RUCKUS™
an ARRIS company

Ruckus ICX 7850 Switch Hardware Installation Guide

Contents

Preface

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	device(config)# interface ethernet 1/1/6
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**.
italics	Publication titles	Refer to the *Ruckus Small Cell Release Notes* 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
Boldface text	Identifies command names, keywords, and command options.
Italic text	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, *member[member...]*.
\	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, please 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 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 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. Request 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 not of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The 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

- 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.

About This Document

Supported Hardware and Software

This document is applicable for the various Ruckus ICX 7850 switch models. The following tables list the device models, power supplies, fan assemblies, and rack mount kits supported.

TABLE 2   Switch Models

Part Number	Description	Introduced (OS)	Currently Supported (OS)	Notes
ICX 7850-32Q	32×40/100 Gbps QSFP28 ports	08.0.90	Yes	
ICX 7850-48F	48× 1/10/25 Gbps SFP28 ports and 8x40/100 Gbps QSFP28 ports	08.0.90	Yes	
ICX 7850-48FS	48× 1/10 Gbps SFP+ ports and 8x40/100 Gbps QSFP28 ports	08.0.90	Yes	

TABLE 3   Power Supplies

Part Number	Description	Introduced (OS)	Currently Supported (OS)
RPS19-E	650 W AC power supply with nonport–side exhaust airflow	08.0.90	Yes
RPS19-I	650 W AC power supply with nonport–side intake airflow	08.0.90	Yes
RPS19DC-E	650 W DC power supply with nonport–side exhaust airflow	08.0.90	Yes
RPS19DC-I	650 W DC power supply with nonport–side intake airflow	08.0.90	Yes

TABLE 4   Fan Assemblies

Part Number	Description	Introduced (OS)	Currently Supported (OS)
ICX-FAN12-E	Fan with nonport–side exhaust airflow	08.0.90	Yes
ICX-FAN12-I	Fan with nonport–side intake airflow	08.0.90	Yes

TABLE 5   Rack Mount Kits

Part Number	Description
XBR-R000295	1U, 1.5U, and 2U Universal Kit for Four-Post Racks
ICX-RMK-4POST-TL	Four-post fixed rack mount kit

Device Overview

Hardware Features

The Ruckus ICX 7850 is a high-density aggregation switch that offers 1, 10, and 25 Gigabit Ethernet (GbE) and 10, 25, 40, and 100 GbE line rates, low latency cut-through switching, and up to 3.2 Tbps throughput for campus LAN and classic Ethernet data center environments.

The Ruckus ICX 7850 switch contains the following features:

- Comprehensive support for a range of 1-GbE, 10-GbE, 25-GbE, 40-GbE, and 100-GbE optics (refer to the latest Ruckus Optics Family Data Sheet)

- QSFP28 ports supporting 100-GbE and 40-GbE transceivers, including support for 4x25-GbE and 4x10-GbE breakout transceivers

- SFP28 ports supporting 1-GbE, 10-GbE, and 25-GbE transceivers (ICX 7850-48F)

- SFP+ ports supporting 1-GbE and 10-GbE transceivers (ICX 7850-48FS)

- Dual redundant, hot-swappable power supplies available with intake or exhaust airflow (650 W AC or 650 W DC)

- Eight 40/100-GbE QSFP28 stacking ports (supporting stacking for up to twelve switches)

- Multi-speed configuration support for some qualified passive cables (10-GbE, 25-GbE, 40-GbE, and 100-GbE cables in lengths up to 5 m)

- Five (4+1) redundant, hot-swappable fan assemblies available with intake or exhaust airflow on the ICX 7850-48F and ICX 7850-48FS.
  Six (5+1) redundant, hot-swappable fan assemblies available with intake or exhaust airflow on the ICX 7850-32Q.

- Includes support for MACSec on the Ruckus ICX 7850-48FS

- One 10/100/1000-Mbps Ethernet port (RJ-45) for out-of-band management

- RJ-45 and USB Type-C serial management ports to configure and manage the switch through the CLI

- One USB Type A port for the transfer of software and configuration files from an external disk drive

Port-side Views of the Ruckus ICX 7850 Switch

Figure 1 shows the front view of the Ruckus ICX 7850-32Q switch.

FIGURE 1 Front View of the Ruckus ICX 7850-32Q
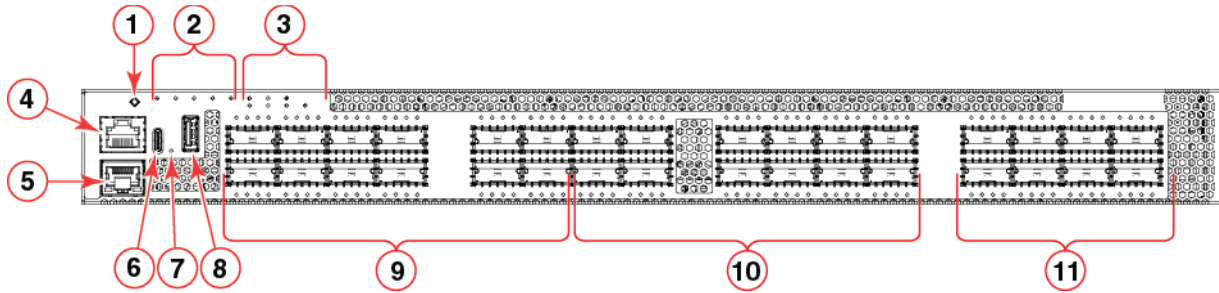
1	Status mode button	7	Reset button
2	Status mode LEDs	8	USB port (for flash drive)
3	System LEDs	9	Slot 1: 40/100 GbE QSFP28 ports
4	RJ-45 console port	10	Slot 2: 40/100 GbE QSFP28 ports
5	Management port (RJ-45)	11	Slot 3: 40/100 GbE QSFP28 stacking/uplink ports
6	USB Type-C console port		

Figure 2 shows the front view of the Ruckus ICX 7850-48F switch.

