



# 4120 Series Cloud Managed Switches Hardware Installation Guide

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# Table of Contents

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<b>Preface.....</b>	<b>7</b>
Text Conventions.....	7
Documentation and Training.....	8
Open Source Declarations.....	9
Training.....	9
Help and Support.....	9
Subscribe to Product Announcements.....	10
Send Feedback.....	10
<b>4120 Switch Overview.....</b>	<b>11</b>
Management.....	11
Cooling.....	12
Power Supplies.....	12
Stacking Ports.....	12
Operating Temperatures.....	13
Feature Licensing.....	13
4120-24MW-4Y Switch Features.....	13
4120-48MW-4Y Switch Features.....	13
<b>Power Supplies for Use with Your Switch.....</b>	<b>15</b>
<b>Build Stacks.....</b>	<b>16</b>
Introduction to Stacking.....	16
Build Basic Stacks.....	17
SummitStack Topologies.....	18
SummitStack Terms.....	21
Plan to Create Your Stack.....	25
Enable and Disable the Stacking-Support Option.....	25
Recommendations for Placing Switches for Stacked Operation.....	25
Recommendations for Configuring Stacks.....	26
Combine Switches from Different Series.....	27
Select Stacking Cables.....	27
Using the Extreme Stacking Tool.....	27
Set up the Physical Stack.....	28
Connect the Switches to Form the Stack Ring.....	29
Connect Your Stack to the Management Network.....	31
<b>Site Preparation.....</b>	<b>33</b>
Plan Your Site.....	33
Operating Environment Requirements.....	34
Meet Building and Electrical Codes.....	34
Set Up the Wiring Closet.....	35
Control the Temperature.....	36

Control the Humidity Level.....	37
Protect Your System from ESD (Electrostatic Discharge).....	37
Rack Specifications and Recommendations.....	37
Mechanical Recommendations for the Rack.....	38
Ground the Rack.....	38
Provide Adequate Space for the Rack.....	38
Secure the Rack.....	39
Evaluate and Meet Cable Requirements.....	39
Label Cables and Keep Accurate Records.....	40
Install Cable.....	40
Use RJ45 Connector Jackets.....	42
Prevent Radio Frequency Interference (RFI).....	43
Meet Power Requirements.....	43
Requirements for PoE Devices.....	43
Power Supply Requirements.....	44
Power Cord Requirements.....	44
UPS (Uninterruptible Power Supply) Requirements.....	44
Follow Applicable Industry Standards.....	46
<b>Install the Switch.....</b>	<b>47</b>
Safety Considerations for Installing Switches.....	47
What You Will Need for the Installation.....	48
Attach the Switch to a Rack or Cabinet.....	48
Mount Options.....	49
Mount the Device on a Table.....	49
Install the Device in a Rack.....	49
Install Optional Components.....	52
Pluggable Transceiver Modules.....	52
Optical Cables.....	52
Connect Network Interface Cables.....	53
Turn on the Switch.....	53
<b>Activate and Verify the Switch.....</b>	<b>54</b>
Connect to a Management Console.....	54
Log in for the First Time on Switch Engine.....	54
Manual Setup.....	55
Configure the Switch's IP Address for the Management VLAN.....	56
<b>Remove and Replace Components.....</b>	<b>58</b>
Remove and Replace an AC Power Supply.....	58
Remove a Switch from a Rack.....	60
<b>Monitor the Switch.....</b>	<b>61</b>
4120 Series System LEDs.....	61
Port LEDs in Default (SYS) Mode.....	62
Port LEDs in SPD Mode.....	63
Port LEDs in STK Mode.....	63
Management Port LEDs.....	63
QSFP28 Port LEDs in SYS Mode (default).....	64
QSFP28 Port LEDs in SPD Mode.....	64
Locator LED.....	65

<b>Technical Specifications.....</b>	<b>66</b>
4120 Series Technical Specifications.....	66
External Interfaces.....	66
Weights and Dimensions.....	67
Weights and Dimensions of Accessories.....	67
Acoustics.....	67
Memory.....	68
Mean Time Between Failures (MTBF).....	68
Power Specifications.....	69
Power Supply Specifications.....	69
Max PoE Power Budget.....	69
Minimum/Maximum Power Consumption and Heat Dissipation.....	69
Environmental.....	69
Environmental Specifications.....	69
Environmental Compliance.....	70
Environmental Operating Conditions.....	70
Packaging and Storage Specifications.....	70
Standards.....	70
North American EMC for ITE.....	70
European EMC Standards.....	70
International EMC Certifications.....	71
Country Specific.....	71
IEEE 802.3 Media Access Standards.....	71
Regulatory and Safety.....	71
<b>Safety Information.....</b>	<b>73</b>
Considerations Before Installing.....	73
General Safety Precautions.....	74
Maintenance Safety.....	75
Fiber Optic Ports and Optical Safety.....	75
Cable Routing for LAN Systems.....	76
Power Cord Requirements for AC-Powered Switches and AC Power Supplies.....	76
Select Power Supply Cords.....	77
Install Power Supply Units and Connect Power.....	77
Battery Notice.....	78
Battery Warning - Taiwan.....	79
<b>Regulatory Information.....</b>	<b>80</b>
CE statement.....	80
EMC Warnings.....	81
China CQC Warning.....	81
China and Taiwan: Restriction of Hazardous Substances (ROHS).....	81
BSMI statement (Taiwan).....	81
Canadian requirements.....	81
Australia (RCM).....	81
Federal Communications Commission (FCC) Notice.....	81
Germany statement.....	82
KCC statement (Republic of Korea).....	82
Japan (VCCI Class A).....	82
Japan power cord .....	83

**Index..... 84**



# Preface

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Read the following topics to learn about:

- The meanings of text formats used in this document.
- Where you can find additional information and help.
- How to reach us with questions and comments.






## Text Conventions

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Unless otherwise noted, information in this document applies to all supported environments for the products in question. Exceptions, like command keywords associated with a specific software version, are identified in the text.

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as Extreme Networks switches or SLX routers, the product is referred to as *the switch* or *the router*.

**Table 1: Notes and warnings**

Icon	Notice type	Alerts you to...
	Tip	Helpful tips and notices for using the product
	Note	Useful information or instructions
	Important	Important features or instructions
	Caution	Risk of personal injury, system damage, or loss of data
	Warning	Risk of severe personal injury

**Table 2: Text**

Convention	Description
screen displays	This typeface indicates command syntax, or represents information as it is displayed on the screen.
The words <i>enter</i> and <i>type</i>	When you see the word <i>enter</i> in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says <i>type</i> .
<b>Key names</b>	Key names are written in boldface, for example <b>Ctrl</b> or <b>Esc</b> . If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press <b>Ctrl+Alt+Del</b>
<i>Words in italicized type</i>	Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles.
<b>NEW!</b>	New information. In a PDF, this is searchable text.

**Table 3: Command syntax**

Convention	Description
<b>bold text</b>	Bold text indicates command names, keywords, and command options.
<i>italic text</i>	Italic text indicates variable content.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ <b>x</b>   <b>y</b>   <b>z</b> }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
<b>x</b>   <b>y</b>	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member [member...]</i> .
\	In command examples, the backslash indicates a “soft” line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

## Documentation and Training

Find Extreme Networks product information at the following locations:



[Current Product Documentation](#)

[Release Notes](#)

[Hardware and Software Compatibility](#) for Extreme Networks products

[Extreme Optics Compatibility](#)

[Other Resources](#) such as articles, white papers, and case studies

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Extreme Networks offers product training courses, both online and in person, as well as specialized certifications. For details, visit the [Extreme Networks Training](#) page.

## Help and Support

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If you require assistance, contact Extreme Networks using one of the following methods:

### Extreme Portal

Search the GTAC (Global Technical Assistance Center) knowledge base; manage support cases and service contracts; download software; and obtain product licensing, training, and certifications.

### The Hub

A forum for Extreme Networks customers to connect with one another, answer questions, and share ideas and feedback. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

### Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2800. For the support phone number in your country, visit [www.extremenetworks.com/support/contact](http://www.extremenetworks.com/support/contact).

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number, or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any actions already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

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You can subscribe to email notifications for product and software release announcements, Field Notices, and Vulnerability Notices.

1. Go to [The Hub](#).
2. In the list of categories, expand the **Product Announcements** list.
3. Select a product for which you would like to receive notifications.
4. Select **Subscribe**.
5. To select additional products, return to the **Product Announcements** list and repeat steps 3 and 4.

You can modify your product selections or unsubscribe at any time.

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The User Enablement team at Extreme Networks has made every effort to ensure that this document is accurate, complete, and easy to use. We strive to improve our documentation to help you in your work, so we want to hear from you. We welcome all feedback, but we especially want to know about:

- Content errors, or confusing or conflicting information.
- Improvements that would help you find relevant information.
- Broken links or usability issues.

To send feedback, email us at [documentation@extremenetworks.com](mailto:documentation@extremenetworks.com).

Provide as much detail as possible including the publication title, topic heading, and page number (if applicable), along with your comments and suggestions for improvement.



# 4120 Switch Overview

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[4120-24MW-4Y Switch Features](#) on page 13

[4120-48MW-4Y Switch Features](#) on page 13

The 4000 Series are ExtremeCloud IQ managed Layer 2 switches that are fully cloud managed. The 4000 Series maintains all the power and flexibility of a traditional enterprise access switch, while simplifying network operations. Visibility is centralized and actions are instantaneous. Zero-touch provisioning allows rapid deployment across sites, and machine learning tools help quickly isolate issues when troubleshooting. The 4000 Series also provides support for stacking and PoE.



## Note

An ExtremeCloud IQ Pilot license is required for each 4000 Series switch.

The 4120 family of switches consists of a 24-port and a 48-port model. Both models contain multi-gigabit (1/2.5Gb) and 90W PoE support across all access ports. The 4120 Series contains high-speed 4 x 10/25Gb uplink plus 2 x 100Gb uplink/stack ports, which makes it ideal as a wired concentrator for high-density Wi-Fi/IoT environments.

## Management

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An RJ45 serial console port on the switch enables you to connect a terminal and perform local management. An Ethernet management port can be used to connect the system to an out-of-band 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 100/1000 Mbps speeds. The RJ45 serial console port is located on the rear panel of the switch.

There is one Micro-B USB console port located on the front panel. If the Micro-B USB console port is connected, it is selected over the RJ45 serial console port. The Micro-B USB console port disconnects when the switch is rebooted. You can re-connect the port if needed. When the Micro-B USB console is active, there is no support for the RJ45 serial console port.



## Note

Using a Micro-USB Type B to USB Type A cable, connect the Micro-USB Type B end to the switch, and the USB Type A end to a laptop or PC and complete the driver installation steps

You can manage 4000 Series switches using Bluetooth with mobile devices or laptops. Bluetooth is enabled by default. 4000 Series switches support the Extreme Networks Bluetooth 5.0 dongle (XN-USB-BT500-ADAPTER). 4120 Series switches have a Bluetooth LED that blinks green while pairing is in progress, and then becomes solid green when Bluetooth is connected.

There are also two USB 2.0 Type A ports on the front panel labeled USB 1 and USB 2. They can host removable devices like flash drives.

## Cooling

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Fixed internal switch fans in the 4120 Series provide front-to-back airflow for switch cooling. The internal fans are not responsible for cooling the removable power supply module; the power supply module has an integrated cooling fan that operates independently of the switch fan, which also cools from front-to-back.

## Power Supplies

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Each 4120 Series has a fixed internal AC power supply that provides enough power for the basic power needs of the switch and a basic POE power budget. For power redundancy and a higher POE power budget, the 4120 Series also supports the addition of a hot-swappable AC power supply. See [Max PoE Power Budget](#) on page 69 for more information.

The hot-swappable AC power supply has an integrated cooling fan that operates independently of the switch fans, and also provides front-to-back cooling. For more information about power supplies, see [Power Supplies for Use with Your Switch](#) on page 15.

## Stacking Ports

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Each switch comes equipped with two stacking ports, also referred to as Universal Ethernet ports. The stacking ports are labeled U1 and U2 and are located on the front of the switch. When running Switch Engine, these ports can be used in either stacking mode or Ethernet mode. When in stacking mode, up to eight systems can be stacked using qualified direct attach cables or optical transceivers. The U1 and U2 ports operate as stacking ports by default. Use the `disable stacking-support` command to set the U1 and U2 ports in Ethernet mode.



### Note

4120 Series switches can only be stacked with themselves.

Stacking cables are ordered separately.

For information about optical modules, see the [Extreme Optics](#) website.

For information about stacking, see [Build Stacks](#) on page 16.

## Operating Temperatures

All 4120 Series switch models support an operating range from 0°C (32°F) to 50°C (122°F).

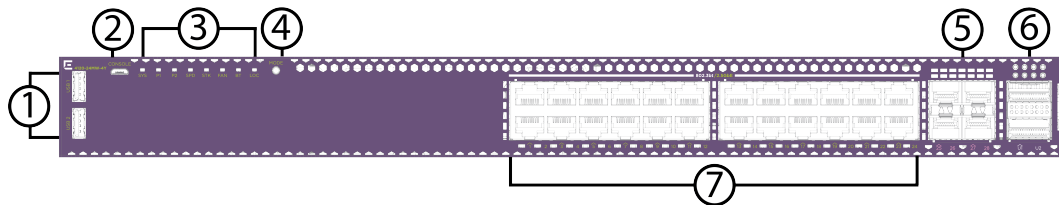
## Feature Licensing

A base license for the 4120 Series is the only license supported in Switch Engine. For additional Switch Engine licensing information see the *Feature License Requirements* for your version of the Switch Engine software.

