

Ruckus ICX 7250 Switch Hardware Installation Guide

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Document Conventions

The following table lists the text conventions that are used throughout this guide.

TABLE 1 Text Conventions

Convention	Description	Example
monospace	Identifies command syntax examples	<code>device(config)# interface ethernet 1/1/6</code>
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the Start menu, click All Programs .
<i>italics</i>	Publication titles	Refer to the <i>Ruckus Small Cell Release Notes</i> for more information.

Notes, Cautions, and Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE

A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION

An ATTENTION statement indicates some information that you must read before continuing with the current action or task.



CAUTION

A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.



DANGER

A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

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

Document Feedback

Ruckus is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus at ruckus-docs@arris.com.

When contacting us, include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)

For example:

- Ruckus SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

Ruckus Product Documentation Resources

Visit the Ruckus website to locate related documentation for your product and additional Ruckus resources.

Release Notes and other user documentation are available at <https://support.ruckuswireless.com/documents>. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a Ruckus Support Portal user account. Other technical documentation content is available without logging in to the Ruckus Support Portal.

White papers, data sheets, and other product documentation are available at <https://www.ruckuswireless.com>.

Online Training Resources

To access a variety of online Ruckus training modules, including free introductory courses to wireless networking essentials, site surveys, and Ruckus products, visit the Ruckus Training Portal at <https://training.ruckuswireless.com>.

Contacting Ruckus Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their Ruckus products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the Ruckus Support Portal using <https://support.ruckuswireless.com>, or go to <https://www.ruckuswireless.com> and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at <https://support.ruckuswireless.com/contact-us> and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The Ruckus Support Portal at <https://support.ruckuswireless.com> offers a number of tools to help you to research and resolve problems with your Ruckus products, including:

- Technical Documentation—<https://support.ruckuswireless.com/documents>

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Contacting Ruckus Customer Services and Support

- Community Forums—<https://forums.ruckuswireless.com/ruckuswireless/categories>
- Knowledge Base Articles—<https://support.ruckuswireless.com/answers>
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—<https://support.ruckuswireless.com/security>

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management.

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What's new in this document

There are no enhancements in this edition.

Supported Software

For information about the features supported on a hardware platform, refer to the appropriate *Features and Standards Support Matrix* document.

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Hardware features

The following sections describe the physical characteristics of the devices.

ICX 7250 models

The Ruckus ICX 7250 Ethernet switch is available in the models listed in the following table.

TABLE 2 ICX 7250 models

Model	Description
Ruckus ICX 7250-24G	24 fixed 10/100/1000Base-T, non-PoE ports, 4 SFP 1-GbE uplink ports, no stacking, no EPS4000 connection
Ruckus ICX 7250-24	24 fixed 10/100/1000Base-T, non-PoE ports, 8 SFP+ 1-GbE or 10-GbE uplink or stacking ports, EPS4000 connection
Ruckus ICX 7250-24P	24 fixed 10/100/1000Base-T, PoE/PoE+ ports, 8 SFP+ 1-GbE or 10-GbE uplink or stacking ports, EPS4000 connection
Ruckus ICX 7250-48	48 fixed 10/100/1000Base-T, non-PoE ports, 8 SFP+ 1-GbE or 10-GbE uplink or stacking ports, EPS4000 connection
Ruckus ICX 7250-48P	48 fixed 10/100/1000Base-T, PoE/PoE+ ports, 8 SFP+ 1-GbE or 10-GbE uplink or stacking ports, EPS4000 connection

NOTE

Some examples of the front and rear panels are shown. Other models have similar front and rear panels.

FIGURE 1 ICX 7250-48P front panel



FIGURE 2 ICX 7250-24 front panel

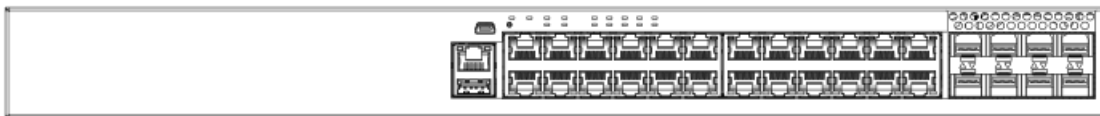


FIGURE 3 ICX 7250-24G rear panel



FIGURE 4 ICX 7250-48 rear panel



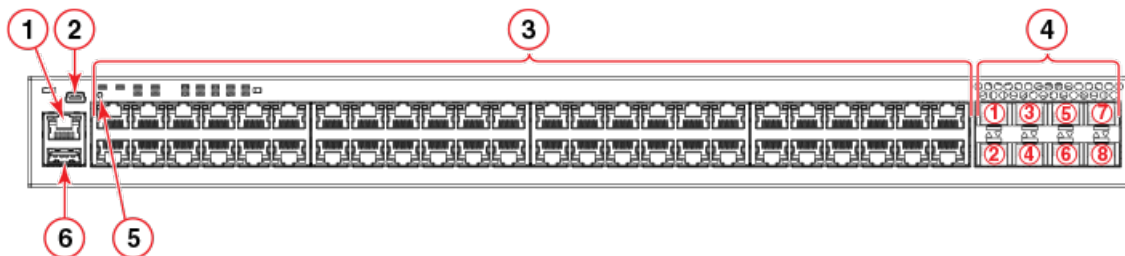
Network and management interfaces

Each device includes the following management interfaces.

- Console management interface (mini-USB port)
- Out-of-band management interface (RJ-45 port)

The ports are located on the front panels of the devices. The following figure shows an example of a 48-port device.

FIGURE 5 Network and management interfaces on a 48-port model



1. Out-of-band management port (RJ-45)
2. Console port (mini-USB)
3. Slot 1 (10/100/1000 Mbps ports - RJ-45)
4. Slot 2 (SFP+ uplink or stacking ports)
5. Reset button - not a management interface, shown for reference only.

The reset button allows you to restart the system without switching the power supply off and on or using the CLI. When the reset button is pressed, the system resets and the software is reloaded.

6. USB port

NOTE

24-port devices have similar front panels. For the ICX 7250-24G, the slot 2 ports are SFP ports.

Console management interface

The console management interface is a mini-USB port that allows you to configure and manage the device using a third-party terminal emulation application from a directly connected PC or through a terminal server.

Out-of-band management interface

The out-of-band management interface is an RJ-45 port that allows you to access, configure and manage the device from the network.

Network interfaces for devices

The Ruckus ICX 7250 contains the following network interfaces:

- 10/100/1000 Mbps ports with RJ-45 copper connectors
- SFP or SFP+ ports

SFP ports support 1 Gbps port speed. SFP+ ports support both 1 Gbps and 10 Gbps port speeds.

NOTE

Refer to the [Ruckus ICX 7250 Switch Technical Specifications](#) on page 95 to see the ports supported by your model.

Slot designations

Refer to [Network and management interfaces](#) on page 14 for the location of slot 1 and slot 2 on the front panel of the 24-port models and the 48-port models.

TABLE 3 Slot designations for ICX 7250 devices

Device	Slot 1 (10/100/1000 BASE-T ports)	Slot 2 (SFP and SFP+ ports)
Ruckus ICX 7250-24G	RJ-45 ports 1-24	SFP ports 1-4
Ruckus ICX 7250-24	RJ-45 ports 1-24	SFP+ ports 1-8
Ruckus ICX 7250-24P	RJ-45, PoE/PoE+ ports 1-24	SFP+ ports 1-8
Ruckus ICX 7250-48	RJ-45 ports 1-48	SFP+ ports 1-8
Ruckus ICX 7250-48P	RJ-45, PoE/PoE+ ports 1-48	SFP+ ports 1-8

10/100/1000 BASE-T ports

All devices provide 24 or 48 RJ-45 ports that operate at 10 Mbps or 100 Mbps half or full duplex, or at 1000 Mbps full duplex. Because all ports support automatic MDI or MDI-X operation, you can use straight-through cables for all network connections to PCs, servers, or other devices or hubs. In addition, it is ideal (and preferred) to use straight-through cables for switch-to-switch connections.

Each port supports auto-negotiation, so the optimum transmission mode (half or full duplex), and the data rate (10, 100, or 1000 Mbps) can be selected automatically. If a device connected to one of these ports does not support auto-negotiation, the communication mode of the port can be configured manually.

SFP or SFP+ fiber ports

The Ruckus ICX 7250-24G contains four small form-factor pluggable (SFP) ports (ports 1 through 4). The top row contains odd-numbered ports and the bottom row contains even-numbered ports. These ports reside on slot 2 of the switch and can be used as uplink (data) ports. These ports support 1 Gbps but not 10 Gbps port speeds.

All other Ruckus ICX 7250 devices contain eight SFP+ ports that support 1 Gbps or 10 Gbps port speeds. The top row ports are odd numbered (ports 1, 3, 5, and 7) and the bottom row ports are even numbered (ports 2, 4, 6, and 8). All ports can be used for stacking or uplinking.

NOTE

You may need software licenses to enable some SFP+ ports at the full 10 Gbps. Refer to the *FastIron Ethernet Switch Software Licensing Guide* for more information.

For information about supported SFP and SFP+ transceivers, refer to the Ruckus datasheet.

Specifying a port address

You can specify a port address for an uplink (data) port, a stacking port, or a management port.

Specifying a data port

The port address format is *stack-unit/slot/port*:

- *stack-unit*: Specifies the stack unit ID. The range is from 1 through the maximum number of devices supported in a stack. Refer to the technical specifications for your device for the actual value. If the device is not part of a stack, the stack unit ID is 1.
- *slot*: Specifies the slot number; either 1 or 2.
- *port*: Specifies the port number in the slot. The range is from 1 through 24 (24-port models) or 1 through 48 (48-port models) for the RJ-45 ports. For the SFP ports, the range is from 1 through 4, and for the SFP+ ports, the range is from 1 through 8.

The following example shows how to specify port 2 in slot 1 of a device that is not part of a stack:

```
device (config)# interface ethernet 1/1/2
```

Specifying a stacking port

The port address format is *stack-unit/slot/port*:

- *stack-unit*: Specifies the stack unit ID. For models that support stacking, the range is from 1 through the maximum number of devices (units) that can be supported in the stack.
- *slot*: Specifies the slot number. Stacking ports are in slot 2.
- *port*: Specifies the port number in the slot.

The following example shows how to specify stacking port 3 in slot 2 of unit 3 in a stack:

```
device (config)# interface ethernet 3/2/3
```

Specifying a management port

The management port number is always 1. This example shows how to specify the management port:

```
device (config)# interface management 1
```

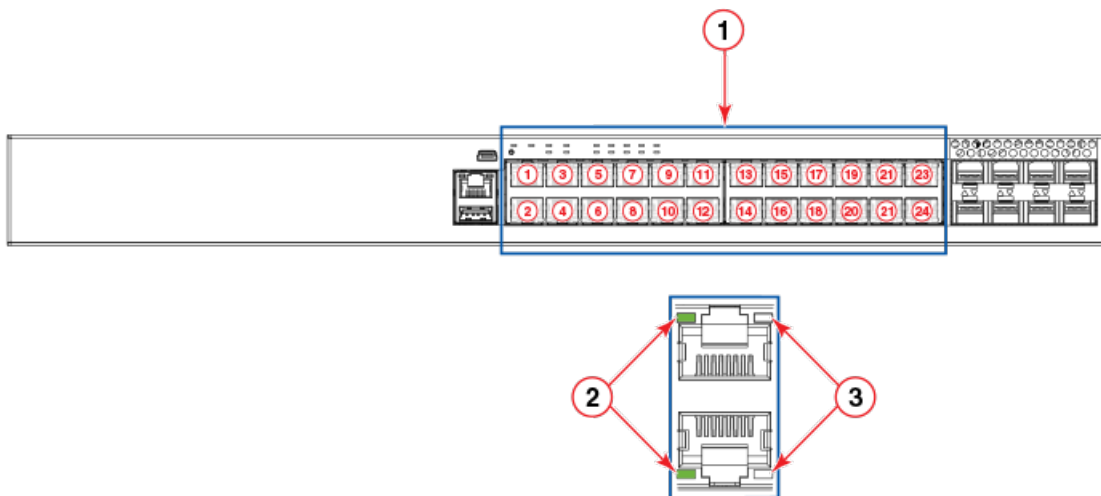
Port, system, and power status LEDs

The devices include LEDs that indicate the status of device components.

NOTE

The following figures show examples of the port status LEDs for similar ports are present for models with a higher number of ports.

FIGURE 6 Port status LEDs on RJ-45 ports

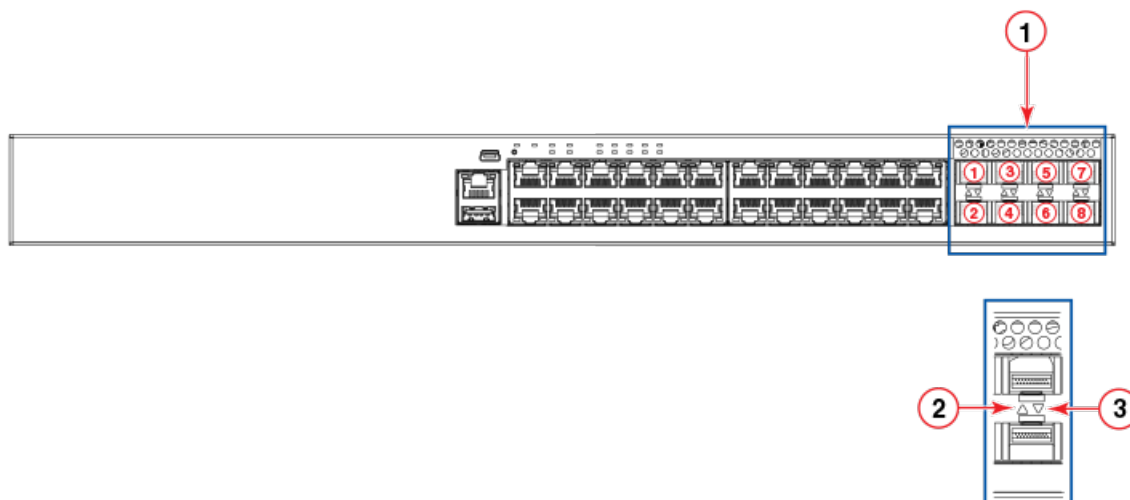


1. RJ-45 ports
2. Status LEDs for corresponding ports
3. PoE/PoE+ LEDs for corresponding ports

NOTE

The PoE/PoE+ LEDs are reserved on models that do not support PoE or PoE+ operation.

FIGURE 7 Port status LEDs for SFP or SFP+ ports



1. SFP or SFP+ ports
2. Bi-color status LED for upper port
3. Bi-color status LED for lower port

TABLE 4 Port status LEDs

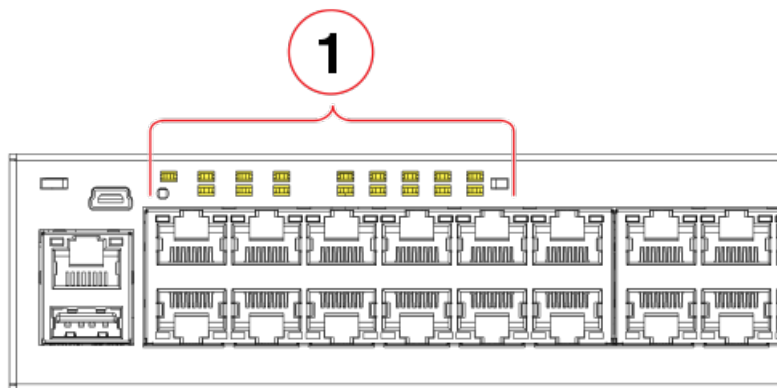
LED	Condition	Status
RJ-45 (1-24/48)	On/Flashing Green	The port has established a valid link at 10, 100, or 1000 Mbps. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.
PoE/PoE+ (1-24/48)	On/Green	The port is providing PoE or PoE+ power to a connected device.
	Off	The port is not providing PoE or PoE+ power.
SFP (F1 - F4) for ICX 7250-24G devices	On/Flashing Green	The SFP port is operating at 1 Gbps. Flashing indicates the port is transmitting and receiving user packets at 1 Gbps.
	Off	A link is not established with a remote port.
SFP+ (X1 - X8) for all other ICX 7250 devices	On/Flashing Green	The SFP+ port is operating at 10 Gbps. Flashing indicates the port is transmitting and receiving user packets at 10 Gbps.
	On/Flashing Yellow	The SFP+ port is operating at 1 Gbps. Flashing indicates the port is transmitting and receiving user packets at 1 Gbps.
	Off	A link is not established with a remote port.
Out-of-band management port (RJ-45)	Green	The management port link is up at 1000Base-T.
	Off	Either the management port link is up at 100Base-Tx/10Base-T, or the link is down.
	Blinking green	The port is receiving and transmitting data.
	Off	No data is being received or transmitted.

The following figure shows an example of the system status LEDs.

NOTE

Not all models have all the LEDs and the location of the LEDs on the front panel may also be slightly different.

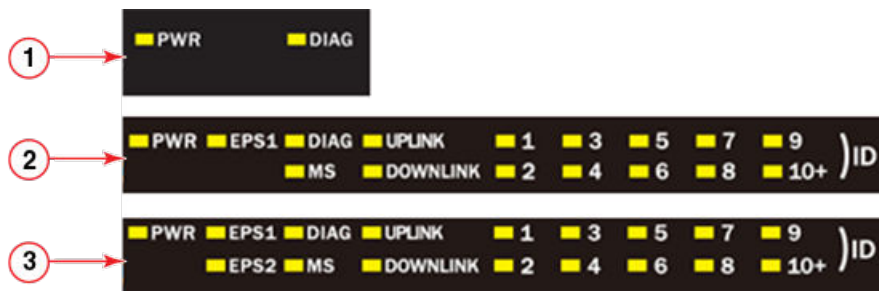
FIGURE 8 System status LEDs on the ICX 7250-48P



1. System status LEDs

The following figure shows the system status LEDs for ICX 7250 models.

FIGURE 9 System status LEDs for ICX 7250 models



1. ICX 7250-24G LEDs
2. ICX 7250-24, ICX 7250-24P, ICX 7250-48 LEDs
3. ICX 7250-48P LEDs

TABLE 5 System status LEDs

LED	Condition	Status
PWR	Green	Power supply is operating normally.
	Yellow	Power supply fault.
	Off	Power supply off.
EPS1 and EPS2 (for supported models)	Green	EPS1 and EPS2 power supplies are operating normally.
	Yellow	EPS1 and EPS2 power supply fault.
	Off	EPS1 and EPS2 off or not present.
DIAG	Flashing Green	System self-diagnostic test in progress. System reloads automatically.
	Steady Yellow	System self-diagnostic test has detected a fault. (Fan, thermal, or any interface fault.) The user must reload the system.
MS	Green	The device is the Active controller. Flashing indicates the system is initializing.
	Yellow	Indicates the device is the Standby controller. Flashing indicates the system is in Master arbitration or selection state.
	Off	Device is operating as a stack member, or is in standalone mode.
UPLINK	Green	Uplink port is operating normally.
	Off	Uplink has failed or there is no link.
DOWNLINK	Green	Downlink port is operating normally.
	Off	Downlink has failed or there is no link.
1-10+ (ID) (Switch ID in the stack)	Green	Indicates the switch ID in the stack. The switch can display up to 19 switch IDs. The 10+ LED is used in conjunction with the 1 through 9 LEDs to indicate numbers greater than 10. The number of devices supported in a stack is 12.

Power supplies

The devices have one standard C14 AC power supply receptacle on the rear panel of the device for an AC power cord that uses a C13 connector. In addition, there is an optional connector on some models for the power cord from an external power supply (EPS4000) that can provide DC power to the device in the event the internal power supply fails or for supplemental power for PoE or PoE+ applications.

The following figure shows an example of a typical rear panel for an ICX 7250 device.

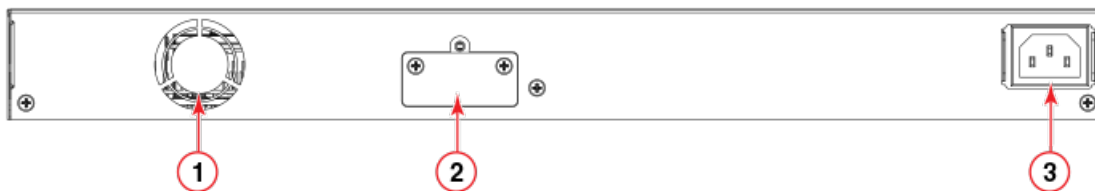
FIGURE 10 ICX 7250 power supply connectors



1. External power supply (EPS4000) connector
2. AC power supply socket

NOTE

The power connector for the EPS4000 is typically covered with a lid that is screwed on as shown in the following figure. To ensure proper device cooling, keep the connector covered when not in use.



1. Fan
2. External power supply (EPS4000) connector with cover on
3. AC power supply socket

TABLE 6 EPS4000 connectors on the ICX 7250 models

Model	EPS4000 connectors
Ruckus ICX 7250-24G	0
Ruckus ICX 7250-24	1
Ruckus ICX 7250-24P	1
Ruckus ICX 7250-48	1
Ruckus ICX 7250-48P	1

Power supply usage

The Ruckus ICX 7250 models support specific AC power supply inputs and a number of PoE and PoE+ ports with an internal power supply.

NOTE

Depending on the configuration, each EPS4000 connection from the device to the EPS4000 can add 24 ports of PoE (Class 3) or 12 ports of PoE+ power (54-volt supply) in addition to the internal power supply by providing system power backup. If the overall PoE requirement is less than the power budget of 370 W (or 740 W), the device can support 24 (or 48) PoE ports. The system power (12-volt supply) portion of the EPS4000 can be used for internal system power redundancy.

TABLE 7 AC power supply and PoE and PoE+ usage

Model	Maximum power draw from AC line input (Watts)	Number of PoE ports supported with internal power supply	Number of PoE+ ports supported with internal power supply
Ruckus ICX 7250-24G	44.4	0	0
Ruckus ICX 7250-24	57.6	0	0
Ruckus ICX 7250-24P	454.0	24 (class 3)	12 (class 4)
Ruckus ICX 7250-48	69.5	0	0
Ruckus ICX 7250-48P	942.0	48 (class 3)	24 (class 4)

Installation

• Shipping carton contents.....	23
• Configuration requirements.....	23
• Summary of installation tasks.....	24
• Installation precautions.....	24
• Preparing the installation site.....	25
• Installing the device.....	26
• Connecting devices in a traditional stack.....	57
• Powering on the system.....	60
• Long-reach multimode adaptor module.....	60



DANGER

The procedures in this manual are for qualified service personnel.



DANGER

Before beginning the installation, see the precautions in “Power precautions.”



CAUTION

Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

Shipping carton contents

Ruckus ICX 7250 devices ship with all of the following items included in the shipping carton. When unpacking the device, verify that the contents of the shipping carton is complete, if any items are missing, contact the place of purchase.

- The Ruckus ICX 7250 device
- An accessory kit containing the following items:
 - Rack mounting kit containing two L-shaped mounting brackets and two sets of eight sink-head screws
 - Two-post rack kit containing four rack-mounting screws and four cage nuts
 - Four rubber feet
 - One US AC power cord, shielded
 - Power cord retaining clip
 - One console cable (Mini-USB to RJ45)
 - One RJ45-to-DB9 adapter
 - China ROHS sheet
 - Read Me First document

Configuration requirements

To manage the ICX 7250, you need a management station, such as a PC running a terminal emulation application, for serial connection to the device.

Use the serial connection to perform basic configuration tasks, including assigning an IP address and network mask to the system. This information is required to manage the system using the CLI through Telnet or Brocade Network Advisor.

Summary of installation tasks

Follow the steps in the following table to install your device. Details for each of these steps are provided on the pages indicated.

TABLE 8 Installation tasks

Task number	Task	Where to find more information
1	Ensure that the physical environment that will host the device has the proper cabling and ventilation.	Preparing the installation site on page 25
2	Unpack the device and all included accessories.	Shipping carton contents on page 23
3	Install the device on a desktop, or in an equipment rack.	Installing the device on page 26
4	Once the device is installed, plug the device into a nearby power source that adheres to the regulatory requirements outlined in this manual.	Powering on the system on page 60

Installation precautions

Follow all precautions when installing a device.

General precautions



DANGER

All fiber-optic interfaces use Class 1 lasers.



CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 50°C (122°F).



CAUTION

Make sure the airflow around the front, and back of the device is not restricted.

Lifting precautions



DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.



DANGER

Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

Power precautions



CAUTION

Use a separate branch circuit for each power cord, which provides redundancy in case one of the circuits fails.



CAUTION

Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.



DANGER

Disconnect the power cord from all power sources to completely remove power from the device.



DANGER

If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

Preparing the installation site

Before installing the device, plan its location and orientation relative to other devices and equipment.

Cabling infrastructure

Ensure that the proper cabling is installed at the site. For information about supported SFP and SFP+ transceivers and cable lengths and types, refer to the Ruckus optics family datasheet.

Installation location

Devices can be mounted in a standard 19-inch equipment rack, on the wall, or on a flat surface.

The site should meet the following requirements:

- Maintain the operating environment as specified in the Technical Specifications.
- Allow a minimum of 7.62 cm (3 in.) of space between the front and the back of the device and walls or other obstructions for proper airflow.
- Allow at least 7.62 cm (3 in.) of space at the front and back of the device for the twisted-pair, fiber-optic, and power cabling.
- The site should be accessible for installing, cabling, and maintaining the devices.
- Allow the status LEDs to be clearly visible.
- Allow for twisted-pair cables to be routed away from power lines, fluorescent lighting fixtures, and other sources of electrical interference, such as radios and transmitters.
- Allow for the unit to be connected to a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, within 2 m (6.6 ft) of each device, and is powered from an independent circuit breaker. As with any equipment, a filter or surge suppressor is recommended.
- Some combinations of intake and exhaust airflows may not be compatible with your environment.

Rack mount installation considerations

Before mounting the device in a rack, ensure that the following rack mount installation requirements are met:

- Temperature: Because the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. Refer to [Ruckus ICX 7250 Switch Technical Specifications](#) on page 95.
- Airflow: Be sure that the airflow direction for all equipment in a rack is the same or consistent.
- Mechanical loading: Do not place any equipment on top of a rack-mounted unit.
- Circuit overloading: Be sure that the supply circuit to the rack assembly is not overloaded.
- Grounding: Rack-mounted equipment should be properly grounded.

Installing the device

You can install the device on a desktop, the wall, or in an equipment rack.



DANGER

Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

Desktop installation

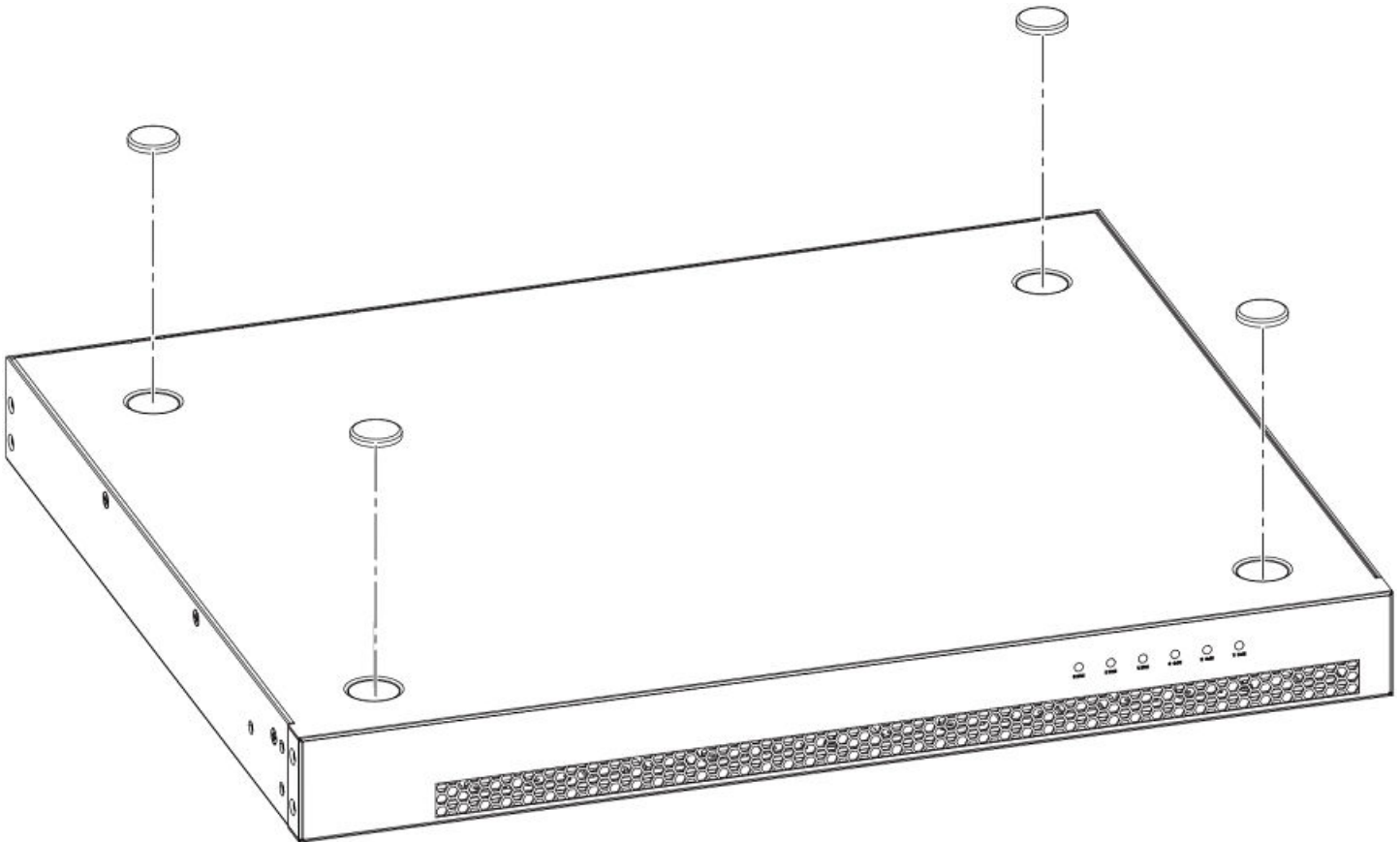
Complete the following steps to install the ICX 7250 device on a desktop or other flat surface. The device you are installing might look different than the one in the following illustration.



