to Back air flow (AS04012UB565300)
5	1	10928z	Summit 550W DC PSU Back to Front air flow (DS550DC-3-003)	5	17112z	Summit X670 fan module Back to Front air flow (JDD0405612UB3A01)
6	1	10926z	Summit 550W DC PSU Front to Back air flow (DS550DC-3)	5	17111z	Summit X670 fan module Front to Back air flow (AS04012UB565300)
7	2	10928z	Summit 550W DC PSU Back to Front air flow (DS550DC-3-003)	5	17112z	Summit X670 fan module Back to Front air flow (JDD0405612UB3A01)
8	2	10926z	Summit 550W DC PSU Front to Back air flow (DS550DC-3)	5	17111z	Summit X670 fan module Front to Back air flow (AS04012UB565300)
9	1	10927z	Summit 550W AC PSU Back to Front air flow (DS550HE-3)	5	17112z	Summit X670 fan module Back to Front air flow (JDD0405612UB3A01)
	1	10928z	Summit 550W DC PSU Back to Front air flow (DS550DC-3-003)			
10	1	10925z	Summit 550W AC PSU Front to Back air flow (DS550HE-3)	5	17111z	Summit X670 fan module Front to Back air flow (AS04012UB565300)
	1	10926z	Summit 550W DC PSU Front to Back air flow (DS550DC-3			

Summit 300 W Power Supplies

The following Summit 300 W power supplies are available for use in the Summit X460 series non-PoE switches:

- Summit 300 W AC power supply Front-to-Back airflow Model 10930A
- Summit 300 W AC power supply Back-to-Front airflow Model 10943
- Summit 300 W DC power supply Front-to_Back airflow Model 10933
- Summit 300 W DC power supply Back-to-Front airflow Model 10944

These power supplies are for use with the Summit X460-G2 series, Summit X460-24t, Summit X460-24x, Summit X460-48t, and Summit X460-48x switches.

Summit 300 W AC Power Supply (Model 10930A and 10943)

Table 323: Physical Specifications

Dimensions	Height: 1.57 inches (4.0 cm) Width: 3.15 inches (8.0 cm) Depth: 9.5 Inches (24.1 cm)
Weight	2.30 lb (1 kg)

Table 324: Power Specifications

Voltage input range	85 to 264 V∼
Nominal input ratings	100 to 240 V∼, 50 to 60 Hz, 5 A
Nominal input current at full loads	4.2 A @ 90 V∼ (low-line) 1.7 A @ 230 V∼ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	30 A
Output	12 V⎓, 25 A max, 300 Watts 3.3 V⎓, 3.03 A max, 10 Watts
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	Low Line: 85% at 50% load and 88% at 100% load High Line: 86% at 50% load and 89% at 100% load

Table 325: Environmental Specifications

Operating temperature	0°C to 50°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 300 W DC Power Supply (Model 10933 and 10944)

For use with the Summit X460-G2, Summit X460-24t, Summit X460-24x, Summit X460-48t, and Summit X460-48x switches:

Table 326: Physical Specifications

Dimensions	Height: 1.57 inches (4.0 cm) Width: 3.15 inches (8.0 cm) Depth: 9.5 Inches (24.1 cm)
Weight	2.30 lb (1.0 kg)

Table 327: Power Specifications

Nominal Input	–40 to –72 V, 9 A
DC Voltage Input Range	–48 V⎓
Maximum Input Amperages	9 A @ 40 V⎓ 7.5 A @ 48 V⎓ 5 A @ 72 V⎓
Inrush Current	82 A at 72 V⎓ peak
Minimum wire size	14 AWG (1.5 mm^2) copper stranded
DC Output	12 V⎓, 25 A/3.3 V⎓, 3.0 A
DC Output Power (W)	300 W

Table 328: Environmental Specifications

Operating temperature	0°C to 50°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 450 W Power Supplies

The following two power supplies are available for use in the Summit X480 series switches and in Summit X670 series switches that have front-to-back ventilation airflow.