## 4120-24MW-4Y Switch Features

The front panel of the 4120-24MW-4Y switch includes:

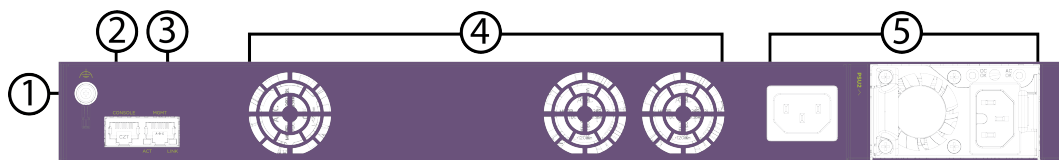
- 1 = 2 x USB Type-A ports
- 2 = USB Micro-B console port
- 3 = System LEDs
- 4 = Mode button
- 5 = 4 x 1/10/25Gb SFP28 ports
- 6 = 2 x 100G Universal/Stacking/QSFP28 ports
- 7 = 24 x 10M/100M/1G/2.5GBase-T ports



**Figure 1: 4120-24MW-4Y Front View**

The rear panel of the switch includes:

- 1 = Grounding lug
- 2 = Serial console port (RJ-45)
- 3 = 100/1000BASE-T OOB management port
- 4 = 3 x Fan modules
- 5 = 1 x Internal AC power supply and 1 x replaceable power supply slot

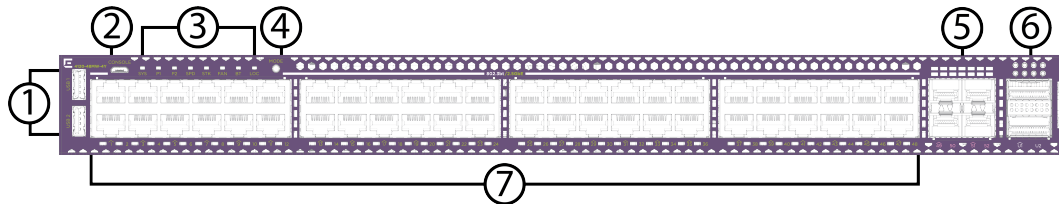


**Figure 2: 4120-24MW-4Y Rear View**

## 4120-48MW-4Y Switch Features

The front panel of the 4120-48MW-4Y switch includes:

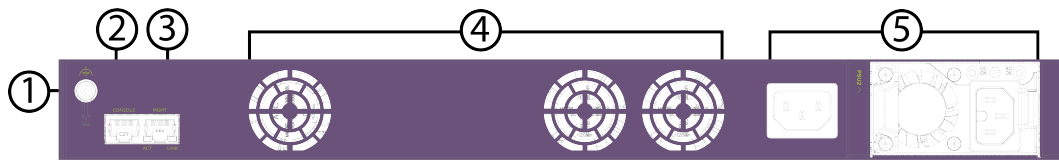
- 1 = 2 x USB Type-A ports
- 2 = USB Micro-B console port
- 3 = System LEDs
- 4 = Mode button
- 5 = 4 x 1/10/25Gb SFP28 ports
- 6 = 2 x 100G Universal/Stacking/QSFP28 ports
- 7 = 48 x 10M/100M/1G/2.5GBase-T ports



**Figure 3: 4120-48MW-4Y Front View**

The rear panel of the switch includes:

- 1 = Grounding lug
- 2 = Serial console port (RJ-45)
- 3 = 100/1000BASE-T OOB management port
- 4 = 3 x Fan modules
- 5 = 1 x Internal AC power supply and 1 x replaceable power supply slot



**Figure 4: 4120-48MW-4Y Rear View**



# Power Supplies for Use with Your Switch

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The 4120 Series switch contains a fixed internal AC power supply that supplies the power needed for switch operations and basic POE power budget. The 4120-24MW-4Y model switch contains an 860W internal AC power supply, while the 4120-48MW-4Y model switch contains a 1200W internal AC power supply. An optional replaceable AC power supply can be added to protect against a power supply failure and a higher POE power budget. See [Max PoE Power Budget](#) on page 69 for more information. The replaceable power supplies are hot-swappable; you can add or remove the power supply without interrupting switch operations.



## Note

AC power input cords are not provided with AC power supplies. You can order an appropriate cord from Extreme Networks or from your local supplier. The power cord must meet the requirements listed in [Select Power Supply Cords](#) on page 77.

The following replaceable AC power supplies with front-to-back airflow are available for the 4120 Series switches:

- The 920W modular AC power supply (part no. XN-ACPWR-920W-FB-U) is only supported on model 4120-24MW-4Y.
- The 1200W AC power supply (part no. XN-ACPWR-1200W-FB-U) is supported on both models 4120-24MW-4Y and 4120-48MW-4Y.
- The 2000W AC power supply (part no. XN-ACPWR-2000W-FB-U) is only supported on model 4120-48MW-4Y.

For information on installing or replacing an AC power supply, see [Remove and Replace an AC Power Supply](#) on page 58.



# Build Stacks

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[Introduction to Stacking](#) on page 16

[Plan to Create Your Stack](#) on page 25

[Set up the Physical Stack](#) on page 28

A stack consists of a group of up to eight switches that are connected to form a ring. The stack offers the combined port capacity of the individual switches; it operates as if it were a single switch, making network administration easier.

Stacking is facilitated by the SummitStack-V feature – part of the Switch Engine Basic License features.

This topic describes the supported configurations for stacking switches, the considerations for planning a stack, and the steps for setting up the hardware. Read this chapter before installing the switches that will make up the stack.

Refer to the Stacking chapter in the [Switch Engine 32.71 User Guide](#) for information about configuring a stack, maintaining the stack configuration, and troubleshooting.

## Introduction to Stacking

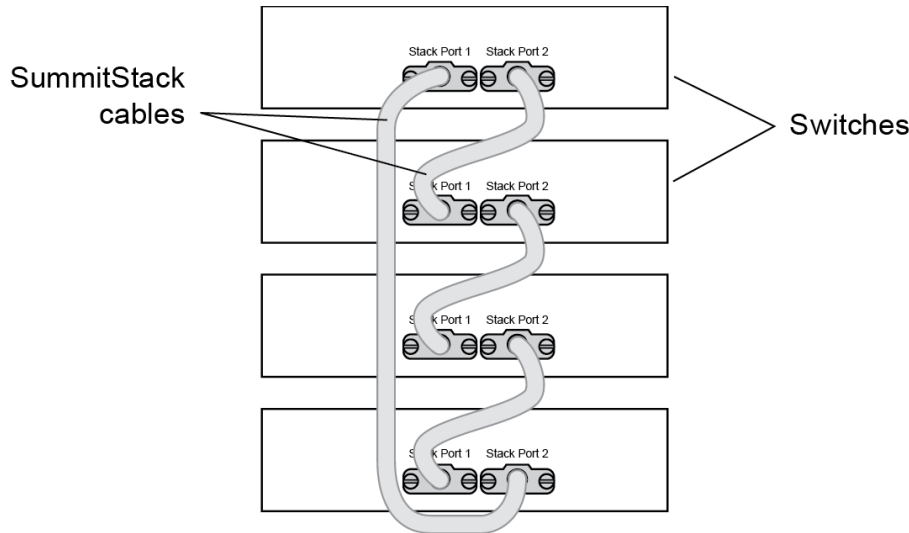
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When stacking switches, the stack operates as if it were a single switch with a single IP address and a single point of authentication. One switch – called the primary switch – is responsible for running network protocols and managing the stack. The primary runs Switch Engine software and maintains all the software tables for all the switches in the stack.

All switches in the stack, including the primary switch, are called nodes. [Figure 5](#) shows four nodes in a stack, connected to each other by SummitStack cables.

All connections between stack ports must be directly between switches. A stacking connection cannot pass through a third device, for example a Virtual Port Extender or an LRM/MACsec Adapter.





**Figure 5: Switches Connected to Form a Stack**

Using the SummitStack feature—part of the Switch Engine Edge/Base license—a stack can combine switches from different series, provided that every switch in the stack:

- Runs in the same partition (primary or secondary).
- Runs the same version of Switch Engine.
- Includes support for stacking.

See [Combine Switches from Different Series](#) on page 27 for information about which switch series can be combined to form a stack.

The following topics introduce you to the basic principles of stacking and provide recommendations for creating stacks.

More information to answer your questions about stacking and help you plan your configuration is available on the [Extreme Networks GTAC Knowledge Base](#).

## Build Basic Stacks

A stack can be created in either of two ways:

- In *native stacking*, switches are connected using either designated Ethernet data ports or dedicated stacking connectors.
- In *alternate stacking*, switches are connected using 10-Gbps Ethernet data ports that have been configured for stacking. These ports are located either on the switch itself or on option cards installed on either the front or the rear of the switch.



### Note

4120 Series does not support alternate stacking.

When planning and building your stack, be sure to follow port compatibility and cabling recommendations as described in this chapter.

### Slot Numbers in Stacks

A switch stack can be thought of as a virtual chassis. Each switch (node) operates as if it were occupying a slot in a chassis and is controlled by the primary. The high-speed stacking links function like the backplane links of a chassis.

Each switch 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 [Figure 5](#) on page 17 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.

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 might 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.

### Primary/Backup Switch Redundancy

When your stack is operational, one switch is the primary switch, 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 primary if the primary 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 primary and slot 2 as the backup. You can also configure additional switches as “primary-capable,” meaning they can become a stack primary in case the initial backup switch fails.

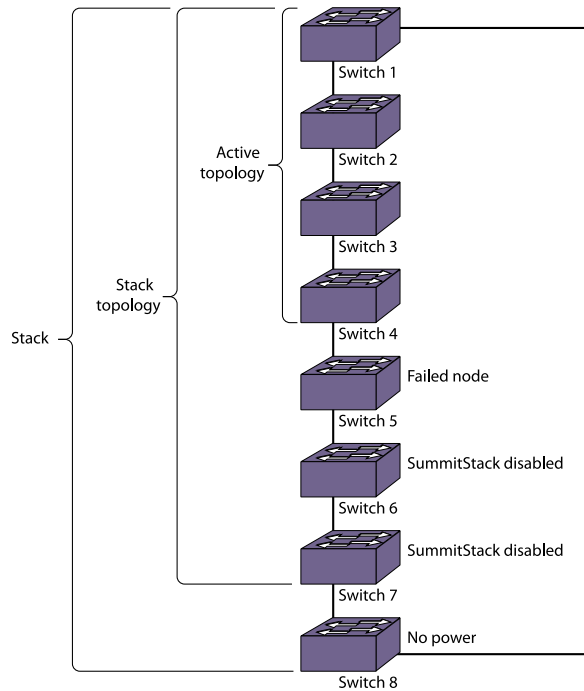
**Note**

4120 Series switches can only be stacked with themselves using Native V200 stacking.

When easy setup compares two switches that have the same capability, the lower slot number takes precedence.

## SummitStack Topologies

[Figure 6](#) presents a graphical representation of a stack and some of the terms that describe stack conditions.



**Figure 6: Example of a Stack, Showing the Active Topology and the Stack Topology**

A stack is the collection of all switches, or nodes, that are cabled together to form one virtual switch using the Switch Engine SummitStack feature.

The maximum cable length supported between switches depends on the types of switches in your stack, the installed option cards, and the configured stacking ports.

A stack topology is the set of contiguous nodes that are powered up and communicating with each other. In the example shown, Switch 8 is not part of the stack topology because it is not powered up.

An active topology is the set of contiguous nodes that are active. An active node is powered up, is configured for stack operation, and is communicating with the other active nodes.

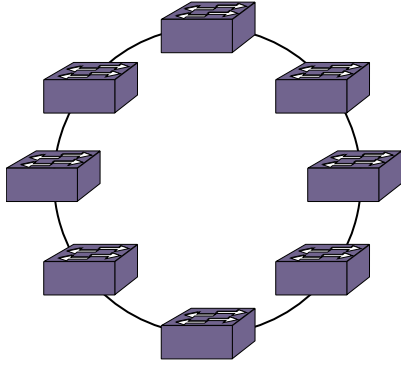
Switch 5 in the example has failed, stacking is disabled on Switches 6 and 7, and Switch 8 has no power. As a result, the active topology includes Switches 1 through 4 only.

For more information about SummitStack terminology, see [SummitStack Terms](#) on page 21.

#### *Ring Topology: Recommended for Stacking*

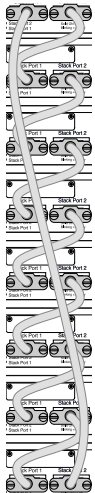
SummitStack nodes should be connected to each other in a ring topology. In a ring topology, one link is used to connect to a node and the other link is used to connect to another node. The result forms a physical ring connection. This topology is highly recommended for normal operation.

[Figure 7](#) represents a maximal ring topology of eight active nodes.



**Figure 7: Graphical Representation of a Ring Topology**

Figure 8 shows what the same ring topology would look in actual practice. Each switch in the rack is connected to the switch above it and the switch below it. To complete the ring, a longer cable connects Switch 1 with Switch 8.



**Figure 8: Switches Connected to Each Other in a Ring Topology**

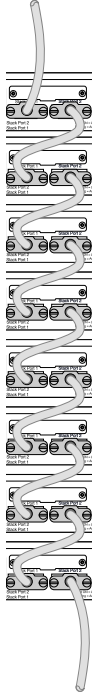
Note that, while a physical ring connection may be present, a ring active topology exists only when all nodes in the stack are active.

#### *Daisy Chain Topology: Not Recommended for Stacking*

Stackable switches can be connected in a daisy-chain topology. This is a [ring topology](#) with one of the links disconnected, inoperative, or disabled. A daisy chain can be created when a link fails or a node reboots in a ring topology, but the daisy chain topology is not recommended for normal operation.

Connect your stack nodes in a ring topology, not a daisy-chain topology, for normal operation.

In [Figure 9](#), the nodes delineated as the active topology are operating in a daisy-chain configuration, even though there is physically a ring connection in the stack.



**Figure 9: Daisy Chain Topology**

You might need to use a daisy chain topology while adding a new node, removing a node, or joining two stacks.

If you are using a daisy chain topology, the possibility of a dual primary condition increases. Before you create a daisy chain topology, read "Managing a Dual Primary Situation" in the [Switch Engine 32.7.1 User Guide](#).

## SummitStack Terms

[Table 4](#) describes the terms used for the SummitStack feature. These terms are listed in the recommended reading sequence.

**Table 4: List of Stacking Terms**

Term	Description
Stackable switch	An Extreme Networks switch that provides two stacking ports and can participate in a stack.
Stacking port	A physical interface of a stackable switch that is used to allow the connection of a stacking link. Stacking ports are point-to-point links that are dedicated for the purpose of forming a stack.
Native stacking	A stacking configuration in which stack members are connected using either designated Ethernet data ports or dedicated stacking connectors.