DANGER

This equipment is suitable for mounting on concrete or other noncombustible surfaces only.

FIGURE 11 Attaching the adhesive feet



1. Attach the four adhesive feet to the bottom of the device. If installing multiple devices, attach the adhesive feet to each device.
2. Set the device on a flat desktop, table, or shelf near an AC power source. Make sure that adequate ventilation is provided for the system. A 7.62 cm (3 in.) clearance is recommended on each side.
3. If installing a single device only, proceed to [Powering on the system](#) on page 78. If installing multiple devices, place each device squarely on top of the one below.

Installing the device into a rack

This section describes the procedures you use to mount the device into a rack.

The Ruckus ICX 7250 can be installed in a 2-post or 4-post rack.

The device ships with a 2-post rack. To use the rack that ships with the product, refer to [Installing the device using the included two-post rack mount kit](#) on page 28.

To install the product into a four-post rack, you can order one of two four-post rack kits with the part number XBR-R000295 or XBR-000296. For the procedures to install these kits, refer to [Installing the 1U, 1.5U, and 2U Universal Kit for Four Post Racks \(XBR-R000295\)](#) on page 29 and [Installing the Universal Four-Post Rack Kit \(XBR-R000296\)](#) on page 44.

Installing the device using the included two-post rack mount kit

Use this procedure to install the device to a 2-post rack using the rack-mount ears that are included with the device.



DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

NOTE

You need a #2 Phillips screwdriver for rack mount installation.

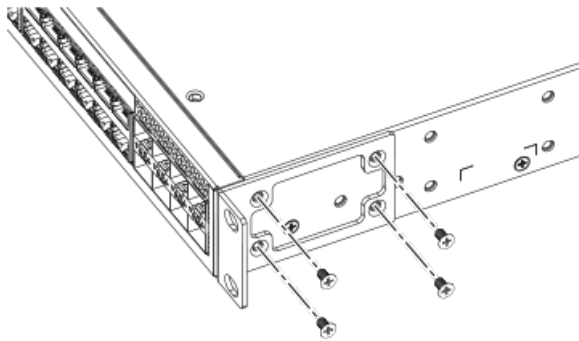
Complete the following steps to mount devices in a rack. The example shows a front-mounting.

1. Remove the rack mounting kit from the shipping carton. The kit contains two L-shaped mounting brackets and two sets of eight sink-head screws.
2. Using a Phillips screwdriver, attach the mounting brackets to the sides of the device using eight #6-32 sink-head screws, four screws on each side.

NOTE

The #6-32 sink-head screws are for front-mounting. Use the #8-32 screws for rear-mounting.

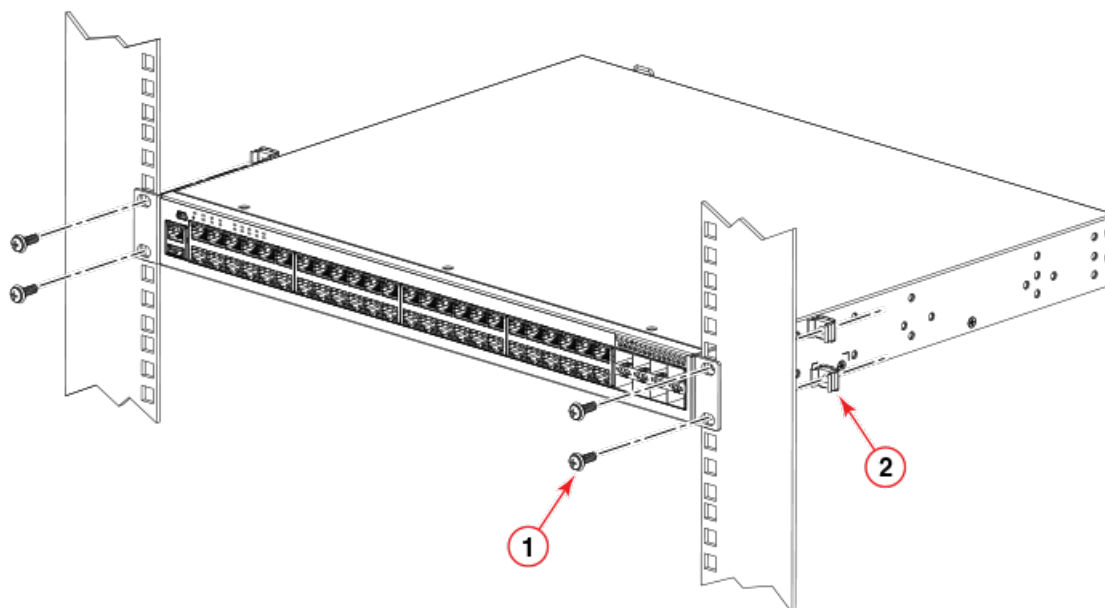
FIGURE 12 Attaching the rack mounting brackets for the ICX 7250



3. Remove the two-post rack kit from the shipping carton. The kit contains four rack-mounting screws and four cage nuts.
4. Insert the cage nuts in the two-post rack where you want to mount the device.

5. Using a Phillips screwdriver, mount the device in a two-post rack using four rack-mounting screws.

FIGURE 13 Installing the device in a two-post rack



- a. Rack-mounting screws
 - b. Cage nuts
6. If installing a single device only, proceed to [Powering on the system](#) on page 60. If installing multiple devices, mount them in the rack, one above the other.

Installing the 1U, 1.5U, and 2U Universal Kit for Four Post Racks (XBR-R000295)

Use the following instructions to install a device in a 19-in. (48.3 cm) EIA rack using the 1U, 1.5U, and 2U Universal Kit for Four Post Racks (XBR-R000295).

Observe the following when mounting this device:

- The device can be installed so that the port side is either flush with the front posts or recessed with the non-port side flush with the rear posts. A recessed position allows a more gradual bend in the fiber-optic cables connected to the device and less interference in the aisle at the front of the rack.
- Use Electronic Industries Association (EIA) standard racks. Provide space in a 19-in. (48.3 cm) EIA rack, as required for the device, with a minimum distance of 24 in. (609.60 mm) and a maximum distance of 32 in. (812.80 mm) between the front and back posts.
- Two people are required to install the device in a rack. One person should hold the device, while the other while the other secures the device in the rack.
- Before mounting your device, review any specific installation and facility requirements in the Hardware Installation Guide for the device.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Installation

Installing the device

Installation requirements

Review the installation and facility requirements for your product before mounting the device. Refer to the hardware installation guide for your product for more information.

Use Electronic Industries Association (EIA) standard racks. Provide space in a 19-in. (48.3 cm) EIA rack, as required for the device type, with a minimum distance of 24 in. (609.60 mm) and a maximum distance of 32 in. (812.80 mm) between the front and back posts.

Time and items required

Allow 15 to 30 minutes to complete this procedure. Note the following requirements to ensure correct installation and operation.

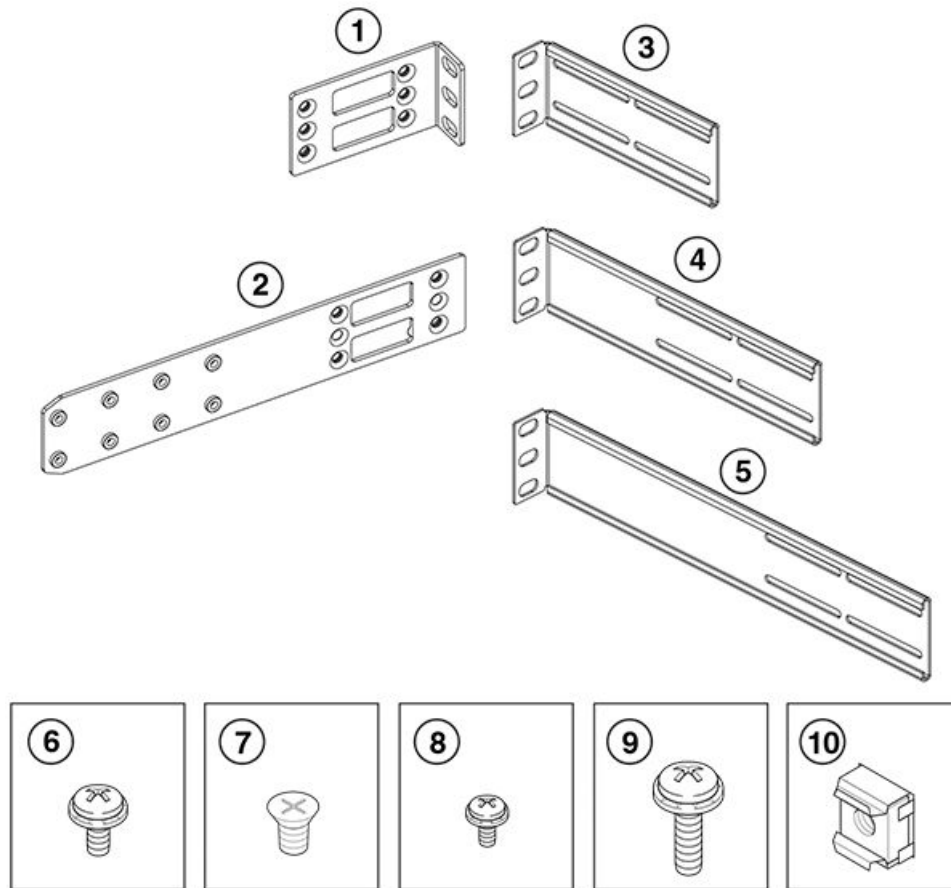
The following items are required to install the device using the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks:

- #2 Phillips torque screwdriver
- 1/4-inch slotted-blade torque screwdriver

Parts list

The following parts are provided with the 1U, 1.5U, and 2U Universal Kit for Four Post Racks Installation (XBR-R000295).

FIGURE 14 Rack kit parts



- | | |
|------------------------------|---|
| 1. Front brackets (2) | 6. Screw, 8-32 x 5/16-in., panhead Phillips (8) |
| 2. Bracket extensions (2) | 7. Screw, 8-32 x 5/16-in., flathead Phillips (16) |
| 3. Rear brackets, short (2) | 8. Screw, 6-32 x 1/4-in., panhead Phillips (8) |
| 4. Rear brackets, medium (2) | 9. Screw, 10-32 x 5/8-in., panhead Phillips (8) |
| 5. Rear brackets, long (2) | 10. Retainer nut, 10-32 (8) |

Ensure that the items listed and illustrated are included in the kit. Note that not all parts may be used with certain installations depending on the device type.



CAUTION

Use the screws specified in the procedure. Using longer screws can damage the device.

Flush-front mounting the device in the rack



CAUTION

The device must be turned off and disconnected from the fabric during this procedure.

NOTE

Illustrations in these rack installation procedures are for reference only and may not show the actual device that you are installing.

Installation

Installing the device

Complete the following tasks to install the device in a four-post rack:

1. [Attaching the front brackets](#) on page 32
2. [Attaching the bracket extensions to the device](#) on page 33
3. [Installing the device in the rack](#) on page 34
4. [Attaching the rear brackets to the extensions](#) on page 35
5. [Attaching the rear brackets to the rack posts](#) on page 37

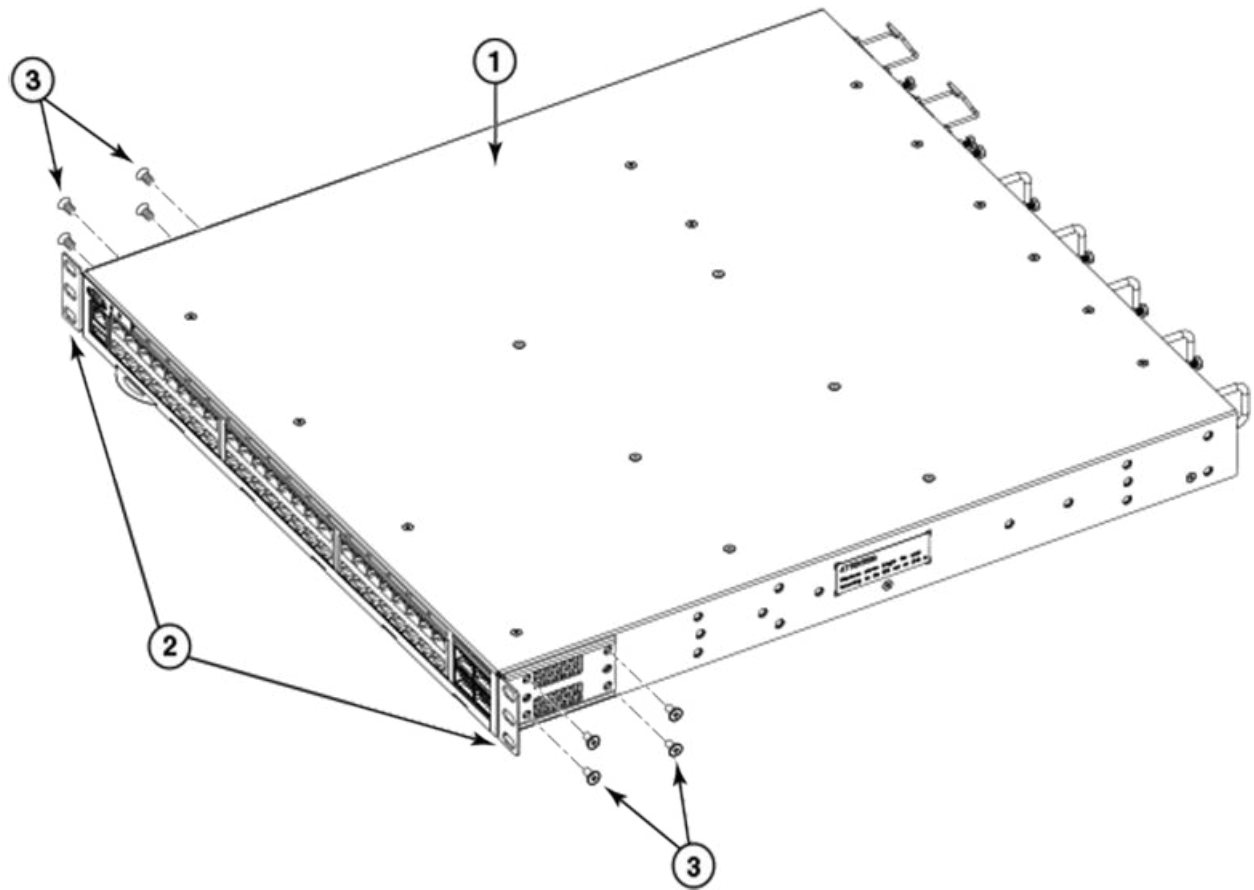
Attaching the front brackets

Complete the following steps to attach the front brackets to the device.

1. Position the right front bracket with the flat side against the right side of the device at the front of the device, as shown in [Figure 15](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat [Step 1](#) and [Step 2](#) to attach the left front bracket to the left side of the device.

4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 15 Attaching the front brackets



1. Ruckus ICX switch
2. Front brackets

3. Screws, 8-32 x 5/16-in., flathead Phillips

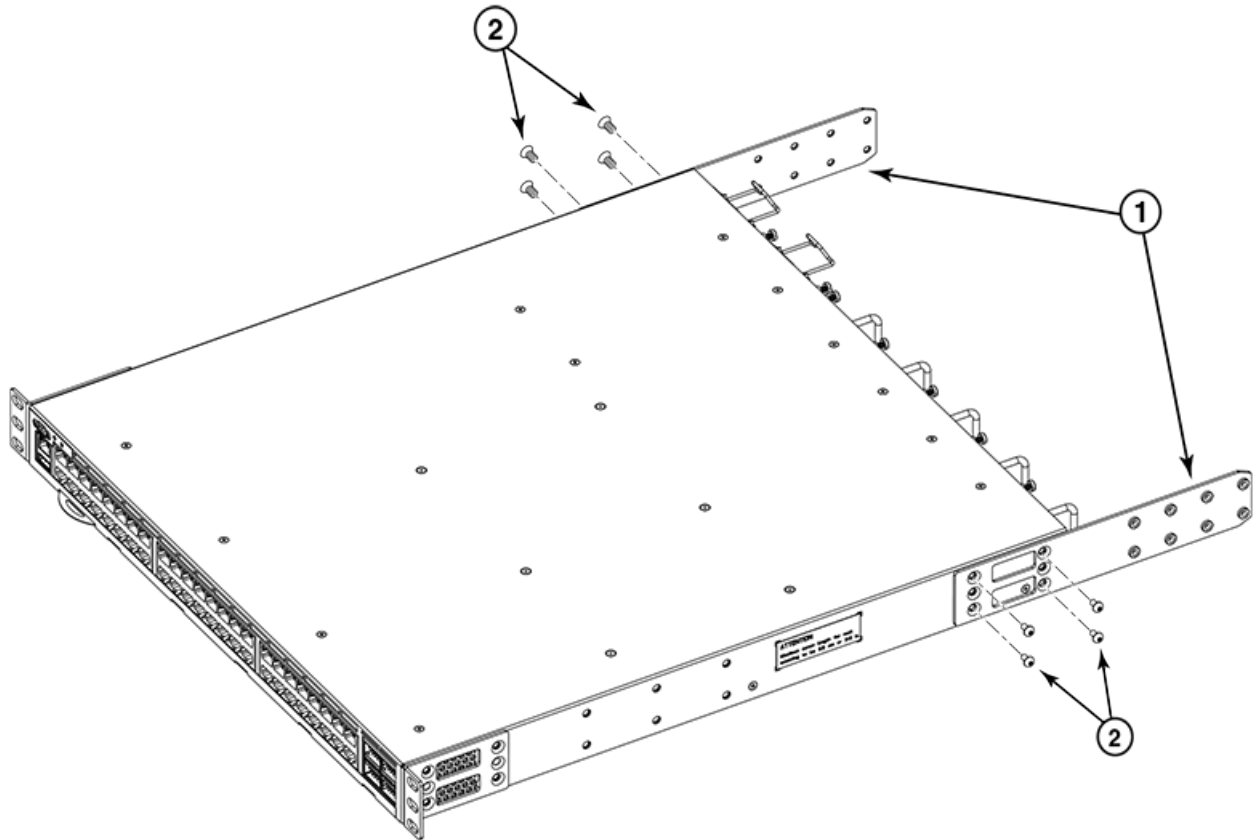
Attaching the bracket extensions to the device

Complete the following steps to attach the extension brackets to the device.

1. Position the right bracket extension along the side of the device as shown in [Figure 16](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket extension and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left bracket extension to the left side of the device.

4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 16 Attaching the bracket extensions to the device



1. Bracket extensions

2. Screws, 8-32 x 5/16-in., flathead Phillips

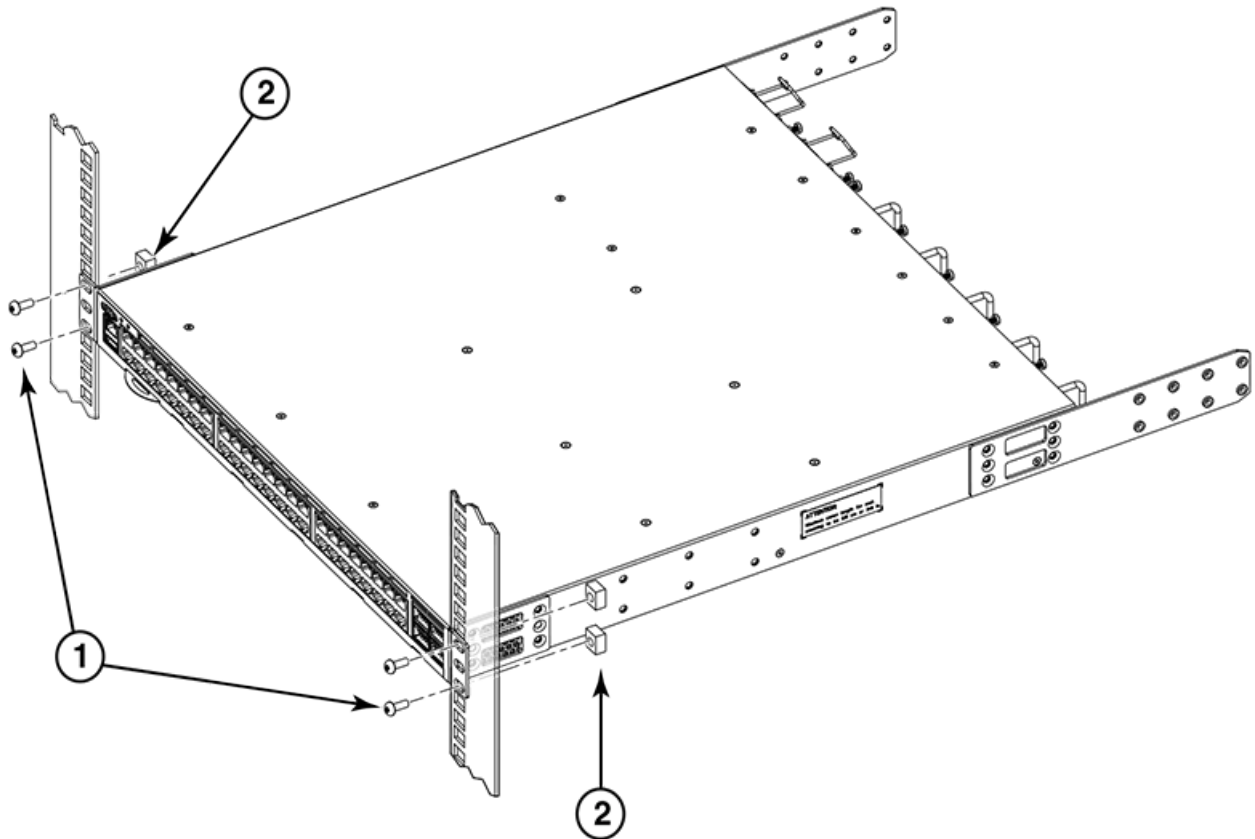
Installing the device in the rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in [Figure 17](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 17 Positioning the device in the rack



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

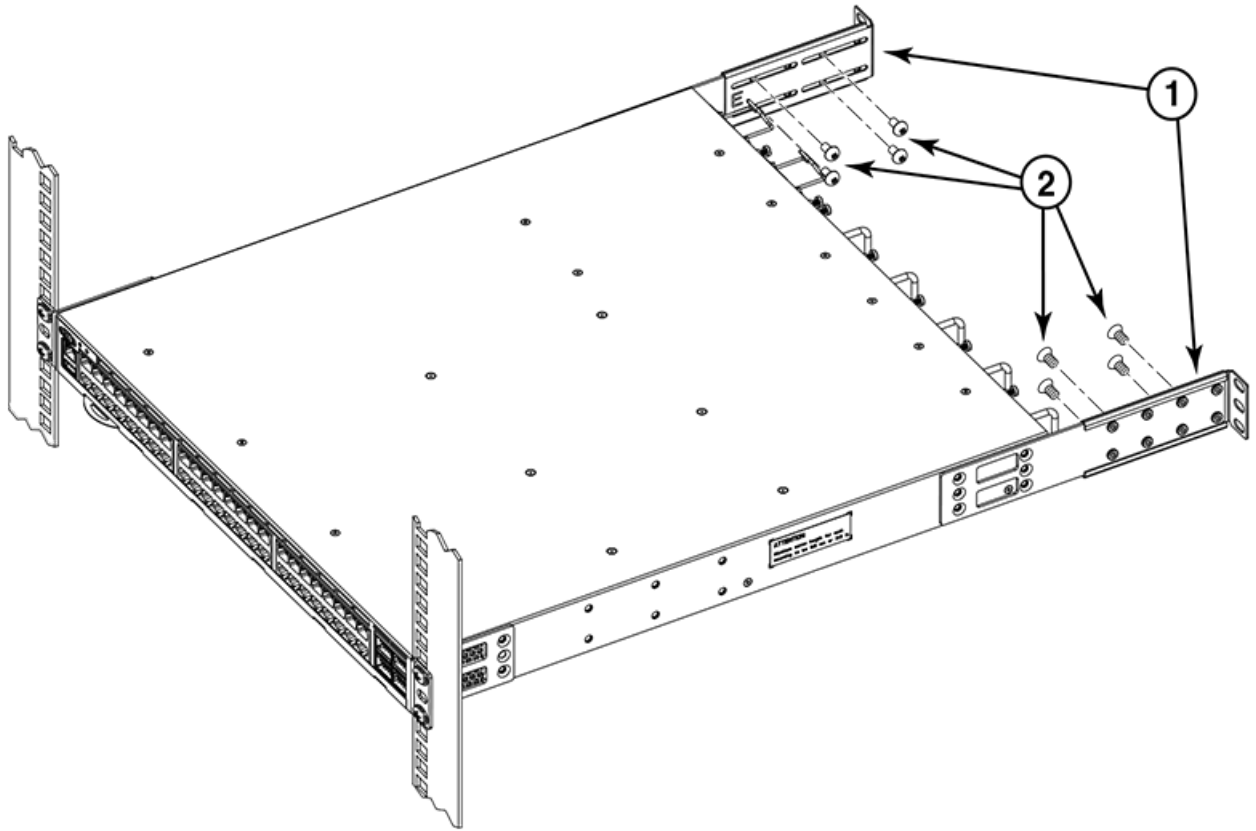
Attaching the rear brackets to the extensions

Complete the following steps to attach the rear brackets to the extensions. There are short, medium, and long rear brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 18](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 19](#) for the positioning of the medium or long brackets and screws.
3. Attach the brackets using four 6-32 x 1/4-in. panhead screws.
4. Repeat [Step 2](#) and [Step 3](#) to attach the left rear bracket to the left extension.

- Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

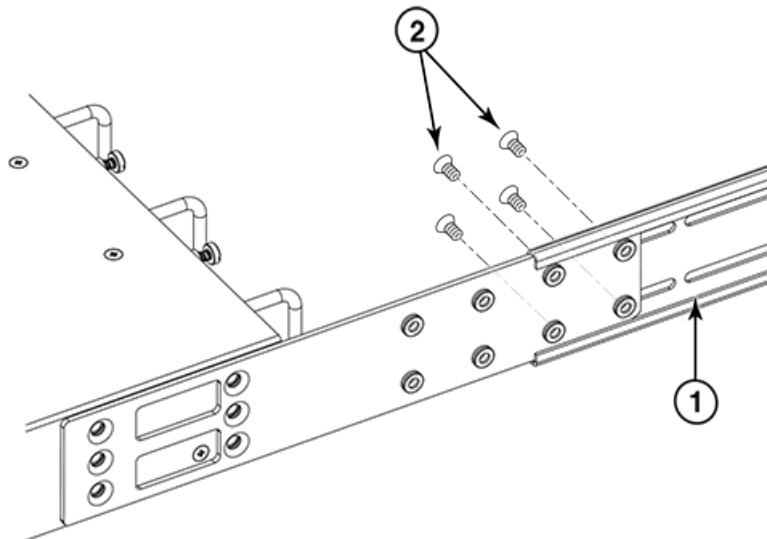
FIGURE 18 Attaching the short rear brackets to the extensions



1. Rear brackets

2. Screws, 6-32 x 1/4-in., panhead Phillips

FIGURE 19 Attaching the medium or long rear brackets to the extensions



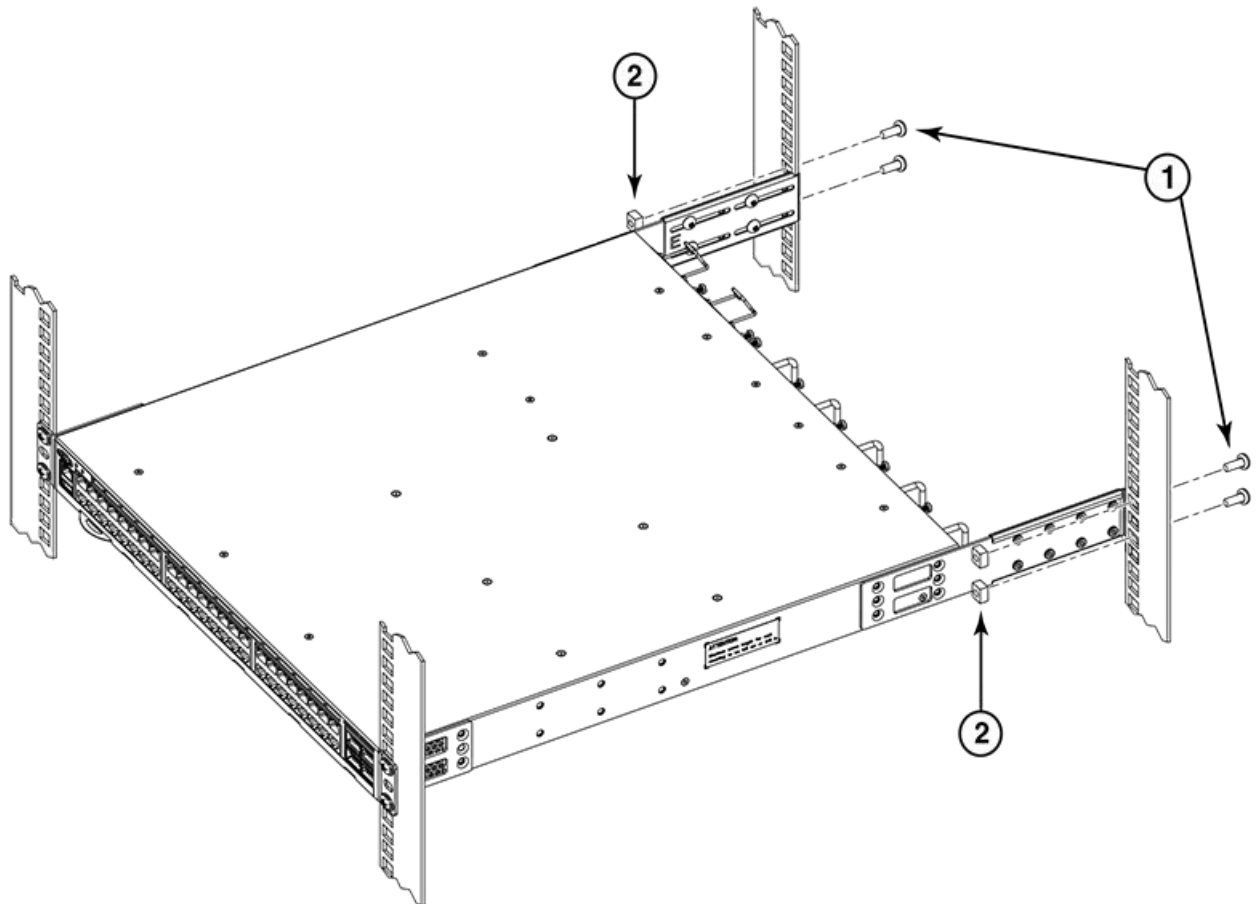
1. Rear bracket, medium or long
2. Screws, 6-32 x 1/4-in., panhead Phillips

Attaching the rear brackets to the rack posts

Complete the following steps to attach the rear brackets to the rack posts.