FIGURE 2 Front View of the Ruckus ICX 7850-48F
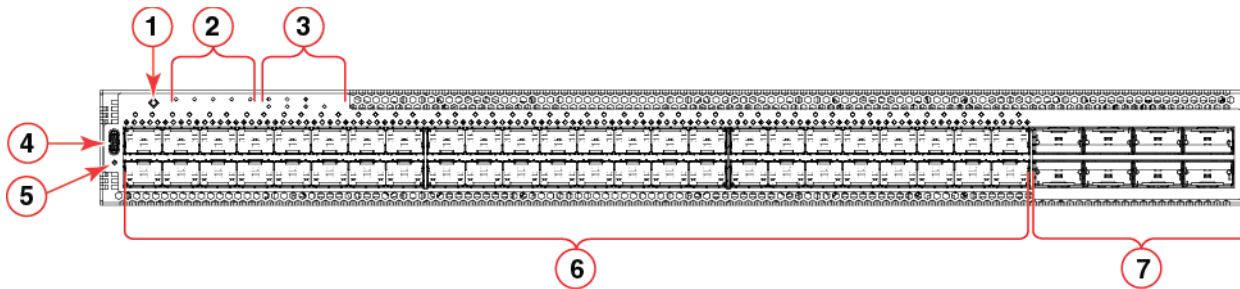
1	Status mode button	5	Reset button
2	Status mode LEDs	6	Slot 1: 1/10/25 GbE SFP28 ports
3	System LEDs	7	Slot 2: 40/100 GbE QSFP28 stacking/uplink ports
4	USB Type-C console port		

Figure 3 shows the front view of the Ruckus ICX 7850-48FS switch.

FIGURE 3   Front View of the Ruckus ICX 7850-48FS
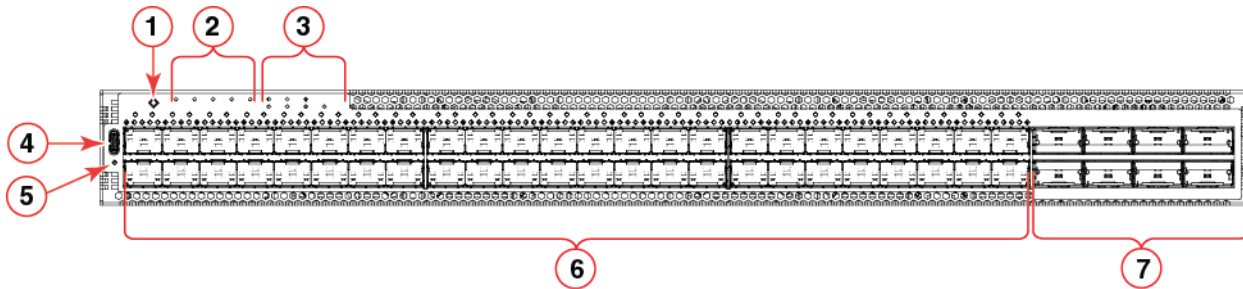
1	Status mode button	5	Reset button
2	Status mode LEDs	6	Slot 1: 1/10 GbE SFP+ ports (MACSec capable)
3	System LEDs	7	Slot 2: 40/100 GbE QSFP28 stacking/uplink ports
4	USB Type-C console port		

Nonport-side View of the Ruckus ICX 7850 Switch

Figure 4 shows the rear view of the Ruckus ICX 7850-32Q switch.

FIGURE 4   Rear View of the Ruckus ICX 7850-32Q
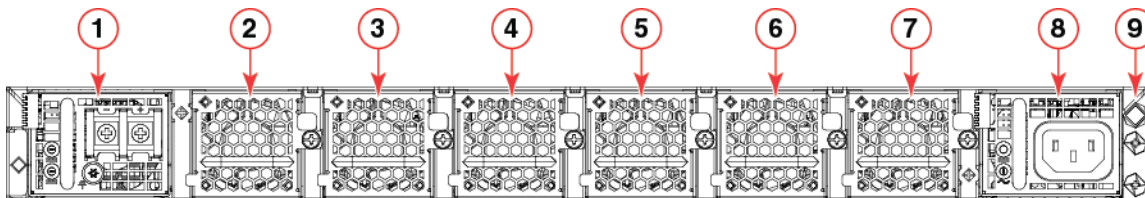
1	Power supply unit 2	6	Fan assembly 2
2	Fan assembly 6	7	Fan assembly 1
3	Fan assembly 5	8	Power supply unit 1
4	Fan assembly 4	9	Grounding terminal
5	Fan assembly 3		

Figure 5 shows the rear view of the Ruckus ICX 7850-48F and ICX 7850-48FS switch.

FIGURE 5   Rear View of the Ruckus ICX 7850-48F and ICX 7850-48FS
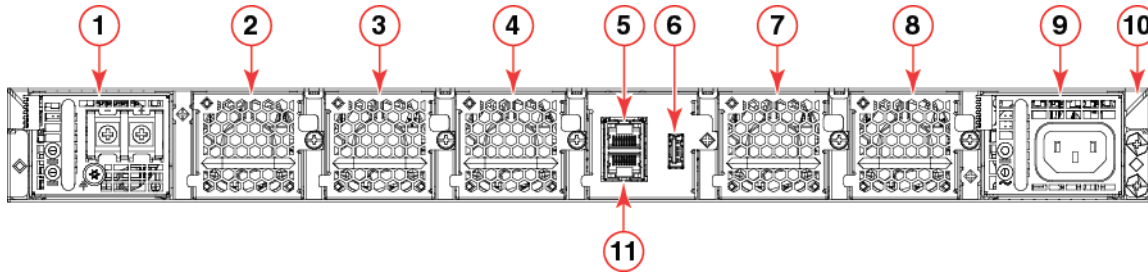
1	Power supply unit 2	7	Fan assembly 2
2	Fan assembly 5	8	Fan assembly 1
3	Fan assembly 4	9	Power supply unit 1
4	Fan assembly 3	10	Grounding terminal
5	RJ-45 console port	11	Management port (RJ-45)
6	USB port (for flash drive)		

Device Management Options

You can use the management functions built into the switch to monitor the port status, physical status, and other information to help you analyze device performance and system debugging. The switch automatically performs power-on self-test (POST) each time it is turned on.

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

TABLE 6   Management Options for the Switch

Management Tool	Out-of-Band Support	In-Band Support	Reference Documents
Command line interface (CLI)	Ethernet or serial connection	N/A	*Ruckus FastIron Command Reference Guide*
Standard SNMP applications	Ethernet or serial connection	N/A	*Ruckus FastIron Management Configuration Guide*

Preparing for Installation

Safety Precautions

When using this product, observe all danger, caution, and attention notices in this manual. The safety notices are accompanied by symbols that represent the severity of the safety condition.

Refer to "Cautions and Danger Notices" on page 83 for translations of safety notices for this product.