**Table 4: List of Stacking Terms (continued)**

Term	Description
Alternate stacking	A stacking configuration in which stack members are connected using 10-Gbps Ethernet data ports that have been configured for stacking. These ports are located either on the switch itself or on option cards installed on the rear of the switch.
Stacking link	A cable that connects a stacking port of one stackable switch to a stacking port of another stackable switch, plus the stacking ports themselves.
Node	A switch that runs the Switch Engine operating system and is part of a stack. Synonymous with <i>stackable switch</i> .
Stack	A set of stackable switches and their connected stacking links made with the intentions that: (1) all switches are reachable through their common connections; (2) a single stackable switch can manage the entire stack; and (3) configurable entities such as VLANs and link trunk groups can have members on multiple stackable switches. A stack consists of all connected nodes regardless of the state of the nodes.
Stack topology	A contiguously connected set of nodes in a stack that are currently communicating with one another. All nodes that appear in the <code>show stacking</code> command display are present in the stack topology.
Stack path	A data path that is formed over the stacking links for the purpose of determining the set of nodes that are present in the stack topology and their locations in the stack. Every node is always present in a stack path whether or not stacking is enabled on the node.
Control path	A data path that is formed over the stacking links that is dedicated to carrying control traffic, such as commands to program hardware or software image data for software upgrade. A node must join the control path to fully operate in the stack. A node that is disabled for stacking does not join the control path, but does communicate over the stack path.
Active node	A node that has joined the control path. The active node can forward the control path messages or can process them. It can also forward data traffic. Only an active node can appear as a card inserted into a slot when the <code>show slot {slot} {detail}   detail</code> command is executed on the primary node of the stack.
Active topology	A contiguous set of active nodes in a stack topology plus the set of stacking links that connect them. When an active topology consists of more than one node, each node in the active topology is directly and physically connected to at least one other node in the active topology. Thus, the active topology is a set of physically contiguous active nodes within a stack topology.

**Table 4: List of Stacking Terms (continued)**

Term	Description
Candidate node	A node that is a potential member of an active topology, or an active node that is already a member of an active topology. A candidate node may or may not be an active mode – that is, it may or may not have joined the control path.
Node role	The role that each active node plays in the stack – either primary, backup, or standby.
Primary node	<p>The node that is elected as the primary node in the stack. The primary node runs all of the configured control protocols such as OSPF (Open Shortest Path First), RIP (Routing Information Protocol), Spanning Tree, and EAPS (Extreme Automatic Protection Switching).</p> <p>The primary node controls all of its own data ports as well as all data ports on the backup and standby nodes. To accomplish this, the primary node issues specific programming commands over the control path to the backup and standby nodes.</p>
Backup node	<p>The node assigned to take over the role of primary if the primary node fails. The primary node keeps the backup node's databases synchronized with its own databases in preparation for such an event.</p> <p>If and when the primary node fails, the backup node becomes the primary node and begins operating with the databases it has previously received. In this way, all other nodes in the stack can continue operating.</p>
Standby node	A node that is prepared to become a backup node in the event that the backup node becomes the primary node. When a backup node becomes a primary node, the new primary node synchronizes all of its databases to the new backup node. When a node operates in a standby role, most databases are not synchronized – except those few that directly relate to hardware programming.
Acquired node	<p>A standby or backup node that is acquired by a primary node. This means that the primary node has used its databases to program the hardware of the standby or backup node. The standby or backup node has acted as a hardware programming proxy, accepting the instructions of the primary node to do so.</p> <p>An acquired backup node maintains the databases needed to reflect why the hardware is programmed as it is. However, a standby node does not. An acquired node can be re-acquired (without a reboot) by the backup node only when the backup node becomes the primary node, and only when both the backup and standby nodes were already acquired by the same primary node at the time of its failure.</p>
Data ports	The set of ports on a stackable switch that are available for connection to your data networks. Such ports can be members of a user-configured VLAN or trunk group. They can be used for Layer 2 and 3 forwarding of user data traffic, for mirroring, or other features you can configure. Data ports are different from stacking ports.

**Table 4: List of Stacking Terms (continued)**

Term	Description
Failover	The process of changing the backup node to the primary node when the original primary node has failed. When a primary node fails, if a backup node is present, and if that node has completed its initial synchronization with the primary node, then the backup node assumes the role of primary node. The standby nodes continue their operation and their data ports do not fail.
Hitless failover	A failover in which all data ports in the stack, except those of the failing primary node, continue normal operation when the primary node fails.
Node address	The unique MAC address that is factory-assigned to each node.
Node role election	The process that determines the role for each node. The election takes place during initial stack startup and elects one primary node and one backup node. An election also takes place after a primary node failover, when a new backup node is elected from the remaining standby nodes.
Node role election priority	A priority assigned to each node, to be used in node role election. The node with the highest node role election priority during a role election becomes the primary node. The node with the second highest node role election priority becomes the backup.
Operational node	A node that has achieved operational state as a card in a slot. The operational state can be displayed using the <code>show slot {slot} {detail}   detail</code> command.
System uptime	The amount of time that has passed since the last node role election. You can display the system uptime by entering the <code>show switch {detail}</code> command on the primary node.
Stack segment	A collection of nodes that form a stack topology. The term is useful when a stack is severed. Each severed portion of the stack is referred to as a stack segment.
Stack state	A state assigned by the stack to a node. You can display the stack state by entering the <code>show stacking</code> command.
Easy Setup	A procedure that automatically configures the essential stacking parameters on every node for initial stack deployment, and then automatically reboots the stack to put the parameters into effect. The choice to run Easy Setup is offered when you run the <code>enable stacking {node-address node-address}</code> command and the essential stacking parameters are unconfigured or inconsistent. It can also be invoked directly by running the <code>configure stacking easy-setup</code> command.



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## Plan to Create Your Stack

---

Use the information in the following topics to plan the physical makeup of your stack – switches, versatile interface modules (VIMs), and cables – and the stacking protocols you will use. Included are:

- Guidelines and other information for each switch model in your stack
- Considerations for combining different switch models in a stack
- Information about stacking cables

### Enable and Disable the Stacking-Support Option

The stacking-support option is enabled by default for many switch and option card configurations. However, some configurations require you to enable the stacking-support option before a switch can participate in a stack.

- To enable stacking-support, issue the `enable stacking-support` command. You must enable stacking-support individually for every switch in the stack that does not have stacking support enabled by default.
- To disable stacking support, configure the switch data ports to use the Ethernet protocol instead of the stacking protocol. Use the `disable stacking-support` command.

### Recommendations for Placing Switches for Stacked Operation

For best results in a SummitStack configuration, follow these recommendations for physically situating your equipment:

- Use the shortest possible stacking cables to connect the switches in the stack. This reduces the likelihood that the stacking cables might accidentally be damaged or disconnected.
- When possible, place all switches for the stack in the same rack or in adjacent racks. This facilitates using shorter stacking cables.
- The primary switch, or node, 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 primary switch. If switches are installed in several adjacent racks, place the primary switch at one end of the row.
- Physically locate the intended primary and backup nodes adjacent to each other, and plan to connect these nodes to each other directly so that Switch Engine application synchronization traffic is localized to a single stack link.
- On the primary node, connect the Ethernet management port to your management network.
- To provide management access to the stack in case of a failure in the primary switch, connect all switches that will participate in redundancy to your management network using the Ethernet management port on each switch.
- Use stacking cables to interconnect the stack nodes into a ring topology (see [Ring Topology: Recommended for Stacking](#) on page 19). Include only the nodes that you expect to be active in the stack.

Follow the recommendations in [Recommendations for Configuring Stacks](#) on page 26 to configure the software for your stack.

The recommended procedures for installing and interconnecting a stack are found in [Set up the Physical Stack](#) on page 28.

## Recommendations for Configuring Stacks

When deploying a new stack, follow these recommendations for configuring the software:

- Plan to use the stack as if it were a single multi-slot switch. You need to decide the number and type of stackable switches in the stack and how the stack ports will be connected to the network.
- You can physically connect the stack to your networks before the nodes are configured. However, the default configuration on a switch in non-stacking mode assumes a default untagged VLAN that contains all switch ports. When first powered on, the switch acts as a Layer 2 switch, possibly resulting in network loops.
- Make sure all nodes support the SummitStack feature and are running the same Switch Engine software version. (See the [Switch Engine 32.7.1 Feature License Requirements](#).) To view the Switch Engine software version on a node, restart the node and run the command:

```
show version {detail | process name | images {partition partition}  
{slot slot_number} } .
```

If any node does not have the right version, install the correct version on that node. Use the same image partition on all nodes. After stacking is enabled, images can be upgraded from the stack only if the same image is selected on all nodes.

- If you intend to deploy new units that might be part of a stack in the future, turn on stacking mode during initial deployment to avoid the need for a future restart. The only disadvantages of stacking mode are the loss of QoS (quality of service) profile QP7 and the reservation of some of the packet buffer space for stacking control traffic.
- You can configure the stack by logging into the primary node or any of the other nodes.
- If the primary-capable stackable switches have different purchased license levels, you might need to configure license level restrictions on some nodes before those nodes can join the stack. See the [Switch Engine 32.7.1 User Guide](#) for more information about managing licenses.
- If the stack supports any feature pack license (such as MPLS or Direct Attach), that feature pack license must be installed on all primary-capable nodes to support that feature and to prevent traffic interruption if a failover event occurs.
- Most stacking specific configurations are effective only after a restart. However, most non-stacking configuration commands take effect immediately and require no restart.

- A basic stack configuration can be achieved by using the Easy Setup procedure, as described in the [Switch Engine 32.7.1 User Guide](#).
- If EAPS, Spanning Tree, or any Layer 2 redundancy protocol is not running on the network, make sure that your network connections do not form a network loop.

Follow the recommendations in [Recommendations for Placing Switches for Stacked Operation](#) on page 25 for physically situating your equipment.

## Combine Switches from Different Series

4120 Series switches can only stack with themselves using Native V200 stacking.

## Select Stacking Cables

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.



### Note

For the most recent information about available cables, contact your Extreme Networks sales representative or refer to the [Extreme Optics](#) website.



### Caution

Use of non-recommended cables or optics could cause stack instability.

## Using the Extreme Stacking Tool

The Extreme Stacking Tool provides an easy way to plan your stack. As you select various switch models and stacking methods, the tool shows you:

- What switch models can be stacked together and which cannot.
- Statistics showing the routing options that are available with every stack combination.
- Recommendations about which switches should be the primary and backup nodes.
- Information about the supported versions of Switch Engine for every combination.

To use the Stacking Tool, follow these steps.

1. Open the Stacking Tool (<https://stackingtool.extremenetworks.com/StackingTool/>) in a web browser.



### Note

The Stacking Tool is also available in the Support Tools section of the Extreme Portal.

2. Find a switch model in the **Switches** column.

Each switch model is represented by a rectangle, as shown in the example in the following figure. In this example, stacking ports are represented by U1 and U2 on the right side.

**Figure 10: 4120 Switch Shown in the Stacking Tool**



**Tip**

Select a rectangle to display more information about the switch model and the VIMs (if any) that it can use for stacking.

3. Drag the rectangle to the first slot in the Stack column in the middle of the page.

To the right of the Stack column, the tool displays statistics about available routes, supported software versions, and primary/backup recommendations.



**Tip**

If you do not see statistics and other information, select the arrow (> symbol) to the immediate right of the Stack column.

4. Use the tool in any of the following ways:

- Select other switches and drag them to the slots in the stacking column.
- For any switch in the stack, select the U1 and U2 symbols to choose stacking methods – for example, SummitStack-V and SummitStack-V80.
- To remove a switch from the stack, drag it away from the stacking column.

Whenever you add or remove a switch from the stack, the statistics and recommendations update automatically.

In addition to statistics and recommendations, colors in the display show whether the selected switch models and stacking methods are compatible.

**Table 5: Colors in the Stacking Tool Display**

Color	Meaning
Green	Compatible and preferred
Blue	Compatible
Yellow	Incompatible with the selected primary node
Red	Incompatible

## Set up the Physical Stack

After you have installed the individual switches (see "Installing Your Switch"), follow these steps to create the physical stack.

1. Connect the switches that will form the stack.  
See [Connect the Switches to Form the Stack Ring](#) on page 29.
2. Connect the switches to your management network.  
See [Connect Your Stack to the Management Network](#) on page 31.

After setting up and connecting the switches, perform software configuration for the stack. See "Configuring a New Stack" in the [Switch Engine 32.7.1 User Guide](#).

## Connect the Switches to Form the Stack Ring

After you have installed the individual switches, connect them 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.

All connections between stack ports must be directly between switches. A stacking connection cannot pass through a third device, for example a Virtual Port Extender or an LRM/MACsec Adapter.

It is essential to create an unbroken data path through all the switches in the stack.

### Examples of Valid Stacking Configurations

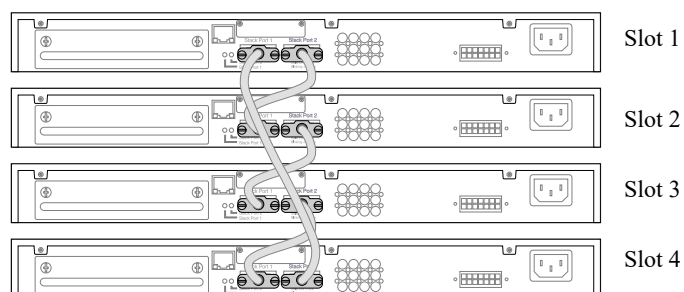
The examples in the following sections show various physical stacking arrangements: all switches in a single rack, switches in two adjacent racks, and switches at the tops of several racks in a row.

#### Example: Basic Stack with Four Switches

This example shows a stack of four switches in a single rack.

The slot numbers presume a console connection to the switch at the top of the physical stack.

**Figure 11** shows cable connections for a 4-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.



**Figure 11: SummitStack Cable Connections Using Four Switches with Integrated SummitStack Ports**

Table 6 lists the recommended order for connecting the stacking ports in this example.

**Table 6: Basic Stack with Four Switches: Connections**

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

**Example: Basic Stack with Eight Switches**

Figure 12 shows cable connections for an 8-node stack using SummitStack 40G cables to connect switches with integrated SummitStack ports.



**Figure 12: SummitStack Cable Connections Using Eight Switches with Integrated SummitStack Ports**

Table 7 lists the recommended order for connecting the stacking ports in this example.

**Table 7: Basic Stack with Eight Switches: Connections**

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

**Table 7: Basic Stack with Eight Switches: Connections (continued)**

Connect this slot and port ...		... To this slot and port	
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

**Example: Stacked Switches across Several Racks**

Figure 13 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.

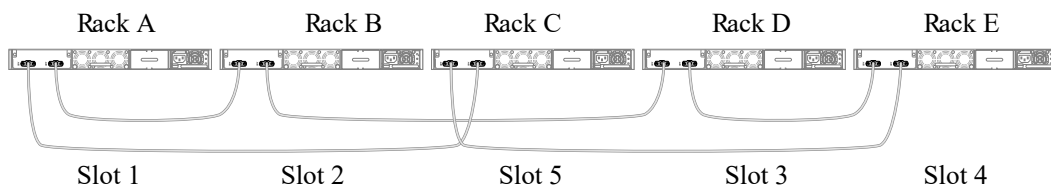
**Figure 13: Top-of-Rack Stack Installation**

Table 8 lists the recommended order for connecting the stacking ports in this example.