1. Attach the right rear bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts, as shown in Figure 20. Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 20 Attaching the rear brackets to the rack posts



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

Flush-rear (recessed) mounting the device in the rack

The flush-rear (recessed) mounting is similar to the flush-front mounting except that the brackets are reversed on the device.



CAUTION

The device must be turned off and disconnected from the fabric during this procedure.

NOTE

Illustrations used in these rack installation procedures are for reference only and may not show the actual device that you are installing.

Complete the following tasks to install the device in a four-post rack:

1. [Attaching the front brackets to the rear of the device](#) on page 38
2. [Attaching the bracket extensions to the front of the device](#) on page 39
3. [Installing the device in the rack](#) on page 40
4. [Attaching the rear brackets to the bracket extensions at the front of the device](#) on page 41
5. [Attaching the rear brackets to the front rack posts](#) on page 43

Attaching the front brackets to the rear of the device

NOTE

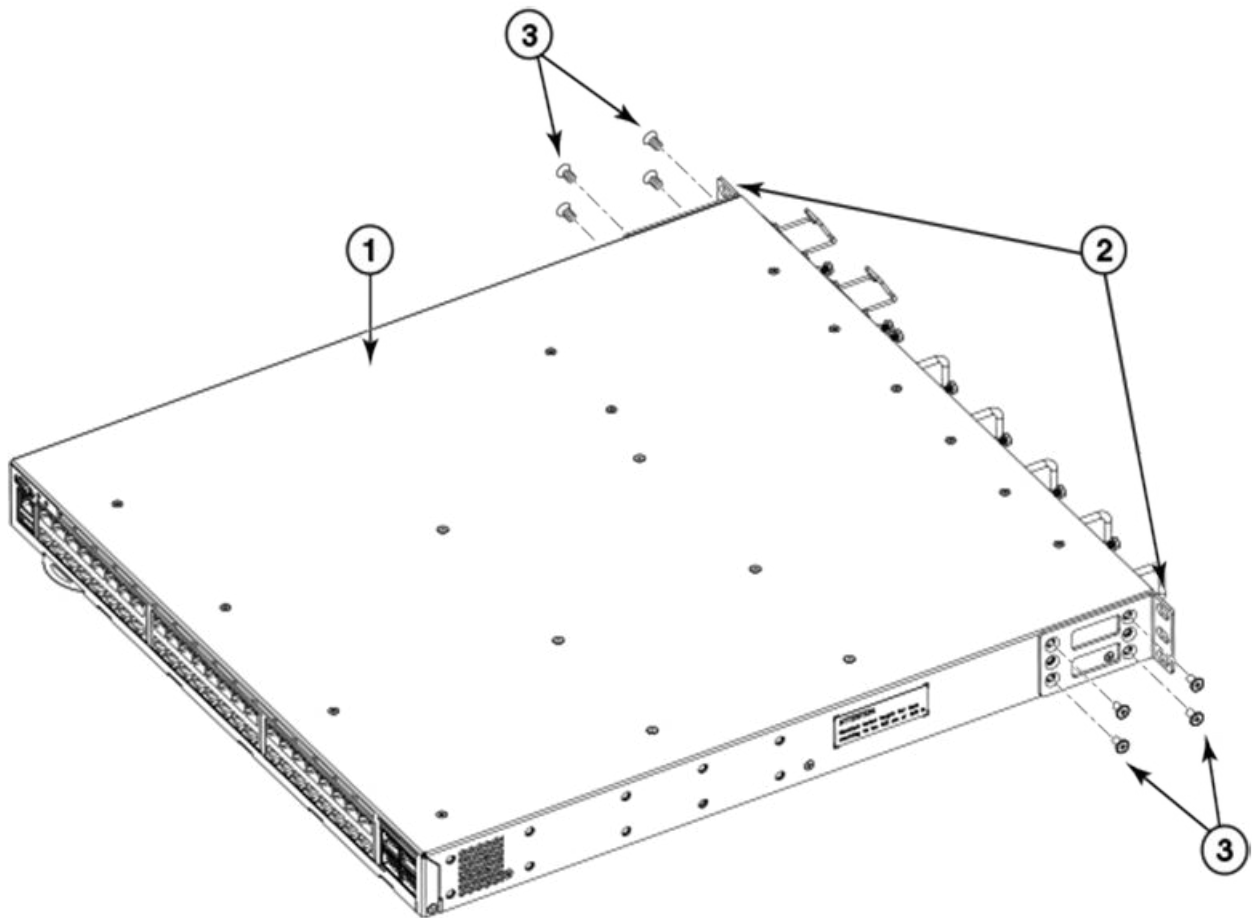
In this installation, the brackets are named as listed in the parts list even though the installation of the brackets is reversed from the flush-front installation.

Complete the following steps to attach the front brackets to the rear of the device.

1. Position the right front bracket with the flat side against the right rear side of the device, as shown in [Figure 21](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat [Step 1](#) and [Step 2](#) to attach the left front bracket to the left rear side of the device.

4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 21 Attaching the front brackets to the rear of the device



1. Ruckus ICX device
2. Front brackets

3. Screws, 8-32 x 5/16-in., flathead Phillips

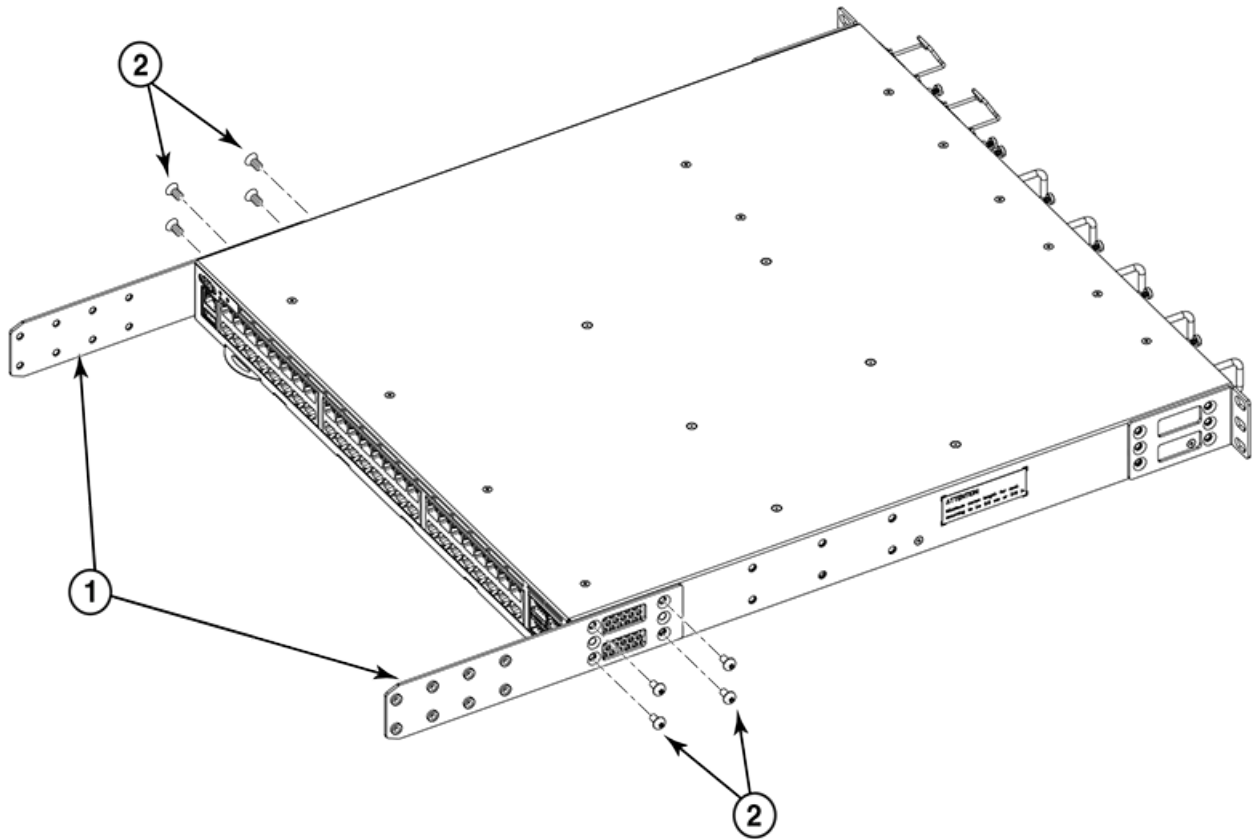
Attaching the bracket extensions to the front of the device

Complete the following steps to attach the bracket extensions to the front of the device.

1. Position the right bracket extension along the side of the device as shown in [Figure 22](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket extension and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket extension to the left side of the device.

4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 22 Attaching the bracket extensions to the device



1. Bracket extensions

2. Screws, 8-32 x 5/16-in., flathead Phillips

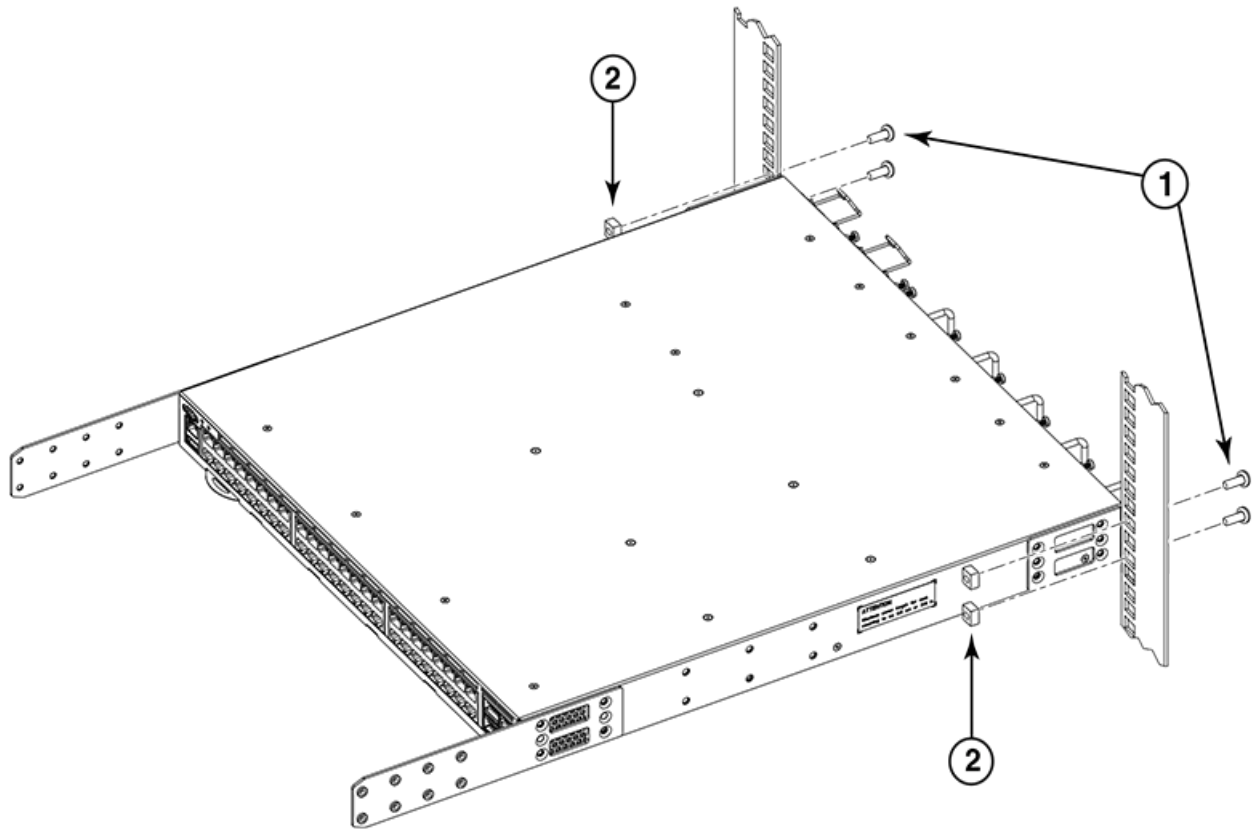
Installing the device in the rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in [Figure 23](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 23 Positioning the device in the rack



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

Attaching the rear brackets to the bracket extensions at the front of the device

Complete the following steps to attach the rear brackets to the bracket extensions. There are short, medium, and long front brackets that you can use for this step.

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 24](#).

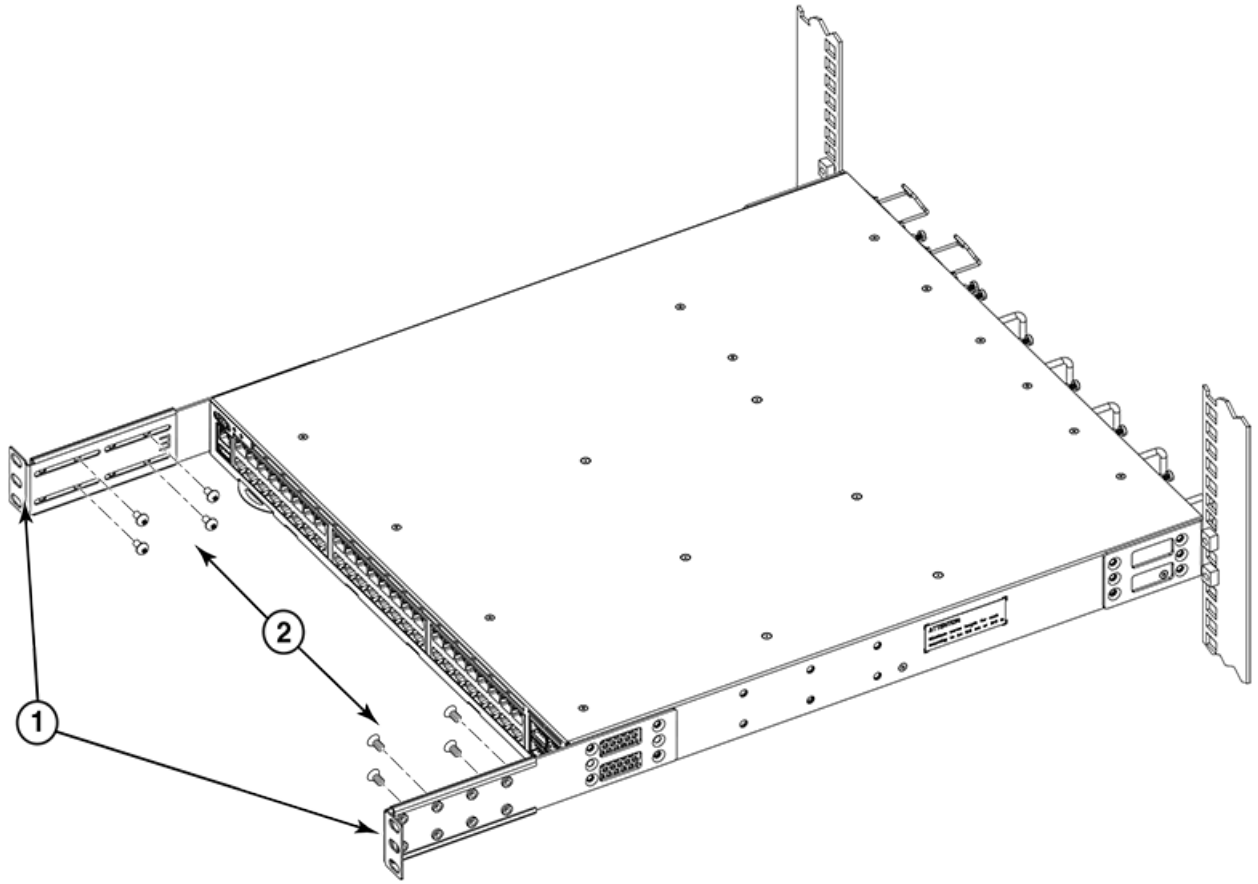
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.

Refer to [Figure 25](#) for the positioning of the medium or long brackets and screws.

3. Attach the brackets using four 6-32 x 1/4-in. panhead screws.
4. Repeat [Step 2](#) and [Step 3](#) to attach the left rear bracket to the left extension.

- Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

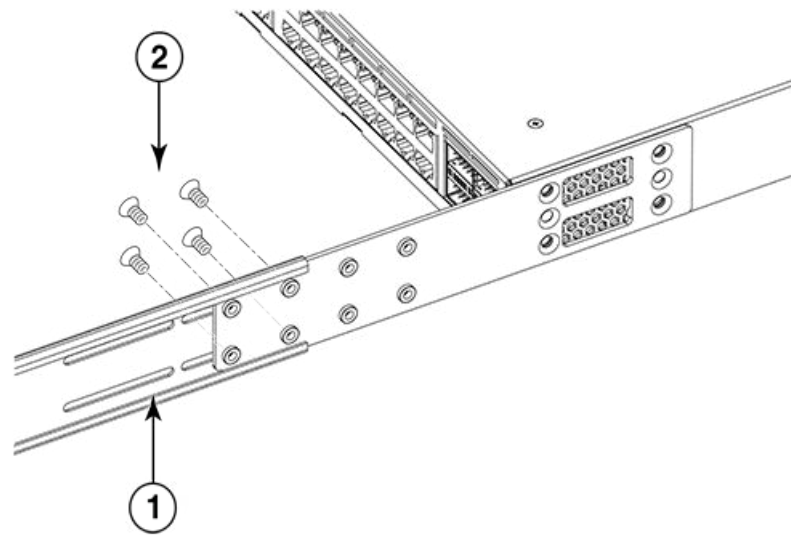
FIGURE 24 Attaching the short rear brackets to the extensions at the front of the device



1. Rear brackets, short

2. Screws, 6-32 x 1/4-in., panhead Phillips

FIGURE 25 Attaching the medium or long rear brackets to the extensions



1. Rear bracket, medium or long

2. Screws, 6-32 x 1/4-in., panhead Phillips

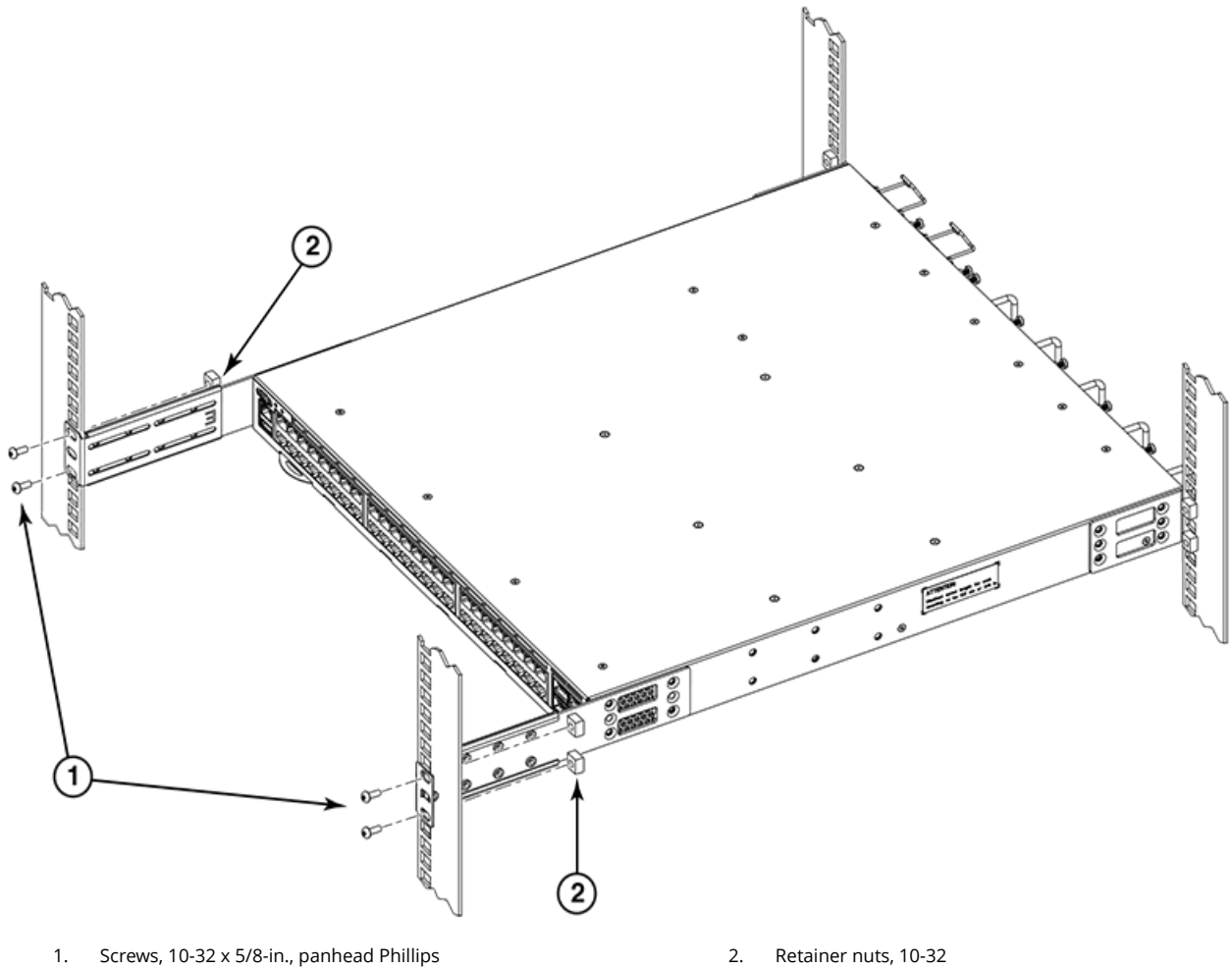
Attaching the rear brackets to the front rack posts

Complete the following steps to attach the rear brackets to the front rack posts.

1. Attach the right rear bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in [Figure 26](#). Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left front rack post using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.

3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 26 Attaching the rear brackets to the front rack posts



Installing the Universal Four-Post Rack Kit (XBR-R000296)

Use the following instructions to install a device in EIA racks that are between L-12.7 to 81.28 cm deep (L-5.0 to 32.0 in.), where L is the chassis depth, using the *Universal Four-Post Rack Kit (XBR-R000296)*.

There are two ways you can mount the device in a four-post rack:

- With the port side flush with the front posts
- With the nonport side flush with the rear posts in a recessed position

A recessed position allows a more gradual bend in the fiber-optic cables connected to the switch and less interference in the aisle at the front of the rack.

NOTE

Although this document describes how to install both single height (1U) and double height (2U) switches, the illustrations show a 1U switch as a typical installation.

NOTE

Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Installation requirements

Provide space in an EIA rack with the following minimum and maximum distances between the front and back posts.

NOTE

For 1U and 2U devices, two people are required to install the device in a rack. One person holds the device, while the other screws in the front and rear "L" brackets.

TABLE 9 Space requirements

Chassis with port-side side vents	Notes	Chassis depth	Minimum rack depth	Maximum rack depth
No	Applicable to port-side and nonport-side flush mounts.	L	L-12.7 cm (L-5 in.)	81.28 cm (32 in.)
Yes	Applicable to port-side flush mounts.	L	L-12.7 cm (L-5 in.)	81.28 cm (32 in.)
Yes	Applicable to nonport-side flush mounts.	L	L	81.28 cm (32 in.)

Note that if chassis depth (L) is less than 40.64 cm (16 in.), the chassis will not fit into a rack with a maximum depth of 81.28 cm (32 in.) using the universal four-post rack kit. The maximum rack depth for a chassis less than 40.64 cm (16 in.) is 81.28 cm (32 in.) minus the difference between the chassis depth and 40.64 cm (16 in.). For example, a chassis with a depth (L) of 35.56 cm (14 in.) is 5.08 cm (2 in.) smaller than 40.64 cm (16 in.), so it will install into a rack with a maximum depth of 81.28 cm (32 in.) - 5.08 cm (2 in.) = 76.2 cm (30 in.).

Review the installation and facility requirements for your product before mounting the device . Refer to the *Hardware Installation Guide* for your product for more information.

Time and items required

Allow 15 to 30 minutes to complete the installation.

The following items are required to install the device using the Universal Four-Post Rack Kit:

- #2 Phillips torque screwdriver
- 1/4-inch slotted-blade torque screwdriver



CAUTION

Use the screws specified in the procedure. Using longer screws can damage the device.

Flush-front mounting



CAUTION

The device must be turned off and disconnected from the fabric during this procedure.

NOTE

The illustrations in the rack installation procedures show a 1U device, but the instructions are the same for a 2U device. The illustrations in the rack installation procedures are for reference only and may not show the actual device.

Complete the following tasks to install the device in a four-post rack:

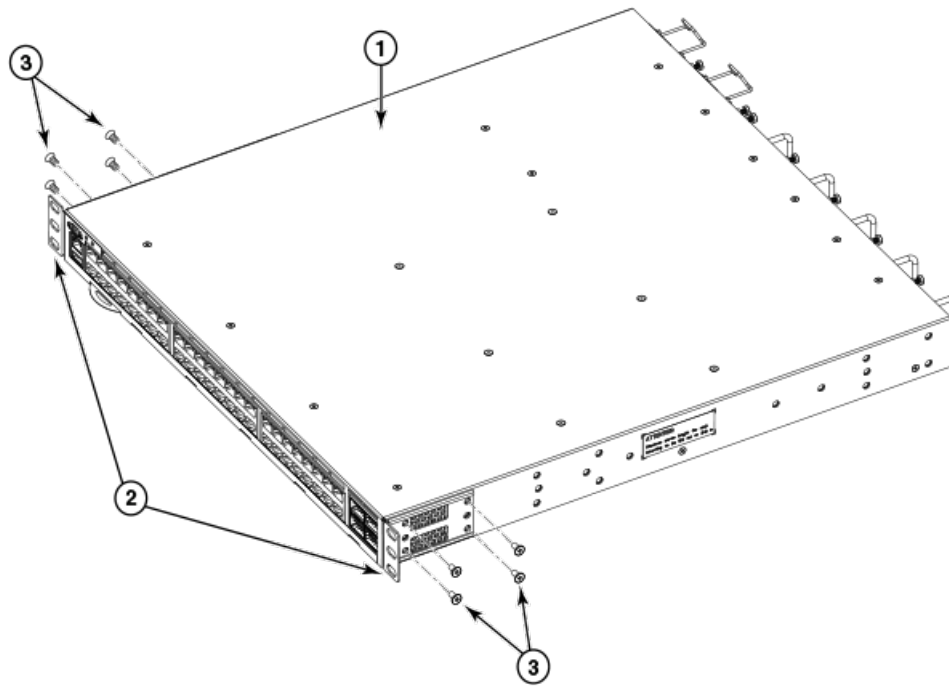
1. [Attaching the front brackets](#) on page 46
2. [Attaching the extension brackets to the device](#) on page 47
3. [Installing the device in the rack](#) on page 47
4. [Attaching the rear brackets to the extensions](#) on page 48
5. [Attaching the rear brackets to the rack posts](#) on page 49

Attaching the front brackets

Complete the following steps to attach the front brackets to the device.

1. Position the right front bracket with the flat side against the right side of the device at the front of the device, as shown in [Figure 27](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 27 Attaching the front brackets



1. The Ruckus ICX device
2. Front brackets

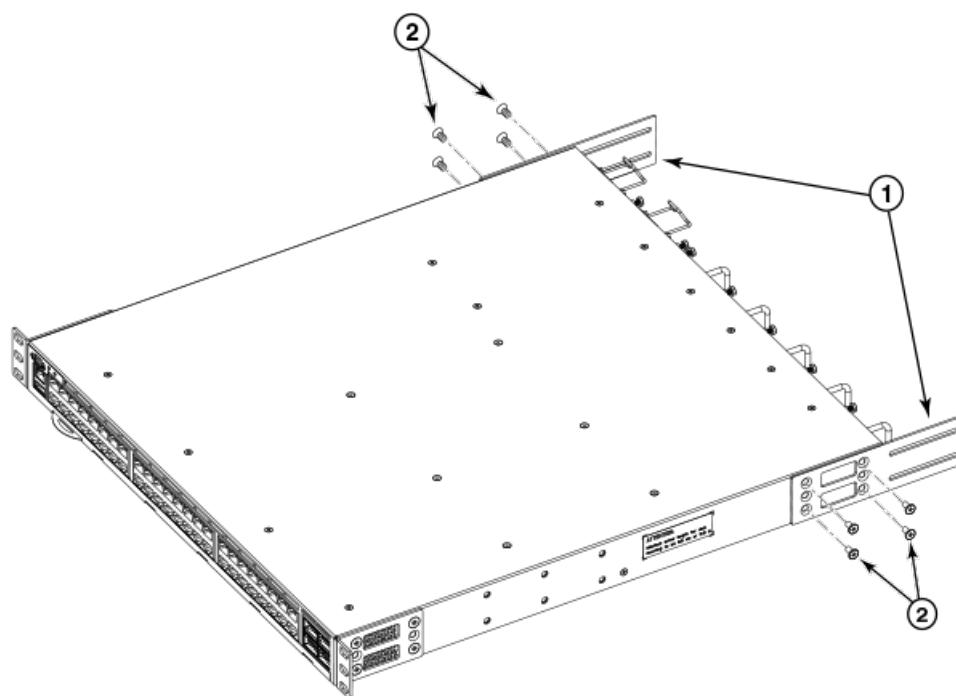
3. Screws, 8-32 x 5/16-in., flathead Phillips

Attaching the extension brackets to the device

Complete the following steps to attach the extension brackets to the device. There are medium and long extension brackets that you can use for this step. Choose the correct extension bracket for the depth of your rack.