General Precautions

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 accidently insert your fingers into the fan tray while removing it from the chassis. The fan may still be spinning at a high speed.

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

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.

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

CAUTION
Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

CAUTION
To protect the serial port from damage, keep the cover on the port when not in use.

CAUTION
Never leave tools inside the chassis.

CAUTION
If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

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

CAUTION
Do not install the device in an environment where the operating ambient temperature might exceed 45°C (113°F).

CAUTION
Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the manufacturer's instructions.

ESD Precautions

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

CAUTION
Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

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

Power Precautions

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.

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

DANGER
This device might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

CAUTION
To avoid high voltage shock, do not open the device while the power is on.

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.

Lifting Precautions

DANGER
Use safe lifting practices when moving the product.

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.

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

CAUTION
To prevent damage to the chassis and components, never attempt to lift the chassis using the fan or power supply handles. These handles were not designed to support the weight of the chassis.

Laser Precautions

DANGER
All fiber-optic interfaces use Class 1 lasers.

⚠ **DANGER**
Laser radiation. Do not view directly with optical instruments. Class 1M laser products.

⚠ **DANGER**
Use only optical transceivers that are qualified by Ruckus and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 60825 and EN60825. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

Facility Requirements

To install and operate the device successfully, ensure compliance with the following electrical, environmental, location, and cable management requirements.

Electrical Considerations

For successful installation and operation of the device, ensure that the following electrical requirements are met:

- The primary outlet is correctly wired, protected by a circuit breaker, and grounded in accordance with local electrical codes.
- The supply circuit, line fusing, and wire size are adequate, as specified by the electrical rating on the device nameplate.
- The power supply standards are met.

Environmental Considerations

For successful installation and operation of the device, ensure that the following environmental requirements are met:

- Because the Ruckus ICX 7850 switch can be ordered with fans that move air either front to back or back to front, be sure to orient your switch with the airflow pattern of any other devices in the rack. All equipment in the rack should force air in the same direction to avoid intake of exhaust air.
- Some combinations of intake and exhaust airflows may not be compatible with your environment. Consult your fan assembly and power supply module FRU kits to determine the correct configuration.
- The ambient air temperature does not exceed 45°C (113°F).

Location Considerations

Before installing the device, plan its location and orientation relative to other devices and equipment. Devices can be mounted in a standard 19-inch equipment rack or on a flat horizontal surface.

The site should meet the following requirements:

- Maintain the operating environment as specified in "Environmental Considerations" on page 10.
- 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.
- Allow access space for installing, cabling, and maintaining the devices.
- Ensure the status LEDs are 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, is 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.

Rack Considerations

For successful installation and operation of the device in a rack, ensure the following rack requirements are met:

- The rack must be a standard EIA rack.

- The equipment in the rack is grounded through a reliable branch circuit connection and maintains ground at all times. Do not rely on a secondary connection to a branch circuit, such as a power strip.

- Airflow and temperature requirements are met on an continual basis, particularly if the device is installed in a closed or multirack assembly.

- The additional weight of the device does not exceed the rack's weight limits or unbalance the rack in any way.

- The rack is secured to ensure stability in case of unexpected movement, such as an earthquake.

Recommendations for Cable Management

Cables can be organized and managed in a variety of ways; for example, use cable channels on the sides of the rack or patch panels to reduce the potential for tangling the cables. The following list provides some recommendations for cable management:

⚠️ **CAUTION**
Before plugging a cable to any port, be sure to discharge any static charge stored on the cable by touching the electrical contacts to ground surface.

NOTE
You should not use tie wraps with fiber-optic cables because they are easily overtightened and can damage the optical fibers. Velcro-like wraps are recommended.

- Plan for the rack space required for cable management before installing the device.

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the device, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.

- For easier maintenance, label the cables and record the devices to which they are connected.

- Keep LEDs visible by routing port cables and other cables away from the LEDs.

Quick Installation Checklist

This checklist provides a high-level overview of the basic installation process from the planning stage to the point where the device comes online and is ready to be deployed. Completing all the tasks in the suggested order ensures successful installation. Ruckus recommends that you print this checklist and take it to the installation site.

Follow the steps listed in Table 7 to install your device. Details for each of these steps are provided on the pages indicated.

TABLE 7 Installation Tasks

Task Number	Task	Where to Find More Information	Completed
1	Ensure that the physical environment that will host the device has the proper cabling and ventilation.	"Facility Requirements" on page 10	
2	If customizing a Ruckus ICX 7850 switch baseline chassis: 1. Install at least one power supply unit. 2. Install at least four fans.	"Inserting a New AC Power Supply" on page 62 "Inserting a New DC Power Supply" on page 63 "Inserting a New Fan Assembly" on page 69	
3	Mount the device on a desktop or in a rack.	"Installing the Device on a Desktop" on page 16 "Four-Post Rack Mount Installation (ICX-RMK-4POST-TL)" on page 20 "Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295)" on page 24	
4	Connect devices in a stack	"Connecting Devices in a Stack" on page 35	
5	Plug the device into a nearby power source that adheres to the regulatory requirements outlined in this manual.	"Providing Power to the Device" on page 41	
6	Attach a terminal or laptop to the device. This will enable you to configure the device through the command line interface (CLI).	"Establishing a First-Time Serial Connection" on page 41	
7	Assign a password for additional access security. No default password is assigned to the CLI.	*Ruckus FastIron Command Reference Guide*	
8	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.	*Ruckus FastIron Command Reference Guide*	
9	Connect network equipment to the system.	"Connecting Network Devices" on page 46	
10	Test IP connectivity to other devices by pinging them and tracing routes.	*Ruckus FastIron Command Reference Guide*	
11	Continue configuring the device using the CLI.	*Ruckus FastIron Command Reference Guide*	
12	Secure access to the device.	*Ruckus FastIron Management Configuration Guide*	

Shipping Carton Contents

Ruckus ICX 7850 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 are complete. If any items are missing, contact the place of purchase.

- The Ruckus ICX 7850 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
  - Four rubber feet
  - One grounding kit, containing one grounding lug and two grounding screws

- One US AC power cord, shielded (included only with devices with pre-installed power supplies. (E2 devices have two power cords.)