**Table 8: Stacked Switches across Several Racks: Connections**

Connect this slot and port ...			... To this slot and port		
Slot 1	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	Rack E	Port 1
Slot 4	Rack E	Port 2	Slot 5	Rack C	Port 1
Slot 5	Rack C	Port 2	Slot 1	(Rack A	Port 1

## Connect Your Stack to the Management Network

Before you can configure Switch Engine for a new stack, your management console must be connected to at least one switch in the stack.

Connect your management console to a serial console port or the Ethernet management console port on the switch that will become the stack primary node. If you plan to configure redundancy, connect to the console ports of all switches in the stack that will be primary-capable.

If you followed the cabling examples in [Connect the Switches to Form the Stack Ring](#) on page 29, and if you use the Easy Setup configuration procedure, only slots 1 and 2 can become the primary node. However, you can connect all switch management

ports in the stack if you choose to do so. There is an alternate IP address configuration that will enable you to log in directly to each switch in the stack through its Ethernet management port.

See the *Switch Engine User's Guide* for your version of Switch Engine for instructions to perform the software configuration for your stack.





# Site Preparation

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- [Plan Your Site](#) on page 33
- [Operating Environment Requirements](#) on page 34
- [Rack Specifications and Recommendations](#) on page 37
- [Evaluate and Meet Cable Requirements](#) on page 39
- [Meet Power Requirements](#) on page 43
- [Follow Applicable Industry Standards](#) on page 46

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, and before carrying out any maintenance procedures, read the safety information in "Technical Specifications."

## Plan Your Site

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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."

## Operating Environment Requirements

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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.

### Meet 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, VA 22041 USA  
[www.iccsafe.org](http://www.iccsafe.org)

The organizations listed in [Table 9](#) are authorities on electrical codes.

**Table 9: 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, MA 02169 USA	<a href="http://www.nfpa.org/">www.nfpa.org/</a>
Underwriters' Laboratory (UL) 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, IL 60062 USA	<a href="http://www.ul.com">www.ul.com</a>
National Electrical Manufacturing Association (NEMA) (USA only) Organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components.	NEMA 1300 N. 17th Street Rosslyn, VA 22209 USA	<a href="http://www.nema.org">www.nema.org</a>
Electronic Components Industry Association (ECIA) Trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry.	ECIA 111 Alderman Drive Suite 400 Alpharetta, GA 30005 USA	<a href="http://www.ecianow.org">www.ecianow.org</a>
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 of 1934. The FCC regulates all U.S. telephone and cable systems.	FCC 445 12th Street S.W. Washington, DC 20554 USA	<a href="http://www.fcc.gov">www.fcc.gov</a>

## Set Up the Wiring Closet

Be aware of the following recommendations for your wiring closet:

- Make sure that your system is easily accessible for installation and service. See [Rack Specifications and Recommendations](#) on page 37 for more 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**

Consult an electrical contractor for commercial building and wiring specifications.

## Control the 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.

Observe these additional thermal recommendations for the location where you plan to install your equipment:

- Ensure that the ventilation in the wiring closet is adequate to maintain a temperature below the maximum operating temperature for the equipment..
- 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 a storage temperature between  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) and  $85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ ).

[Table 10](#) summarizes the behavior of ExtremeSwitching switches when they experience high operating temperatures.

Safeguards are built into all Extreme Networks switches and power supply units to minimize the risk of fire.

**Table 10: Thermal Shutdown and Restart Behavior**

Switch Model(s)	Behavior
All models	<p>When internal system temperatures exceed the thermal shutdown temperature limit (typically about 20°C higher than normal system operating temperatures), the system's power supplies are turned off and the switch shuts down. The system remains in the OFF state until the system has sufficient time to cool and the internal thermal sensor measures a temperature lower than the maximum specified ambient temperature, at which time the system restarts automatically.</p> <p>Alternately, you can restart the system by removing and then restoring all line power to the system. The internal sensor must still measure a system temperature that is lower than the maximum specified ambient temperature, so recovery might not be immediate.</p>

## Control the Humidity Level

To maximize equipment life, keep operating humidity between 50% and 70% relative humidity (non-condensing) during typical operation.

The equipment can operate between 5% and 95% relative humidity (non-condensing) for short intervals.

## Protect Your System from ESD (Electrostatic Discharge)

Your system must be protected from static electricity or 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 270 kg (600 lb).

## Ground the Rack

The rack must be properly grounded.

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 DC-powered switch, use a minimum 14 AWG stranded copper wire for grounding.

AC-powered 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, consult an electrical contractor to ensure proper equipment grounding for your specific installation.

## Provide Adequate Space 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**

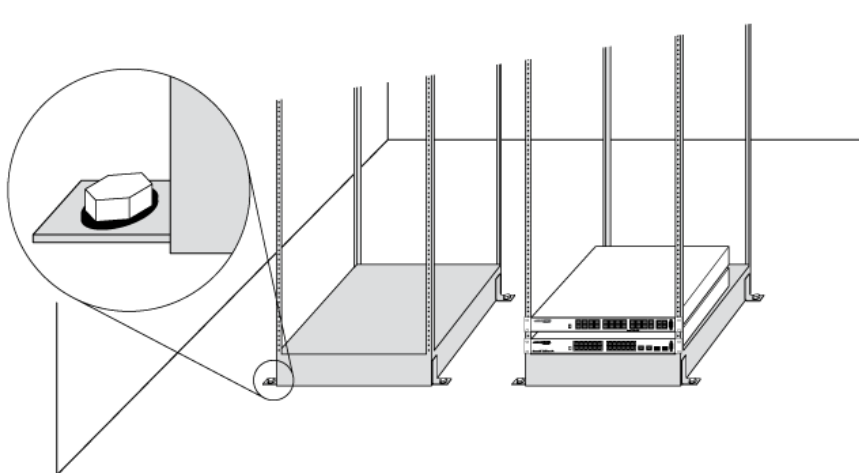
Extreme Networks switches do not have a switch for turning power to the unit on and off. For systems using an AC power supply, power to the switch is disconnected by removing the wall plug from the electrical outlet.

Be sure that cables and other equipment do not block the switch's air intake or outflow.

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.

## Secure the Rack

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



**Figure 14: Properly Secured Rack**

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

## Evaluate and Meet Cable Requirements

Use professional consultants for site planning and cabling.

The Building Industry Consulting Service International (BICSI) Registered Communications Distribution Designer (RCDD), which is globally recognized as a standard in site planning and cabling, can be used.

For information, visit [www.bicsi.org](http://www.bicsi.org).

## Label Cables and Keep Accurate Records

A reliable cable labeling system is essential when planning and installing a network.

Keeping 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:

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

## Install Cable

When you connect cable to your network equipment, keep the following things in mind.

- 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 5 to 7.5 cm (2 to 3 in), to provide proper strain relief as shown in [Figure 15](#) on page 41.
- 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 2.5 cm (1 in) of the cable to avoid radio frequency (RF) interference.
- Discharge the RJ45 Ethernet cable before plugging it into a port on the switch.

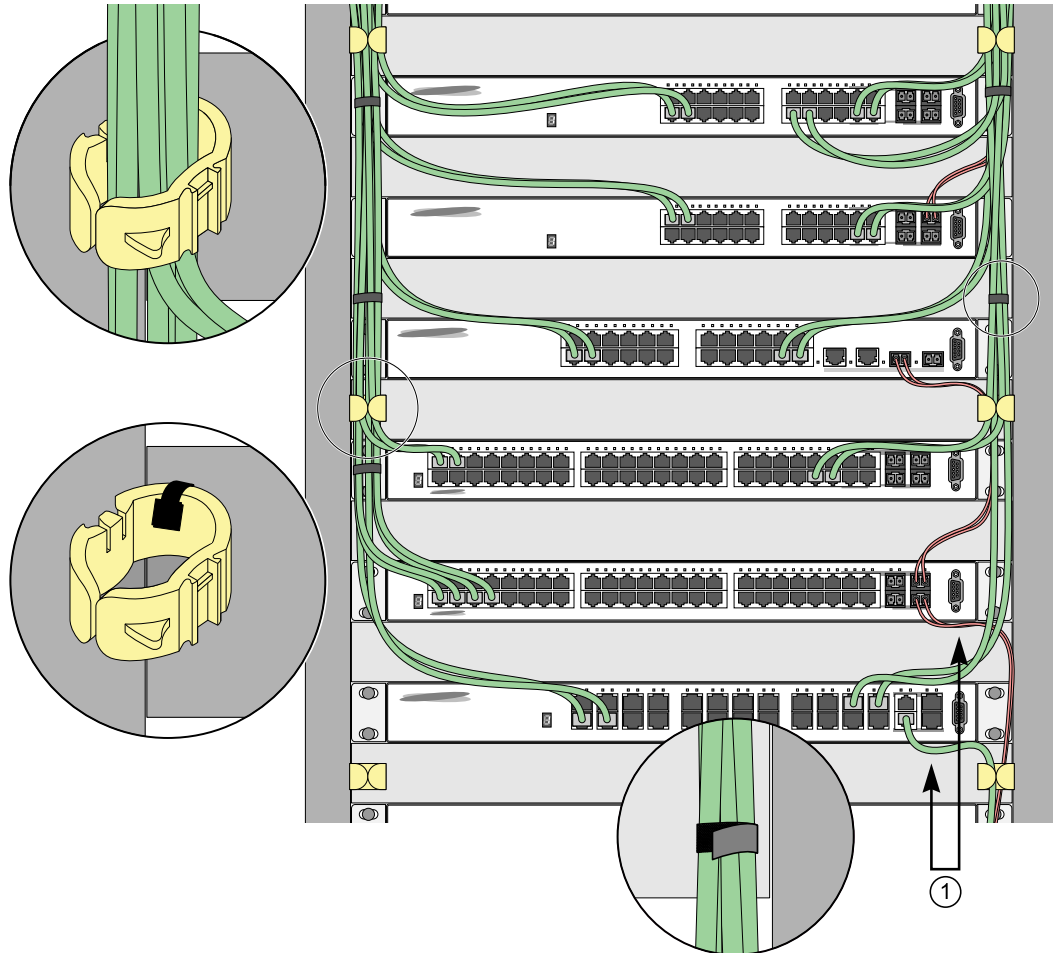


### Caution

Unshielded twisted pair (UTP) cable can build up electrostatic charges when being pulled into a new installation. Before connecting any category 5 UTP cable to the switch, discharge ESD from the cable by plugging the RJ45 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.



**Figure 15: Properly Installed and Bundled Cable**

1 = Ensure adequate slack and bend radius

### *Handle Fiber Optic Cable*

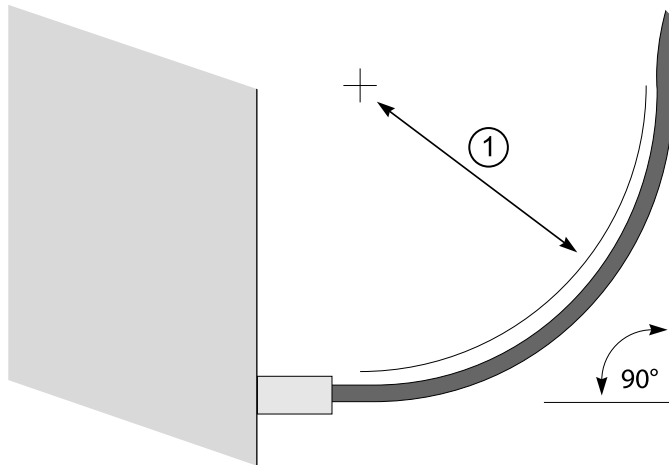
Fiber optic cable must be handled carefully during installation.

Every cable has a minimum bend radius, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. Ensure

that the bend radius for fiber optic cables is equal to at least 5 cm (2 in) for each 90-degree turn as shown in [Figure 16](#).

**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 16: Bend Radius for Fiber Optic Cable**

1 = Minimum 5 cm (2 in) radius in 90° bend

### *Cable Distances and Types*

Refer to the [Extreme Optics](#) website for descriptions of optics and cables, as well as a complete list of supported cable lengths, and a list of the cable types that are compatible with your equipment.

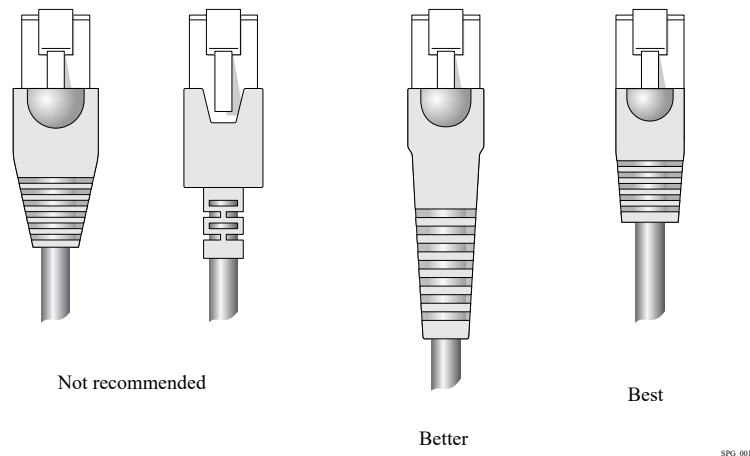
## Use RJ45 Connector Jackets

Use RJ45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

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

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

[Figure 17](#) shows examples of recommended and non-recommended connector jacket types.



**Figure 17: RJ45 Connector Jacket Types**

## Prevent Radio Frequency Interference (RFI)

If you use UTP cabling in an installation, take precautions to avoid radio frequency (RF) interference.

RF interference can cause degradation of signal quality, and, in an Ethernet network environment, can cause excessive collisions, loss of link status, or other physical layer problems that can lead to poor performance or loss of communication.

To prevent RF interference, avoid the following 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.

## Meet Power Requirements

Observe the following requirements and precautions for powering your hardware.

### Requirements for PoE Devices

When connecting 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 your equipment:

- 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, the best practice is to plug your system into a surge suppressor.

For detailed power specifications for your equipment, see "Technical Specifications."

## Power Cord Requirements

Most Extreme Networks switches do not ship with power cords. See [Select Power Supply Cords](#) on page 77 for information on selecting and purchasing the correct AC power cords for use with specific Extreme Networks equipment.

## UPS (Uninterruptible Power Supply) Requirements

A UPS (uninterruptible power supply) 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 [Provide a Suitable UPS Transition Time](#) on page 45.)



#### Note

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 found on a sticker on the back or bottom of your equipment.
2. Multiply the numbers together to get Volt-Amperes (VA):  
 $VA = \text{Volts} \times \text{Amperes}$
3. 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, add 30% to the total.