- Summit 450 W AC power supply
- Summit 450 W DC power supply

Summit 450 W AC Power Supplies

The following tables list the specifications of the AC power supplies for use with the Summit X480-24x, X480-48x, Summit X480-48t, Summit X670-48x, and Summit X670V-48x switches:

Table 329: Physical Specifications

Dimensions	Height: 1.5 inches (3.8 cm) Width: 3.1 inches (7.8 cm) Depth: 13.3 inches (33.8 cm)
Weight	3.64 lb (1.65 kg)

Table 330: Power Specifications

Voltage input range	90 to 264 V$\sim$
Nominal input ratings	100 to 240 V$\sim$, 50 to 60 Hz, 8 A
Nominal input current at full loads	12 A @ 90 V$\sim$ (low-line) 5 A @ 230 V$\sim$ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	15 A
Output	12 V$=$, 37 A max, 450 Watts 3.3 V$=$, 3 A max, 9.9 Watts Maximum continuous DC output shall not exceed 450 Watts.
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	84% typical at full load, high line

Table 331: Environmental Specifications

Operating temperature	0°C to 45°C (normal operation)
Storage temperature	-40°C to 70°C

Table 331: Environmental Specifications (continued)

Operating humidity	20% to 90% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 450 W DC Power Supplies

The following tables list the specifications of the DC power supplies for use with the Summit X480-24x, X480-48x, and Summit X480-48t:

Table 332: Physical Specifications

Dimensions	Height: 1.5 inches (3.8 cm) Width: 3.1 inches (7.8 cm) Depth: 13.3 inches (33.8 cm)
Weight	3.22 lb (1.46 kg)

Table 333: Power Specifications

Nominal Input	–48 to –60 V⎓, 24 A
DC Voltage Input Range	–40 to –75 V⎓
Maximum Input Amperages	13.5 A @ 40 V⎓ 11.2 A @ 48 V⎓ 7.5 A @ 72 V⎓
Inrush Current	10 A peak
Inrush Energy	1.5 A^{2}S
Minimum wire size	14 AWG (1.5 mm^2) copper stranded
DC Output	12 V⎓, 36.7 A/3.3 V⎓, 3.0 A
DC Output Power (W)	450 W

Table 334: Environmental Specifications

Operating temperature	0°C to 45°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 550 W Power Supplies

The following four power supplies are available for use in the Summit X670 and X770 series switches:

- 550 W AC PSU-FB (Model 10925)—AC power supply with front-to-back ventilation airflow
- 550 W AC PSU-BF (Model 10927)—AC power supply with back-to-front ventilation airflow

- 550 W DC PSU-FB (Model 10926)—DC power supply with front-to-back ventilation airflow
- 550 W DC PSU-BF (Model 10928)—DC power supply with back-to-front ventilation airflow

Summit AC Power Supplies for X670 and X770 Series Switches

The following tables list the specifications for the 550 W AC PSU-FB (Model 10925) and 550 W AC PSU-BF (Model 10927) AC power supplies for use in X670 and X770 series switches.

Table 335: Physical Specifications

Dimensions	Height: 1.5 inches (3.8 cm) Width: 3.1 inches (7.8 cm) Depth: 13.3 inches (33.8 cm)
Weight	3.64 lb (1.65 kg)

Table 336: Power Specifications

Voltage input range	90 to 264 V $\sim$
Nominal input ratings	100 to 240 V $\sim$, 50 to 60 Hz, 8 A
Nominal input current at full loads	8 A @ 90 V $\sim$ (low-line), 4 A @ 230 V $\sim$ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	15 A at 25° C (77° F)
Output	12 V $=$, 45 A max, 540 Watts, 3 V $=$, 3 A max, 10 Watts Maximum continuous DC output shall not exceed 550 Watts.
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	87% at 110 V $\sim$ with full load 88% at 220 V $\sim$ with full load

Table 337: Environmental Specifications

Operating temperature	0°C to 45°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operating altitude	Up to 10,000 feet
Operational shock	

Table 337: Environmental Specifications (continued)

Frequency Range	5 to 350 Hz, 200 to 2000 Hz PSD: 0.0001g2/Hz 350 to 500 Hz -6dB/Octave, 500 Hz 0.000052 Hz
Acceleration	0.21.0 gRMS (Typical Level) Duration: 20 min per axis

Summit DC Power Supplies for X670 and X770 Series Switches

The following tables list the specifications for the 550 W DC PSU-FB (Model 10926) and 550 W DC PSU-BF (Model 10928) power supplies for use with the Summit X670 and Summit X770 series switches.