- One console cable (RJ-45 to RJ-45 crossover)

- One RJ-45-to-DB9 adapter

- Installed filler panels for the power supply slot or fan assembly slot where such modules are not supplied for the switch

- China ROHS sheet

- Read Me First document

Mounting the Device

Mounting Options

You can install the Ruckus ICX 7850 in the following ways:

- As a standalone unit on a flat surface.
- In a two-post Telco rack using a flush-mount rack kit. The two-post rack mount ears are included with the switch and support various mounting positions (refer to Figure 7).
- In a four-post EIA rack using the flush-mount rack kit (ICX-RMK-4POST-TL) included with the switch. The rack kit can be used to install devices in EIA racks that are between 46 cm and 79 cm (18 in. to 31 in.) deep.
- In a four-post EIA rack using the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295). The rack kit can be used to install devices in EIA racks that are between 61 cm and 81 cm (24 in. to 32 in.) deep.

Precautions Specific to Mounting

The following precautions specifically apply to mounting the device.

DANGER
Use safe lifting practices when moving the product.

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

CAUTION
Make sure the airflow around the front and sides of the device is not restricted.

CAUTION
Never leave tools inside the device.

> ⚠ **CAUTION**
> **Use the screws specified in the procedure. Using longer screws can damage the device.**

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

Installing the Device on a Desktop

Complete the following steps to install the Ruckus ICX 7850 on a desktop or other flat surface.

FIGURE 6   Attaching the Adhesive Feet
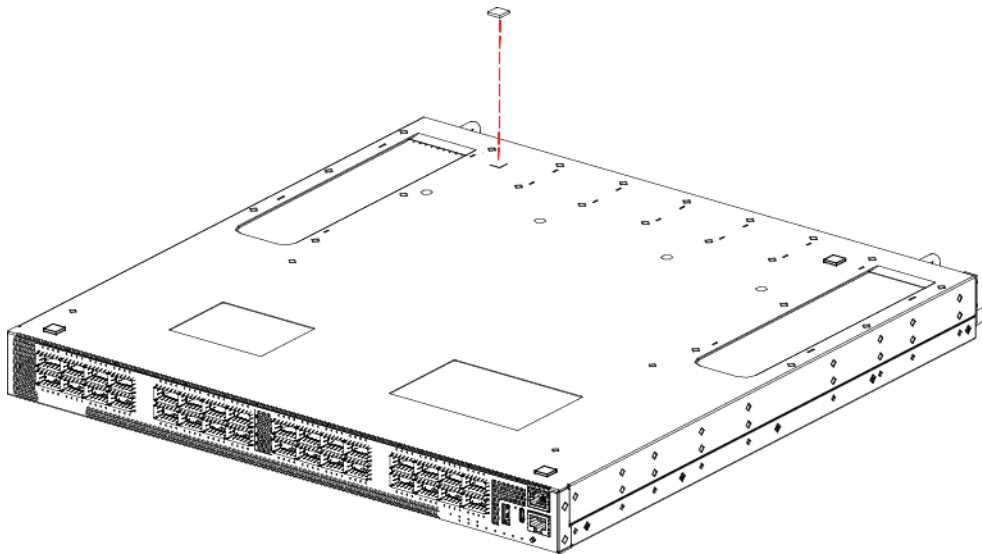
1. Attach the four adhesive feet to the bottom of the device.

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-inch) clearance is recommended on each side.

3. If installing a single device only, go to "Providing Power to the Device".

4. If installing multiple devices, attach the adhesive feet to each device. Place each device squarely on top of the one below.

Installing the Device in a Rack

> ⚠ **CAUTION**
> **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 installation.

Before mounting the switch in a rack, pay particular attention to 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. (Refer to "Environmental Considerations" on page 10.)

- 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. Particular attention should be given to supply connections other than direct connections to the mains electricity supply.

To mount the product into a two-post rack using the included rack-mount kit, refer to "Two-Post Rack Mount Installation (ICX-RMK-4POST-TL)" on page 17 for the installation procedure.

To mount the product into a four-post rack using the included rack-mount kit, refer to "Four-Post Rack Mount Installation (ICX-RMK-4POST-TL)" on page 20 for the installation procedure.

To mount the product into a four-post rack that is between 61 cm and 81 cm (24 in. to 32 in.) deep, you can order a four-post rack kit with the part number XBR-R000295. For the procedures to install this kit, refer to "Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295)" on page 24.

Two-Post Rack Mount Installation (ICX-RMK-4POST-TL)

The Ruckus ICX 7850 can be installed in a two-post rack in various mounting positions, as shown in Figure 7.

FIGURE 7   Two-post rack mounting positions
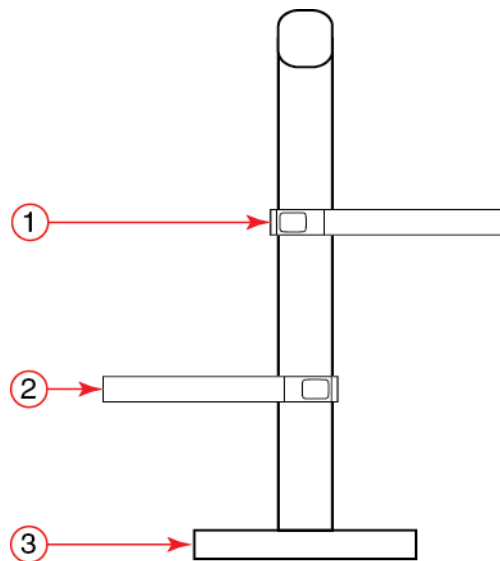
1	Front flush mount	3	Two-post rack, side view
2	Rear mount		

> **NOTE**
> Use the following procedure when installing the Ruckus ICX 7850 in a two-post rack. For four-post racks, follow the procedures in "Four-Post Rack Mount Installation (ICX-RMK-4POST-TL)" on page 20 or "Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295)" on page 24.

Use the following instructions to install the Ruckus ICX 7850 switch in two-post Telco racks using the front brackets in the four-post flush-mount rack kit included with the switch (ICX-RMK-4POST-TL).

Time and Items Required

Allow 15 to 30 minutes to complete the installation.

The following items are required to install the device using the four-post flush-mount rack kit (ICX-RMK-4POST-TL):

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

Parts List

The following parts are provided with the four-post flush-mount rack kit (ICX-RMK-4POST-TL).