### Provide a Suitable UPS Transition Time

*UPS transition time* is the time required for the UPS to change from providing AC power derived from the utility (or mains) supply to providing AC power derived from the battery backup. UPS transition time is sometimes called *UPS transfer time*.

UPS transition times vary between UPS models and implementations, but shorter transition times are preferred. For Extreme Networks stacking products, a UPS transition time of 20 milliseconds or less ensures optimum performance and minimizes service interruptions.

For high-availability and fault-tolerant installations in which the switches use redundant power supply units (PSUs), ensure that each PSU in a switch is connected to a different UPS and that each UPS is powered by an independent AC supply. This will prevent service interruptions when a power source is lost, or when a UPS unit fails. (Note that a single, appropriately sized UPS can power PSUs in multiple switches. The recommendation is simply that for any given switch, the two PSUs should be connected to different UPS units.)

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## Follow Applicable Industry Standards

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Always follow applicable industry standards.

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

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

You can access these standards at: [www.ansi.org](http://www.ansi.org) or [www.tiaonline.org](http://www.tiaonline.org).



# Install the Switch

---

[Safety Considerations for Installing Switches](#) on page 47

[What You Will Need for the Installation](#) on page 48

[Attach the Switch to a Rack or Cabinet](#) on page 48

[Install Optional Components](#) on page 52

[Connect Network Interface Cables](#) on page 53

[Turn on the Switch](#) on page 53

Before you attempt to install or remove an Extreme Networks switch, read the precautions in [Safety Considerations for Installing Switches](#) on page 47.

Extreme Networks switches fit into standard 19-inch equipment racks.

A two-post rack-mounting kit (part no. XN-2P-RMKIT-008) is provided with the switch. The installation process includes the following tasks:

1. Prepare to install the switch. See [What You Will Need for the Installation](#) on page 48.
2. Install the switch in the rack. See [Attach the Switch to a Rack or Cabinet](#) on page 48.
3. Install optional components: optical transceivers and cables. See the instructions in [Install Optional Components](#) on page 52.
4. Install an optional modular AC power supply. See [Remove and Replace an AC Power Supply](#) on page 58.
5. Connect network interface cables. See [Connect Network Interface Cables](#) on page 53.
6. Power up the switch. See [Turn on the Switch](#) on page 53.
7. Perform initial network connection and configuration. See [Activate and Verify the Switch](#) on page 54.

## Safety Considerations for Installing Switches

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Read the information in this chapter thoroughly before you attempt to install or remove an Extreme Networks switch.

Ensure that proper ESD (electrostatic discharge) controls are in use before switch maintenance is performed. This includes but is not limited to wrist straps that are grounded to the switch housing and earth grounds.

**Warning**

Connect the chassis ground wire **before** you connect any DC power cables. Disconnect the ground wire **after** you disconnect all DC power cables.

Take care to load the equipment 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.

**Note**

See [Safety Information](#) on page 73 for additional safety information.  
See [Regulatory Information](#) on page 80 for additional information regarding regulatory compliance certifications.

## What You Will Need for the Installation

---

Ensure that you have followed the guidance in [Site Preparation](#) on page 33, and ensure that you have the appropriate people and tools on hand.

Installing switches is easiest when there are two people to maneuver the switch and attach mounting hardware.

Provide enough space in front of and behind the switch so that you can service it easily. Ensure that a minimum of 122 cm (48 in) in front of the switch and 76 cm (30 in) behind the switch.

Check the *Quick Reference Guide* for your switch model to see what hardware is provided in the switch packaging.

You need the following additional tools and equipment. These are not provided with your switch:

- Screwdriver for securing the mounting screws.
- #2 Phillips magnetic screwdriver to attach bracket screws that are provided with the switch.
- ESD-preventive wrist strap for installing optional ports at the back of the switch.

## Attach the Switch to a Rack or Cabinet

---

The 4120 Series provides multiple options for mounting or installing the switch.



## Mount Options

You can mount or install the device in the following ways:

- The 4120 Series supports mounting as a standalone unit on a flat surface, such as a table top. Use the rubber feet included with the device to secure the device on the surface. No other equipment is required for table installation
- The 4120 Series support mounting in a standard two-post rack or four-post rack. Rack mounting ears are included with the device.

### Mount the Device on a Table

4120 Series switches provide four self-adhesive rubber pads for mounting on tables or other flat surfaces. 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. You can safely place up to four switches on top of one another.



#### Caution

Do not place other equipment on top of table-mounted switches.

To mount a switch on a table - or any firm, flat surface - follow these steps.

1. Carefully separate the four rubber pads that are provided
2. Apply the pads to the underside of the switch by placing a pad at each corner, ensuring that all corners are aligned. [Figure 18](#) shows the locations for attaching the rubber mounting feet on the switch.

#### **Figure 18: Table Mount: 4120 Series**

### Install the Device in a Rack

The 4120 Series can be installed in a four-post rack, using just the two front posts or two back posts, or a two-post rack.

A two-post rack-mounting kit XN-2P-RMKIT-008 is included in the box with your switch. The rack mount kit contains an instruction sheet, along with the following components:

- Mounting ears (2 count)
- Mounting ear screws (8 count)

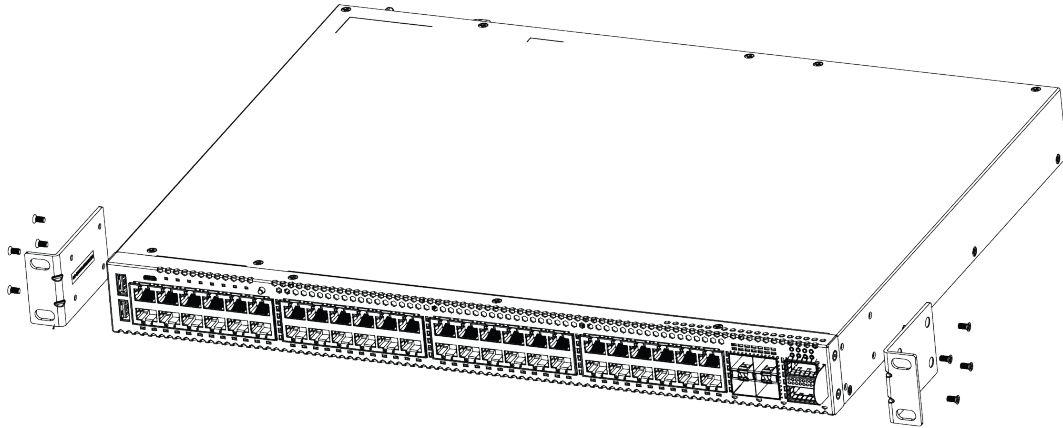
Rack mounting ears can support two configurations: flush- and mid-mount.

Take care to load the rack so that it is not top-heavy. Start installing equipment at the bottom and work up.

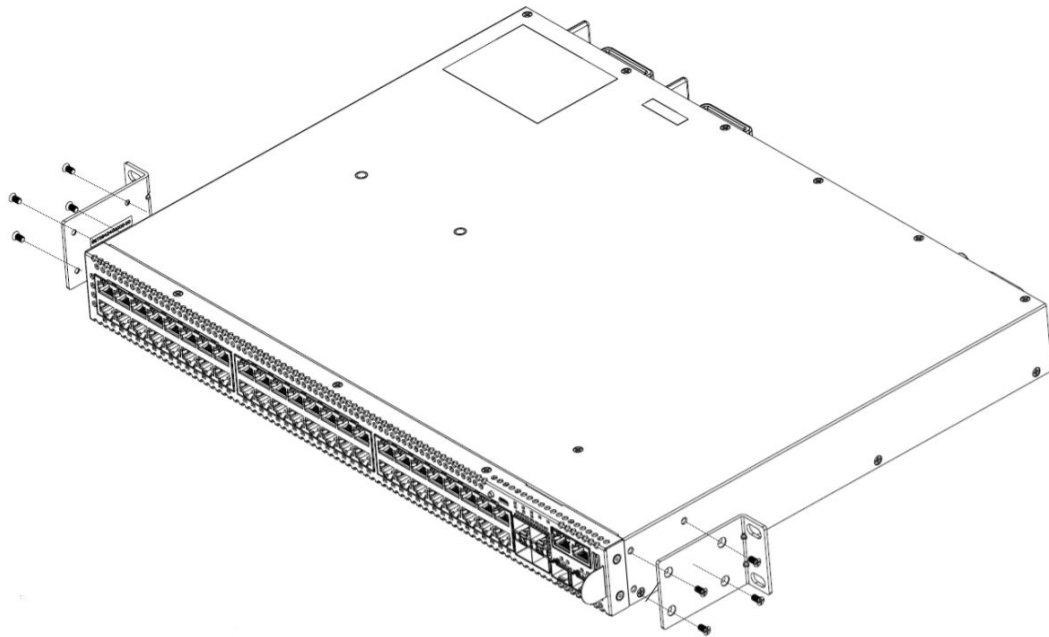
To attach the switch to a rack, follow these steps:

1. Attach a mounting bracket to each side of the switch. Align each mounting bracket so that the flange (ear) faces the front of the switch to flush-mount, or faces the rear of the switch to mid-mount.

The following figures illustrate how to attach the mounting ears for two common mounting options.

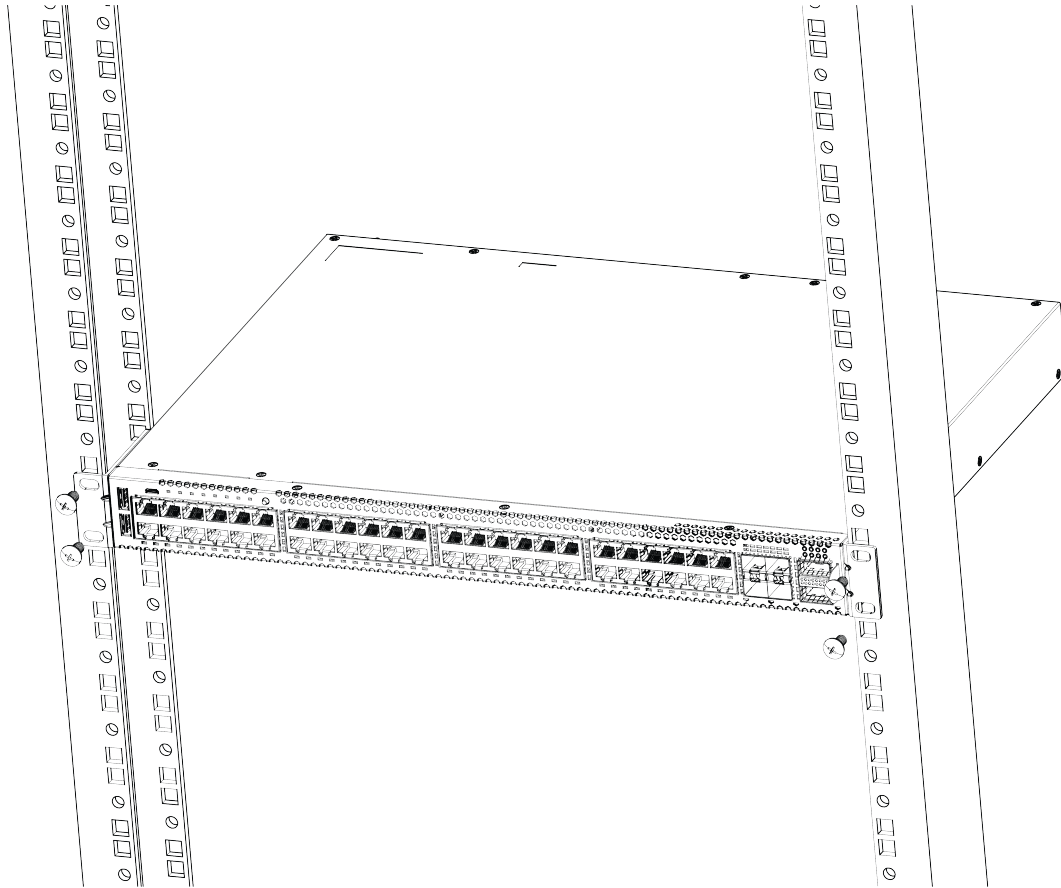


**Figure 19: Flush-Mount: Attaching the Mounting Ears to the Switch**

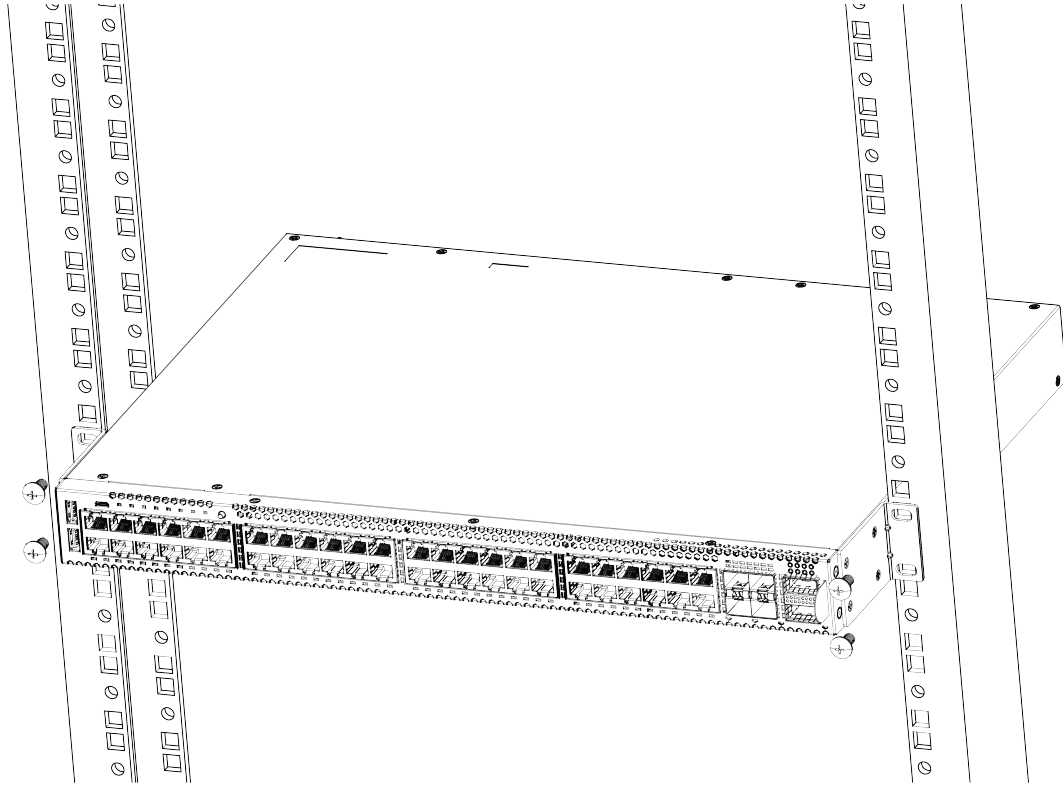


**Figure 20: Mid-Mount: Attaching the Mounting Ears to the Switch**

2. With the mounting brackets attached, position the switch between the vertical rack rails of the 19-inch rack.
3. Fasten the switch securely to the rack rails using four customer-supplied rack screws. Ensure that the threaded length of the screws is within 4 to 5 cm.