1. Select the proper length extension bracket for your rack depth.
2. Position the right extension bracket along the side of the device as shown in [Figure 28](#).
3. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the extension bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
4. Repeat step 1 and step 2 to attach the left extension bracket to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 28 Attaching the extension brackets to the device



1. Extension brackets

2. Screws, 8-32 x 5/16-in., flathead Phillips

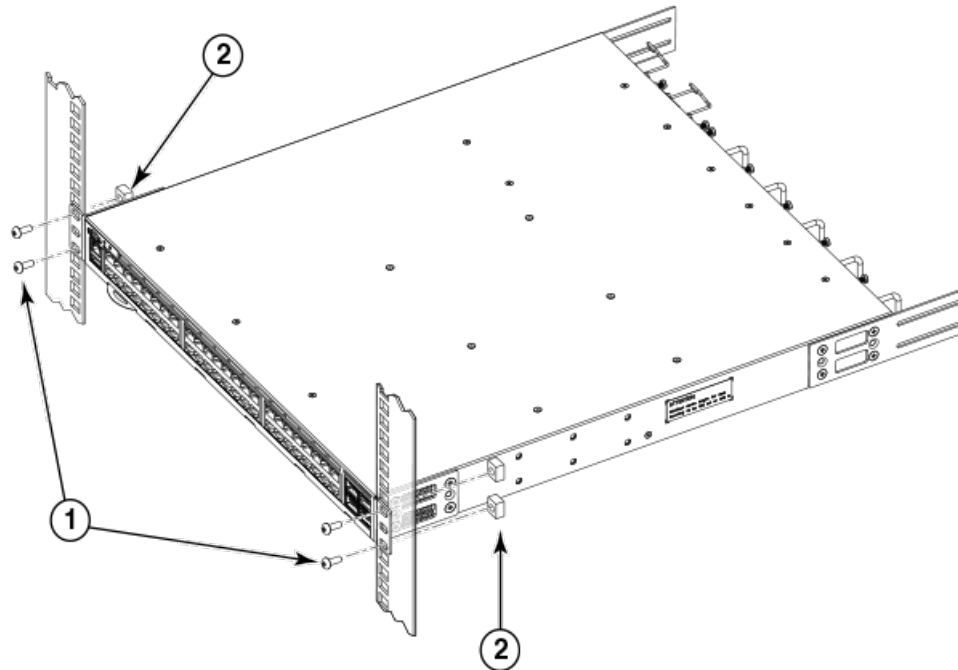
Installing the device in the rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in [Figure 29](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 29 Positioning the device in the rack



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

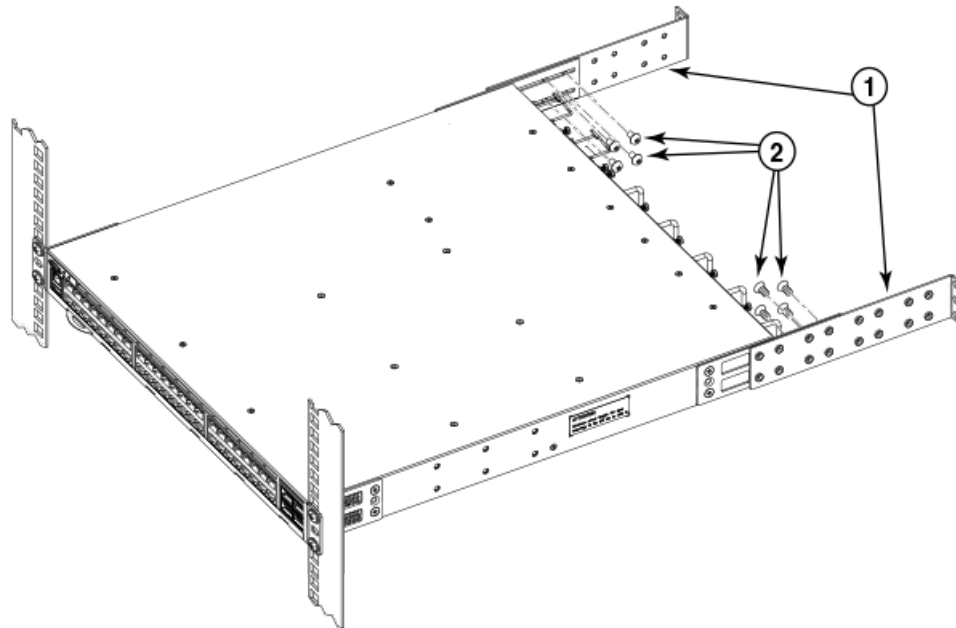
Attaching the rear brackets to the extensions

Complete the following steps to attach the rear brackets to the extensions. There are short and long rear brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension and attach to the extension by inserting four 6-32 x 1/4-in. panhead screws through the bracket holes. If possible, leave at least one empty vertical pair of holes between the screws for better support.
3. Repeat step 2 to attach the left rear bracket to the left extension.

- Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

FIGURE 30 Attaching the rear brackets to the extensions



1. Rear brackets

2. Screws, 6-32 x 1/4-in., panhead Phillips

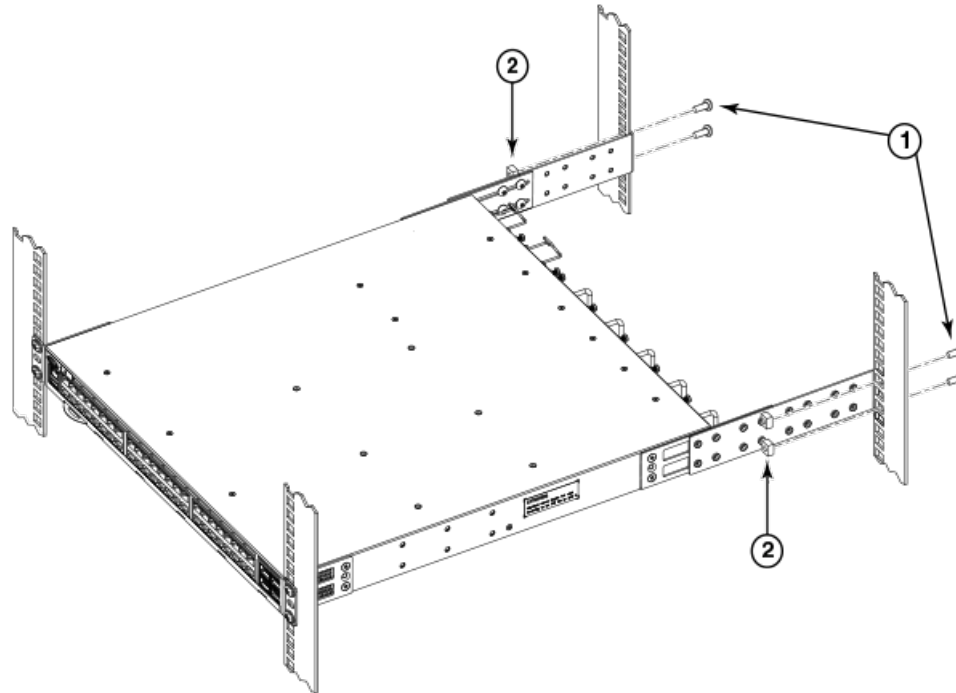
Attaching the rear brackets to the rack posts

Complete the following steps to attach the rear brackets to the rack posts.

- Attach the right rear bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts, as shown in [Figure 31](#). Use the upper and lower holes in the bracket.
- Attach the left rear bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 31 Attaching the rear brackets to the rack posts



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

Flush-rear (recessed) mounting

The flush-rear (recessed) mounting is similar to the flush-front mounting except that the brackets are reversed on the device.



CAUTION

The device must be turned off and disconnected from the fabric during this procedure.

NOTE

The illustrations in the rack installation procedures show a 1U device, but the instructions are the same for a 2U device. The illustrations in the rack installation procedures are for reference only and may not show the actual device.

Complete the following tasks to install the device in a four-post rack:

1. [Attaching the front brackets to the rear of the device](#) on page 51
2. [Attaching the extensions to the front of the device](#) on page 51
3. [Installing the device in the rack](#) on page 52
4. [Attaching the rear brackets to the extensions at the front of the device](#) on page 53
5. [Attaching the rear brackets to the front rack posts](#) on page 55

Attaching the front brackets to the rear of the device

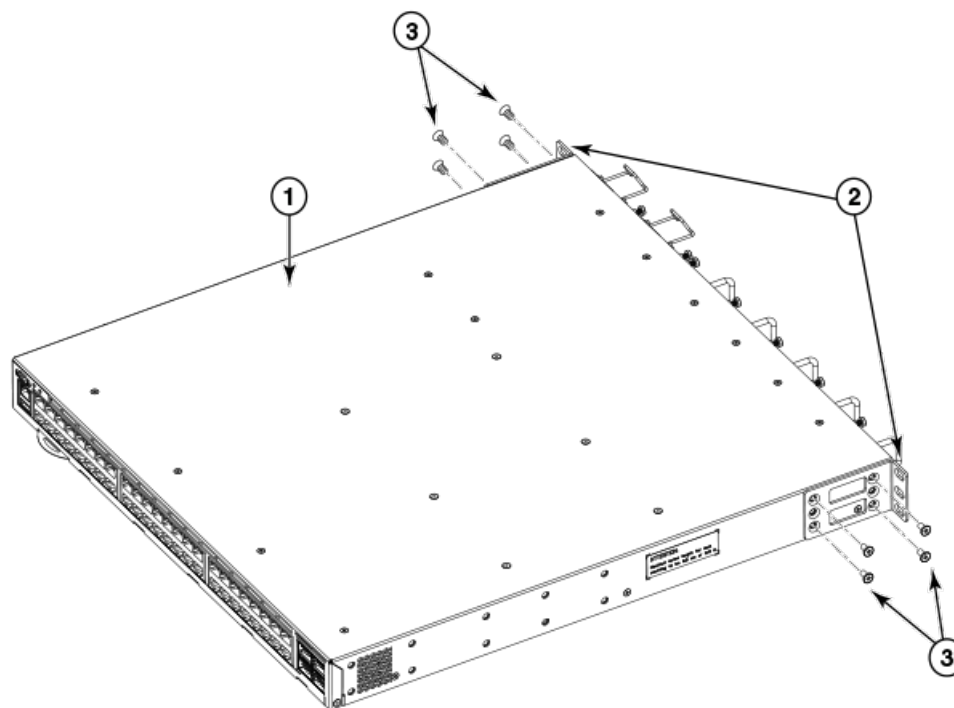
NOTE

In this installation, the brackets are named as listed in the parts list even though the installation of the brackets is reversed from the flush-front installation.

Complete the following steps to attach the front brackets to the rear of the device.

1. Position the right front bracket with the flat side against the right rear side of the device, as shown in [Figure 32](#).
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left rear bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 32 Attaching the front brackets to the rear of the device



- | | |
|---|-------------------|
| 1. The Ruckus ICX device | 3. Front brackets |
| 2. Screws, 8-32 x 5/16-in., flathead Phillips | |

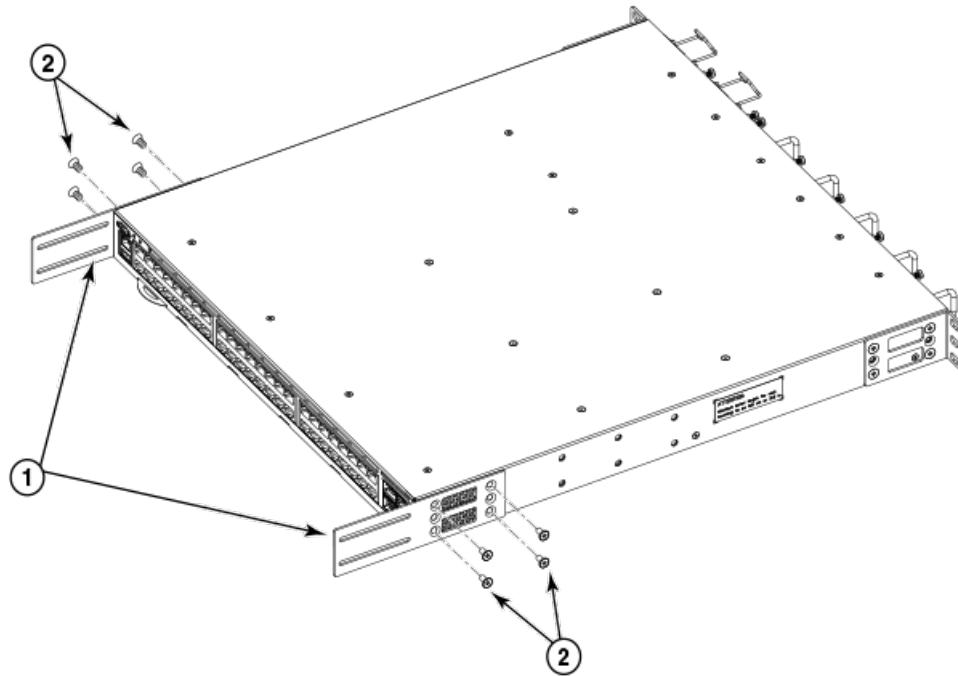
Attaching the extensions to the front of the device

Complete the following steps to attach the extension brackets to the front of the device. There are medium and long extension brackets that you can use for this step. Choose the correct extension for the depth of your rack.

1. Select the proper length extension bracket for your rack depth.
2. Position the right extension along the side of the device as shown in [Figure 33](#).
3. Attach the bracket using four 8-32 x 5/16-in. flathead screws.
4. Repeat step 1 and step 2 to attach the left front extension to the left side of the device.

5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 33 Attaching the bracket extensions to the device



1. Extension brackets

2. Screws, 8-32 x 5/16-in., flathead Phillips

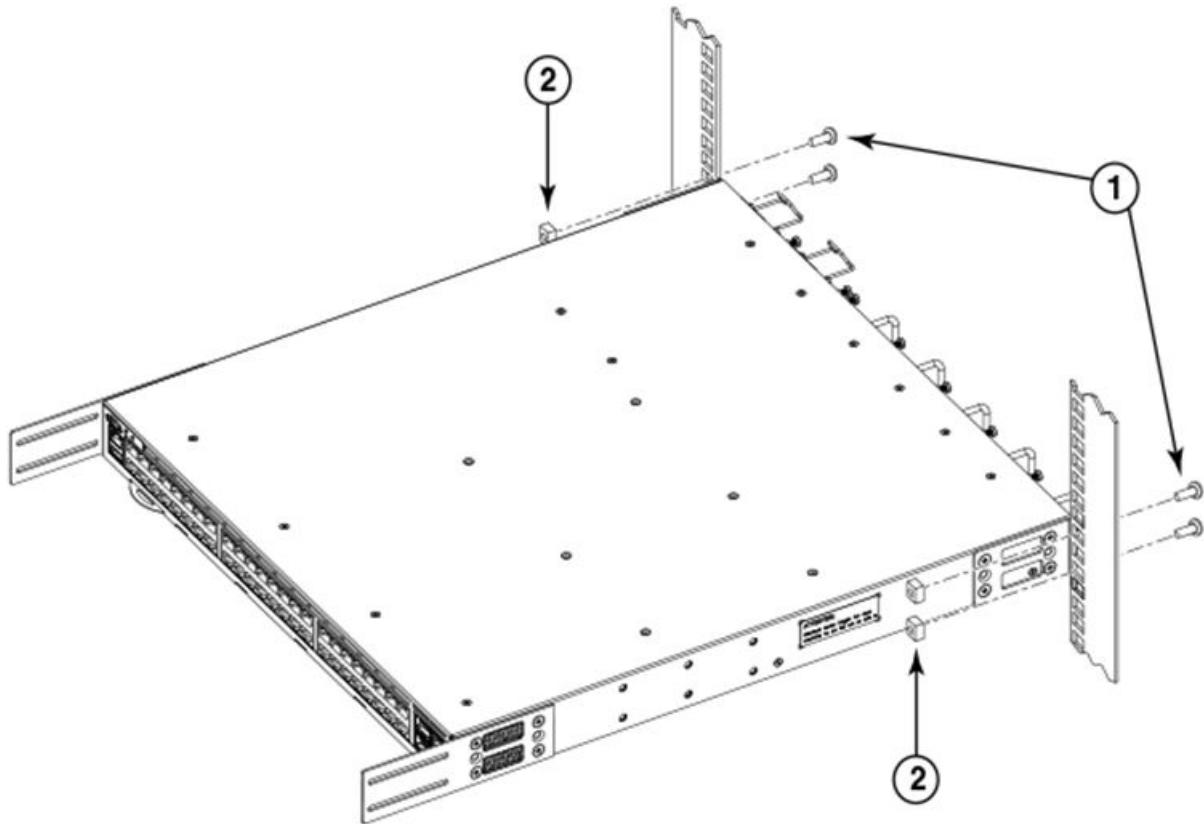
Installing the device in the rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in [Figure 34](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 34 Positioning the device in the rack



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

Attaching the rear brackets to the extensions at the front of the device

Complete the following steps to attach the rear brackets to the extensions. There are short and long front brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 35](#).

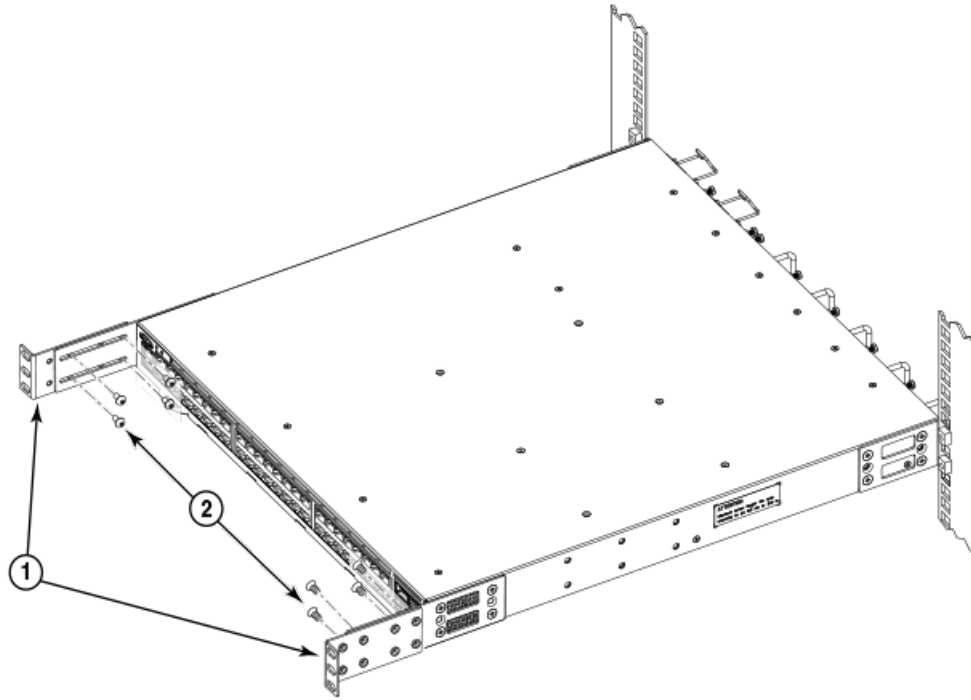
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.

Refer to [Figure 36](#) for the positioning of the short or long brackets and screws.

3. Attach the brackets using four 6-32 x 1/4-in. screws.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left extension.

- Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

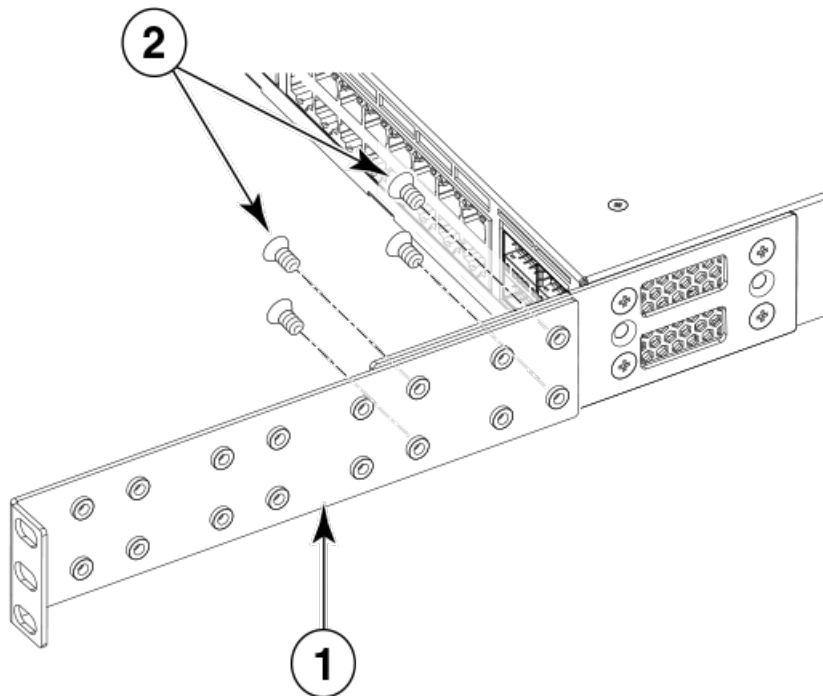
FIGURE 35 Attaching the rear brackets to the extensions at the front of the device



1. Rear brackets, short

2. Screws, 6-32 x 1/4-in., panhead Phillips

FIGURE 36 Attaching the short or long rear brackets to the extensions



1. Rear bracket, short or long

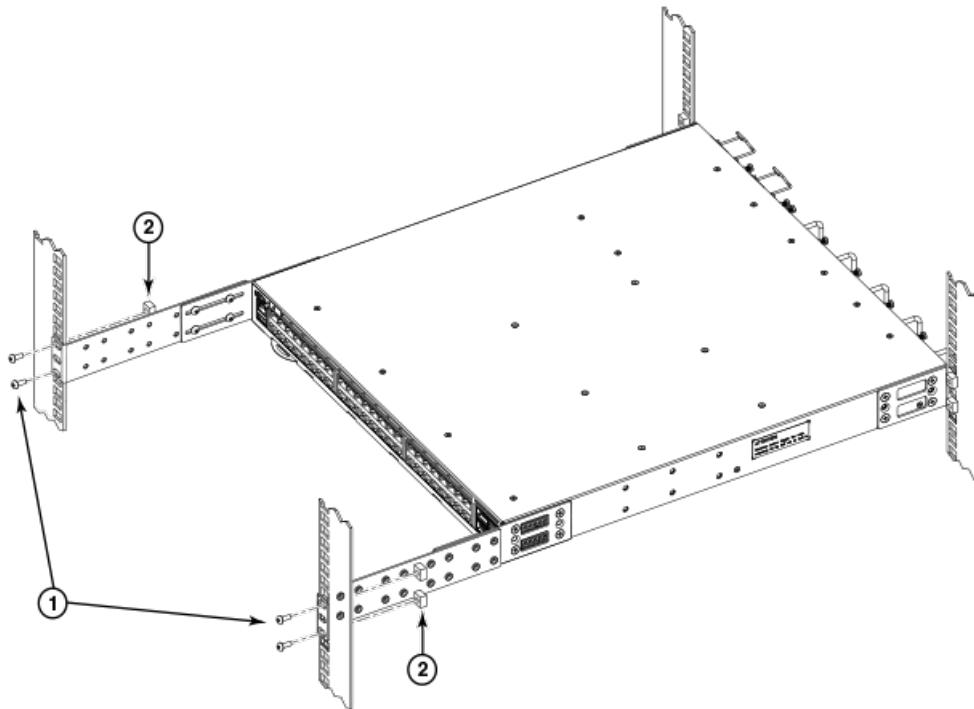
2. Screws, 6-32 x 1/4-in., panhead Phillips

Attaching the rear brackets to the front rack posts

Complete the following steps to attach the rear brackets to the front rack posts.

1. Attach the right rear bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in Figure 37. Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left front rack post using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 37 Attaching the rear brackets to the front rack posts



1. Screws, 10-32 x 5/8-in., panhead Phillips

2. Retainer nuts, 10-32

Wall mount installation

NOTE

You need a #2 Phillips screwdriver, a hammer, and a drill for wall mount installation.

Ruckus recommends that you wall mount the device with the port side down.

Complete the following steps to mount the device to a wall.

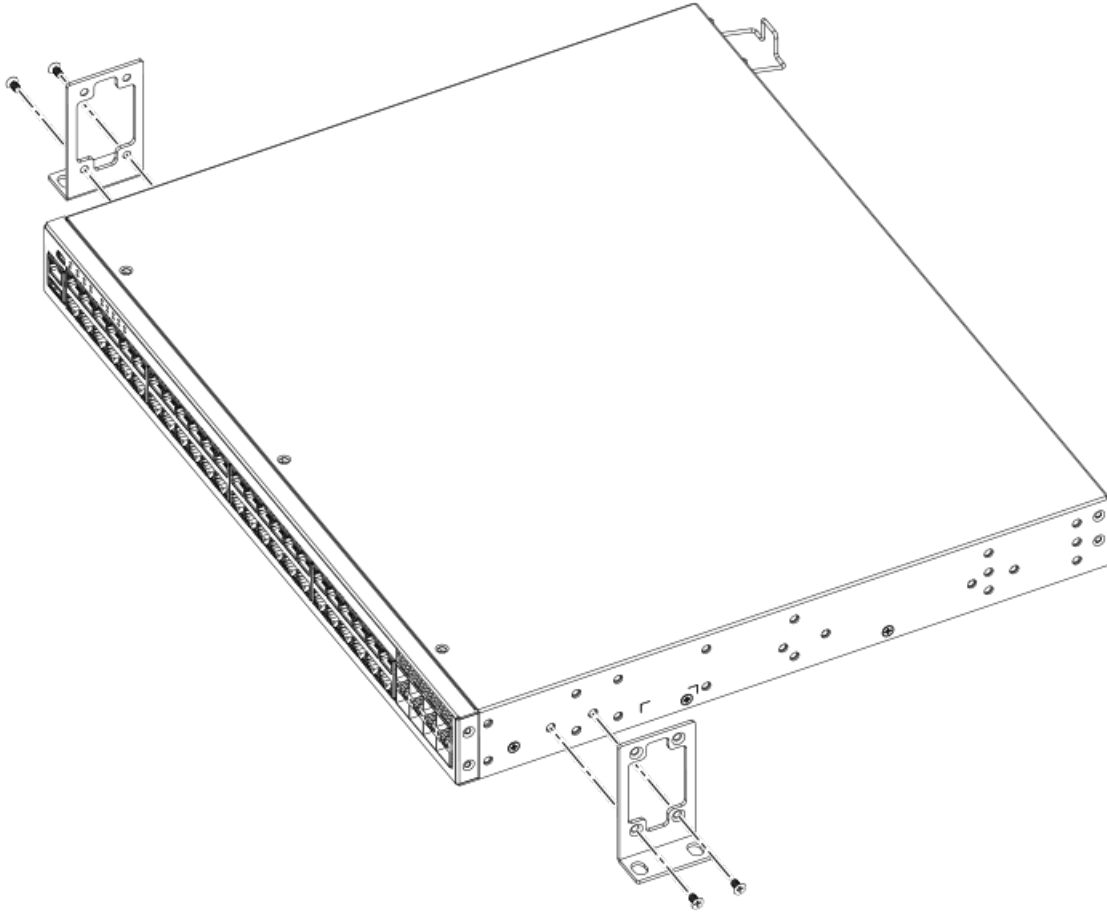


DANGER

This equipment is suitable for mounting on concrete or other noncombustible surfaces only.

1. Attach the four adhesive feet to the bottom of the device.
2. Using a Phillips screwdriver, attach the wall mount brackets to the sides of the device using four #6-32 sink-head screws on each side.

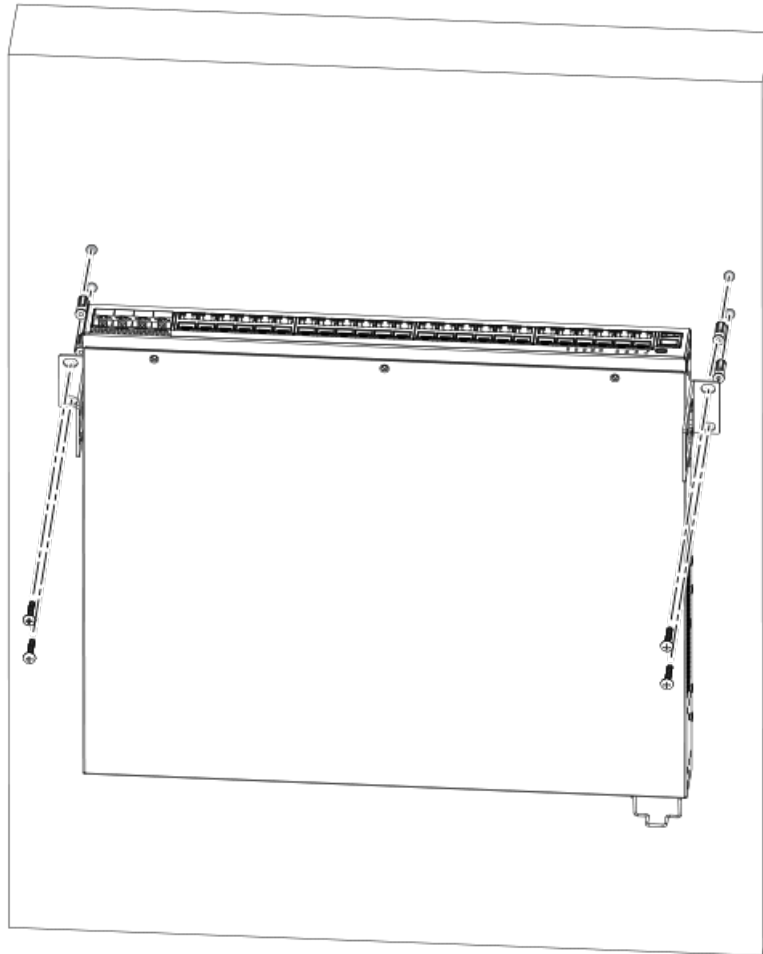
FIGURE 38 Attaching the wall mount brackets



3. Drill two holes on the wall where you want to mount the device.
4. Hammer two wall mount anchors into the holes on the wall.