FIGURE 8 Items in the Four-Post Flush-Mount Rack Kit
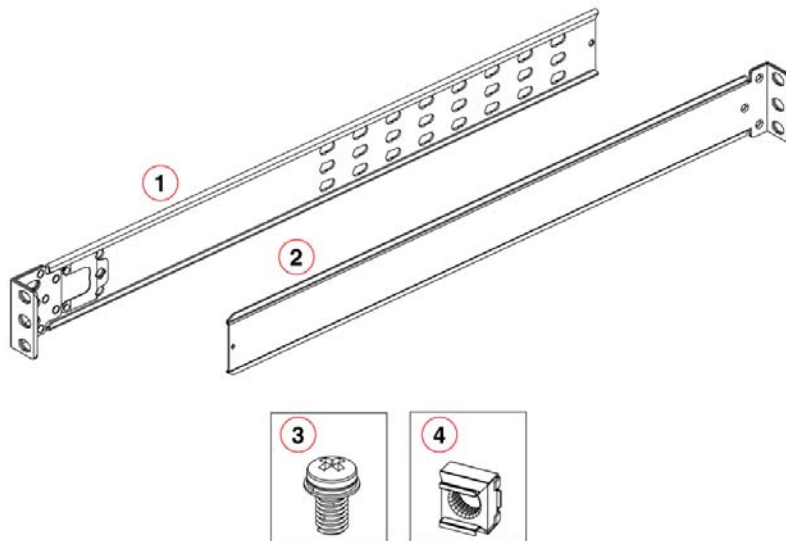
| 1 | Front brackets (2) | 3 | Screw, 10-32 x 5/8-in., panhead Phillips (12) |
| 2 | Rear brackets (2) | 4 | Retainer nut, 10-32 (12) |

Ensure that the items listed and illustrated in Figure 11 are included in the kit.

Flush-Front Mounting

![Caution icon] **CAUTION**
The device must be turned off and disconnected from the fabric during this procedure.

Complete the following tasks to install the device in a two-post rack.

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 over the six pre-installed keyhole fasteners, as shown in Figure 9.

2. Slide the bracket toward the front of the device until the bracket latch clicks into its secure position.

3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.

FIGURE 9   Attaching the Front Brackets
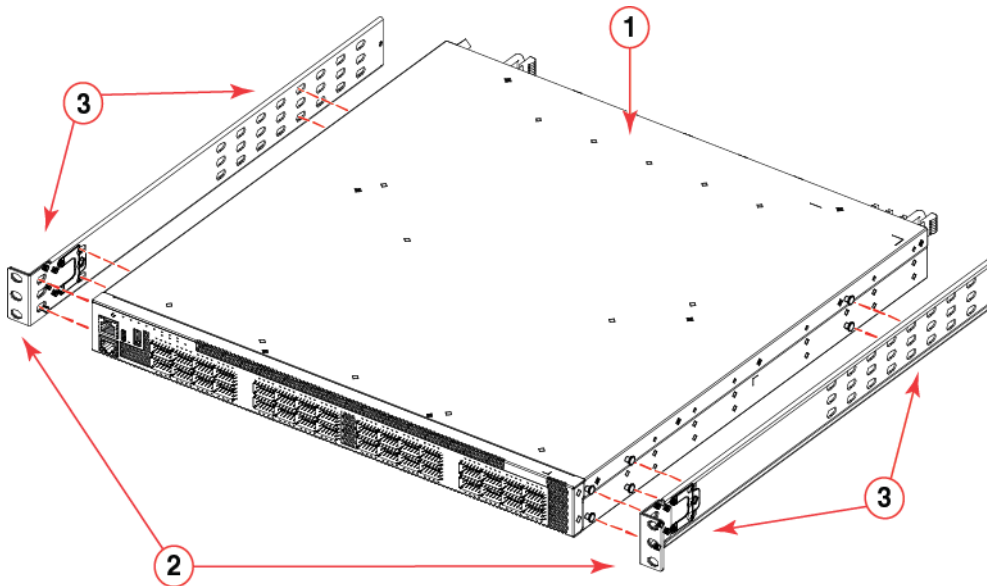
1	Top of the device	3	Keyhole fasteners (pre-installed)
2	Front brackets		

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 10, 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 10 Positioning the Device in the Rack
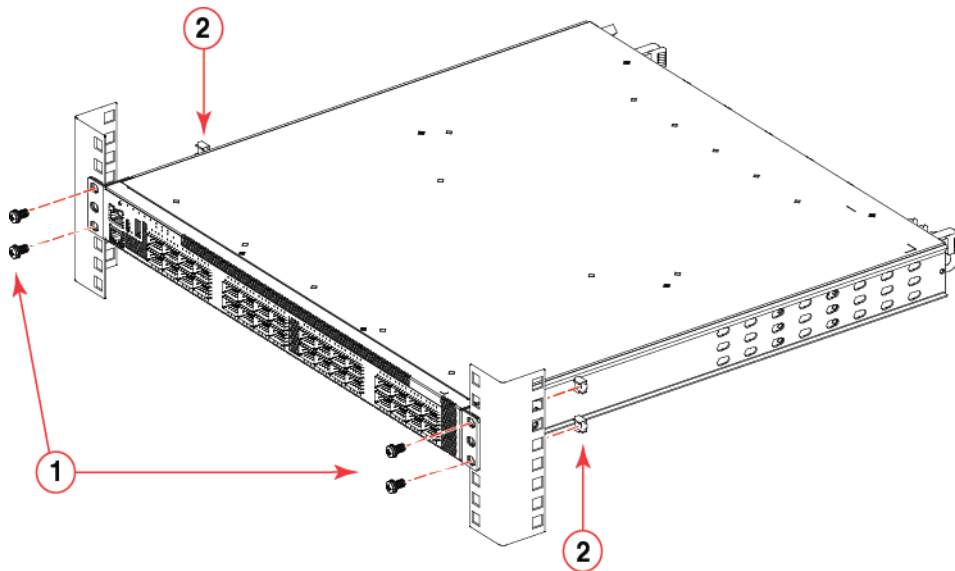
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

Four-Post Rack Mount Installation (ICX-RMK-4POST-TL)

Use the following instructions to install the Ruckus ICX 7850 switch in EIA racks that are between 46 cm and 79 cm (18 in. to 31 in.) using the four-post flush-mount rack kit included with the switch.

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

Time and Items Required

Allow 15 to 30 minutes to complete the installation.

The following items are required to install the device using the four-post flush-mount rack kit (ICX-RMK-4POST-TL):

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

Parts List

The following parts are provided with the four-post flush-mount rack kit (ICX-RMK-4POST-TL).