**Figure 21: Flush-Mount: Attaching the Switch to the Rack**



**Figure 22: Mid-Mount: Attaching the Switch to the Rack**

The switch comes with an installed power supply, so you can skip to the topic: [Turn on the Switch](#) on page 53.

If you want to add an additional replaceable power supply, install the power supply using the instructions in [Remove and Replace an AC Power Supply](#) on page 58.

## Install Optional Components

---

After the switch is secured to the rack, install optional components.

ExtremeSwitching switches support the use of pluggable transceivers and cables in the SFP+, SFP28, QSFP+, and QSFP28 formats.

For a list of the optical components supported with ExtremeSwitching devices, see the [Extreme Optics](#) website.

### Pluggable Transceiver Modules

Extreme Networks offers several optical transceiver modules for transmitting and receiving data over optical fiber rather than through electrical wires.

### Optical Cables

Direct-attach copper and fiber cables provide connections between populated SFP+, SFP28, QSFP+, and QSFP28 ports.

---

## Connect Network Interface Cables

---

Use the appropriate type of cable to connect the ports of your switch to another switch or router. Refer to the [Extreme Optics](#) website for descriptions of optics and cables, as well as a complete list of supported cable lengths, and a list of the cable types that are compatible with your equipment.

Working carefully, one port at a time, do the following:

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 the preceding steps 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.

---

## Turn on the Switch

---

An AC power cord is not included with the 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](#) on page 76.

For devices that are connected to AC power, connect the power cord to the AC power input socket on the device (or power supply) and to an AC power outlet.

If the PSU LEDs do not turn green, refer to the [4120 Series System LEDs](#) on page 61 topic for troubleshooting information.



# Activate and Verify the Switch

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[Connect to a Management Console](#) on page 54

[Log in for the First Time on Switch Engine](#) on page 54

[Configure the Switch's IP Address for the Management VLAN](#) on page 56

After you have installed the switch and connected network cables, complete these tasks to configure the software on the switch and prepare it for use.

## Connect to a Management Console

---

Connect each switch's serial console interface (an RJ45 jack) to a PC or terminal. The PC or terminal serves as the *management console*, used to monitor and configure the switch.

The default communication protocol settings for the serial console interface are:

- Baud rate: 115200
- Data bits: 8
- Stop bit: 1
- Parity: None

## Log in for the First Time on Switch Engine

---

The 4120 Series is designed for easy-to-use cloud management. 4120 Series switches can be managed by either of the native cloud management options ExtremeCloud™ IQ or ExtremeCloud™ IQ Site Engine, avoiding the need for complex on-switch provisioning through a direct console interface. Onboarding to the cloud is a hands-off operation using zero-touch provisioning. Connect the switch to the network and the switch automatically finds its connection to the cloud and is ready to be provisioned.



### Note

An ExtremeCloud IQ Pilot License is required for each 4120 Series switch.

Use the following steps to log into the switch.

1. The initial login prompt displays as follows:

```
(Pending-AAA) login:
```

The failsafe account is available at this time, but the normal AAA login security is not available yet.

2. Wait for the following message to display:

```
Authentication Service (AAA) on the master node is now available for login.
```

The normal AAA login security is available at this time.

3. Press **[Enter]**.

Whether or not you press **[Enter]**, after you see the logon prompt, you can perform a normal logon.

You can perform a normal logon after you see the logon prompt regardless of whether or not you pressed **[Enter]**. The following prompt displays:

```
login
```

After you have successfully logged on, the following information about successful and unsuccessful logons displays:

```
There have been 26 successful logins since last reboot and 0 failed logins since last
successful login
Last Successful Login was on: Thu Apr 23 17:16:08 2020
```

## Manual Setup

This section describes how to manually onboard the switch and finish the switch configuration.

Onboard your switch with ExtremeCloud™. Log in or create your XIQ administrator account <https://extremecloudiq.com>

Before logging in, verify that the switch LEDs are on (solid green or blinking green) and that it is connected to a management console as described in [Connect to a Management Console](#) on page 54.

To perform the initial login and complete initial configuration tasks, follow these steps.

1. Use a terminal emulator such as PuTTY or TeraTerm to connect to the switch through the serial port connection.

You can also connect to the switch via telnet or SSH. Be sure that your serial connection is set properly:

- Baud rate: Baud rate: 115200
  - Data bits: 8
  - Stop bit: 1
2. At the management console, press **[Enter]** one or more times until you see the login prompt.
  3. At the login prompt, log in using the default user name `admin`.

For example:

login: admin



**Note**

For the initial password, simply press **[Enter]**.

When you have successfully logged on to the system, the command line prompt displays the system name (for example, 4120-424MW-SwitchEngine =). You are logged in to the CLI and have limited access to switch functions.

4. Respond to the screen prompts to configure the level of security you need.



**Note**

For more information about logging in to the switch and configuring switch management access, see the [Switch Engine 32.7.1 User Guide](#).

5. Enter `show version`.

The switch serial number is displayed, as highlighted in the following example. Make a note of this number for future reference.

```
(Software Upgrade Required) 4120-48MW-4Y-SwitchEngine.8 = show version
Switch      : 801187-00-AA FF022335G-00007 Rev AA BootROM: 4.6.0.3   IMG:
32.7.1.22

Image       : Extreme Networks Switch Engine version 32.7.1.22 by release-manager
              on Fri 12 Apr 2024 02:38:24 PM UTC

BootROM    : Default 4.6.0.3 Alternate 4.6.0.3
Diagnostics : 0.0.1.6
Certified Version : EXOS Linux 5.10.177, Extreme Networks FIPS Object Module 2.0.16a
Build Tools Version : exos-arm64-sdk-3.1.19.1.0
```



**Note**

Software upgrade is required.

Configure the switch's IP address for the management virtual LAN (VLAN) by following the steps in [Configure the Switch's IP Address for the Management VLAN](#) on page 56.

## Configure the Switch's IP Address for the Management VLAN

You can configure the switch's IP address for the management virtual LAN (VLAN).



**Note**

The management port is part of the `mgmt` VLAN. This VLAN membership cannot be changed.

Log in to the management console, connect to the switch, and follow these steps.

If the switch has no saved configuration, a startup provisioning script asks the user about management connectivity and security:

By default, Auto-Provisioning uses DHCP on all Ethernet ports as this switch attempts to connect to an Extreme Networks management product. Instead of using DHCP, do you want to 'disable auto-provision' and



configure a static IP address, default gateway and DNS server now?  
[y/N/q]:

From the CLI "=" prompt, you can enter `run provisioning` to run the provisioning script.

Or you can use the `vlan` CLI command to assign a name, IP address, and default subnetwork mask for the VLAN.

1. Assign a name, IP address, and default subnetwork mask for the VLAN as shown in the following example. `configure vlan vlan_name ipaddress nn.nn.nn.nn 255.255.255.0`

Your changes take effect immediately.

2. Enter `save` to save your configuration changes so that they will be in effect after the next system reboot.

**Note**

For more information about saving configuration changes, see the [Switch Engine 32.7.1 User Guide](#).

The configuration is saved to the configuration database of the switch.



# Remove and Replace Components

---

[Remove and Replace an AC Power Supply](#) on page 58

[Remove a Switch from a Rack](#) on page 60

You can add and replace modular power supplies, as needed, while the device is operating ("hot swapping").

Follow the procedures in this section to add or remove and replace power supplies and to remove a device from a rack.

## Remove and Replace an AC Power Supply

---

The switches have one bay for a hot-swappable AC power supply, located on the rear switch panel. Since the 4120 Series has an internal power supply, you can replace the removable power supply without powering down the switch.



### Warning

Be sure to disconnect all power cables before you disconnect the chassis ground wire.

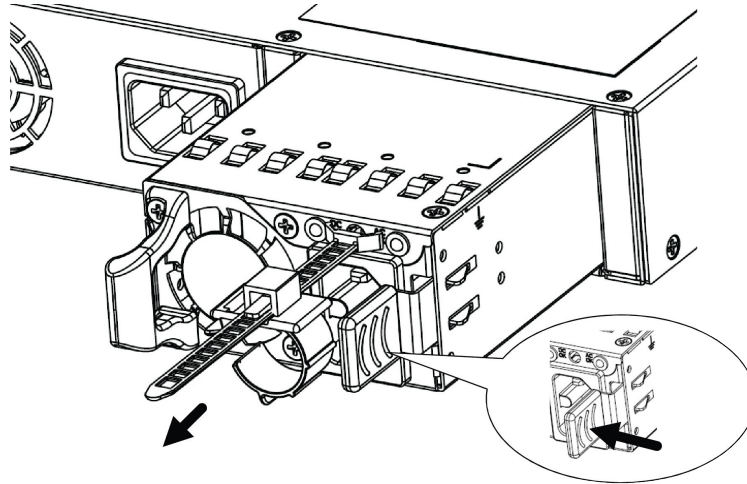


### Warning

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.

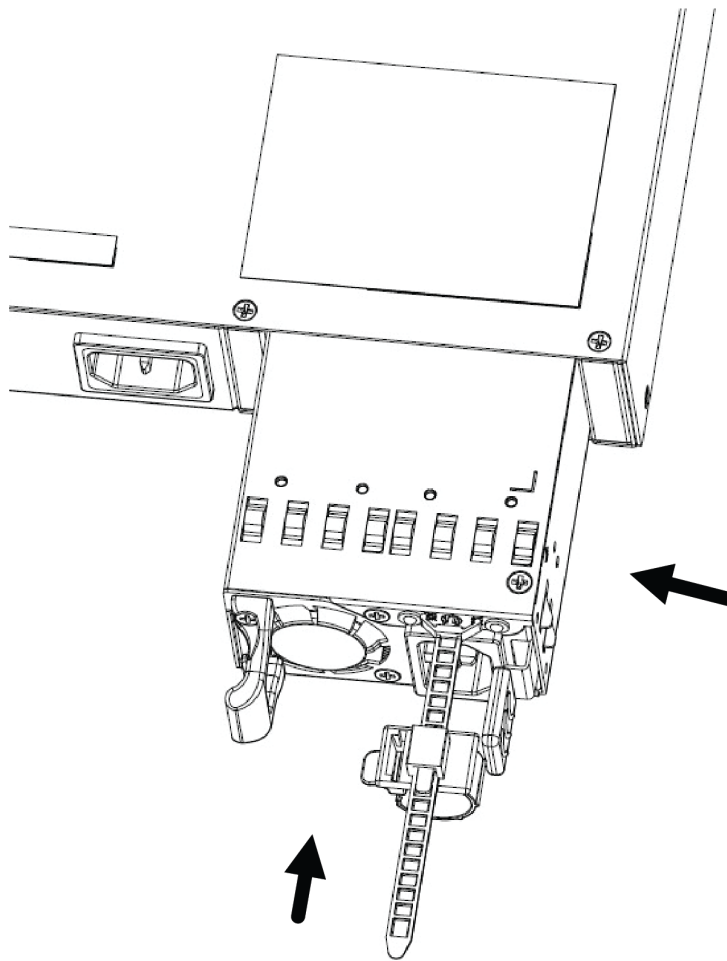
To remove and replace an AC power supply, follow these steps:

1. Disconnect the AC power cord from the wall outlet and from the power supply.
2. If necessary, remove a blank panel from the back of the switch.
3. Note the orientation of the installed power supply, and the location of the latching tab at the right of the unit.
4. Push the latching tab toward the power supply handle and pull outward on the handle to disengage the power supply internal connectors. See [Figure 23](#)



**Figure 23: Removing a Replaceable AC Power Supply**

5. Carefully slide the power supply all the way into the power supply bay (see [Figure 24](#))



**Figure 24: Installing a Replaceable AC Power Supply**

6. Push the power supply in until the latch snaps into place.

Do not slam the power supply into the switch.

**Note**

If power supplies are not installed in all 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 the power cord to the power supply and to a grounded AC power outlet.

**Warning**

Always make sure that the source outlet is properly grounded before plugging the AC power cord into the AC power supply.

8. If the power supply is equipped with a power cord retainer, use the retainer to secure the power cord to the power supply.

## Remove a Switch from a Rack

---

Before removing a switch from a rack, verify that:

- The removable power supply has been removed. See [Remove and Replace an AC Power Supply](#) on page 58.
- The switch has been disconnected from all other sources of electrical power.

To remove a switch from a rack, follow these steps:

1. Unscrew the mounting brackets from the rack while carefully supporting the weight of the device.
2. Tilt the device so that the brackets are clear of the rack posts, and carefully lift it out of the rack.

If the device cannot be tilted (because other equipment is mounted directly above and below), remove one or two mounting brackets from the device and then slide the device out.

If you plan to use the device again later, store it with the mounting brackets attached.

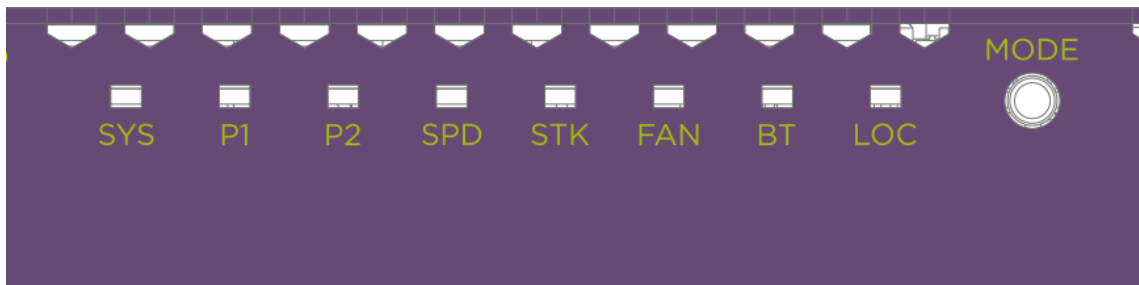
# Monitor the Switch

[4120 Series System LEDs](#) on page 61

The following topics help you monitor the status of the switch/appliance as it is running.