Dimensions	Height: 1.5 inches (3.8 cm) Width: 3.1 inches (7.8 cm) Depth: 13.3 inches (33.8 cm)
Weight	3.22 lb (1.46 kg)

Table 338: Power Specifications

Nominal Input	–40 V to –60 V, 18 A
DC Voltage Input Range	–36 to –75 V
Maximum Input Amperages	18 A @ 36 V 13.5 A @ 48 V 8.5 A @ 75 V
Inrush Current	25 A peak
Inrush Energy	0.625 A^{2}S
Minimum wire size	14 AWG (1.5 mm^2) copper stranded
DC Output	12 V, 45 A/3.3 V, 3.0 A
DC Output Power (W)	550 W

Table 339: Environmental Specifications

Operating temperature	0°C to 45°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operating altitude	Up to 10,000 feet
Operational shock	
Frequency Range	5 to 350 Hz, 200 to 2000 Hz PSD: 0.0001g2/Hz 350 to 500 Hz -6dB/Octave, 500 Hz 0.000052 Hz
Acceleration	0.21.0 gRMS (Typical Level) Duration: 20 min per axis

Summit 715W Power Supplies

The following Summit 715 W power supplies are available for use in Summit X460-G2 series switches.

• Summit 715W AC power supply Front-to-Back airflow Model 10951
• Summit 715W AC power supply Back-to-Front airflow Model 10952

These power supplies are for use with the Summit X460-G2 series switches.

Summit 715 W AC Power Supply (Model 10951 and 10952)

Table 340: Physical Specifications

Dimensions	Height: 1.57 inches (4.0 cm) Width: 3.25 inches (8.3 cm) Length: 10.22 inches (26.0 cm)
Weight	2.55 lb (1.12 kg)

Table 341: Power Specifications

Voltage input range	100V to 264V〜 47 to 63Hz
Nominal input ratings	12.5 A max at 115VAC and 6A max at 230VAC at Full 715W load
Maximum inrush current	45A at Max 264 VAC at 25C with cold start
Output	54 V, 13.2 A max, 715W Watts
Power supply input socket and cord	IEC/EN 60320-1/C16 AC input receptacles
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Efficiency	Minimum efficiency: 88% at maximum power output.

Table 342: Environmental Specifications

Operating temperature	-10°C to 50°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	93% relative humidity, non-condensing at 30C
Operational shock	30 m/s^2 (3 G)

Summit 750 W AC Power Supply

The Summit 750 W AC power supply is used with the Summit X460 series PoE-capable switches.

For use with the Summit X460-24p and Summit X460-48p switches

Table 343: Physical Specifications

Dimensions	Height: 1.57 inches (4.0 cm) Width: 3.15 inches (8.0 cm) Depth: 9.5 inches (24.1 cm)
Weight	2.25 lb (1 kg)

Table 344: Power Specifications

Voltage input range	85 to 264 V $\sim$
Nominal input ratings	100 to 240 V $\sim$, 50 to 60 Hz, 10 A
Nominal input current at full loads	10 A at 90 V $\sim$ (low-line) 3.7 A at 230 V $\sim$ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	35 A
Output	12 V ⎓, 25 A max, 300 Watts 55 V ⎓, 8.18 A max, 450 Watts 3.3 V ⎓, 3.03 A max, 10 Watts
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	Low Line: 88% at 50% load and 86% at 100% load High Line: 90% at 50% and 100% loads

Table 345: Environmental Specifications

Operating temperature	0°C to 45°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	20% to 90% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 850 W Power Supplies

The Summit X650 power supplies can be used in the Summit X650-24t switch and the Summit X650-24x switch.

Two Summit X650 power supplies are available:
- Summit X650 AC power supply
- Summit X650 DC power supply

For use with the Summit X650-24t and X650-24x switches

Weight	3.04 lb (1.38 kg)
Voltage input range	90 to 264 V$\sim$
Nominal input ratings	100 to 240 V$\sim$, 50 to 60 Hz, 10 A
Nominal input current at full loads	12 A @ 90 V$\sim$ (low-line) 5 A @ 230 V$\sim$ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	100 A
Output	12 V⎓, 70 A max, 840 Watts 3.3 V⎓, 6 A max, 19.8 Watts Maximum continuous DC output shall not exceed 850 Watts.
Power supply cord type	AC
Power supply input socket	IEC 320 C14
Power cord input plug	IEC 320 C13
Power cord wall plug	
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% with 60% to 100% load