5. Use the two wall mount screws to fasten the device to the wall mount anchors.

FIGURE 39 Wall mounting the device



- a. Drilled holes
- b. Wall mount anchors
- c. Wall mount screws

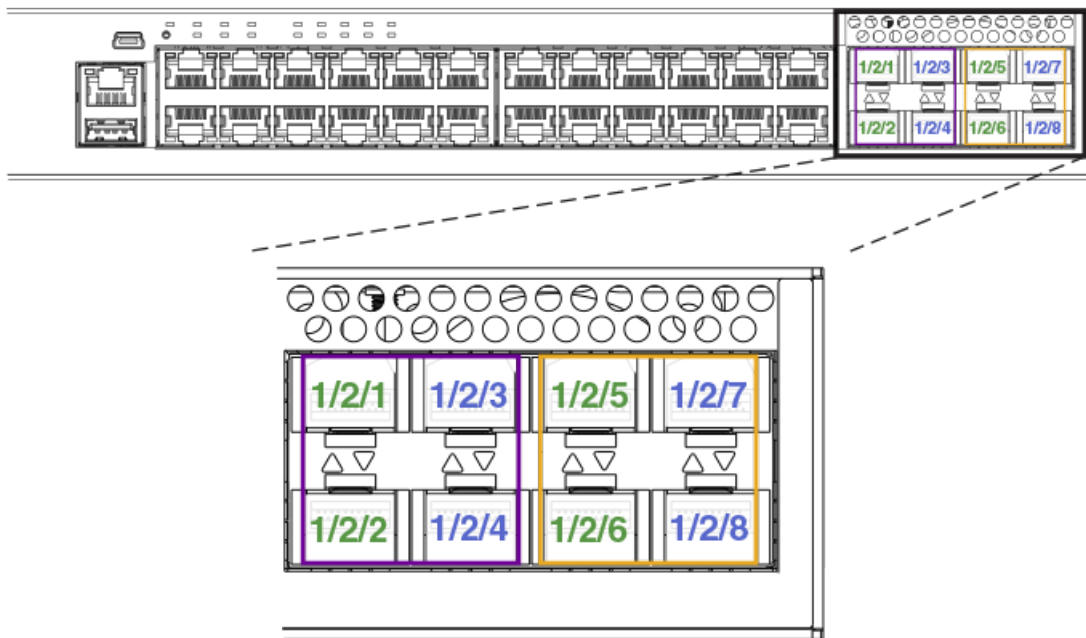
Connecting devices in a traditional stack

ICX 7250 devices can operate as standalone devices and also as members of traditional stacks. A stack is a group of devices—Ruckus stackable units and their connected stacking links—that are connected so that the stack is managed as a single entity. A traditional stack contains devices from only one model in a product family.

Stacking ports and trunks

There are eight SFP+ ports on the front panels of the ICX 7250 devices that support stacking, which can be used as uplink (data) ports or as stacking ports. The following figure shows the ports in slot 2; the top row consists of ports 1, 3, 5, and 7, and the bottom row consists of ports 2, 4, 6, and 8. The numbering for the ports in the following figure is provided in the format $x/x/x$ and refers to StackID/Slot/Port.

FIGURE 40 Stacking ports



Stacking configuration requirements

Before configuring the traditional stack using the CLI, physically connect the devices using stacking cables. For information about configuring a stack, refer to the *Ruckus FastIron Stacking Configuration Guide*.

Traditional stack size

A traditional stack can contain a maximum of twelve ICX 7250 devices.

Stacking topologies for a traditional stack

Both linear and ring topologies are supported in a traditional stack. In a linear stack topology there is a connection between each switch that carries two-way communications across the stack. The physical connection between the devices can use one port (stacked-port) or two ports (stacked-trunk) per trunk. The stack uses a pair of ports ($n, n+1$, where n is odd and ranges from 1 through 7) even if there is only one physical connection between the devices in a stack. The physical connections must be from an odd-numbered port to an odd-numbered port or an even-numbered port to an even-numbered port.

NOTE

The examples in the following figures show a 24-port device. The 48-port devices show the same behavior for stacking.

The following figure shows a linear stacking topology example.

- For the first device in the stack, ports (1/2/1, 1/2/2) are being used as stacked ports.
- For the second device in the stack, ports (2/2/1, 2/2/2 and 2/2/3, 2/2/4) are being used as stacked ports.
- There is a single physical connection between device 1 and device 2 in the stack, ports 1/2/1 and 2/2/1 (odd-numbered port to odd-numbered port). This is a stacked-port configuration.
- There are two physical connections between device 2 and device 3 in the stack. Port 2/2/3 is connected to port 3/2/7 (odd-numbered port to odd-numbered port) and port 2/2/4 is connected to 3/2/8 (even-numbered port to even-numbered port). This is a stacked-trunk configuration.

FIGURE 41 Linear stacking topology



1. First device in stack
2. Second device in stack
3. Third device in stack

In a ring stacking topology, there is an extra connection between the logical first and last devices, forming a "ring" or "closed-loop." The closed-loop connection provides a redundant path for the stack link, so if one link fails, stack communications can be maintained.

FIGURE 42 Ring stacking topology



1. First device in stack
2. Second device in stack

3. Third device in stack

Powering on the system

After you complete the physical installation, you can power on the system.

NOTE

The power outlet should be installed near the equipment and should be easily accessible.

1. Remove the power cord from the shipping container.
2. Install the power cord clip.
3. Attach the AC power cord to the AC connector on the rear panel.
4. Insert the power cord plug into a 100V-240V outlet.

NOTE

To turn the system off, simply unplug the power cord or cords.

Long-reach multimode adaptor module

Ruckus ICX7150, ICX7250, and ICX7750 Ethernet switches require a long-Reach Multimode (LRM) adaptor module to support LRM optics connections.

The Ruckus LRM adaptor module has two 280 mm Twinax tails and two corresponding SFP+ sockets which operate independently. Power for each of the SFP+ sockets and for the adaptor is provided through the Twinax connections.

The LRM adaptor module requires FastIron software release 08.0.61 or later on the host Ruckus ICX switches. The LRM adaptor module is not field configurable, rather you can apply all configuration to the host switch port. Use the **show lrm-adapter ethernet** command to display the status of the LRM module.

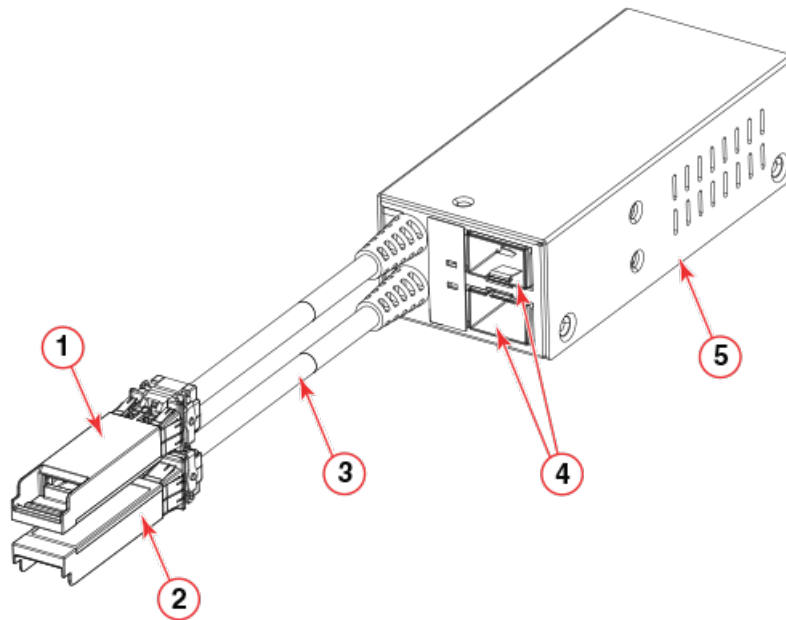
LRM module part numbers

The LRM adaptor module is available in the models listed in the following table.

TABLE 10 LRM module models

Model/Part number	Description
10G-SFPP-LRM-1-ADP	10G LRM SFP+ Optic, 1-pack bundle with LRM adapter; includes a rack-mount bracket.
10G-SFPP-LRM-2-ADP	10G LRM SFP+ Optic, 2-pack bundle with LRM adapter; includes rack-mount brackets.
RMK-LRM-ADP	19-inch LRM Adapter Rack Mount Shelf Kit (supports 8 units).

FIGURE 43 LRM adaptor module



1. Port 1
2. Port 2
3. Passive cable (280 mm)
4. 10G LRM cages
5. Adaptor body

The LRM adaptor module ships with either one or two LRM optics (10G-SFP+LRM) depending on the model that you purchased.

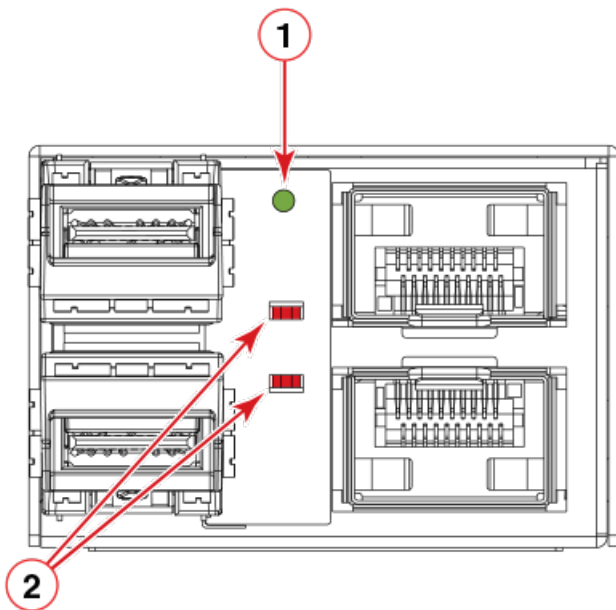
LRM adaptor module specifications

- Compatible with SFP+ ports on the ICX7150, ICX7250, and ICX7750
- Two independent SFP+ sockets for LRM optics
- Two integrated Twinax cables for power and data connectivity to the host switch
- Each port can operate at either 1Gbps or 10Gbps

LEDs

On the LRM adaptor module, two LEDs indicate the power status and link status of each connection.

FIGURE 44 System and link LEDs



1. System LED
2. Link LEDs

TABLE 11 System and link status LEDs

System component	Description
System status LEDs	LED off: No power Amber: Power applied, no link
Link status LEDs	Steady Green: Link up Blinking Green: Link activity

ICX platform support for the LRM adaptor module

Platform	Total number of modules supported	Total number of LRM connections
ICX7150-C12P	1	2
ICX7150-24 and -48 models	2	4
ICX7150-48ZP	4	8
ICX7250-24 and -48 models	4	8
ICX7750-48F	6	12 (see the note below)

Note: On the ICX7750-48F, the connections must be distributed across the SFP+ ports as follows:

- Maximum three LRM modules on ports 1/1/1 to 1/1/32
- Maximum three LRM modules on ports 1/1/33 to 1/1/48

Unpacking the LRM adaptor module

When unpacking the LRM adaptor module, verify that the shipping carton has the items as listed below. Save the shipping carton and packaging incase you need to return the shipment.

- One LRM adaptor module
- One or two L-shaped mounting bracket (depending on the model purchased)
- One or two 10G-SFP-IRM optics (depending on the model purchased)
- China-RoHS Hazardous and Toxic Substance statement

Installing the EPS4000

- EPS4000 external power supply..... 65
- Items included with the EPS4000..... 69
- Configuration requirements..... 69
- Summary of installation tasks..... 69
- Installation precautions..... 70
- Preparing the installation site..... 71
- Installing the device..... 71
- Installing an RPS17 PSU..... 74
- Uninstalling an RPS17 PSU..... 75
- Connecting the EPS4000 cord..... 76
- Powering on the system..... 78
- Verifying proper operation..... 79
- EPS4000 external power supply technical specifications..... 79



DANGER

The procedures in this manual are for qualified service personnel.



DANGER

Before beginning the installation, see the precautions in “Power precautions.”



DANGER

Be careful not to accidentally insert your fingers into the fan tray while removing it from the chassis. The fan may still be spinning at a high speed.

EPS4000 external power supply

In the event of an AC power loss or internal power supply device failure, the Ruckus EPS4000 external power supply can be used as a 12 V, backup power source to a device when any of the DC power supply ports are connected to an ICX 7250 device. The EPS4000 requires a minimum of one RPS17 Power Supply Unit (PSU) to be functional. Proprietary DC cables are used to connect any of the EPS DC ports of the EPS4000 to the rear EPS4000 port of an ICX 7250 device that is supported by the EPS4000. Each RPS17 PSU can provide backup power to one ICX 7250 device. Even though a fully populated EPS4000 can monitor up to sixteen connected devices, the EPS4000 can provide backup power without performance degradation to only four ICX 7250 devices.

NOTE

The primary source of 12 V power for an ICX 7250 device is the internal power supply. The EPS4000 is designed to serve primarily as a backup source of 12 V power. You should service a failed ICX 7250 device as soon as possible after a 12 V power failure is detected.

In case of a 54 V supply failure, the EPS4000 can provide power to multiple devices up to its capacity limit. You can set the system priority for the power budget allocation for this scenario. The default is for the lower-numbered port to have the higher priority. Should a higher priority device have a 54 V supply failure while a lower priority device is already being serviced by the PSU, the power supply will not switch to provide power to the higher priority device to maintain continuity of service. The EPS4000 uses the next PoE-power-budget cycle to reallocate power among the connected ICX 7250 devices.

In the PoE power extension mode, the EPS4000 can also provide additional power to support the PoE ports as needed. For more information about connecting an ICX 7250 device to the EPS4000, refer to [Connecting devices to the external power supply](#) on page 79.

Each RPS17 PSU can provide up to 740 W at 54 V and 120 W at 12 V. The RPS17 draws power from a standard AC source and converts it to DC for use by the switches.

NOTE

The internal power supply of the ICX 7250 devices is not a field-replaceable unit (FRU). The devices must be shut down by administrators for replacement.

Ruckus recommends that you pay attention to the PoE or PoE+ port configuration of the device when connecting to an EPS4000. The internal power supply of each PoE or PoE+ device has a maximum number of supported PoE or PoE+ ports. Ruckus recommends that when the EPS4000 is used as a redundant power source for the PoE device, that the maximum number of PoE or PoE+ ports of the external power supply must not exceed the maximum number of PoE or PoE+ ports of the internal power supply capability of each device.

The following devices are supported by the Ruckus EPS4000:

- ICX 7250-24
- ICX 7250-24P
- ICX 7250-48
- ICX 7250-48P

NOTE

The ICX 7250-24G is not supported by the EPS4000.

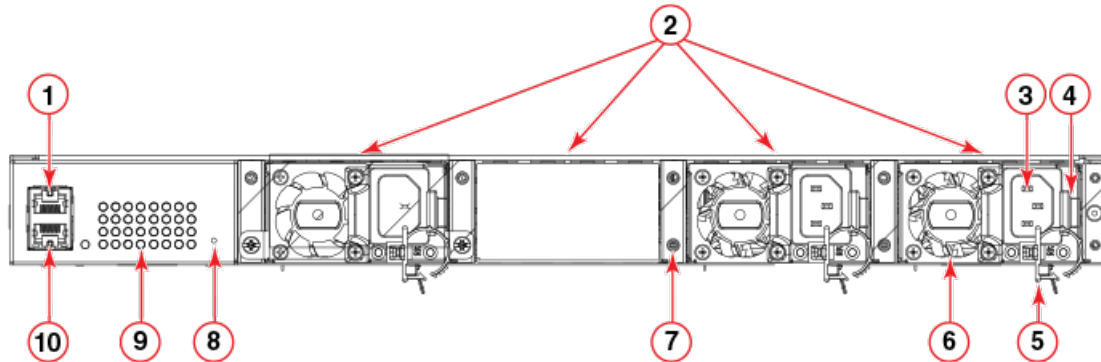
EPS4000 features and benefits

- Hosts up to four hot-swappable RPS17 power supply units (PSUs).
- Provides N:1 power redundancy at 12 V with each PSU.
- Each RPS17 can deliver a maximum of 740 W at 54 V and 120 W at 12 V.
- A fully populated EPS4000 has 8 DC power ports that can monitor up to 16 switches simultaneously and provide 12 V redundant power to four switches.
- Provides power redundancy at 54 V and true extended PoE power support.
- 1:1 and 1:2 cables support 54 V or 12 V distribution up to 1 meter.
- Universal (100-240 V) AC line cord draws power from standard power outlet.
- The EPS4000 firmware is field-upgradeable.
- The power to the switches is maintained while the microcontroller unit (MCU) is being reset.
- The power distribution to the connected switches can be controlled per a priority scheme that you set.

EPS4000 front and rear panels

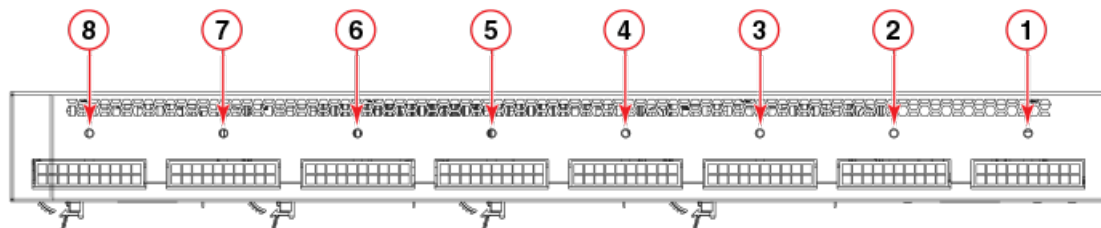
There are 32 LEDs on the front panel of the EPS4000 to indicate the status for the DC power on the 8 ports. 16 LEDs (Ex.y) are for the 54 VDC and the other sixteen (Rx.y) are for the 12 VDC supply. There is a reset button next to the LEDs. There are port LEDs for each of the management ports. Both the serial port and the out-of-band Ethernet management ports use RJ-45 connectors. The slots for the RPS17 PSUs are covered with slot covers. The slot cover must be removed to install the PSU.

FIGURE 45 EPS4000 front panel



1. Management console serial port (RJ-45)
2. RPS17 PSU slots (three populated, one with cover on)
3. AC power cord input (C14)
4. PSU release latch
5. Power cord clip
6. Integrated RPS17 PSU fan
7. PSU slot cover screws
8. Reset button (sets EPS4000 configuration to factory default)
9. System status indicators
10. Out-of-band, Ethernet management port (RJ-45)

FIGURE 46 EPS4000 rear panel

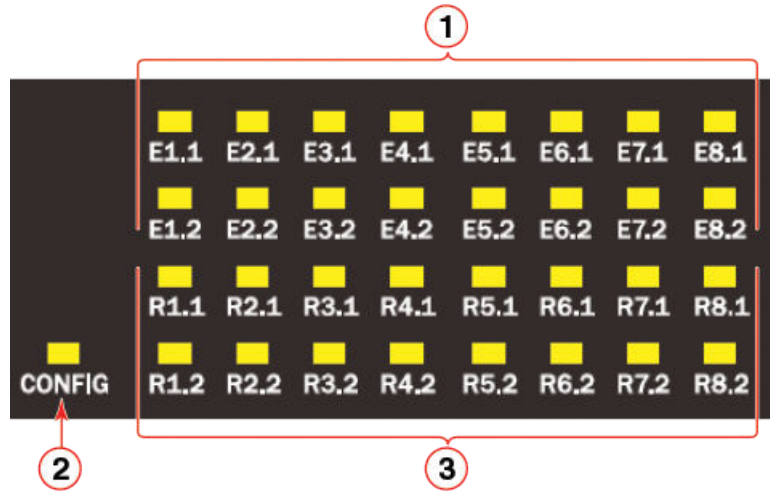


1. DC power cable connector 1
2. DC power cable connector 2
3. DC power cable connector 3
4. DC power cable connector 4
5. DC power cable connector 5
6. DC power cable connector 6
7. DC power cable connector 7
8. DC power cable connector 8

LEDs

The following figure shows the LEDs on the EPS4000.

FIGURE 47 EPS4000 LEDs



1. Ex.y: Power status indicator (54 V): x= EPS4000 connector (1-8), y = Channel or port (1-2)
2. CONFIG: EPS configuration mode indicator
3. Rx.y: Power status indicator (12 V): x = EPS4000 connector (1-8), y = Channel or port (1-2)

The following table describes the functions of the EPS4000 LEDs.

TABLE 12 System Status LEDs on the EPS4000

LED	State	Description
E1.1 ~ E8.1 (54 V1) E1.2 ~ E8.2 (54 V2)	Off	No connection.
	Green	EPS4000 is delivering up to 370 W PoE power to switch.
	Amber	Switch is connected to this channel but EPS4000 does not have sufficient PoE power for this channel.
	Blinking amber	This channel has a fault (for example, over current).
R1.1 ~ R8.1 (12 V1) R1.2 ~ R8.2 (12 V2)	Blinking amber and green	This channel has been granted PoE power but there is a fault on the channel (for example, over current).
	Off	No connection.
	Green	Switch is connected to this channel and EPS is ready to provide 12 V backup power for this channel.
	Blinking green	Switch is connected to this channel and EPS is providing 12 V backup power to this channel.
	Amber	Switch is connected to this channel but EPS does not have sufficient 12 V backup power for this channel.
CONFIG	Blinking amber	This channel had a fault (for example, over current).
	Green	Auto-configuration mode.
	Amber	Manual configuration mode.

TABLE 12 System Status LEDs on the EPS4000 (continued)

LED	State	Description
Management port LED (Left down)	Green	Management port link up at 100BASE-T mode.
	Off	Management port link up at 10BASE-T mode or link is down.
Management port LED (Right down)	Blinking green	Indicates management port receive and transmit activity.
	Off	Indicates no Ethernet traffic on management port.

Items included with the EPS4000

The EPS4000 ships with all of the following items included in your shipping container. Verify the contents of your shipping container. If any items are missing, contact the place of purchase.

- EPS4000 external power supply
- Rack mounting kit containing two L-shaped mounting brackets and eight sink-head screws
- Two-post rack kit containing four rack-mounting screws and four cage nuts
- Four rubber feet
- Console cable
- RJ-45 to DB9 adapter
- China ROHS sheet
- Read Me First document

Configuration requirements

The configuration requirements for the EPS4000 are the same as the for the ICX 7250. Refer to [Configuration requirements](#) on page 23.

Summary of installation tasks

Follow the steps in the following table to install your device. Details for each of these steps are provided on the pages indicated.

TABLE 13 Installation tasks

Task number	Task	Where to find more information
1	Ensure that the physical environment that will host the device has the proper cabling and ventilation.	Preparing the installation site on page 71 section
2	Unpack the device and all included accessories.	Items included with the EPS4000 on page 69 section
3	Install the device on a desktop, or in an equipment rack.	Installing the device on page 71 section
4	Once the device is installed, plug the device into a nearby power source that adheres to the regulatory requirements outlined in this manual.	Powering on the system on page 78 section

TABLE 13 Installation tasks (continued)

Task number	Task	Where to find more information
5	Verify that the device is working properly by plugging it into a power source and verifying that it passes the self test.	Verifying proper operation on page 79 section

Installation precautions

Follow all precautions when installing a device.

General precautions



DANGER

All fiber-optic interfaces use Class 1 lasers.



CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 50°C (122°F).



CAUTION

Make sure the airflow around the front, and back of the device is not restricted.

Lifting precautions



DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.



DANGER

Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

Power precautions



CAUTION

Use a separate branch circuit for each power cord, which provides redundancy in case one of the circuits fails.



CAUTION

Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.



DANGER

Disconnect the power cord from all power sources to completely remove power from the device.



CAUTION

Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.



DANGER

If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

Preparing the installation site

EPS4000 external power supplies can be mounted in a standard 19-inch equipment rack or on a flat surface.

The installation site should meet these requirements:

- Be at the center of all the devices you want to link, and near a power outlet.
- Maintain temperatures within 0 to 50°C (32 to 122°F) and humidity levels within 5 to 95%, non-condensing.
- Provide adequate space (approximately 5.08 cm [2 in.]) on all sides for proper airflow.
- Be accessible for installing, cabling, and maintaining the devices.
- Allow the status LEDs to be clearly visible.
- Allow for twisted-pair cables to be routed away from power lines, fluorescent lighting fixtures, and other sources of electrical interference, such as radios and transmitters.
- Provide a separate grounded power outlet that provides 100 to 240 VAC, 50 - 60 Hz, is within 2.44 m (8 ft) of each device, and is powered from an independent circuit breaker.
- As with any electrical equipment, a filter or surge suppressor is recommended.

Rack-mount installation considerations

Before mounting the external power supply in a rack, consider the following factors:

- Temperature: Because the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range.
- Airflow: Be sure that the airflow direction for all equipment in a rack is the same or consistent.
- Mechanical loading: Do not place any equipment on top of a rack-mounted device.
- Circuit overloading: Be sure that the supply circuit to the rack assembly is not overloaded.
- Grounding: Rack-mounted equipment should be properly grounded.

Installing the device

You can install the device on a desktop or in an equipment rack.



DANGER

Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

NOTE

There are no user-serviceable parts inside the device. Do not open the enclosure, unless you are installing an RPS17 Power Supply Unit (PSU) as shown in [Installing an RPS17 PSU](#) on page 74 or removing an RPS17 as shown in [Uninstalling an RPS17 PSU](#) on page 75.

Desktop installation

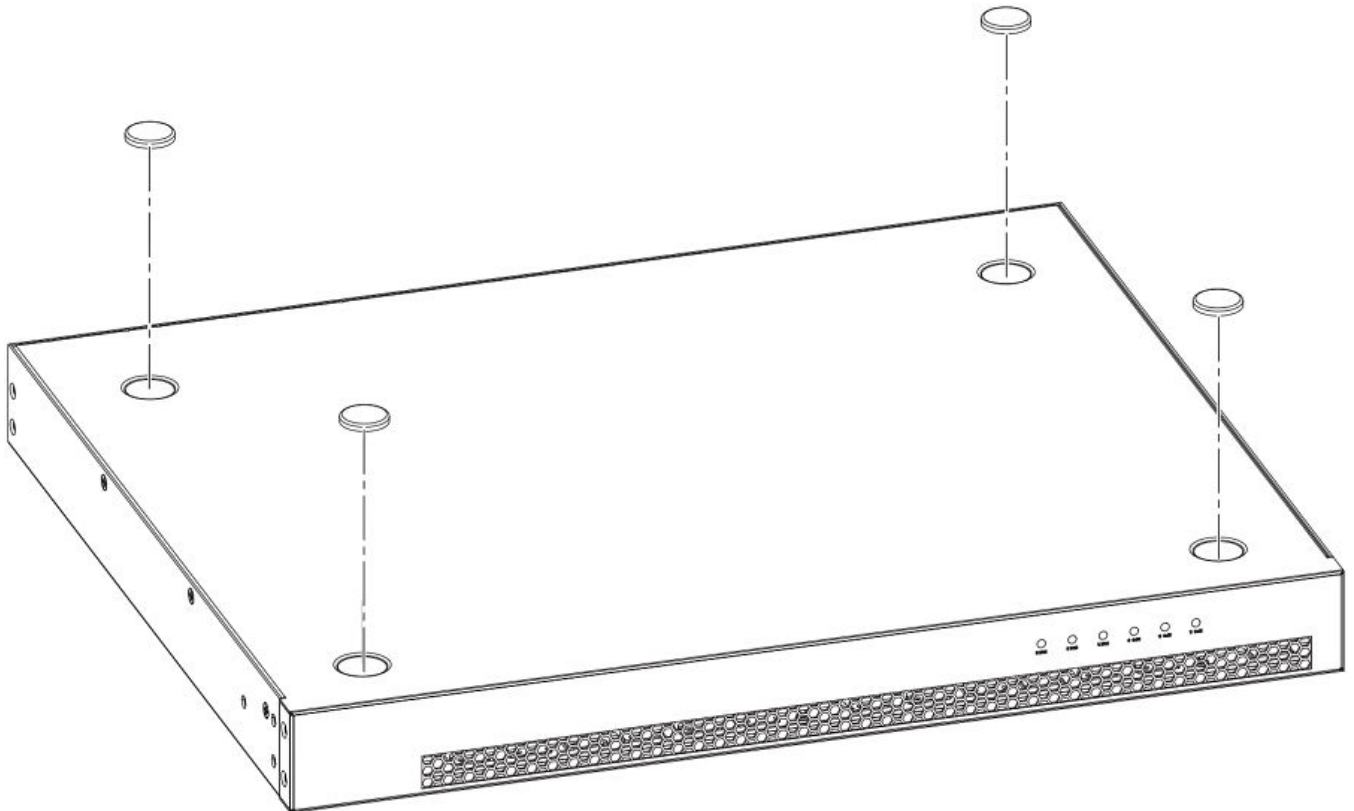
Complete the following steps to install on a desktop or other flat surface.

1. Attach the four adhesive feet to the bottom of the device.

NOTE

The process is the same for multiple devices.

FIGURE 48 Attaching the adhesive feet to the device



2. Set the device on a flat surface near an AC power source, making sure there is the specified amount of space on all sides of the device for proper airflow.