## 4120 Series System LEDs

System status LEDs are located on the front of the switch. The following figure shows the status LEDs for 4120 Series switches:



**Figure 25: 4120 Series Mode and System Status LEDs**

**Table 11: 4120 Series Port LEDs**

Label	Function	Color/State	Port State
SYS	System status LED (Legacy MGMT function)	Green Flash slowly	POST Passed, normal operation, blinks on standalone switch, stack master, and backup nodes in a stack; off for standby nodes in a stack
		Green Blinking	POST in progress
		Amber Blinking	POST failed or overheat
P1/P2	PSU status LEDs	Solid Green	Normal operation
		Amber Blinking	Input or output power failures
		Off	Not present
SPD STK	Speed status LED Stacking status LED	SPD Solid Green	Speed mode
		STK Solid Green	Stacking mode
		All off	Normal mode

**Table 11: 4120 Series Port LEDs (continued)**

Label	Function	Color/State	Port State
FAN	Fan status LEDS	Solid Green	Normal operation
		Amber Blinking	Fan failure
BT	Bluetooth Status LED	Green Blinking	Bluetooth pairing in progress
		Solid Green	Bluetooth connected
		Off	Bluetooth not connected
LOC	Locator LED	Blue Blinking	Locator function

Port LEDs can display in three different modes: SYS (the default mode), SPD (speed) and STK (stacking). The Mode button cycles through the three display modes. In the default SYS mode, SPD and STK are off. The port LEDs enter SPD display mode, indicated by the SPD LED, after pressing the Mode button one time. SPD mode helps to determine the operational speed of a port. The port LEDs enter the STK display mode, indicated by the STK LED, after pressing the Mode button a second time. STK mode is used to indicate slot presence and slot number through the first eight port LEDs. SPD and STK display modes expire after 30 seconds, and the display mode reverts back to the default SYS mode. A long press of the Mode button when in any mode other than STK mode initiates Bluetooth pairing.

## Port LEDs in Default (SYS) Mode

In the default SYS mode, SPD and STK are OFF. Port status displays behavior for link, traffic, and PoE as described in the following table:

**Table 12: Port LEDs in SYS Mode (default)**

Color/State	Meaning
Solid Green	Link is OK; port is not powered
Solid 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

## Port LEDs in SPD Mode

SPD mode helps to determine the operational speed of a port.

**Table 13: Port LEDs in SPD Mode**

Color/State	Speed
Slow Blinking Green	10Mbps
Fast Blinking Green	100Mbps
Solid Green	1000Mbps
Slow Blinking Amber	2.5Gbps
Slow Blinking Green	10Gbps
Fast Blinking Green	25Gbps
Fast Blinking Green	100Gbps

## Port LEDs in STK Mode

STK mode indicates slot presence and slot number through the first eight port LEDs. Pressing the Mode button for 5 seconds when in STK mode initiates InstaStack auto-stacking.

**Table 14: Port LEDs in STK Mode**

Port 1-8 Color/State	Stacking Indication
Steady green	Slot corresponding to the port number of the LED is present
Blinking green	This slot has slot number corresponding the port number of the blinking LED

## Management Port LEDs

100/1000Base-T RJ-45 Management port on the rear panel includes two LED located on each side of the RJ-45 port. The LED on the right side is labeled Link (for link status) and the LED on the left side is labeled Act (for port activity). The following table describes the meaning of the colors and states for the LEDs.

**Table 15: Management Port LEDs**

Right-side LED		State
Link	Green	Link up
	Off	No link up or port disable
Left-side LED		State

**Table 15: Management Port LEDs (continued)**

Right-side LED		State
Act	Blinking Green	Packet transmitting or receiving
	Off	No packet transmitting or receiving

### QSFP28 Port LEDs in SYS Mode (default)

Each QSFP28 port has four green LEDs. The following table describes the states for the LEDs.

**Table 16:**

Location	Port Configuration	LEDs	State	Description
Partitionable Ports U1, U2	4 x 10 Gb or 4 x 25 Gb (partitioned)	All 4 LEDs Green	Solid light	The port has a link.
			Blinking	Port is transmitting and/or receiving.
	1 x 100 Gb (not partitioned)	1st LED is Green, LEDs 2,3,4 are off	Solid light	The port has a link.
			Blinking	Port is transmitting and/or receiving.
Off or not present.	N/A	Light is off.	No link or the port is disabled.	

### QSFP28 Port LEDs in SPD Mode

**Table 17:**

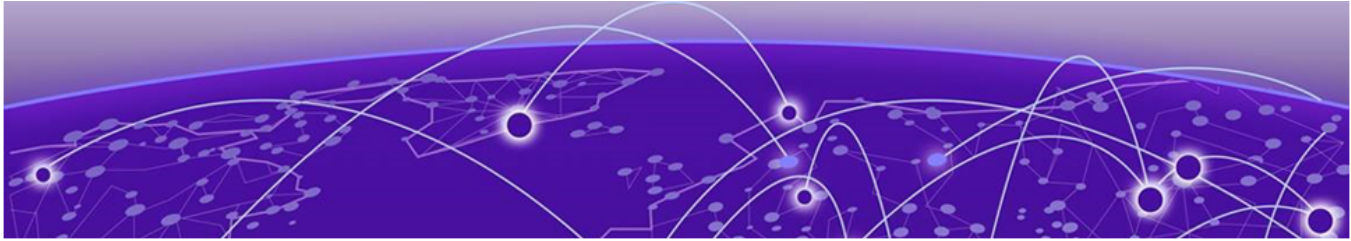
Location	Port Configuration	LEDs	State	Description
Partitionable Ports U1, U2	4 x 10 Gb (partitioned)	All 4 LEDs Green	Slow blinking	The port has a 10 Gbps link.
	4 x 25 Gb (partitioned)	All 4 LEDs Green	Fast blinking	The port has a 25 Gbps link.
	1 x 100 Gb (not partitioned)	1st LED is Green, LEDs 2,3,4 are off	Fast blinking	The port has a 100 Gbps link.
	Off or not present.	N/A	Light is off.	No link or the port is disabled.



## Locator LED

The blue LED labeled LOC on the front panel is the locator LED, which is controlled by using the CLI commands

```
[enable | disable] led locator.
```



# Technical Specifications

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[4120 Series Technical Specifications](#) on page 66

[Acoustics](#) on page 67

[Memory](#) on page 68

[Mean Time Between Failures \(MTBF\)](#) on page 68

[Power Specifications](#) on page 69

[Environmental](#) on page 69

[Standards](#) on page 70

This section lists technical specifications for the hardware products described in this document.

## 4120 Series Technical Specifications

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### External Interfaces

Switch Model	Interfaces
4120-24MW-4Y	<ul style="list-style-type: none"> <li>• 24 x 10M/100M/1G/2.5GBase-T ports</li> <li>• 4 x 1/10/25Gb SFP28 ports (unpopulated)</li> <li>• 2 x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1 x 100/1000BASE-T out-of-band management port</li> <li>• 1x Serial console port (RJ-45)</li> <li>• 2 x USB A port</li> <li>• 1 x USB Micro-B console port</li> </ul>
4120-48MW-4Y	<ul style="list-style-type: none"> <li>• 48 x 10M/100M/1G/2.5GBase-T ports</li> <li>• 4 x 1/10/25Gb SFP28 ports (unpopulated)</li> <li>• 2 x Stacking/QSFP28 ports (unpopulated)</li> <li>• 1 x 100/1000BASE-T out-of-band management port</li> <li>• 1 x Serial console port (RJ-45)</li> <li>• 2 x USB A port</li> <li>• 1 x USB Micro-B console port</li> </ul>

## Weights and Dimensions

**Table 18: 4120 Series Systems**

Part Number	Weight	Physical Dimensions
4120-24MW-4Y	11.9 lb / 5.42 kg	17.4 in W / 1.7 in H / 13.0 in D 441 mm / 44 mm / 330 mm
4120-48MW-4Y	12.4 lb / 5.62 kg	

## Weights and Dimensions of Accessories

**Table 19: 4120 Series Power Supplies**

Part Number	Weight	Physical Dimensions
XN-ACPWR-920W-FB-U	1.9 lb / 0.86 kg	2.9 in W / 1.6 in H / 7.6 in D 73 mm / 40 mm / 194 mm
XN-ACPWR-1200W-FB-U	1.96 lb / 0.89 kg	
XN-ACPWR-2000W-FB-U	2.0 lb / 0.91 kg	

**Table 20: 4120 Series Rack Mount Kit**

Part Number	Weight	Physical Dimensions
XN-2P-RMKIT-008	0.24 lb / 0.11 kg	1.73 in W / 0.8 in H / 2.56 in D 43.9 mm / 20.32 mm / 65.0 mm

**Table 21: 4120 Series Console Cables**

Part Number	Weight	Physical Dimensions
XN-RJ45-USBC-CONSOLE-CBL	0.15 lb / 0.07 kg	4.8 in W / 0.75 in H / 6 in D 122 mm / 19 mm / 152 mm
XN-RJ45-USBA-CONSOLE-CBL		
XN-RJ45-DB9-CONSOLE-CBL		
XN-MICRO-USB-USBA	0.16 lb / 0.07 kg	0.63 in W / 0.32 in H / 78.8 in D 16 mm / 8.1 mm / 2002 mm

## Acoustics

Switch Model	Bystander Sound Pressure (dB(A))	Declared Sound Power (Bels)
4120-24MW-4Y	52.0 dB, 25°C (Typical)	6.3 B, 25°C (Typical)
	52.9 dB, 25°C (Maximum)	6.4 B, 25°C (Maximum)
	75.6 dB, 50°C (Maximum)	8.7 B, 50°C (Maximum)

Switch Model	Bystander Sound Pressure (dB(A))	Declared Sound Power (Bels)
4120-48MW-4Y	51.4 dB, 25°C (Typical)	6.3 B, 25°C (Typical)
	58.1 dB, 25°C (Maximum)	7.0 B, 25°C (Maximum)
	76.1 dB, 50°C (Maximum)	8.7 B, 50°C (Maximum)

Typical = 50% ports linked with full traffic, 50% PoE

Maximum = 100% ports linked with full traffic, 100% PoE

4120-24MW-4Y tested with secondary 920W PSU

4120-48MW-4Y tested with secondary 1200W PSU

## Memory

The following table includes memory specifications for the 4120 Series switches.

Specifications
1 GB DDR3L memory
4 GB EMMC memory
8 MB SPI flash memory

## Mean Time Between Failures (MTBF)

Model	Temperature	w/o OFPS	with OFPS 860w	with OFPS 860w and CRPS 920w	with OFPS 860w and CRPS 1,200w
4120-24MW-4Y	25°C	401,806	258,621	211,046	193,304
4120-24MW-4Y	50°C	148,848	115,137	99,502	92,088

Model	Temperature	w/o OFPS	with OFPS 1200w	with OFPS 1200w and CRPS 1200w	with OFPS 1200w and CRPS 2000w
4120-48MW-4Y	25°C	382,301	242,696	184,267	172,304
4120-48MW-4Y	50°C	144,411	113,492	91,032	85,752

## Power Specifications

### Power Supply Specifications

Switch Model	Internal Fixed PSU - Max Power	Secondary PSU
4120-24MW-4Y	860W ACPSU	XN-ACPWR-920W-FB-U
		XN-ACPWR-1200W-FB-U
4120-48MW-4Y	1200W ACPSU	XN-ACPWR-1200W-FB-U
		XN-ACPWR-2000W-FB-U

### Max PoE Power Budget

Switch Model	With Internal Fixed PSU	With Internal Fixed PSU + 920W PSU	With Internal Fixed PSU + 1200W PSU	With Internal Fixed PSU + 2000W PSU
4120-24MW-4Y (100-120VAC)	680W	1440W	1380W	Not Supported
4120-48MW-4Y (100-120VAC)	640W	Not Supported	1340W	1230W
4120-24MW-4Y (200-240VAC)	680W	1440W	1540W	Not Supported
4120-48MW-4Y (200-240VAC)	980W	Not Supported	1780W	2180W

### Minimum/Maximum Power Consumption and Heat Dissipation

Switch Model	Minimum Power Consumption (W)	Minimum Heat Dissipation (BTU/hr)	Maximum Power Consumption (W)*	Maximum Heat Dissipation (BTU/hr)**
4120-24MW-4Y	48	164	1830	990
4120-48MW-4Y	56	191	2535	1211

\* Includes maximum PoE load (W) through the switch

\*\* Does not include PoE load heat dissipated through external electronic load

## Environmental

### Environmental Specifications

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

## Environmental Compliance

EU RoHS - 2011/65/EU and amendments  
EU WEEE - 2012/19/EU  
EU REACH – Regulation (EC) No 1907/2006 Reporting  
China RoHS - GB/T 26572-2011  
Taiwan RoHS - CNS 15663(2013.7)

## Environmental Operating Conditions

Temp: 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) 300 m/s<sup>2</sup> (30 G), 11 ms, 3 axes, 6 shocks/axis  
Operational Random vibration: 3 to 500 Hz at 1.5 G rms  
Accelerations: 3 Hz @ +10dB/Octave PSD, 10 Hz @ 0.006 PSD, 500 Hz @ 0.006 PSD

## Packaging and Storage Specifications

Temp: -40°C to 70°C (-40°F to 158°F)  
Humidity: 10% to 95% relative humidity, non-condensing  
Packaged Shock (half sine): 3 axes, 100 shocks each axis (+/-), 180 m/s<sup>2</sup> (18 G)  
Packaged Vibration: 5 Hz to 20 Hz @ .01 g<sup>2</sup>/Hz (PSD), 20 to 500 Hz @ -3 dB/Octave (PSD)  
Packaged Random Vibration: 5 Hz to 62 Hz, 5mm/s velocity, 62 Hz to 500 Hz, 2.0 m/s<sup>2</sup>, 5 sweeps of each axis (15 total), Sweep Rate = 1 Octave/min  
Packaged Drop: Height at 42 inches for product <10 kg, 13 drops including 6 surfaces, 3 edges and 4 corners

## Standards

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### North American EMC for ITE

FCC CFR 47 part 15 Class A (USA)  
ICES-003 Class A (Canada)

### European EMC Standards

EN 55032 Class A  
EN 55035  
EN 61000-3-2 (Harmonics)

EN 61000-3-3 (Flicker)  
EN 300 386 (EMC Telecommunications)  
2014/30/EU EMC Directive