FIGURE 11 Items in the Four-Post Flush-Mount Rack Kit
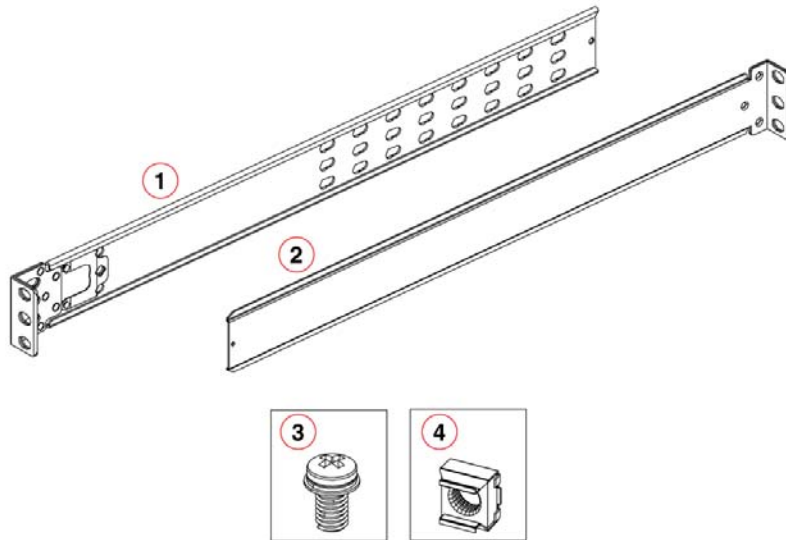
1	Front brackets (2)	3	Screw, 10-32 x 5/8-in., panhead Phillips (12)
2	Rear brackets (2)	4	Retainer nut, 10-32 (12)

Ensure that the items listed and illustrated in Figure 11 are included in the kit.

> **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.

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

1. "Attaching the Front Brackets" on page 22
2. "Installing the Device in the Rack" on page 22
3. "Attaching the Rear Brackets to the Rack Posts" on page 23

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 over the six pre-installed keyhole fasteners, as shown in Figure 12.

2. Slide the bracket toward the front of the device until the bracket latch clicks into its secure position.

3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.

FIGURE 12 Attaching the Front Brackets
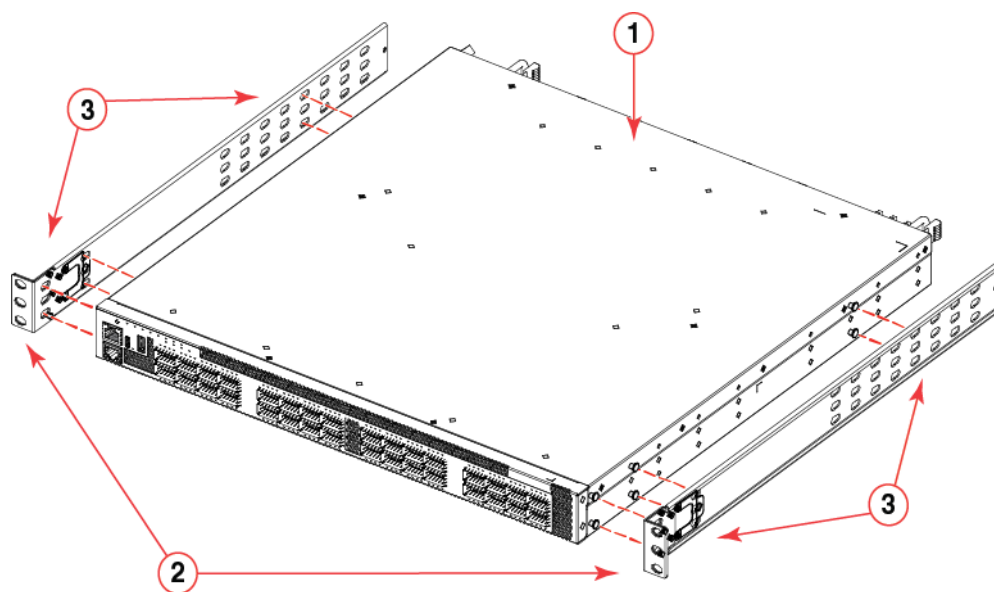
1	Top of the device	3	Keyhole fasteners (pre-installed)
2	Front brackets		

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 13, 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 13 Positioning the Device in the Rack
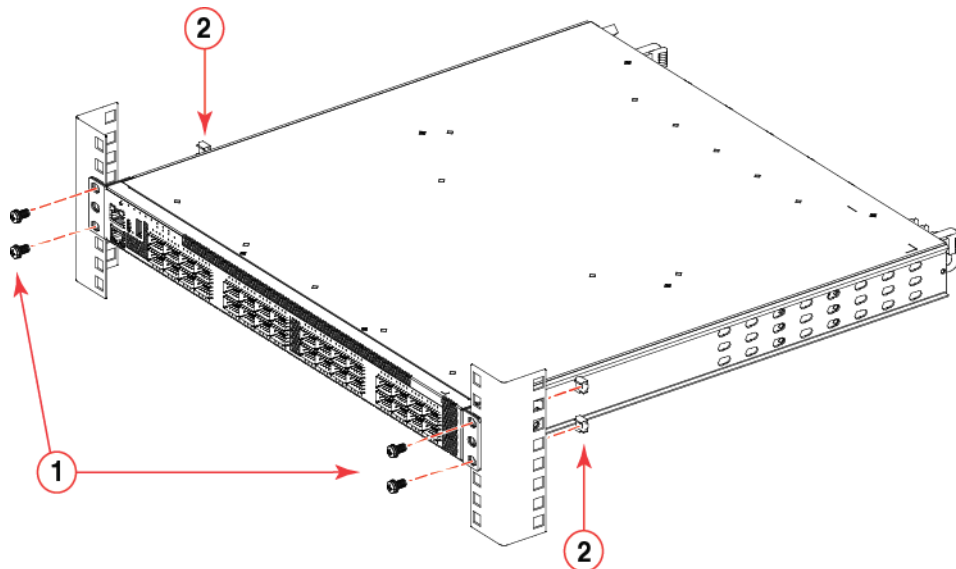
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

Attaching the Rear Brackets to the Rack Posts

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

1. Slide the right rear bracket into the right front bracket and the left rear bracket into the left front bracket.

2. Adjust the rear brackets to the rack depth.

3. 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 14. Use the upper and lower holes in the bracket.