For use with the Summit X650-24t and X650-24x switches

Table 346: Summit 850 W DC Power Supply (Model 10915)

Weight	2.95 lb (1.34 kg)
Nominal Input	–48 to –60 V⎓
DC Voltage Input Range	–39 to –72 V⎓
Maximum Input Amperages	26 A @ 40 V⎓ 22 A @ 48 V⎓ 15 A @ 72 V⎓
Minimum wire size	12 AWG (3.3 mm^2) copper stranded
DC Output	12 V⎓, 70 A/3.3 V⎓, 6 A
DC Output Power (W)	850 W
Operating temperature	0°C to 40°C (normal operation) Short-term operation is permitted at –5° C to 0°C and 40°C to 50°C, for no more than 96 consecutive hours and a total of not more than 15 days in 1 year.
Storage temperature	-40°C to 85°C
Operating humidity	20% to 95% relative humidity, non-condensing
Operational shock	30 m/s^2 (3 G)

Summit 1100 W Power Supplies

The following Summit 1100 W power supplies are available for use in Summit X460-G2 series switches.

- Summit 1100 W AC power supply Front-to-Back airflow Model 10941
- Summit 1100 W AC power supply Back-to-Front airflow Model 10942

These power supplies are for use with the Summit X460-G2 series switches.

Summit 1100 W AC Power Supply (Model 10941 and 10942)

Table 347: Physical Specifications

Dimensions	Height: 1.57 inches (4.0 cm) Width: 3.25 inches (8.3 cm) Length: 10.22 inches (26.0 cm)
Weight	2.55 lb (1.12 kg)

Table 348: Power Specifications

Voltage input range	100V to 264V∼ 47 to 63Hz
Nominal input ratings	12.5 A max at 115VAC and 6 A max at 230VAC at full 1100W load
Maximum inrush current	45A at Max 264 VAC at 25C with cold start
Output	54 V, 20 A max, 1100W Watts
Power supply input socket and cord	IEC/EN 60320-1/C16 AC input receptacles
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Efficiency	Minimum efficiency: 88% at maximum power output.

Table 349: Environmental Specifications

Operating temperature	-10°C to 50°C (normal operation)
Storage temperature	-40°C to 70°C
Operating humidity	93% relative humidity, non-condensing at 30C
Operational shock	30 m/s^2 (3 G)

Summit External Power Supplies

The following external power supplies are available for use with Summit X150, X250e, X450, X450a, and X450e series switches:

- EPS-LD external power supply
- EPS-160 external power module (used with EPS-T chassis)
- EPS-500 external power supply

- EPS-600LS external power module (used with EPS-C chassis)
- EPS-150DC external power supply (used with EPS-T2 chassis)

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 to 60 Hz, 10 A
Input Current	6 A at 100 V∿, 2.5 A at 240 V∿
Line frequency range	47 to 63 Hz
Maximum inrush current	30 A at 115 V∿, 60 A at 230 V∿
Output	-50 V⎓, 7.5 A max, 375 Watts 12 V⎓, 7.5 A max, 90 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	>75% at 100% load
Heat dissipation, Watts, BTU/hr	123 W, 419.7 BTU/hr
Power consumption, Watts, BTU/hr	588 W, 2006.3 BTU/hr
Ambient operating temperature	0° C to 40° C (32° F to 104° F)
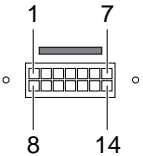
For use with the Summit X150-24t, X150-48t, X250e-24t, X250e-24x, X250e-48t, X450-24t, and X450-24x switches

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
Maximum inrush current	30 A at 115 V∿, 50 A at 230 V∿
Output	12 V⎓, 11 A 5 V⎓, 1.5 A
Power supply cord type	AC
Power supply input socket	IEC 320 C14

Power supply input plug	IEC 320 C13
Power cord wall plug	Refer to Power Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	80% at 100% load
Heat dissipation, Watts/BTU	38.5 W, 131.4 BTU/hr
Power consumption, Watts, BTU/hr	178 W, 607.4 BTU/hr
Ambient operating temperature	0° C to 40° C (32° F to 104° F)

The following figure shows the wire-to-pin connections for the connector on the rear panel of the EPS-160 power supply.