## International EMC Certifications

CISPR 32, Class A (International Emissions)  
AS/NZS CISPR32  
IEC 61000-4-2 / EN 61000-4-2: Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria B  
IEC 61000-4-3 / EN 61000-4-3 Radiated Immunity 3V/m, Criteria A  
IEC 61000-4-4 / EN 61000-4-4 Transient Burst, 2 kV, Criteria B  
IEC 61000-4-5 / EN 61000-4-5 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria B  
IEC 61000-4-6 / EN 61000-4-6 Conducted Immunity, 0.15-80 MHz, 3Vrms, 80%AM (1kHz), Criteria A  
IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C

## Country Specific

VCCI Class A (Japan Emissions)  
ACMA RCM (Australia Emissions)  
CQC Mark (China)  
KCC Mark, EMC Approval (Korea)  
BSMI (Taiwan)  
Anatel (Brazil)  
NoM (Mexico)  
EAC (Russia, Belarus, Kazakhstan)  
NRCS (South Africa)  
TEC (India)

## IEEE 802.3 Media Access Standards

IEEE 802.3ab 1000BASE-T  
IEEE 802.3bz 2.5G  
IEEE 802.3at PoE  
IEEE 802.3bt Type 4 PoE  
IEEE 802.3ae 10GBASE-R  
IEEE 802.3by 25GBASE-R  
IEEE 802.3bm/bj 100GBASE-R  
IEEE 802.3az Energy Efficient Ethernet

## Regulatory and Safety

### North American ITE

UL 60950-1  
UL/CuL 62368-1 Listed  
CSA 22.2 No. 60950-1 2nd edition 2014 (Canada)  
Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)  
CDRH Letter of Approval (US FDA Approval)

**European ITE**

EN 62368-1  
EN 60825-1 Class 1 (Lasers Safety)  
2014/35/ EU Low Voltage Directive

**International ITE**

CB Report & Certificate per IEC 60950-1  
CB Report & Certificate IEC 62368-1  
AS/NZS 60950-1 (Australia /New Zealand)





# Safety Information

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[Considerations Before Installing](#) on page 73

[General Safety Precautions](#) on page 74

[Maintenance Safety](#) on page 75

[Fiber Optic Ports and Optical Safety](#) on page 75

[Cable Routing for LAN Systems](#) on page 76

[Power Cord Requirements for AC-Powered Switches and AC Power Supplies](#) on page 76

[Select Power Supply Cords](#) on page 77

[Install Power Supply Units and Connect Power](#) on page 77

[Battery Notice](#) on page 78

[Battery Warning - Taiwan](#) on page 79



## 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 located in the United States, install the system in accordance with the U.S. National Electrical Code (NEC).

## Considerations Before Installing

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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 45°C (113°F).
  - Clean and free from airborne materials that can conduct electricity.

- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- For equipment designed to be installed in environments that are not environmentally controlled, such as outdoor enclosures, see the product data sheet or 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

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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

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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.

## Fiber Optic Ports and Optical Safety

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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.

## Cable Routing for LAN Systems

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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 metallicity 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 metallicity to OSP wiring. 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.

## Power Cord Requirements for AC-Powered Switches and AC Power Supplies

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An AC power cord is not included with the AC power supply.

Power cords used with AC-powered switches or 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 appropriate AC 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<sup>2</sup>) minimum; over 6 feet, the minimum wire size is 16 AWG (1.0 mm<sup>2</sup>).

For details about obtaining AC power cords for use in your country, refer to <http://www.extremenetworks.com/product/powercords/>.

## Select Power Supply Cords

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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 the Technical Specifications for your product.

To locate a Sales Manager or Partner in your region, visit [www.extremenetworks.com/partners/where-to-buy](http://www.extremenetworks.com/partners/where-to-buy).



### Note

This equipment is not intended to be directly powered by power distribution systems where phase-phase voltages exceed 240 VAC (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 < 240 VAC from phase-phase, or that you make a connection to a (P+N+PE) power distribution where voltages do not exceed 240 VAC.

All installations should confirm that the product is reliably grounded according to the country's local electrical codes.

## Install Power Supply Units and Connect Power

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For the ratings and power input requirements of each power supply unit, see "Technical Specifications" or the data sheet for the power supply at [www.extremenetworks.com](http://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 DC power supplies or connect DC power:

- 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.
- 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.



#### 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.

## Battery Notice



**Warning:** This product contains a battery used to maintain product information. If the battery should need replacement it must be replaced by Service Personnel. Please contact Technical Support for assistance.

Risk of explosion if battery is replaced by an incorrect type. Dispose of expended battery in accordance with local disposal regulations.



**Attention:** Ce produit renferme une pile servant à conserver les renseignements sur le produit. Le cas échéant, faites remplacer la pile par le personnel du service de réparation. Veuillez communiquer avec l'assistance technique pour du soutien.

Il y a risque d'explosion si la pile est remplacée par un type de pile incorrect. Éliminez les piles usées en conformité aux règlements locaux d'élimination des piles.

## Battery Warning - Taiwan

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### 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。



# Regulatory Information

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[CE statement](#) on page 80

[EMC Warnings](#) on page 81

[China and Taiwan: Restriction of Hazardous Substances \(ROHS\)](#) on page 81

[BSMI statement \(Taiwan\)](#) on page 81

[Canadian requirements](#) on page 81

[Australia \(RCM\)](#) on page 81

[Federal Communications Commission \(FCC\) Notice](#) on page 81

[Germany statement](#) on page 82

[KCC statement \(Republic of Korea\)](#) on page 82

[Japan \(VCCI Class A\)](#) on page 82

[Japan power cord](#) on page 83

## CE statement

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### Important

This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on this device contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low Voltage Directive (LVD) 2014/35/EU
- EN 55032/EN 55024 (European Immunity Requirements)
  - EN61000-3-2/IEC61000-3-2 (European and Japanese Harmonics Spec)
  - EN61000-3-3



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## EMC Warnings

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### China CQC Warning

**警告:在居住环境中，运行此设备可能会造成无线电干扰。**

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### China and Taiwan: Restriction of Hazardous Substances (ROHS)

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For more information, see <https://www.extremenetworks.com/company/legal/restriction-of-hazardous-substances/>.

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### BSMI statement (Taiwan)

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**警告:為避免電磁干擾,本產品不應安裝或用於住宅環境。**

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### Canadian requirements

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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

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

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### Australia (RCM)

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**Warning**

This equipment is compliant with Class B of CISPR 32. In a residential environment, this equipment may cause radio interference.

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### Federal Communications Commission (FCC) Notice

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This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this

device must accept any interference received, including interference that may cause undesired operation.



#### Note

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

**WARNING:** Changes or modifications made to this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## Germany statement

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Machine noise information regulation - 3. GPSGV, the highest sound pressure level value is 70.0 dB(A) in accordance with EN ISO 7779.

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70.0 dB(A) gemäss EN ISO 7779.

## KCC statement (Republic of Korea)

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이 기기는 업무용 환경에서 사용할 목적으로 적  
합성평가를 받은 기기로서 가정용 환경에서 사  
용하는 경우 전파간섭의 우려가 있습니다.

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

## Japan (VCCI Class A)

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#### 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

## Japan power cord

---



**注意** - 添付の電源コードを他の装置や用途に使用しない

添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

### *English translation of above statement*

ATTENTION: Never use the power cord packed with your equipment for other products.



# Index

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## Numerics

- 1200 W AC power supply
  - features 15
- 2000 W AC power supply
  - features 15
- 920 W AC power supply
  - features 15

## A

- AC power
  - connecting to switch 53
  - requirements for cords 76
- access 35
- acquired node
  - definition 23
- active node 22
- active topology 22
- alternate stacking 22
- amperage
  - calculating for UPS 45
- announcements 9, 10
- ANSI standards 46

## B

- backup node
  - definition 23
  - redundancy 18
- battery notice 78, 79
- bend radius 40, 41
- BICSI 39
- brackets, for mounting in rack 60
- building codes 34
- Building Industry Consulting Service International,  
*see* BICSI

## C

- cabinet
  - attaching switch 48, 49
- cable
  - ANSI standards 46
  - bend radius 41
  - bundling 40
  - category 5 40
  - fiber optic 41, 53
  - for stacking 27
  - for switch ports 53

- cable (*continued*)
  - installing 40, 41
  - labeling 40
  - network interface 53
  - optical 52
  - plenum-rated 40
  - RJ45 42
  - slack 40
  - standards 39
  - types and distances 42
- Canadian requirements 81
- candidate node 23
- category 5 cable 40
- combining
  - switches in a stack 27
- commercial building standards 46
- components
  - optional 52
- configuration
  - IP address 56
  - VLAN 56
- connecting
  - to management console 54
- connecting power 53
- connector jackets
  - RJ45 42
- console port
  - for stacked configurations 31
  - settings 54
- control path 22
- conventions
  - notice icons 7
  - text 7
- cords
  - requirements 76
  - selecting 77

## D

- daisy chain topology 20
- data port 23
- DC power
  - connecting to switch 53
- design standards 46
- devices
  - initial login 54, 55
- distances
  - cables 42
- documentation

documentation (*continued*)  
    feedback 10  
    location 8, 9  
dual primary condition 20

## E

Easy-Setup 24  
election  
    node role 24  
    priority 24  
electric power  
    connecting to switch 53  
electrical codes 34  
electrostatic discharge, *see* ESD  
environmental requirements  
    building codes 34  
    electrical codes 34  
    electrostatic discharge (ESD) 37  
    humidity 37  
    temperature 36  
    wiring closet 35  
equipment  
    installing 47  
    tools needed to install 48  
equipment rack  
    grounding 38  
    mechanical recommendations 38  
    mounting holes 38  
    securing 39  
    service access 38  
    space requirements 38  
ESD  
    discharge from cable 40  
    system protection 37  
Extreme Stacking Tool 27

## F

failover 24  
feedback 10  
fiber optic cable  
    bend radius 41  
    connecting 53  
    handling 41  
    installing 41  
first device login 54, 55  
frequency, *see* radio frequency interference (RFI)

## G

grounding  
    racks 38  
    requirements 46  
    wiring closet 35

## H

hitless failover 24

humidity 37

## I

industry standards 46  
initial device login 54, 55  
installing  
    connecting power 53  
    fiber optic cable 41  
    modular AC power supply 58  
    optical transceivers 52  
    optional components 52  
    personnel 48  
    preparing 48  
    safety information 47  
    switches 47–49  
    tools 48  
IP settings  
    configuring 56

## J

jackets  
    RJ45 connector 42

## L

labeling cables 40  
LEDs  
    stack number indicator 18  
local management connection 54  
logging in to the device 54, 55

## M

MAC address 24  
management port  
    connecting to switch 54  
    for stacked configurations 31  
    settings 54  
modular AC power supply  
    installing 58  
    replacing 58  
mounting brackets  
    removing 60  
multiple-rack stacking 31

## N

native stacking 21  
native stacking ports 17  
network interface connections 53  
node address 24  
node role  
    definition 23  
    election 24  
notices 7

## O

- operating environment requirements 36
- operational node 24
- optical cables
  - installing 52
- optical transceivers
  - installing 52
- optional components
  - installing 52

## P

- planning
  - site 33
- plenum-rated cable 40
- pluggable transceivers, *see* optical transceivers
- ports
  - console port settings 54
  - for stacked configurations 31
  - management 54
  - native stacking 17
- power
  - connecting to switch 53
  - requirements for cords 76
- Power Cord statement (Japan) 83
- power cords
  - selecting 44, 77
- power over Ethernet (PoE)
  - power requirements 43
- power requirements
  - PoE devices 43
  - power supply 44
- power supply unit (PSU)
  - 1200 W AC 15
  - 2000 W AC 15
  - 920 W AC 15
  - installing 58
  - modular AC 58
  - power requirements 44
  - replacing 58
- primary node
  - definition 23
  - redundancy 18
- primary switch 25
- priority
  - for node role election 24
- product announcements 9, 10

## R

- rack
  - attaching switch 48, 49
  - removing switch 60
- rack specifications
  - grounding 38
  - securing to floor 39
  - space requirements 38
- radio frequency interference (RFI)

- radio frequency interference (RFI) (*continued*)
  - patch panel installation 40
  - preventing 43
- redundancy
  - in a stack 18
- regulatory information 80
- removing
  - switch 60
- replacing
  - modular AC power supply 58
- restricted 35
- restricted access 35
- RFI, *see* radio frequency interference (RFI)
- ring topology 19
- RJ45 cable 42

## S

- safety
  - precautions when installing 47
  - requirements 73
- service access to the rack 38
- settings
  - for management console 54
- signal quality 43
- single-rack stacking 29, 30
- site planning 33
- site preparation 48
- slack in cable 40
- slot number 18
- space requirements, rack 38
- specifications
  - equipment racks 38
- stack 21
  - see also* SummitStack
- stack number indicator 18
- stackable switch 21
- stacking
  - backup 18
  - cables 27
  - combining switch models 27
  - connecting cables 31
  - connecting management port 31
  - connection order 29
  - daisy chain 20
  - definition 17
  - dual primary condition 20
  - examples 29–31
  - guidelines 25, 26
  - LEDs 18
  - multiple-rack 31
  - native stacking ports 17
  - primary 18
  - priority 18
  - recommendations 25, 26
  - redundancy 18
  - ring topology 19
  - single-rack 29, 30
  - slot number 18

- stacking (*continued*)
  - stack number indicator 18
  - terminology 21
  - tool 27
  - troubleshooting 18
  - web app 27
- stacking link 22
- stacking port 21
- standards
  - cabling 39, 46
  - commercial building 46
  - design 46
  - grounding 46
- standby node
  - definition 23
- SummitStack
  - path 22
  - segment 24
  - state 24
  - topology 18, 22
  - web app 27
- SummitStack configuration 16
- support, *see* technical support
- switch
  - removing 60
- switches
  - attaching to cabinet 48, 49
  - attaching to rack 48, 49
  - connecting power 53
  - installing 47
  - installing optional components 52
  - safety information 47
  - tools needed to install 48

## T

- technical support
  - contacting 9, 10
- temperature 36
- tools for installing equipment
  - switches 48
- transceivers, *see* optical transceivers
- transition time
  - UPS 45
- troubleshooting stack connections 18

## U

- unshielded twisted pair, *see* UTP cable
- UPS (uninterruptible power supply)
  - requirements 44
  - selecting 45
  - transition time 45
- UTP cable
  - bend radius 40
  - category 5 40
  - discharge ESD 40
  - preventing RFI 43

## V

- VLAN
  - configuring 56

## W

- warnings 7
- web app
  - SummitStack 27
- wiring closet
  - electrostatic discharge (ESD) 37
  - floor coverings 35
  - grounding 35
  - humidity 37
  - rack, securing 39
  - temperature 36
- wiring terminals 38