Mounting an external power supply in a rack (two-post)



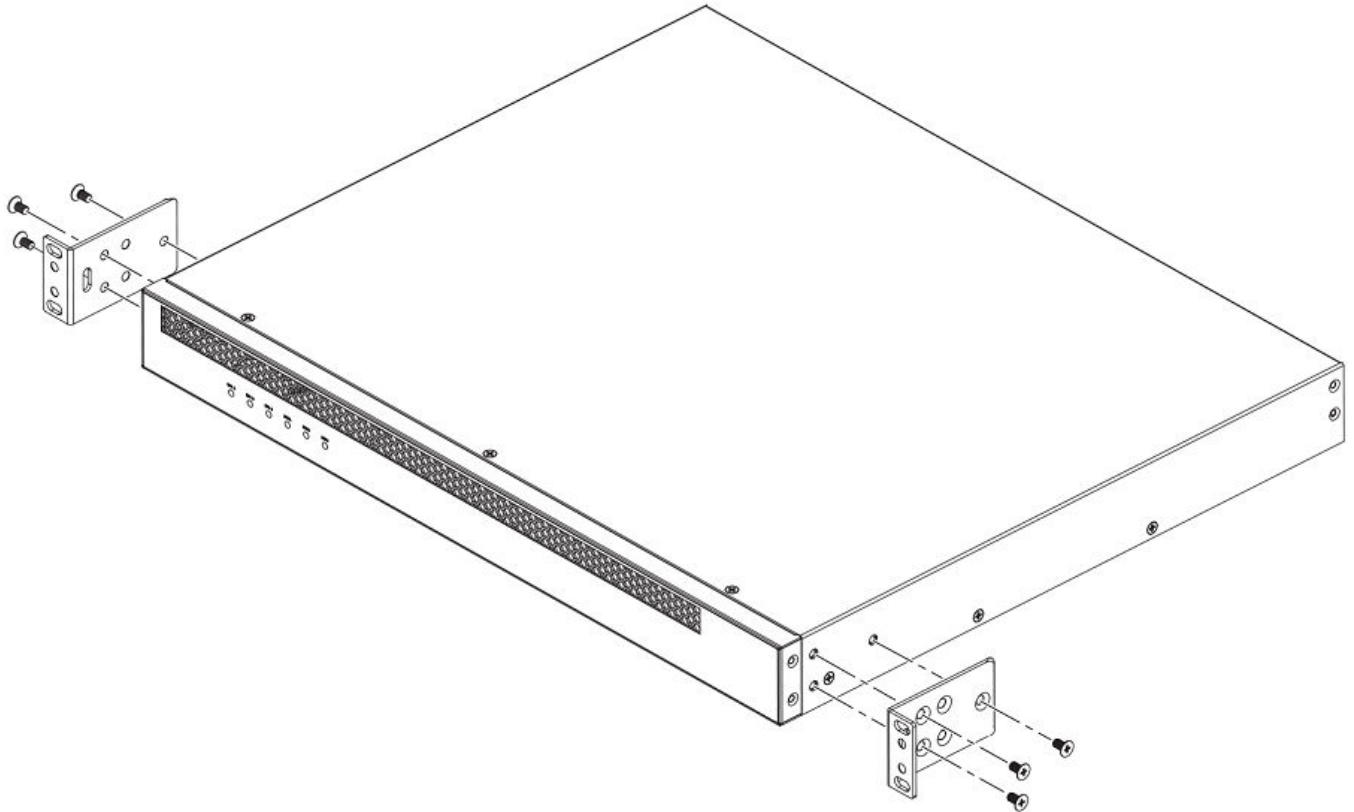
DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

Complete the following steps to install an external power supply in a rack.

1. Remove the rack mounting kit from the shipping carton. The kit contains two L-shaped mounting brackets, eight sink-head mounting screws, four rack-mounting screws, and four cage nuts.
2. Using a Phillips screwdriver, attach the mounting brackets to the sides of the external power supply using 3 sink-head screws on each side.

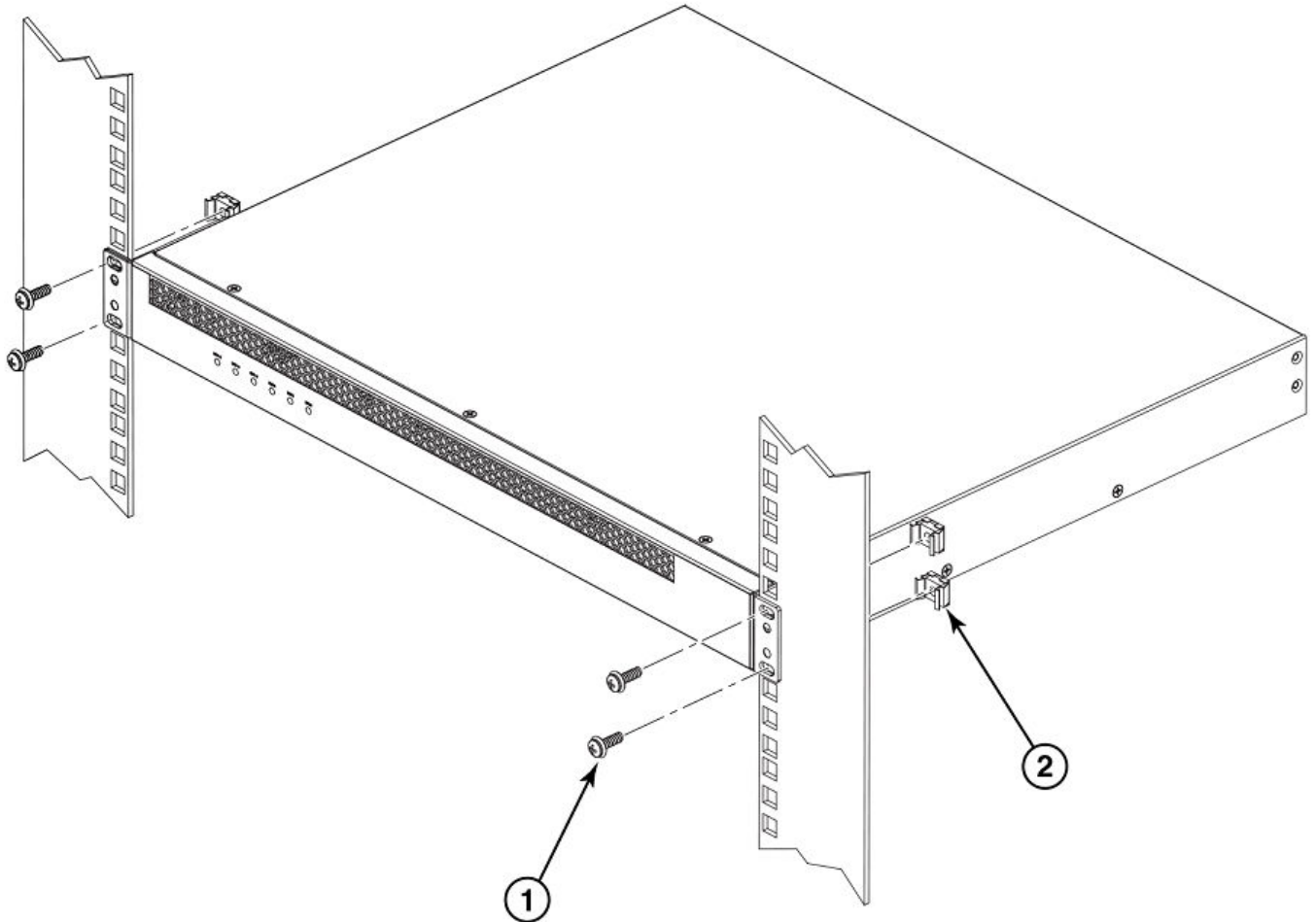
FIGURE 49 Attaching the mounting brackets to the device



3. Mount the external power supply in a rack using four rack-mounting screws.

4. Use the four cage nuts to screw the device to the rack mount holes.

FIGURE 50 Installing the external power supply in a rack



- a. Rack-mounting screws
 - b. Cage nuts
5. If installing multiple external power supplies, mount them in the rack one above the other.

Installing an RPS17 PSU

You can install a new RPS17 Power Supply Unit (PSU) into EPS4000 while the device is powered on and running.

NOTE

While installing a PSU, wear an ESD wrist strap.



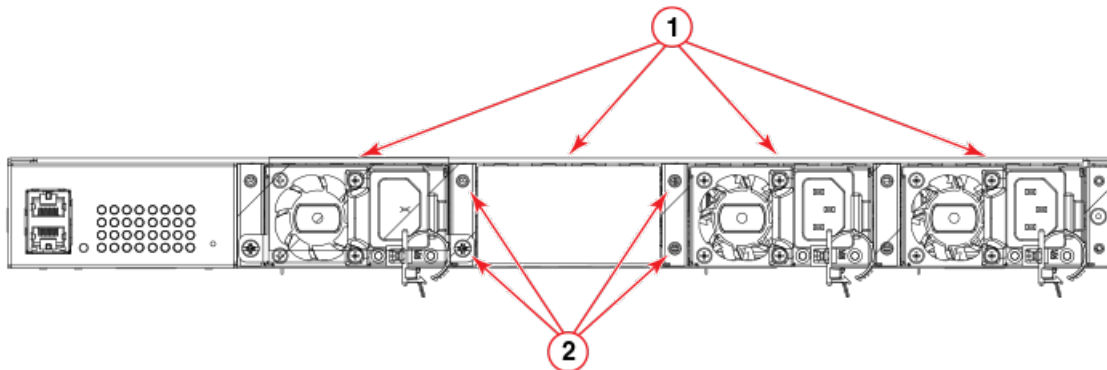
DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

Perform the following steps to install an RPS17 PSU.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.
2. Remove the four screws that hold the PSU slot cover in place.

FIGURE 51 Installing an RPS17 PSU



- a. RPS17 PSU slots (3 populated, 1 available)
- b. Screws

NOTE

If you are replacing an RPS17 PSU, you must uninstall a PSU. Refer to [Uninstalling an RPS17 PSU](#) on page 75.

3. Remove the new PSU from the protective packaging.
4. Gently insert the PSU into the slot until it clicks into place.

Uninstalling an RPS17 PSU

You can uninstall an RPS17 PSU from the EPS4000 while the device is powered on and running.

NOTE

While uninstalling a PSU, wear an ESD wrist strap.



DANGER

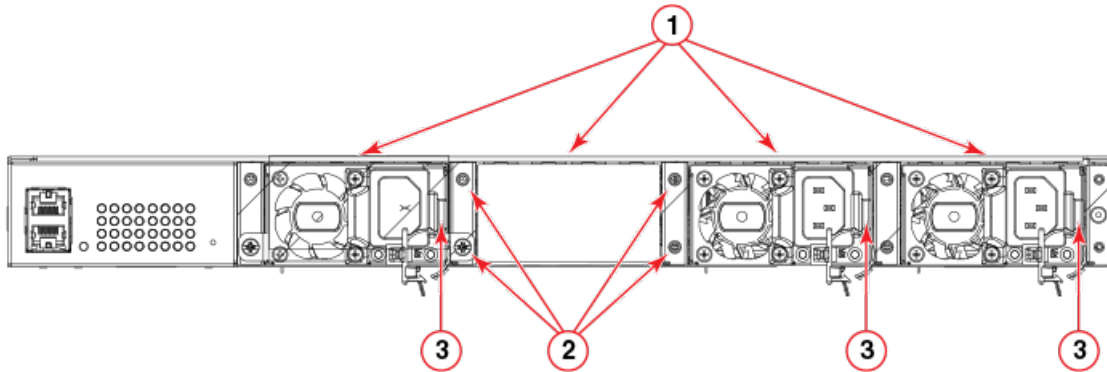
For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

Perform the following steps to uninstall an RPS17 PSU.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.

2. Lift the PSU latch and gently slide the PSU out from the slot.

FIGURE 52 Uninstalling an RPS17 PSU



- a. RPS17 PSU slots (3 populated, 1 available)
 - b. Screws
 - c. PSU latch
3. Either insert a new PSU into the slot until it clicks into place, or close the slot opening with a PSU slot cover and attach the cover with four screws.

Connecting the EPS4000 cord

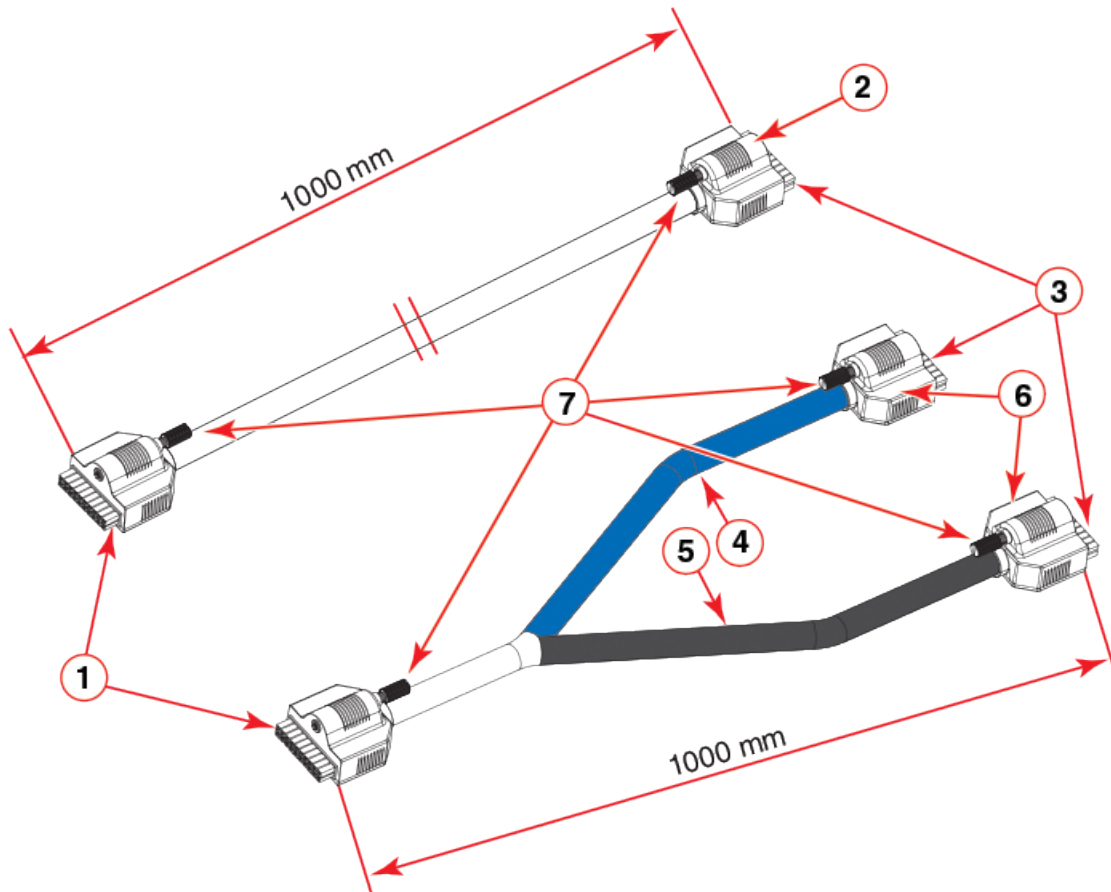
There are two types of EPS4000 cords available, 1:1 and 1:2. The 1:1 cord can deliver 740 W at 54 V to one switch. The 1:2 cord can deliver 370 W at 54 V to each of two switches from one port on the EPS4000 power supply. Both cords deliver up to 120 W at 12 V. You must use a 1:2 cord if you want an ICX 7250-48P device to share 54-V power with another device. Both 1:1 and 1:2 cords will deliver only 370 W of 54 V power to an ICX 7250-24P device.

NOTE

The headers on the cords are color coded to help you connect them correctly to the switch and the EPS4000. You must connect the cables tightly using a flat-blade screwdriver for the latching screws. Otherwise, you could experience intermittent power supply failures.

The following figure shows EPS4000 DC power cords

FIGURE 53 DC power cords for the EPS4000



1. Connector headers EPS4000 side (black)
2. Switch side connector housing (1:1 cord)
3. Connector headers switch side (white)
4. Port #2 cord (Blue)
5. Port #1 cord (Black)
6. Switch side connector housing (1:2 cord)
7. Latch screws

Complete the following steps to connect the EPS4000 cord.



CAUTION

Do not use the cable to connect two EPS4000 ports.

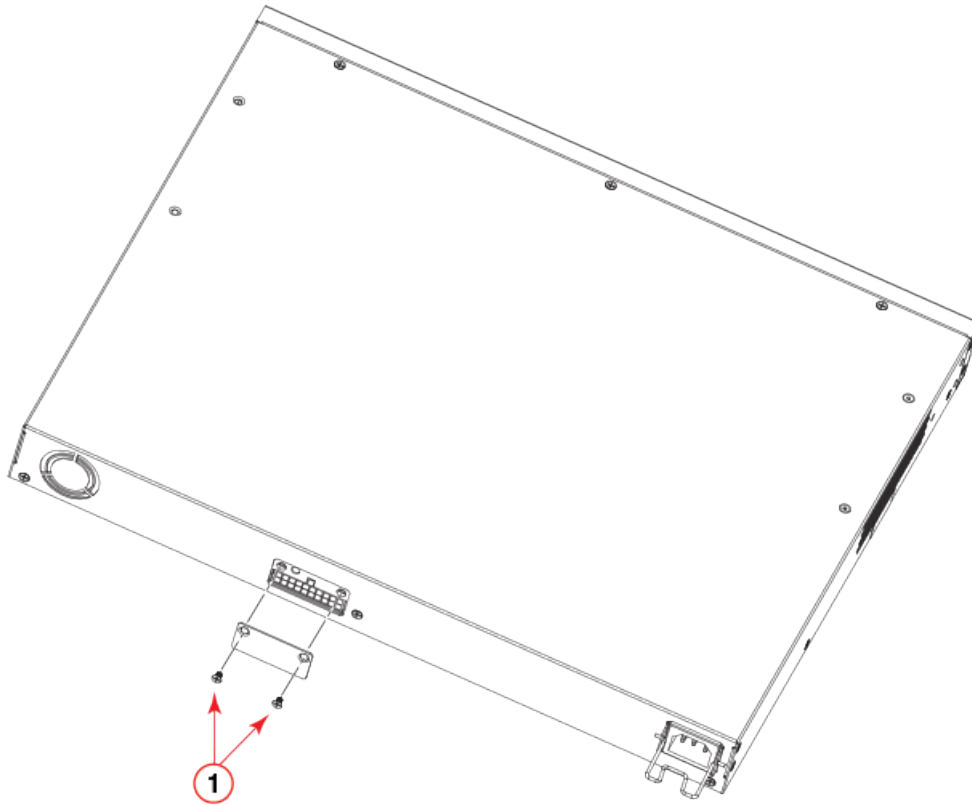
NOTE

You can connect either end of the cable first. Hot insertion is supported for cable installation.

NOTE

The device shown in the diagram may be different from the one you are using. The process to remove the EPS4000 faceplate is the same.

FIGURE 54 Removing the EPS4000 faceplate on the ICX 7250 device



1. Faceplate screws
1. Using a Phillips screwdriver, remove the two screws on the EPS4000 faceplate of the external power receptacle.
2. Attach the port side connector of the EPS4000 DC cord to the switch.
3. Attach the EPS4000 side connector of the EPS4000 DC cord to an available DC power port on the back of the EPS4000.
4. Use a flat-blade screwdriver to attach the latch screw on the DC cord to the EPS4000.

When the screw is tightened securely, all power supplies to your device will be active.

Powering on the system

After you complete the physical installation, you can power on the system.

NOTE

The power outlet should be installed near the equipment and should be easily accessible.

1. Remove the power cord from the shipping container.
2. Attach the AC power cord to the AC connector on the rear panel.

3. Insert the power cord plug into a 100V-240V outlet.

NOTE

To turn the system off, unplug the power cord or cords.

Connecting devices to the external power supply

Complete the following steps to connect devices to the external power supply.

1. Connect one end of the AC cord to the AC receptacle on the device, and the other end to a grounded power outlet.
2. Connect one end of an EPS cord to the external power receptacle on the device, and the other end to an available receptacle on the external power supply.
3. Repeat Step [Step 1](#) and Step [Step 2](#) to connect up to the allowable maximum number of devices to the external power supply. The maximum number of devices will depend on both the number of power supply units in the EPS4000 and whether you use 1:1 cords or 1:2 cords.
4. Connect one end of the AC cord to the AC receptacle on the external power supply, and the other end to a grounded power outlet.
5. Check the LEDs on the external power supply to ensure proper operation with the devices.

Verifying proper operation

After you have installed an external power supply, verify that the device is working properly by plugging it into a power source and verifying that it passes the self test.

1. Connect the power cord supplied with the device to the power connector on the power supply on the rear of the device.
2. Insert the other end into a properly grounded electrical outlet.
3. Verify that the LED for the power supply is green.
4. Verify proper operation by observing the LEDs.

LEDs for linked ports will come on during the boot process, and then all LEDs will go off. Once the boot sequence is complete, LEDs for linked ports will come on again.

EPS4000 external power supply technical specifications

System specifications

System component	Description
Enclosure	1U; 19-inch rack-mountable or desktop
Power inlet	C14 for AC power
Power outlet	Custom connector for DC power to all ICX 7250 devices except ICX 7250-24G
Power supply unit (PSU)	Up to four RPS17, field-replaceable units (FRU)
Fans	One fan per installed RPS17

Installing the EPS4000

EPS4000 external power supply technical specifications

System component	Description
Cooling	Forced air circulation Front-to-back airflow
System architecture	External power supply (also referred to as external power shelf)

Management

System component	Description
Console	RJ-45 serial port
Management interface	One 10/100 Ethernet, out-of-band management interface (RJ-45 port)

LEDs

System component	Description
Power status LEDs	Ex.y: 16 bicolor LEDs indicate 54 V power status for the PoE or PoE+ channels Rx.y: 16 bicolor LEDs indicate 12 V power status for redundant power NOTE x = 1 through 8 and y = 1 through 2
System status LED	CONFIG: Bicolor LED (green/amber) indicates the configuration mode
Management port status LEDs	2 green LEDs indicate status and activity

Other

System component	Description
RESET	Reset button for hardware reset without power cycling. There is a hole in the front panel to allow access. Sets EPS4000 to factory default settings.
RJ-45 console port	Console port for serial access to the device for management
Serial cable	RJ-45 console cable
DB9 adapter	DB9 adapter for serial connection

Weight and physical dimensions

Fully loaded: Populated with 4 RPS17 Power Supply Units (PSUs).

Model	Height	Width	Depth	Weight (empty)	Weight (fully loaded)
EPS4000	4.37 cm	43.7 cm	40.6 cm	4.87 kg	8.35 kg
	1.72 inches	17.2 inches	16.0 inches	10.7 lb	18.4 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	-5°C to 50°C (23°F to 122°F)	-25°C to 70°C (-13°F to 158°F)

Condition	Operational	Non-operational
Relative humidity (non-condensing)	5% to 95% at 50°C (122°F)	5% to 95% at 70°C (158°F)
Altitude (above sea level)	0 to 3,000 m (10,000 feet)	0 to 12,000 m (39,000 feet)
Shock	20 G, 11 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	1 G sine, 0.4 gms random, 5-500 Hz	2.4 G sine, 1.1 gms random, 5-500 Hz
Heat dissipation	Refer to RPS17 specification section in Ruckus ICX 7250 Switch Technical Specifications on page 95	N/A
Operating noise	Single PSU installed: 46.5 to 48.3 dBA Four PSUs installed : 53.4 dBA	N/A

Regulatory compliance (EMC)

- FCC Part 15, Subpart B (Class A)
- EN 55022 (CE mark) (Class A)
- EN 55024 (CE mark) (Immunity) for Information Technology Equipment
- ICES-003 (Canada) (Class A)
- AS/NZ 55022 (Australia) (Class A)
- VCCI (Japan) (Class A)
- EN 61000-3-2
- EN 61000-3-3
- EN 61000-6-1

Regulatory compliance (safety)

- CAN/CSA-C22.2 No. 60950-1-07/UL60950-1 - Safety of Information Technology Equipment
- EN 60825-1 Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide
- EN 60825-2 Safety of Laser Products - Part 2: Safety of Optical Fibre Communications Systems
- EN 60950-1, IEC 60950-1 Safety of Information Technology Equipment

Regulatory compliance (environmental)

- 2011/65/EU - Restriction of the use of certain hazardous substance in electrical and electronic equipment (EU RoHS)
- 2012/19/EU - Waste electrical and electronic equipment (EU WEEE)
- 94/62/EC - packaging and packaging waste (EU)
- 2006/66/EC - batteries and accumulators and waste batteries and accumulators (EU battery directive)
- 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU REACH)
- Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 - U.S. Conflict Minerals
- 30/2011/TT-BCT - Vietnam circular
- SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in EIPs (China)
- SJ/T 11364-2006 Marking for the Control of Pollution Caused by EIPs (China)

Configuring the Device

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- PC or terminal attachment..... 83
- Password assignment..... 84
- IP address configuration..... 86
- Connecting network devices..... 89
- Troubleshooting network connections..... 91
- Testing connectivity..... 92



DANGER

The procedures in this manual are for qualified service personnel.

Configuration tasks

Follow the steps listed in the following table to configure the device. Details for each of these steps are provided on the pages indicated.

TABLE 14 Configuration tasks

Task number	Task	Where to find more information
1	Attach a terminal or PC to the device. This will enable you to configure the device through the command line interface (CLI).	PC or terminal attachment on page 83
2	No default password is assigned to the CLI. For additional access security, assign a password.	Password assignment on page 84
3	Before attaching equipment to the device, you must configure an interface IP address to the subnet on which the device will be located. Initial IP address configuration is performed using the CLI with a direct serial connection.	IP address configuration on page 86
4	Once you power on the device and assign IP addresses, the system is ready to accept network equipment.	Configuring IP parameters for devices running Layer 3 software on page 87
5	Test IP connectivity to other devices by pinging them and tracing routes.	Testing connectivity on page 92
6	Continue configuring the device using the CLI. You can also use Brocade Network Advisor to manage the device.	<i>FastIron Ethernet Switch Administration Guide</i>
7	Secure access to the device.	<i>FastIron Ethernet Switch Administration Guide</i>

PC or terminal attachment

You can access the CLI by attaching a serial cable to the console port. After you assign an IP address, you can access the system through Telnet or Brocade Network Advisor.

Complete the following steps to attach a management station to the console port.

1. Connect a PC or terminal to the console (mini-USB) port of the device.

To connect the console port to a DB9 port, you need a cable with mini-USB and DB9 connectors.

For information about locating the serial port, refer to [Network and management interfaces](#) on page 14.

The serial port has a mini-USB connector. For port pinout information, refer to [Ruckus ICX 7250 Switch Technical Specifications](#) on page 95.

NOTE

You must run a terminal emulation program on the PC.

2. Launch the terminal emulation program and set the following session parameters:

- Baud: 9600 bps
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

The console serial communication port serves as a connection point for management by a PC or SNMP workstation. When you establish the serial connection to the system, press **Enter** to display the CLI prompt in the terminal emulation window, as shown in the following example.

```
device>
```

If you see this prompt, you are connected to the system and can proceed to [Password assignment](#) on page 84.

You can customize the prompt by changing the system name. For more information, refer to the *Ruckus FastIron Management Configuration Guide*.

If you do not see the prompt, make sure the cable is securely connected to your PC and to the Ruckus device.

Check the settings in your terminal emulation program. In addition to the previously configured session settings, make sure the terminal emulation session is running on the same serial port you attached to the Ruckus device.

Password assignment

By default, the CLI is not protected by passwords. To secure CLI access, Ruckus strongly recommends assigning passwords. Refer to the *FastIron Ethernet Switch Administration Guide*.

NOTE

You can assign passwords using Brocade Network Advisor if an enable password for a Super User has been configured on the device.

The CLI contains the following access levels:

- User EXEC: The level you enter when you first start a CLI session. At this level, you can view some system information but you cannot configure system or port parameters.
- Privileged EXEC: This level is also called the Enable level and can be secured by a password. You can perform tasks such as managing files on the flash module, saving the system configuration to flash, and clearing caches at this level.
- CONFIG: The configuration level. This level allows you to configure the system IP address and configure switching and routing features. To access the CONFIG mode, you must already be logged in to the privileged EXEC level.

You can set the following levels of Enable passwords:

- Super User: Allows complete read-and-write access to the system. This is generally for system administrators and is the only password level that allows you to configure passwords.

NOTE

You must set a Super User password before you can set other types of passwords.

- Port Configuration: Allows read-and-write access for specific ports but not for global (system-wide) parameters.
- Read-Only: Allows access to the privileged EXEC mode and CONFIG mode but only with read access.

Assigning passwords

Complete the following steps to set passwords.

NOTE

Depending on the device you purchased, and the code (Layer 2 or Layer 3) loaded on your system, the router prompt is displayed accordingly. For example, for an ICX 7250-48P device running Layer 3 code on the device, the router prompt displays ICX 7250-48P Router> at the CLI level.

1. At the opening CLI prompt, enter the following command to change to the Privileged EXEC mode:

```
device> enable
```

2. Access the configuration mode of the CLI by entering the following command:

```
device# configure terminal
```

3. Enter the following command to set the Super User password:

```
device(config)# enable super-user-password joe
```

NOTE

You must set the Super User password before you can set other types of passwords.

4. Enter the following commands to set the port configuration and read-only passwords:

```
device(config)# enable port-config-password john
device(config)# enable read-only-password sam
```

NOTE

If you forget your Super User password, refer to [Recovering from a lost password](#) on page 85.

Passwords can be up to 32 characters long.

Recovering from a lost password

By default, the CLI does not require passwords. However, if a password has been configured for the device but the password has been lost, you can regain Super User access to the device using the following procedure.

NOTE

Recovery from a lost password requires direct access to the serial port and a system reset.

1. Start a CLI session over the serial interface to the Ruckus device.
2. Reboot the device.

3. While the system is booting, before the initial system prompt appears, enter **b** to enter the boot monitor mode.
4. Enter **no password**. (You cannot abbreviate this command.)
5. Enter **boot**. This command causes the device to bypass the system password check.

After the console prompt reappears, assign a new password.

IP address configuration

You must configure at least one IP address using the serial connection to the CLI before you can manage the system using the other management interfaces.

Ruckus devices support both classical IP network masks (Class A, B, and C subnet masks, and so on) and Classless Interdomain Routing (CIDR) network prefix masks.

- To enter a classical IP network mask, enter the mask in IP address format. For example, enter "10.157.22.99 255.255.255.0" for an IP address with a Class C subnet mask.
- To enter a prefix number for a network mask, enter a forward slash (/) and the number of bits in the mask immediately after the IP address. For example, enter "10.157.22.99/24" for an IP address that has a network mask with 24 significant ("mask") bits.

By default, the CLI displays network masks in classical IP address format (for example, 255.255.255.0). You can change the display to the prefix format. Refer to the *FastIron Ethernet Switch Administration Guide*.

Devices running Layer 2 software

Use the following procedure to configure an IP address on a device running Layer 2 software.