4. 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.

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

FIGURE 14   Attaching the Rear Brackets to the Rack Posts
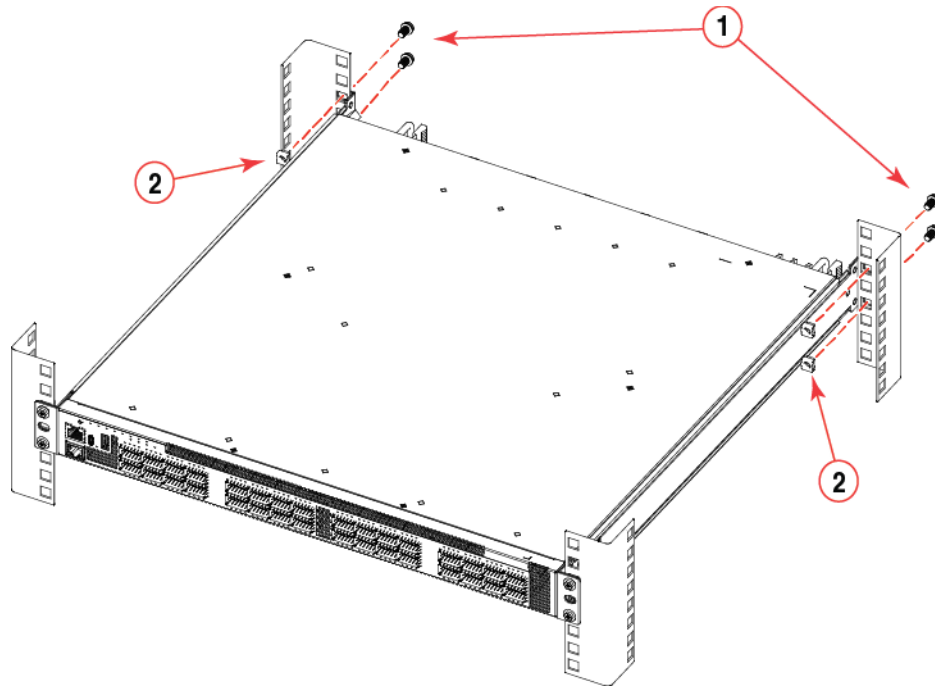
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

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

Use the following instructions to install a Ruckus ICX 7850 switch in a 19-in. (48.3 cm) EIA rack using the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295).

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.

> **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

Review the installation and facility requirements for your product before mounting the device. Refer to "Facility Requirements" on page 10 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.

The following items are required to install the device using the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks (XBR-R000295):

- Clamps or other means of temporarily supporting the device in the rack
- #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 (XBR-R000295) installation.

FIGURE 15 Rack Kit Parts
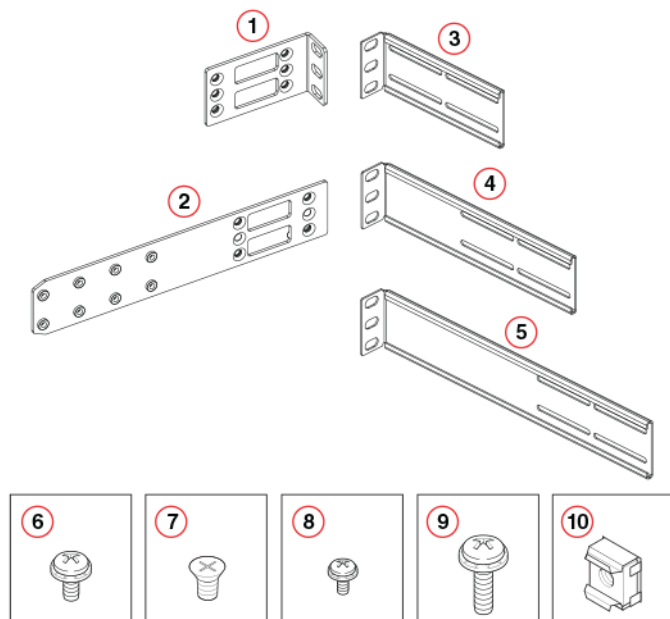
1	Front brackets (2)	6	Screw, 8-32 x 5/16-in., panhead Phillips (8)
2	Bracket extensions (2)	7	Screw, 8-32 x 5/16-in., flathead Phillips (16)
3	Rear brackets, short (2)	8	Screw, 6-32 x 1/4-in., panhead Phillips (8)
4	Rear brackets, medium (2)	9	Screw, 10-32 x 5/8-in., panhead Phillips (8)
5	Rear brackets, long (2)	10	Retainer nut, 10-32 (8)

Flush-Front Mounting the Device in the Rack

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

NOTE
The illustrations in the rack installation procedures are for reference only and may not show the actual device.

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

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

1. "Attaching the Front Brackets" on page 26
2. "Attaching the Extension Brackets to the Device" on page 27
3. "Installing the Device in the Rack" on page 27
4. "Attaching the Rear Brackets to the Extensions" on page 28
5. "Attaching the Rear Brackets to the Rack Posts" on page 29

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 16.
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 16 Attaching the Front Brackets
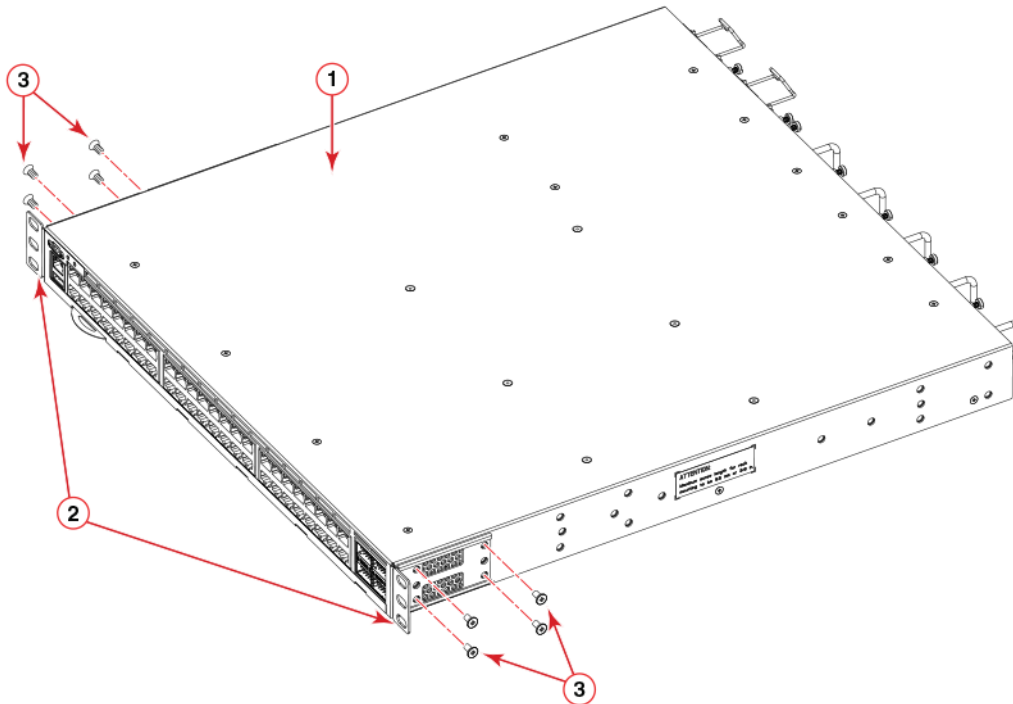
1	Device	3	Screws, 8-32 x 5/16-in., flathead Phillips
2	Front brackets		