Table 350: Pinouts for the Redundant Power Supply Connector

Connector	Pin Number	Wire Label	Pin Number	Wire Label
	1	NC	8	RS+
	2	GND	9	GND
	3	GND	10	INT PG
	4	GND	11	EXT_CON
	5	GND	12	EXT_PG
	6	+12 V	13	+5 V
	7	+12 V	14	+12 V

For use with the Summit X150-24p, X250e-24p, X450a-24t, X450a-24x, X450a-48t, and X450e-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
Maximum inrush current	30 A @ 115 V, 60 A @ 220 V∼
Output	-50 V⎓, 7.5 A max, 375 Watts 12 V⎓, 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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	>70% @ 100% load
Heat dissipation, Watts, BTU/hr	158 W, 539.1 BTU/hr
Power consumption, Watts, BTU/hr	659 W, 2248.6 BTU/hr
Ambient operating temperature	0° C to 40° C (32° F to 104° F)

For use with the Summit X450e-48p and X250e-48p switches

Must be installed in the EPS-C chassis (Model 10912)

Operational voltage range	90 to 264 V$\sim$
Nominal input ratings	100-250 V$\sim$, 50-60 Hz, 10 A
Nominal input current	7 A @ 115 V$\sim$ (low-line) 3.5 A @ 230 V$\sim$ (high-line)
Line frequency range	47 to 63 Hz
Maximum inrush current	17 A @ 115 V/60 Hz, maximum load
Output power	600 W
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 Cord Requirements for AC-Powered Switches and AC Power Supplies.
Power supply cord gauge	18 AWG (0.75 mm^2) up to 6 feet or 2 meters or 16 AWG (1.0 mm^2) over 6 feet
Efficiency	85% nominal
Heat dissipation, Watts, BTU/hr	219 W, 747.3 BTU/hr
Power consumption, Watts, BTU/hr	801 W, 2733.1 BTU/hr
Ambient operating temperature	0° C to 40° C (32° F to 104° F)
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

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 maximum
Input current	5.5 A @ –36 V⎓ (low-line) 2.6 A @ –72 V⎓ (high-line)
Line frequency range	47 to 63 Hz
Inrush current	20 A @ 48 V, 40 A @ 72 V⎓
Input wire harness	Extreme part number 250088-00
Power supply input socket	TYCO PN 206061-1
Power cord input plug	TYCO PN 206060-1
Power cord wall plug	None provided
Power supply cord gauge	14 AWG (2.0 mm^2)
Input wire harness	Extreme part number250088-00
Efficiency	> 75% at 100% load
Heat dissipation, Watts, BTU/hr	45 W, 153.5 BTU/hr
Power consumption, Watts, BTU/hr	195 W, 665.4 BTU/hr
Ambient operating temperature	0° C to 40° C
Storage and transportation temperature	–40° C to 70° C

The following figure provides the wire-to-pin connection specifications for the DC wiring harness shipped with the EPS-150DC power supply. Three-wire Cable Harness shows the connector.

Table 351: 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	
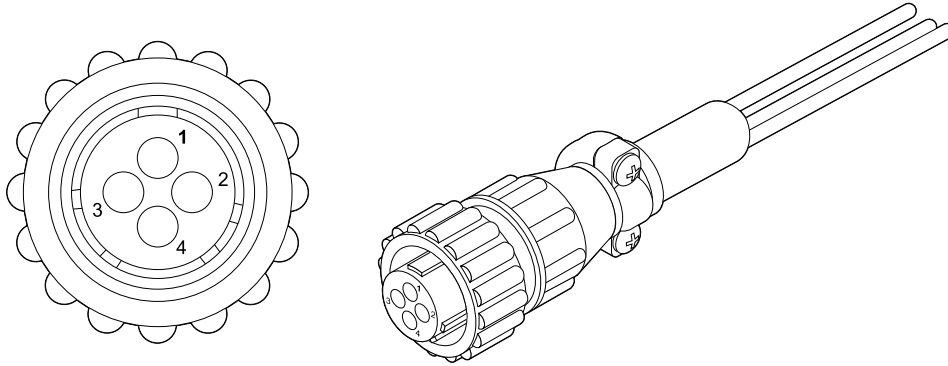
Figure 397: Three-wire Wiring Harness

Power Cord Requirements for AC-Powered Switches and AC Power Supplies

Power cords used with AC-powered Summit family switches or Summit AC power supplies must meet the following requirements:

- The power cord must be agency-certified for the country of use.
- The power cord must have an IEC320-C13 connector for connection to the switch or power supply.
- The power cord must have an appropriately rated and approved wall plug applicable to the country of installation.
- For cords up to 6 feet (2 m) long, the wire size must be 18 AWG (.75 mm^2) minimum; over 6 feet, the minimum wire size is 16 AWG (1.0 mm^2).