1. At the opening CLI prompt, enter **enable**.

```
device> enable
```

2. Enter the following command at the Privileged EXEC level prompt, and then press **Enter**. This command erases the factory test configuration if still present.

```
device# erase startup-config
```



CAUTION

Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

3. Access the global configuration level of the CLI by entering the following command:

```
device# configure terminal
```

4. Configure the IP address and mask for the device.

```
device(config)# ip address 10.22.3.44 255.255.255.0
```

5. Set a default gateway address for the device.

```
device(config)# ip default-gateway 10.22.3.1
```

NOTE

You do not need to assign a default gateway address for single subnet networks.

Devices running Layer 3 software

Before attaching equipment to a Ruckus ICX device running Layer 3 software, you must assign an interface IP address to the subnet on which the device will be located. You must use the serial connection to assign the first IP address. For subsequent addresses, you also can use the CLI through Telnet.

By default, you can configure up to 24 IP interfaces on each port, virtual interface, and loopback interface. You can increase this amount to up to 64 IP subnet addresses per port by increasing the size of the subnet-per-interface table.

The following procedure shows how to add an IP address and mask to a router port.

1. At the opening CLI prompt, enter **enable**.

```
device> enable
```

2. Enter the following command at the privileged EXEC level prompt, and then press **Enter** . This command erases the factory test configuration if still present.

```
device# erase startup-config
```



CAUTION

Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

3. Access the global configuration level of the CLI by entering the following command.

```
device# configure terminal
device(config)#
```

4. Configure the IP addresses and mask addresses for the interfaces on the router.

```
device(config)# interface ethernet 2
device(config)# ip address 10.22.3.44 255.255.255.0
```

NOTE

You can use the **ip address** *ip-addr/mask-bits* command if you know the subnet mask length. In the previous example, you could enter **ip address 10.22.3.44/24**.

Use the **secondary** option of the **ip address** command parameter if you have already configured an IP address within the same subnet on the interface.

Configuring IP parameters for devices running Layer 3 software

You must configure IP parameters for devices running Layer 3 software.

Configuring IP addresses

You can configure an IP address on the following types of Layer 3 interfaces:

- Ethernet port
- Virtual routing interface (also called a Virtual Ethernet or "VE")
- Loopback interface

By default, you can have up to 24 IP addresses on each interface, but you can increase this number to 128 IP addresses.

NOTE

Once you configure a virtual routing interface on a VLAN, you cannot configure Layer 3 interface parameters on individual ports in the VLAN. Instead, you must configure the parameters on the virtual routing interface itself.

Assigning an IP address to an Ethernet port

Enter the following commands to assign an IP address to port 1/1/1.

```
device(config)# interface ethernet 1/1/1
device(config)# ip address 10.45.6.1 255.255.255.0
```

You also can enter the IP address and mask in CIDR format.

```
device># ip address 10.45.6.1/24
```

Assigning an IP address to a loopback interface

Loopback interfaces are always up, regardless of the states of physical interfaces. They can add stability to the network because they are not subject to route flap problems that can occur due to unstable links between a Layer 3 device and other devices. You can configure up to four loopback interfaces on a Layer 3 device.

You can add up to 24 IP addresses to each loopback interface.

NOTE

If you configure the device to use a loopback interface to communicate with a BGP4 neighbor, you must also configure a loopback interface on the neighbor and configure the neighbor to use that loopback interface to communicate with the Ruckus device.

To add a loopback interface, enter the **interface loopback num** and **ip address num** commands similar to the following example.

```
device(config)# exit
device(config)# interface loopback 1
device(config)# ip address 10.0.0.1/24
```

You can specify from 1 through the maximum number of virtual interfaces supported on the device by using the **interface loopback num** command. To display the maximum number of virtual interfaces supported on the device, enter the **show default values** command.

Assigning an IP address to a virtual routing interface

A virtual interface is a logical port associated with a Layer 3 Virtual LAN (VLAN) configured on a Layer 3 device. You can configure routing parameters on the virtual interface to enable the Layer 3 device to route protocol traffic from one Layer 3 VLAN to the other, without using an external router.

NOTE

The device uses the lowest MAC address on the device (the MAC address of port 1 or 1/1/1) as the MAC address for all ports within all virtual interfaces you configure on the device.

Enter commands similar to the following to add a virtual interface to a VLAN and configure an IP address on the interface.

```
device(config)# vlan 2 name IP-Subnet_10.1.2.1/24
device(config-vlan-2)# untag 1/1/1 to 1/1/4
device(config-vlan-2)# router-interface vel
device(config-vlan-2)# interface vel
device(config-vif-1)# ip address 10.1.2.1/24
```

The first two commands in this example create a Layer 3 protocol-based VLAN named "IP-Subnet_10.1.2.1/24" and add a range of untagged ports to the VLAN. The **router-interface** command creates virtual interface 1 as the routing interface for the VLAN. The last two commands change to the interface configuration level for the virtual interface and assign an IP address to the interface.

Deleting an IP address

Enter a command similar to the following to delete an IP address.

```
device(config-if-1/1/1)# no ip address 10.1.2.1
```

This command deletes IP address 10.1.2.1. You do not need to enter the subnet mask.

To delete all IP addresses from an interface, enter the following command.

```
device(config-if-1/1/1)# no ip address *
```

Connecting network devices

Ruckus devices support connections to other vendors' routers, switches, and hubs, as well other Ruckus devices.

Connectors

For port pinouts, refer to [Ruckus ICX 7250 Switch Technical Specifications](#) on page 95.

Cable specifications

For information about supported transceivers and cable lengths and types, refer to the Ruckus optics family datasheet.

Connecting to Ethernet or Fast Ethernet hubs

For copper connections to Ethernet hubs, a 10/100Base-TX or 1000Base-T switch, or another Ruckus device, a crossover cable is required as shown in the following figure. If the hub is equipped with an uplink port, it requires a straight-through cable instead of a crossover cable.

NOTE

The 802.3ab standard (automatic MDI or MDIX detection) calls for automatic negotiation of the connection between two 1000Base-T ports. In this case, a straight-through cable may work just as well as a crossover cable. For more information, refer to the *FastIron Ethernet Switch Administration Guide*.

FIGURE 55 UTP crossover cable



FIGURE 56 Straight-through cable



Connecting to workstations, servers, or routers

Straight-through UTP cabling is required for direct UTP attachment to workstations, servers, or routers using network interface cards (NICs).

Fiber cabling is required for direct attachment to Gigabit NICs or switches and routers through fiber ports. Refer to [Connecting a network device to a fiber port](#) on page 91.

Automatic MDI or MDIX detection

All 10/100 and 1000 Mbps Ethernet copper ports on the devices support automatic Media Dependent Interface (auto-MDI) or automatic Media Dependent Interface Crossover (auto-MDIX) detection. Auto-MDI or auto-MDIX is enabled on all 10/100 and 1000 Mbps copper ports by default. For each port, you can disable auto-MDI or auto-MDIX, designate the port as an MDI port, or designate the port as an MDIX port.

For more information about this feature and how to configure it, refer to the *FastIron Ethernet Switch Administration Guide*.

Connecting a network device to a fiber port

For direct attachment from the device to a Gigabit NIC, switch, or router, using a fiber-optic transceiver, you need fiber cabling with an LC connector.

To connect the device to another network device using a fiber port, you must perform the following tasks:

- Install a fiber-optic transceiver (SFP or SFP+).
- Cable the fiber-optic transceiver.

For instructions on installing fiber-optic transceivers, refer to [Installing a fiber-optic transceiver](#) on page 110.

For instructions on cabling a fiber-optic transceiver, refer to [Cabling a fiber-optic transceiver](#) on page 111.

For instructions on cleaning a fiber-optic module, refer to [Cleaning the fiber-optic connectors](#) on page 112.

Troubleshooting network connections

- For the indicated port, verify that both ends of the cabling (at the device and the connected device) are snug.
- Verify that the device and the connected device are both powered on and operating correctly.
- Verify that you have used the correct cable type for the connection:
 - For twisted-pair connections to an end node, use straight-through cabling.
 - For fiber-optic connections, verify that the transmit port on the device is connected to the receive port on the connected device, and that the receive port on the device is connected to the transmit port on the connected device.
- Use the CLI to verify that the port has not been disabled through a configuration change. If you have configured an IP address on the device, you also can use Brocade Network Advisor.
- If the other procedures do not resolve the problem, try using a different port or a different cable.
- If a 1-Gbps optic transceiver is inserted into an ICX 7250 device, you must configure the port using the **speed-duplex 1000-full-master** command at the interface level.

Digital optical monitoring

NOTE

10 Gbps optical transceivers are not supported on ICX 7250-24G devices.

You can configure your device to monitor optical transceivers in the system, either globally or by specified port. When this feature is enabled, the system monitors the temperature and signal power levels for the optical transceivers in the specified ports. Console messages and syslog messages are sent when optical operating conditions fall below or rise above the SFP and SFP+ manufacturer's recommended thresholds. For more information about digital optical monitoring, refer to the *FastIron Ethernet Switch Administration Guide*.

Testing connectivity

Test for connectivity by observing the LEDs related to network connection.

Pinging an IP address

To verify that a device can reach another device through the network, enter a command similar to the following at any level of the CLI.

```
device> ping 10.33.4.7
```

NOTE

If you address the ping to the IP broadcast address, the device lists the first four responses.

Observing LEDs

After you install the network cables, you can observe certain LEDs to determine if the network connections are functioning properly. The following table outlines the LEDs related to the network connections, the desired state of each LED, possible abnormal states of each LED, and what to do if an LED indicates an abnormal state.

TABLE 15 Network connection-related LED states

LED	Desired state	Meaning	Abnormal state	Meaning or action
Ethernet (1-24/48)	On or flashing (Green)	The port has established a valid link at 10, 100, or 1000 Mbps. Flashing indicates the port is transmitting and receiving user packets.	Off	A link is not established with the remote port. You can do the following: <ul style="list-style-type: none">• Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly.• Verify that the port has not been disabled through a configuration change. You can use the CLI. If you have configured an IP address on the device, you also can use the Web management interface or Brocade Network Advisor.• If the other actions do not resolve the problem, try using a different port or a different cable.
PoE (1-24/48)	On (Green)	The port is providing PoE power to a connected device.	Off	A link is not established with the PoE device. You can do the following: <ul style="list-style-type: none">• Verify that the connection to the other network device has been properly made.• If the other actions do not resolve the problem, try using a different port or a different cable.

TABLE 15 Network connection-related LED states (continued)

LED	Desired state	Meaning	Abnormal state	Meaning or action
SFP (X1 - X4) for ICX 7250-24G devices SFP+ (X1 - X8) for all other ICX 7250 devices	On or flashing (Green or Yellow)	Flashing yellow indicates the port is transmitting and receiving user packets at 1 Gbps. The SFP+ port is operating at 10 Gbps. Flashing green indicates the port is transmitting and receiving user packets at 10 Gbps.	Off	A link is not established with the remote port. You can do the following: <ul style="list-style-type: none"> • Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly. • Verify that the transmit port on the device is connected to the receive port on the other network device, and that the receive port on the device is connected to the transmit port on the other network device. If you are not certain, remove the two cable connectors from the port connector and reinsert them in the port connector, reversing their order. • Dust may have accumulated in the cable connector or port connector. For information about cleaning the connectors, refer to Cleaning the fiber-optic connectors on page 112. • Verify that the port has not been disabled through a configuration change. • Ensure that the SFP+ transceivers in both ends are of the same optic type (for example, SR, LR, LRM). • If the other actions do not resolve the problem, try using a different port or a different cable.

If a problem persists after taking these actions, contact Ruckus Technical Support.

Tracing a route

To determine the path through which a Ruckus device can reach another device, enter a command similar to the following at any level of the CLI on the device.

```
device> traceroute 10.33.4.7
```

The CLI displays trace route information for each hop as soon as the information is received. Traceroute requests display all responses to a given TTL. In addition, if there are multiple equal-cost routes to the destination, the Ruckus device displays up to two responses by default.

Ruckus ICX 7250 Switch Technical Specifications

System specifications

System component	Description
Enclosure	1U; 19-inch rack-mountable; desktop- or wall-mountable
Power inlet	C14 for AC power Custom connector for DC power from EPS4000 (not available on the ICX 7250-24G)
Power supplies	Integrated AC power supply for system and PoE power External AC power supply (EPS4000) for redundant system power and extended PoE/PoE+ power (not applicable to the ICX 7250-24G). DC power supplied to the switches depends on the EPS4000 configuration.
Fans	ICX 7250-24G: One fan per device ICX 7250-24 : One fan per device ICX 7250-24P: Two fans per device ICX 7250-48: Two fans per device ICX 7250-48P: Three fans per device
Cooling	Forced air circulation ICX 7250-24G: front-to-back airflow All other models: sides-to-back airflow
System architecture	Edge Ethernet switches ICX 7250-24G: SFP uplink ports ICX 7250-24, ICX 7250-24P, ICX 7250-48, ICX 7250-48P: SFP+ uplink and stacking ports ICX 7250-24P, ICX 7250-48P: PoE/PoE+ ports

Ethernet

System component	Description
Ethernet ports	ICX 7250-24G: 24 RJ-45 GbE, 4 SFP GbE ICX 7250-24: 24 RJ-45 GbE, 8 SFP+ 10 GbE ICX 7250-24P: 24 RJ-45 GbE with PoE/PoE+, 8 SFP+ 10 GbE ICX 7250-48: 48 RJ-45 GbE, 8 SFP+ 10 GbE ICX 7250-48P: 48 RJ-45 GbE with PoE/PoE+, 8 SFP+ 10 GbE
Management interface	One 10/100/1000 Ethernet, out-of-band management interface (RJ-45 port)

LEDs

System component	Description
Port status LEDs	<p>RJ-45: Indicates Ethernet link status and speed</p> <p>PoE/PoE+: Indicates if a port is providing PoE or PoE+ power to a connected device</p> <p>SFP/SFP+: Indicates link status and speed for SFP or SFP+ ports</p> <p>Out-of-band management port: Two single-color LEDs indicate out-of-band management port link status and speed</p>
System status LEDs	<p>PWR: Bicolor LED (green/amber) indicates the internal power status</p> <p>DIAG: Bicolor LED (green/amber) controlled by software to indicate the system is in diagnostic mode</p> <p>NOTE The following LEDs are not available on the ICX 7250-24G.</p> <p>EPS1: Bicolor LED (green/amber) indicates if the external power supply (EPS1) is operating normally</p> <p>EPS2 (available only on the ICX 7250-48P): Bicolor LED (green/amber) indicates if the external power supply (EPS2) is operating normally</p> <p>MS: Bicolor LED (green/amber) controlled by software to indicate master/slave status in stacking mode</p> <p>UPLINK: Software-controlled LED (green) to indicate stacking uplink port status</p> <p>DOWNLINK: Software-controlled LED (green) to indicate stacking uplink port status</p> <p>(Stack) ID: Ten LEDs (green) to display stacking ID from 1 to 19. The LED marked 10+ is used in conjunction with the others (1 through 9) to indicate stacking IDs 11 to 19.</p> <p>NOTE For those devices that support stacking, the maximum stack size is 12 units.</p>

Other

System component	Description
RESET	Reset button for hardware reset without power cycling. There is a hole in the front panel to allow access.
Mini-USB port	Console port for serial access to the device for management
USB port	Standard type-A USB connector for removable media
Serial cable	Mini-USB to RJ-45 console cable: BPN 50-1000122-01
RJ-45 connector	2x6 stacked RJ-45 connectors for GbE data ports

Weight and physical dimensions

Model	Height	Width	Depth	Weight
ICX 7250-24G	4.37 cm	44.0 cm	28 cm	3.6 kg
	1.72 in	17.32 in	11 in	7.9 lb
ICX 7250-24	4.37 cm	44.0 cm	28 cm	3.8 kg
	1.72 in	17.32 in	11 in	8.4 lb

Model	Height	Width	Depth	Weight
ICX 7250-24P	4.37 cm	44.0 cm	28 cm	4.7 kg
	1.72 in	17.32 in	11 in	10.3 lb
ICX 7250-48	4.37 cm	44.0 cm	37 cm	4.8 kg
	1.72 in	17.32 in	14.6 in	10.6 lb
ICX 7250-48P	4.37 cm	44.0 cm	37 cm	5.9 kg
	1.72 in	17.32 in	14.6 in	13.0 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	-5°C to 50°C (23°F to 122°F)	-25°C to 70°C (-13°F to 158°F)
Relative humidity (non-condensing)	5% to 95% at 50°C (122°F)	5% to 95% at 70°C (158°F)
Altitude (above sea level)	0 to 3,000 m (10,000 feet)	0 to 12,000 m (39,000 feet)
Shock	20 G, 11 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	1 G sine, 0.4 gms random, 5-500 Hz	2.4 G sine, 1.1 gms random, 5-500 Hz
Airflow	ICX 7250-24G: 14.3 CFM (Maximum), 5.7 CFM (Typical) ICX 7250-24 : 14.0 CFM (Maximum), 5.7 CFM (Typical) ICX 7250-24P: 34.4 CFM (Maximum), 13.7 CFM (Typical) ICX 7250-48: 34.8 CFM (Maximum), 13.8 CFM (Typical) ICX 7250-48P: 45.2 CFM (Maximum), 21.4 CFM (Typical)	N/A
Heat dissipation	Refer to Power Consumption specification sections	N/A
Operating noise	ICX 7250-24G: 40 dBA ICX 7250-24: 41.9 dBA ICX 7250-24P: 44.7 dBA ICX 7250-48: 44.5 dBA ICX 7250-48P: 45.9 dBA	N/A

Power supply specifications (per PSU)

The EPS4000 and its power supply modules (RPS17) are field-replaceable. All other Ruckus ICX 7250 power supply units (PSUs) are fixed and internal to the devices. All the PSUs use a C14 inlet and connect to standard AC power.

NOTE

The EPS4000 must have at least one RPS17 installed to provide power to the supported Ruckus ICX 7250 devices.

Ruckus ICX 7250 Switch Technical Specifications
Power consumption (idle configuration)

Device	Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Input line protection	Maximum inrush current
ICX 7250-24G ICX 7250-24	65 W	100 - 240 VAC (nominal) 90 - 264 VAC (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	1.5 A (rms)	Line fused	40 A at 115 VAC 80 A at 230 VAC Cold start @ 25°C
ICX 7250-24P	525 W	100 - 240 VAC (nominal) 90 - 264 VAC (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	6 A (rms)	Line fused	30 A at 115 VAC 60 A at 230 VAC Cold start @ 25°C
ICX 7250-48	100 W	100 - 240 VAC (nominal) 90 - 264 VAC (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	2.0 A (rms)	Line fused	65 A at 115 VAC 130 A at 230 VAC Cold start @ 25°C
ICX 7250-48P	880 W	100 - 240 VAC (nominal) 90 - 264 VAC (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	10.8 A (rms)	Line and neutral fused	60 A at 115 VAC 120 A at 230 VAC Cold start @ 25°C
EPS4000	920 W (per installed PSU)	100 - 240 VAC (nominal) 90 - 264 VAC (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	13 A (rms)	Line and neutral fused	75 A at 230 VAC Cold start @ 25°C

Power consumption (idle configuration)

Idle: No optics or connections to ports installed and system booted up. Fans at nominal speed.

NOTE

The Ruckus ICX 7250 does not support -48 VDC input power.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
ICX 7250-24G	0.56 A 33.6 W 114.7 BTU/hr	0.35 A 33.3 W 113.5 BTU/hr	N/A	1	All ports down, no optics or cables connected. No Load (traffic)
ICX 7250-24	0.71 A 42.6 W 145.4 BTU/hr	0.41 A 39.0 W 132.9 BTU/hr	N/A	1	All ports down, no optics or cables connected. No Load (traffic)
ICX 7250-24P	0.5 A 48.0 W 163.8 BTU/hr	0.36 A 48.0 W 163.8 BTU/hr	N/A	1	All ports down, no optics or cables connected. No Load (traffic)

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
ICX 7250-48	0.51 A 50.6 W 172.8 BTU/hr	0.28 A 51.1 W 174.3 BTU/hr	N/A	1	All ports down, no optics or cables connected. No Load (traffic)
ICX 7250-48P	0.73 A 70.8 W 241.6 BTU/hr	0.46 A 70.8 W 241.6 BTU/hr	N/A	1	All ports down, no optics or cables connected. No Load (traffic)

Power consumption (typical configuration)

Typical: 10% traffic rate on all ports with 64-byte packet size and random payload at room temperature. All ports fully configured. Fans at nominal speed.

NOTE

The Ruckus ICX 7250 does not support -48 VDC input power.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
ICX 7250-24G	0.71 A 42.6 W 216.9 BTU/hr	0.42 A 39.9 W 136.2 BTU/hr	N/A	1	24 1-GbE and 4 10-GbE ports are linked UP ONLY. 10% traffic.
ICX 7250-24	0.86 A 51.6 W 176.1 BTU/hr	0.52 A 49.4 W 168.6 BTU/hr	N/A	1	24 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic.
ICX 7250-24P	4.46 A 441.0 W 1505.2 BTU/hr	2.18 A 428.0 W 1460.8 BTU/hr	N/A	1	24 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic. 100% PoE Load @ Class 3 (15.4 W/port)
ICX 7250-48	0.64 A 63.6 W 216.9 BTU/hr	0.34 A 61.1 W 208.6 BTU/hr	N/A	1	48 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic.
ICX 7250-48P	9.23 A 920.0 W 3140.0 BTU/hr	4.43 A 862.0 W 2942.1 BTU/hr	N/A	1	48 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic. 100% PoE Load @ Class 3 (15.4 W/port)

Power consumption (maximum configuration)

Maximum: All ports fully configured with connection and traffic at maximum throughput. Fans at high speed.

NOTE

The Ruckus ICX 7250 does not support -48 VDC input power.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
ICX 7250-24G	0.74 A 44.4 W 151.5 BTU/hr	0.45 A 42.3 W 144.3 BTU/hr	N/A	1	24 1-GbE and 4 10-GbE ports are linked UP ONLY. 100% traffic.
ICX 7250-24	0.96 A 57.6 W 196.6 BTU/hr	0.57 A 54.2 W 184.8 BTU/hr	N/A	1	24 1-GbE and 8 10-GbE ports are linked UP ONLY. 100% traffic.
ICX 7250-24P	4.56 A 454.0 W 1549.5 BTU/hr	2.24 A 439.0 W 1498.3 BTU/hr	N/A	1	24 1-GbE and 8 10-GbE ports are linked UP ONLY. 100% traffic. 100% PoE Load @ Class 3 (15.4 W/port)
ICX 7250-48	0.70 A 69.5 W 237.2 BTU/hr	0.38 A 69.3 W 236.6 BTU/hr	N/A	1	48 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic.
ICX 7250-48P	9.45 A 942.0 W 3215.1 BTU/hr	4.49 A 880.0 W 3003.5 BTU/hr	N/A	1	48 1-GbE and 8 10-GbE ports are linked UP ONLY. 10% traffic. 100% PoE Load @ Class 3 (15.4 W/port)

Data port specifications (Ethernet)

NOTE

The ICX 7250 10G ports provide a combination of active and passive cable support. Ports 1/2/1 to 1/2/4 can only be used with active cables when used for uplinks and either passive or active when used for stacking. Ports 1/2/5 to 1/2/8 can be used with either active or passive cable for any connection type.

Model	Port type	Number of ports	Description
ICX 7250-24G	GbE (copper)	24	RJ-45 10/100/1000 ports
	GbE (optical)	4	SFP uplink ports
ICX 7250-24	GbE (copper)	24	RJ-45 10/100/1000 ports
	10 GbE (optical)	8	Uplink or stacking SFP+ ports

Model	Port type	Number of ports	Description
ICX 7250-24P	GbE (copper)	24	RJ-45 10/100/1000 ports
	10 GbE (optical)	8	Uplink or stacking SFP+ ports
ICX 7250-48	GbE (copper)	48	RJ-45 10/100/1000 ports
	10 GbE (optical)	8	Uplink or stacking SFP+ ports
ICX 7250-48P	GbE (copper)	48	RJ-45 10/100/1000 ports
	10 GbE (optical)	8	Uplink or stacking SFP+ ports

Serial port specifications (pinout mini-USB)

Pin	Signal	Description
1	Reserved	Not used
2	UART_RX	Receive data by Ruckus ICX 7250
3	UART_TX	Transmit data by Ruckus ICX 7250
4	Reserved	Not used
5	GND	Logic ground

Serial port specifications (protocol)

Parameter	Value
Baud	9600 bps
Data bits	8
Parity	None
Stop bits	1
Flow control	None

Memory specifications

Memory	Type	Size
Boot	SPI Flash	2 x 8 MB
Compact Flash	NAND	2 GB
Main	DDR3 (onboard IC)	ICX 7250-24G: 1 GB ICX 7250-24: 2 GB ICX 7250-24P: 2 GB ICX 7250-48: 2 GB ICX 7250-48P: 2 GB

Regulatory compliance (EMC)

- FCC Part 15, Subpart B (Class A)
- EN 55022 (CE mark) (Class A)
- EN 55024 (CE mark) (Immunity) for Information Technology Equipment
- ICES-003 (Canada) (Class A)
- AS/NZ 55022 (Australia) (Class A)
- VCCI (Japan) (Class A)
- EN 61000-3-2
- EN 61000-3-3
- EN 61000-6-1

Regulatory compliance (safety)

- CAN/CSA-C22.2 No. 60950/UL 60950
- EN 60825 Safety of Laser Products
- EN 60950/IEC 60950 Safety of Information Technology Equipment

Regulatory compliance (environmental)

- 2011/65/EU - Restriction of the use of certain hazardous substance in electrical and electronic equipment (EU RoHS).
- 2012/19/EU - Waste electrical and electronic equipment (EU WEEE).
- 94/62/EC - packaging and packaging waste (EU).
- 2006/66/EC - batteries and accumulators and waste batteries and accumulators (EU battery directive).
- 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU REACH).
- Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 - U.S. Conflict Minerals.
- 30/2011/TT-BCT - Vietnam circular.
- SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in EIPs (China).
- SJ/T 11364-2006 Marking for the Control of Pollution Caused by EIPs (China).

Managing an ICX 7250 Device

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- Managing temperature settings..... 104
- Displaying CPU usage..... 107
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DANGER

The procedures in this manual are for qualified service personnel.

Device management options

You can use the built-in management functions of the device to monitor the topology, port status, physical status, and other information that help you analyze the switch performance, and to accelerate system debugging. The device automatically performs power-on self-test (POST) each time it is turned on. Errors, if any, are recorded in the syslog messages.

You can manage the device using any of the management options listed in the following table.

TABLE 16 Management options for the device

Management tool	Out-of-band support	Reference documents
Command line interface (CLI)	Ethernet, serial connection, or USB console	<i>Ruckus FastIron Command Reference</i> <i>Feature-based Configuration Guides</i>
SmartZone	Ethernet or connection via IP address	Ruckus SmartZone 100 and Virtual SmartZone-Essentials Administrator Guide
Standard SNMP applications	Ethernet or serial connection	<i>Ruckus FastIron MIB Reference</i>
Ruckus FastIron Web Management Interface	Ethernet or connection via IP address	<i>Ruckus FastIron Web Management Interface User Guide</i> NOTE Not all FastIron features are supported via the web management interface.
Brocade Network Advisor (BNA) NOTE Effective November 30, 2018, the Brocade Network Advisor for managing Ruckus switches and Access Points have gone End of Sale. We recommend that you use Ruckus SmartZoneOS 5.	Ethernet or serial connection	The Brocade Network Advisor documentation set.

Managing temperature settings

The device contains temperature sensors that the software reads based on a configurable device poll time. The devices have two automatic speed fan control settings based on the temperature. To protect the device from overheating, the following temperature threshold levels exist:

- The warning level is the temperature at which the device generates a syslog message. It is configurable up to 100°C.
- The shutdown level is the temperature at which the device reboots. It is set by the device and is not configurable. When the device temperature reaches the shutdown level, it generates a warning message that the device's temperature is over the shutdown level and the device shuts down in five minutes. The system restarts five minutes after the device reaches the temperature shutdown level.

Temperature threshold levels

The switch fans have two speeds, low and high. The fan speed settings are set by the device, and are not configurable.

During system bootup, the fans run at high speed. If the switch does not detect any fans, the switch shuts down.

After bootup, the fans operate at low speed when the temperature of the switch is below the high limit temperature that is specified in the following table. If the switch reaches the high limit temperature, the fans operate at high speed until the switch reaches the low limit temperature specified in the table, at which time the fans decrease to low speed.

If the switch reaches or exceeds the critical (shutdown) temperature for two minutes, the switch shuts down.

NOTE

In addition to the overall temperature of the module, the ICX 7250-24P and ICX 7250-48P modules monitor the temperature of the Power Over Ethernet (PoE) power supply unit (PSU). When the low limit and high limit temperatures are reached, the PoE PSU fans change speed using the same algorithm as the module fans. There is no change to the Critical (shutdown) temperature value for these modules.

TABLE 17 Temperature thresholds

Model	Low limit temperature	High limit temperature	Critical (shutdown) temperature
ICX 7250-24G	71° C	98° C	105° C
ICX 7250-24	67° C	98° C	105° C
ICX 7250-24P	82° C PoE PSU: 34° C	93° C PoE PSU: 41° C	105° C
ICX 7250-48P	85° C PoE PSU: 49° C	95° C PoE PSU: 57° C	105° C
ICX 7250-48	67° C	98° C	105° C

Fan detection and error checking policies

During system startup and operation, the Ruckus ICX 7250, checks the fan status and automatically performs corrective actions and generates syslog messages if a problem is detected (refer to the following table).

If the Ruckus ICX 7250 determines that there is a problem with the fans, it performs the following actions and generates the following syslog messages, as shown in the following table.

NOTE

To determine the fan direction (either front to back, or back to front), enter the **show chassis** command.

TABLE 18 Ruckus ICX 7250 fan error detection and resolution

Issue detected	Attempted resolution
During system bootup, no fan is detected	The system immediately shuts down.
During system bootup, fewer fans than required for normal operation are detected	The system boots up normally and follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
System boots up normally, but all fans fail during system operation	The system immediately shuts down. A syslog message describing the issue is generated prior to shutdown.
After system bootup, fewer fans than required for normal operation are detected	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
After system bootup, two of the power supply fans are detected as operating in opposite directions	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
After system bootup, two of the module fans are detected as operating in opposite directions	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
After system bootup, the power supply and module fans are detected as operating in opposite directions	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
During normal system operation, one of the module fans reports that it is operating in the incorrect direction	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
During normal system operation, the system detects that a power supply or module fan has been replaced, and the new fan is operating in the incorrect direction	No action is performed. The system follows the fan speed and shutdown policy as described in Temperature threshold levels on page 104. A syslog message is generated that describes the issue.
System detects that the critical (shutdown) temperature has been exceeded	The system generates a syslog message when the issue is detected, and every 30 seconds after detection. If the critical (shutdown) temperature is exceeded for two minutes, the system shuts down.

Shutdown reset time and syslog message

When the temperature crosses the critical (shutdown) threshold levels, the device will reset after 5 minutes. The following console and syslog message is displayed:

```
!!! Temperature is over shutdown level, please shutdown your stack unit 1 to avoid hw damage!!!
```

NOTE

Ruckus recommends that you shut down your stack unit to avoid any hardware damage.

Displaying the temperature

To display the temperature of a device, enter the **show chassis** command at any level of the CLI. The **show chassis** command displays the current temperature, the power supply status, and temperature threshold levels.

NOTE

The displayed temperature reflects the temperature of the board inside the device.

```
device# show chassis
```

```
The stack unit 1 chassis info:
Power supply present, status ok
Sensor B Temperature Readings:
```

```
Current temperature : 55.0 deg-C
Sensor A Temperature Readings:
Current temperature : 50.0 deg-C
Warning level.....: 71.0 deg-C
Shutdown level.....: 105.0 deg-C
Boot Prom MAC : 748e.f8ea.0360
Management MAC: 748e.f8ea.0360
=====
```

Displaying syslog messages for temperature

The software sends a syslog message and an SNMP trap if the temperature crosses the warning or shutdown thresholds. If you have configured the device to use a syslog server or SNMP trap receiver, refer to the documentation for the server or receiver.

To display the system log, enter the **show log** command at any CLI level.

```
device# show log

Syslog logging: enabled (0 messages dropped, 0 flushes, 0 overruns)
Buffer logging: level ACDMEINW, 20 messages logged
level code: A=alert C=critical D=debugging M=emergency E=error
             I=informational N=notification W=warning
Static Log Buffer:
1d02h07m29s:A:System: Stack unit 1 Temperature 60.0 C degrees, warning level 55.0 C degrees, shutdown level
65.0 C degrees
1d02h07m29s:W:System: Temperature is over warning level on unit 1
Dec 1 10:16:34:A:System: Stack unit 2 Temperature 46.0 C degrees, warning level 70.0 C degrees, shutdown
level 80.0 C degrees
Dec 1 10:16:34:A:System: Temperature on Unit 2 is over shutdown level, system is going to be reset in 2
seconds
Dynamic Log Buffer (50 lines):
0d00h00m53s:I:STP: VLAN 1 Port 1/2/2 Bridge TC Event (FwdDlyExpiry)
0d00h00m53s:I:STP: VLAN 1 Port 1/2/2 STP State -> FORWARDING (FwdDlyExpiry)
0d00h00m37s:I:STP: VLAN 1 Port 1/2/2 STP State -> LEARNING (FwdDlyExpiry)
0d00h00m26s:I:STP: VLAN 1 Port 1/2/3 STP State -> FORWARDING (FwdDlyExpiry)
0d00h00m26s:I:STP: VLAN 1 Port 1/1/1 STP State -> FORWARDING (FwdDlyExpiry)
0d00h00m24s:I:STP: VLAN 1 Port 1/2/3 STP State -> LEARNING (FwdDlyExpiry)
0d00h00m24s:I:STP: VLAN 1 Port 1/1/1 STP State -> LEARNING (FwdDlyExpiry)
0d00h00m23s:I:STP: VLAN 1 Port 1/2/4 STP State -> BLOCKING (MakeBlking)
0d00h00m22s:I:System: Interface ethernet 1/2/4, state up
0d00h00m22s:I:STP: VLAN 1 Port 1/2/4 STP State -> LISTENING (MakeFwding)
0d00h00m22s:I:System: Interface ethernet 1/2/3, state up
```

Changing the temperature warning level

To change the temperature at which the device sends a syslog message and an SNMP trap, enter the **temperature warning stack-id value** command at the privileged EXEC level of the CLI.

```
device# temperature warning 1 82
```

The *stack-id* variable can be a value from 1 through 12.

The *value* variable is the temperature warning level, in Celsius. You cannot set this level higher than the maximum value allowed by your device. The temperature warning level must be at least five degrees Celsius less than the temperature shutdown level, which is automatically set by the device.

The following console and syslog message is displayed when the temperature reaches the warning level:

```
!!! Temperature is over warning level on stack unit 1!!!
```

Changing the temperature poll time

By default, the software polls the temperature sensor every 60 seconds to get the current temperature. This poll rate is controlled by the device poll time, which also controls how often the software polls other system components.

To change the poll time, enter the **chassis poll-time** *value* command at the global configuration level.

```
device(config)# chassis poll-time 200
```

The *value* variable can be from 0 through 65535 seconds.

Displaying CPU usage

You can display the amount of the CPU in use. To do so, enter the **show cpu** command at any level of the CLI.

```
device# show cpu

20 percent busy, from 318 sec ago
1  sec avg:  2 percent busy
5  sec avg:  1 percent busy
60 sec avg:  1 percent busy
300 sec avg: 1 percent busy
```

Removing MAC address entries

You can remove the following types of learned MAC address entries from the system MAC address table:

- All MAC address entries
- All MAC address entries for a specified Ethernet port
- All MAC address entries for a specified VLAN
- A specified MAC address entry in all VLANs

For example, to remove entries for the MAC address 00-00-00 in all VLANs, enter the following command at the privileged EXEC level of the CLI.

```
device# clear mac-address 00-00-00
```

Syntax: **clear mac-address** [*mac-address* | **ethernet** *port-num* | **vlan** *number*]

If you enter the **clear mac-address** command without any parameters, the software removes all MAC entries.

Use the **clear mac-address** *mac-address* command to remove a specified MAC address from all VLANs. Specify the MAC address in the following format: *HHHH.HHHH.HHHH*.

Use the **clear mac-address ethernet** *port-num* command to remove all MAC addresses for a specified Ethernet port.

Use the **clear mac-address vlan** *number* command to remove all MAC addresses for a specified VLAN.

Hardware Maintenance Schedule

- Pre-connection cleaning recommendations..... 109
- Copper or fiber-optic module replacement..... 109
- Cabling a fiber-optic transceiver..... 112



DANGER

The procedures in this manual are for qualified service personnel.

Pre-connection cleaning recommendations

The ICX 7250 devices require minimal maintenance for their hardware components. However, Ruckus recommends cleaning the fiber-optic connectors on a fiber-optic port and the connected fiber cable each time you disconnect or reconnect the cable as shown in [Cleaning the fiber-optic connectors](#) on page 112.

Copper or fiber-optic module replacement

You can replace the copper and fiber-optic modules (SFP and SFP+ transceivers). You can remove an SFP or an SFP+ transceiver from a slot and replace it with a new one while the ICX 7250 device is powered on and running.

Removing a copper or fiber-optic module

You can remove a copper or fiber SFP or SFP+ transceiver from a slot while the ICX 7250 device is powered on and running.

While removing a copper or fiber-optic module, be sure to wear an ESD wrist strap with a plug that can be inserted in the ESD connector on the ICX 7250 device.



DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

To remove a copper or fiber-optic module from an SFP or SFP+ slot, complete the following steps.

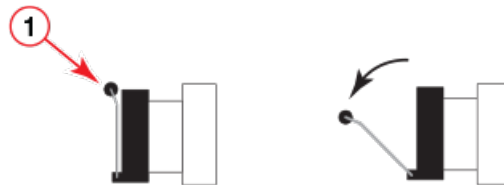
1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack).
2. Disconnect the copper or fiber cable connector from the port connector.

3. Unlock the copper or fiber-optic module by pulling the bail latch forward, away from the front panel of the module. This unlocks the module from the front panel.

NOTE

On 1000Base-SX ports, the bail latch is enclosed in a black sleeve, and on 1000Base-LX ports, the bail latch is enclosed in a blue sleeve.

FIGURE 57 Unlocking the bail latch



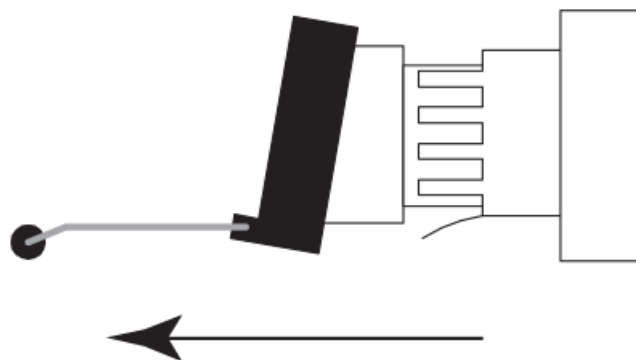
- a. Bail latch

NOTE

The bail latch may be attached to either the top or the bottom of the SFP transceiver.

4. Grasp the bail latch and pull the copper or fiber-optic module out of the port.

FIGURE 58 Removing the fiber-optic module



5. Store the copper or fiber-optic module in a safe, static-free place or in an anti-static bag.
6. If you are installing a new module, install the new copper or fiber-optic module in the port. For instructions to install a fiber-optic transceiver, refer to [Installing a fiber-optic transceiver](#) on page 110.

Installing a fiber-optic transceiver

You can install a new fiber-optic transceiver in an SFP or SFP+ slot while the device is powered on and running.

While installing a transceiver, wear an ESD wrist strap with a plug that can be inserted in the ESD connector on the ICX 7250 device.



DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.



DANGER
All fiber-optic interfaces use Class 1 lasers.

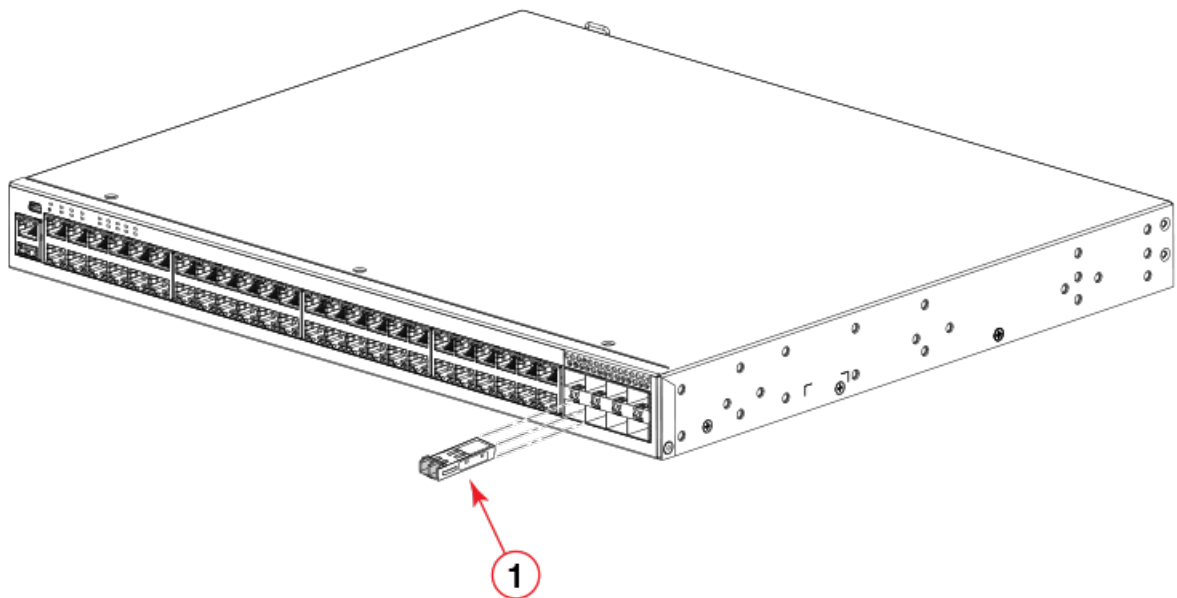
Perform the following steps to install a fiber-optic transceiver.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.
2. Remove the new transceiver from the protective packaging.
3. Gently insert the transceiver into the slot until it clicks into place. Transceivers are keyed to prevent incorrect insertion.

NOTE

The location of the fiber-optic interface shown is for illustration purposes only. They may be in a slightly different location on the device you are using.

FIGURE 59 Installing a transceiver



- a. Transceiver

Cabling a fiber-optic transceiver

Perform the following steps to cable a fiber-optic transceiver.

1. Remove the protective covering from the fiber-optic port connectors and store the covering for future use.

NOTE

Before cabling a fiber-optic transceiver, Ruckus strongly recommends cleaning the cable connectors and the port connectors.

2. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tabs lock into place.

3. Observe the link and active LEDs to determine if the network connections are functioning properly. For more information about the LED indicators, refer to [Observing LEDs](#) on page 92.

Cleaning the fiber-optic connectors

To avoid problems with the connection between the fiber-optic transceiver (SFP or SFP+) and the fiber cable connectors, Ruckus strongly recommends cleaning both connectors each time you disconnect and reconnect them. Dust can accumulate in the connectors and cause problems, such as reducing the optic launch power.

To clean the fiber cable connectors, Ruckus recommends using a fiber-optic reel-type cleaner. When not using an SFP or SFP+ connector, make sure to keep the protective covering in place.

Cabling a fiber-optic transceiver

Perform the following steps to cable a fiber-optic transceiver.

1. Remove the protective covering from the fiber-optic port connectors and store the covering for future use.

NOTE

Before cabling a fiber-optic transceiver, Ruckus strongly recommends cleaning the cable connectors and the port connectors.

2. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tabs lock into place.
3. Observe the link and active LEDs to determine if the network connections are functioning properly. For more information about the LED indicators, refer to [Observing LEDs](#) on page 92.

Troubleshooting

- Diagnosing switch indicators..... 113

Diagnosing switch indicators

The following table lists the troubleshooting steps you can perform based on device LED status.

TABLE 19 Troubleshooting the device based on LED status

Symptom	Action
Power LED is Off	<ul style="list-style-type: none">• Check if internal power supply is disconnected.• Check connections between the device, the power cord, and the wall outlet.• Contact Technical Support.
Power LED is Amber	Internal power supply has failed. Contact Technical Support.
Diag LED is Amber	<ul style="list-style-type: none">• The device self test has detected a fault.• Power cycle the device to try and clear the condition. If the condition persists, contact Technical Support.
Link LED is Off	<ul style="list-style-type: none">• Verify that the device and attached device are powered on.• Be sure the cable is plugged into both the device and the corresponding device.• Verify that the proper cable type is used and its length does not exceed specified limits.• Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Power and cooling problems

If the power indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and use the **show chassis** command to verify that the temperature is below the shutdown threshold. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact Ruckus Technical Support for assistance.

In-band access

You can access the management agent in the device from anywhere within the attached network using Telnet or other network management software. However, you must first configure the device with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the management agent, check to see if you have a valid network connection. Then verify that you entered the correct IP address. Also, be sure the port through which you are connecting to the device has not been disabled. If it has not been disabled, then check the network cabling that runs between your remote location and the device.

Regulatory Statements

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CE statement

ATTENTION

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

China ROHS

Refer to the latest revision of the China ROHS document (P/N 53-1000428-xx) which ships with the product.

BSMI statement (Taiwan)

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

設備名稱: 電源供應器 Equipment name		, 型號 (型式) : EPS4000 Type designation (Type)				
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
外殼	○	○	○	○	○	○
印刷電路板	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
分離式電源線	○	○	○	○	○	○

備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。
Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-” 係指該項限用物質為排除項目。
Note 3 : The “-” indicates that the restricted substance corresponds to the exemption.

設備名稱: 乙太網交換機 Equipment name		, 型號 (型式) : ICX 7250-24 Type designation (Type)				
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
外殼	○	○	○	○	○	○
印刷電路板	-	○	○	○	○	○
電池	○	○	○	○	○	○
直流風扇	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○

備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。
Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-” 係指該項限用物質為排除項目。
Note 3 : The “-” indicates that the restricted substance corresponds to the exemption.

型號: ICX 7250-24

系列型號: ICX 7250-24G, ICX 7250-24P, ICX 7250-48, ICX 7250-48P

Canadian requirements

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.

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Germany statement

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)

A급 기기 (업무용 방송통신기기): 이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

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.

VCCI statement

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

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective actions.

Cautions and Danger Notices

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Cautions

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

Ein Vorsichtinweis warnt Sie vor potenziellen Personengefahren oder Beschädigung der Hardware, Firmware, Software oder auch vor einem möglichen Datenverlust

Un message de mise en garde vous alerte sur des situations pouvant présenter un risque potentiel de dommages corporels ou de dommages matériels, logiciels ou de perte de données.

Un mensaje de precaución le alerta de situaciones que pueden resultar peligrosas para usted o causar daños en el hardware, el firmware, el software o los datos.

General cautions



CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 50°C (122°F).

VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 50°C (122°F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 50°C (122°F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 50°C (122°F).



CAUTION

Make sure the airflow around the front, and back of the device is not restricted.

VORSICHT	Stellen Sie sicher, dass an der Vorderseite, den Seiten und an der Rückseite der Luftstrom nicht behindert wird.
MISE EN GARDE	Vérifiez que rien ne restreint la circulation d'air devant, derrière et sur les côtés du dispositif et qu'elle peut se faire librement.
PRECAUCIÓN	Asegúrese de que el flujo de aire en las inmediaciones de las partes anterior, laterales y posterior del instrumento no esté restringido.



CAUTION

Ensure that adequate ventilation is provided for the system. A 3 cm clearance is recommended above the device and 8 cm clearance is recommended on each side.

VORSICHT	Stellen Sie sicher, dass das System ausreichend belüftet wird. Über dem Gerät wird 3 cm Freiraum, auf beiden Seiten jeweils 8 cm Freiraum empfohlen.
MISE EN GARDE	Assurez-vous que le circuit est correctement ventilé. Il est recommandé de conserver un espace de 3 cm au-dessus du dispositif, et de 8 cm sur chaque côté.

Cautions and Danger Notices

Cautions

PRECAUCIÓN	Asegúrese de proporcionar una ventilación adecuada al sistema. Se recomienda dejar 3 cm de espacio libre por encima del dispositivo y 8 cm a cada lado.
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CAUTION

Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

VORSICHT	Das Zerlegen von Netzteilen oder Lüftereinheiten macht die Garantie und die gesetzlichen Zertifizierungen ungültig. Die Netzteile und Lüftereinheiten enthalten keine Teile, die vom Benutzer gewartet werden können.
MISE EN GARDE	Le démontage d'une pièce du bloc d'alimentation ou du ventilateur annule la garantie et les certificats de conformité. Aucune pièce du bloc de l'alimentation ou du ventilateur ne peut être réparée par l'utilisateur.
PRECAUCIÓN	Si se desmonta cualquier pieza del módulo de fuente de alimentación y ventiladores, la garantía y las certificaciones normativas quedan anuladas. En el interior del módulo de fuente de alimentación y ventiladores no hay piezas que pueda reparar el usuario.



CAUTION

Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

VORSICHT	Verwenden Sie den Befehl Erase startup-config (Löschen Startup-Konfig) nur für neue Systeme. Wenn Sie diesen Befehl in ein bereits konfiguriertes System eingeben, löscht der Befehl die Konfiguration. Falls Sie aus Versehen die Konfiguration eines bereits konfigurierten Systems löschen, geben Sie den Befehl Write Memory (Speicher schreiben) ein, um die laufende Konfiguration in der Startup-Konfig-Datei zu speichern.
MISE EN GARDE	N'utilisez la commande erase startup-config que pour les nouveaux systèmes. Si vous entrez cette commande sur un système que vous avez déjà configuré, elle efface la configuration. Si vous effacez la configuration par accident sur un système configuré, entrez la commande write memory pour enregistrer la configuration actuelle dans le fichier startup-config.
PRECAUCIÓN	Use el comando erase startup-config (borrar configuración de inicio) para sistemas nuevos solamente. Si usted introduce este comando en un sistema que ya ha configurado, el comando borrará la configuración. Si usted borra accidentalmente la configuración en un sistema ya configurado, introduzca el comando write memory (escribir memoria) para guardar la configuración en ejecución en el archivo startup-config.

Electrical cautions



CAUTION

Use a separate branch circuit for each power cord, which provides redundancy in case one of the circuits fails.

VORSICHT	Es empfiehlt sich die Installation eines separaten Stromkreisweiges für jede Elektroschnur als Redundanz im Fall des Ausfalls eines Stromkreises.
MISE EN GARDE	Utilisez un circuit de dérivation différent pour chaque cordon d'alimentation ainsi, il y aura un circuit redondant en cas de panne d'un des circuits.
PRECAUCIÓN	Use un circuito derivado separado para cada cordón de alimentación, con lo que se proporcionará redundancia en caso de que uno de los circuitos falle.



CAUTION

Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.

VORSICHT	Stromkreise, Verdrahtung und Überlastschutz dürfen nicht durch das Gerät überbelastet werden. Addieren Sie die Nennstromleistung (in Ampere) aller Geräte, die am selben Stromkreis wie das Gerät installiert sind. Somit können Sie feststellen, ob die Gefahr einer Überbelastung der Versorgungsstromkreise vorliegt. Vergleichen Sie diese Summe mit der Nennstromgrenze des Stromkreises. Die Höchstnennströme (in Ampere) stehen normalerweise auf der Geräterückseite neben den Eingangstromanschlüssen.
MISE EN GARDE	Assurez-vous que le dispositif ne risque pas de surcharger les circuits d'alimentation, le câblage et la protection de surintensité. Pour déterminer le risque de surcharge des circuits d'alimentation, additionnez l'intensité nominale (ampères) de tous les dispositifs installés sur le même circuit que le dispositif en question. Comparez alors ce total avec la limite de charge du circuit. L'intensité nominale maximum en ampères est généralement imprimée sur chaque dispositif près des connecteurs d'entrée d'alimentation.
PRECAUCIÓN	Verifique que el instrumento no sobrecargue los circuitos de corriente, el cableado y la protección para sobrecargas. Para determinar la posibilidad de sobrecarga en los circuitos de suministros, añada las capacidades nominales de corriente (amp) de todos los instrumentos instalados en el mismo circuito que el instrumento. Compare esta suma con el límite nominal para el circuito. Las capacidades nominales de corriente máximas están generalmente impresas en los instrumentos, cerca de los conectores de corriente de entrada.



CAUTION

Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

VORSICHT	Bevor Sie ein Kabel in einen Anschluss einstecken, entladen Sie jegliche im Kabel vorhandene elektrische Spannung, indem Sie mit den elektrischen Kontakten eine geerdete Oberfläche berühren.
MISE EN GARDE	Avant de brancher un câble à un port, assurez-vous de décharger la tension du câble en reliant les contacts électriques à la terre.
PRECAUCIÓN	Antes de conectar un cable en cualquier puerto, asegúrese de descargar la tensión acumulada en el cable tocando la superficie de conexión a tierra con los contactos eléctricos.



CAUTION

Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

VORSICHT	Das Zerlegen von Netzteilen oder Lüftereinheiten macht die Garantie und die gesetzlichen Zertifizierungen ungültig. Die Netzteile und Lüftereinheiten enthalten keine Teile, die vom Benutzer gewartet werden können.
MISE EN GARDE	Le démontage d'une pièce du bloc d'alimentation ou du ventilateur annule la garantie et les certificats de conformité. Aucune pièce du bloc de l'alimentation ou du ventilateur ne peut être réparée par l'utilisateur.
PRECAUCIÓN	Si se desmonta cualquier pieza del módulo de fuente de alimentación y ventiladores, la garantía y las certificaciones normativas quedan anuladas. En el interior del módulo de fuente de alimentación y ventiladores no hay piezas que pueda reparar el usuario.

Danger Notices

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Ein Gefahrenhinweis warnt vor Bedingungen oder Situationen die tödlich sein können oder Sie extrem gefährden können. Sicherheitsetiketten sind direkt auf den jeweiligen Produkten angebracht um vor diesen Bedingungen und Situationen zu warnen.

Un énoncé de danger indique des conditions ou des situations potentiellement mortelles ou extrêmement dangereuses. Des étiquettes de sécurité sont posées directement sur le produit et vous avertissent de ces conditions ou situations.

Una advertencia de peligro indica condiciones o situaciones que pueden resultar potencialmente letales o extremadamente peligrosas. También habrá etiquetas de seguridad pegadas directamente sobre los productos para advertir de estas condiciones o situaciones.

General dangers



DANGER

The procedures in this manual are for qualified service personnel.

GEFAHR	Die Vorgehensweisen in diesem Handbuch sind für qualifiziertes Servicepersonal bestimmt.
DANGER	Les procédures décrites dans ce manuel doivent être effectuées par un personnel de maintenance qualifié.
PELIGRO	Los procedimientos de este manual deben llevarlos a cabo técnicos cualificados.



DANGER

Be careful not to accidentally insert your fingers into the fan tray while removing it from the chassis. The fan may still be spinning at a high speed.

GEFAHR	Die Finger dürfen nicht versehentlich in das Ventilatorblech gesteckt werden, wenn dieses vom Gehäuse abgenommen wird. Der Ventilator kann sich unter Umständen noch mit hoher Geschwindigkeit drehen.
DANGER	Faites attention de ne pas insérer vos doigts accidentellement dans le boîtier du ventilateur lorsque vous le retirez du châssis. Il est possible que le ventilateur tourne encore à grande vitesse.
PELIGRO	Procure no insertar los dedos accidentalmente en la bandeja del ventilador cuando esté desmontando el chasis. El ventilador podría estar girando a gran velocidad.



DANGER

This equipment is suitable for mounting on concrete or other noncombustible surfaces only.

GEFAHR	Dieses Gerät darf nur auf Beton oder auf andere, nicht brennbare Flächen installiert werden.
DANGER	Cet équipement est adapté à être monté sur du béton ou seulement sur d'autres surfaces non combustibles.
PELIGRO	Este equipo es apto para el montaje solamente en superficies de concreto ó en otro tipos de superficies no combustibles.

Electrical dangers



DANGER

Before beginning the installation, see the precautions in "Power precautions."

GEFAHR	Vor der Installation siehe Vorsichtsmaßnahmen unter "Power Precautions" (Vorsichtsmaßnahmen in Bezug auf elektrische Ablagen).
DANGER	Avant de commencer l'installation, consultez les précautions décrites dans "Power Precautions" (Précautions quant à l'alimentation).
PELIGRO	Antes de comenzar la instalación, consulte las precauciones en la sección "Power Precautions" (Precauciones sobre corriente).



DANGER

Disconnect the power cord from all power sources to completely remove power from the device.

GEFAHR	Ziehen Sie das Stromkabel aus allen Stromquellen, um sicherzustellen, dass dem Gerät kein Strom zugeführt wird.
DANGER	Débranchez le cordon d'alimentation de toutes les sources d'alimentation pour couper complètement l'alimentation du dispositif.
PELIGRO	Para desconectar completamente la corriente del instrumento, desconecte el cordón de corriente de todas las fuentes de corriente.



DANGER

If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

GEFAHR	Falls für die Installation ein anderes Stromkabel erforderlich ist (wenn das mit dem Gerät gelieferte Kabel nicht passt), müssen Sie sicherstellen, dass Sie ein Stromkabel mit dem Siegel einer Sicherheitsbehörde verwenden, die für die Zertifizierung von Stromkabeln in Ihrem Land zuständig ist. Das Siegel ist Ihre Garantie, dass das Stromkabel sicher mit Ihrem Gerät verwendet werden kann.
DANGER	Si l'installation nécessite un cordon d'alimentation autre que celui fourni avec le dispositif, assurez-vous d'utiliser un cordon d'alimentation portant la marque de l'organisation responsable de la sécurité qui définit les normes et réglementations pour les cordons d'alimentation dans votre pays. Cette marque vous assure que vous pouvez utiliser le cordon d'alimentation avec le dispositif en toute sécurité.
PELIGRO	Si la instalación requiere un cordón de corriente distinto al que se ha suministrado con el instrumento, verifique que usa un cordón de corriente que venga con la marca de la agencia de seguridad que defina las regulaciones para cordones de corriente en su país. Esta marca será su garantía de que el cordón de corriente puede ser utilizado con seguridad con el instrumento.



DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

GEFAHR	Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein.
DANGER	Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm.
PELIGRO	Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio.

Dangers related to equipment weight



DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

GEFAHR	Stellen Sie sicher, dass das Gestell für die Unterbringung des Geräts auf angemessene Weise gesichert ist, so dass das Gestell oder der Schrank nicht wackeln oder umfallen kann.
DANGER	Vérifiez que le bâti abritant le dispositif est bien fixé afin qu'il ne devienne pas instable ou qu'il ne risque pas de tomber.
PELIGRO	Verifique que el bastidor que alberga el instrumento está asegurado correctamente para evitar que pueda hacerse inestable o que caiga.



DANGER

Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

GEFAHR	Montieren Sie die Geräte im Gestell so tief wie möglich. Platzieren Sie das schwerste Gerät ganz unten, während leichtere Geräte je nach Gewicht (je schwerer desto tiefer) darüber untergebracht werden.
DANGER	Montez les dispositifs que vous installez dans un bâti aussi bas que possible. Placez le dispositif le plus lourd en bas et le plus léger en haut, en plaçant tous les dispositifs progressivement de bas en haut du plus lourd au plus léger.
PELIGRO	Monte los instrumentos que instale en un bastidor lo más bajos posible. Ponga el instrumento más pesado en la parte inferior y los instrumentos progresivamente más livianos más arriba.

Laser dangers



DANGER

All fiber-optic interfaces use Class 1 lasers.

GEFAHR	Alle Glasfaser-Schnittstellen verwenden Laser der Klasse 1.
DANGER	Toutes les interfaces en fibre optique utilisent des lasers de classe 1.
PELIGRO	Todas las interfaces de fibra óptica utilizan láser de clase 1.



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