Console Connector Pinouts

The following table describes the pinouts for a DB-9 console plug connector.

Table 352: 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

The following table shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.
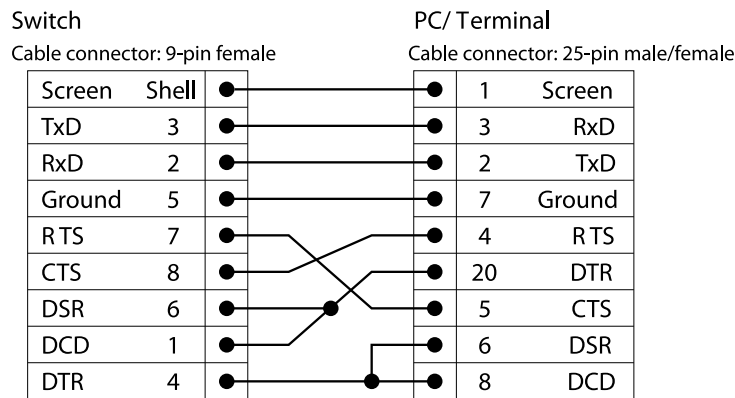
Figure 398: Null-Modem Cable Pinouts

The following table shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.
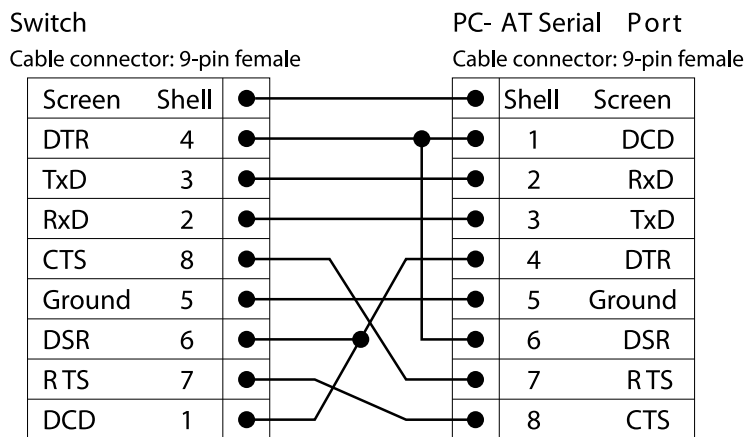
Figure 399: PC-AT Serial Null-modem Cable Pinouts

The following table shows the pinouts for the RJ-45 console port on the Summit X670 series switches.

Table 353: RJ-45 Console Port on Summit X670 Series Switches

Function	Pin Number	Direction
CTS (clear to send)	1	In
DTR (data carrier detect)	2	Out
TXD (transmit data)	3	Out
GND (ground)	4	—
GND (ground)	5	—
RXD (receive data)	6	In
DSR (data set ready)	7	In
RTS (request to send)	8	Out

The following table shows the pinouts for an RJ-45-to-DB-9 adapter.

Table 354: Pinouts for an RJ-45 to DB-9 Adapter

Signal	RJ-45 Pin	DB-9 Pin
CTS (clear to send)	1	8
DTR (data carrier detect)	2	6
TXD (transmit data)	3	2
GND (ground)	4	5
GND (ground)	5	5
RXD (receive data)	6	3
DSR (data set ready)	7	4
RTS (request to send)	8	7

Taiwan Warnings

Warning

警告使用者：
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

警告:此为A级产品，在生活环境中，该产品可能造成线电干扰。在这种情下，可能需要用户对干扰采取切实可行的措施。

Japan (VCCI Class A)

Warning

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

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

Korea EMC Statement

Warning

이 기기는 업무용(A급) 전자파적합기기로서 판매자
또는 사용자는 이 점을 주의 하시기 바라며, 가정
외의 지역에서 사용하는 것을 목적으로 합니다.

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