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. Position the right extension bracket along the side of the device as shown in Figure 17.

2. 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.

3. Repeat Step 1 and Step 2 to attach the left extension 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 17 Attaching the Extension Brackets to the Device
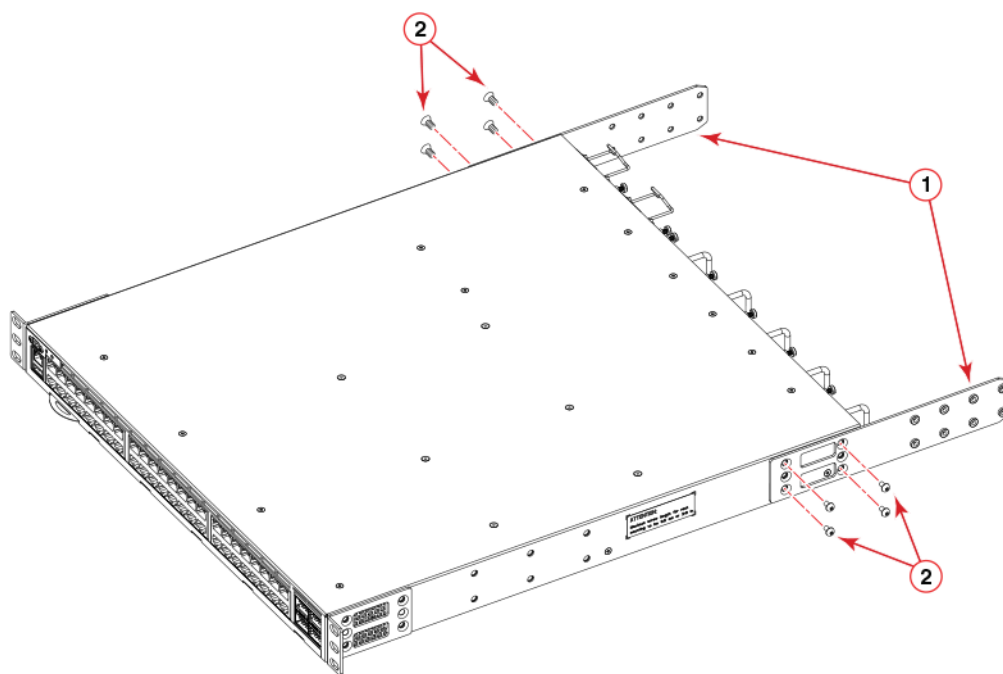
| 1 | Bracket extensions | 2 | Screws, 8-32 x 5/16-in., flathead Phillips |

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 18, 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 18 Positioning the Device in the Rack
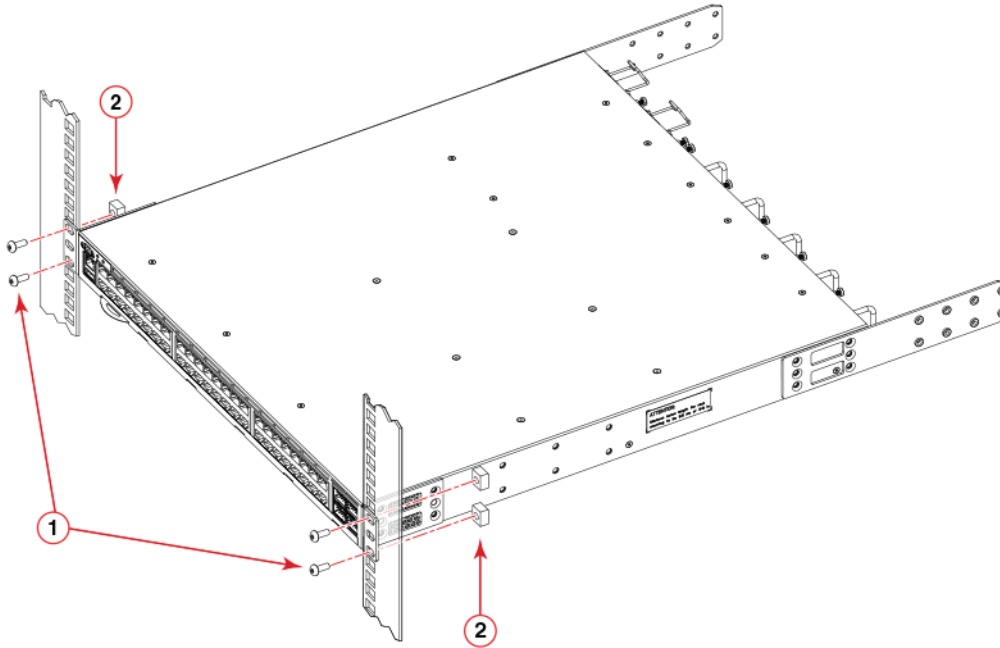
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

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. Slide the right rear bracket onto the right extension, as shown in Figure 19.

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

   Refer to Figure 20 for the positioning of the medium or long brackets and screws.

2. Attach the brackets using four 6-32 x 1/4-in. panhead screws.

3. Repeat step 1 and step 2 to attach the left rear bracket to the left extension.

4. 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 19 Attaching the Rear Brackets to the Extensions
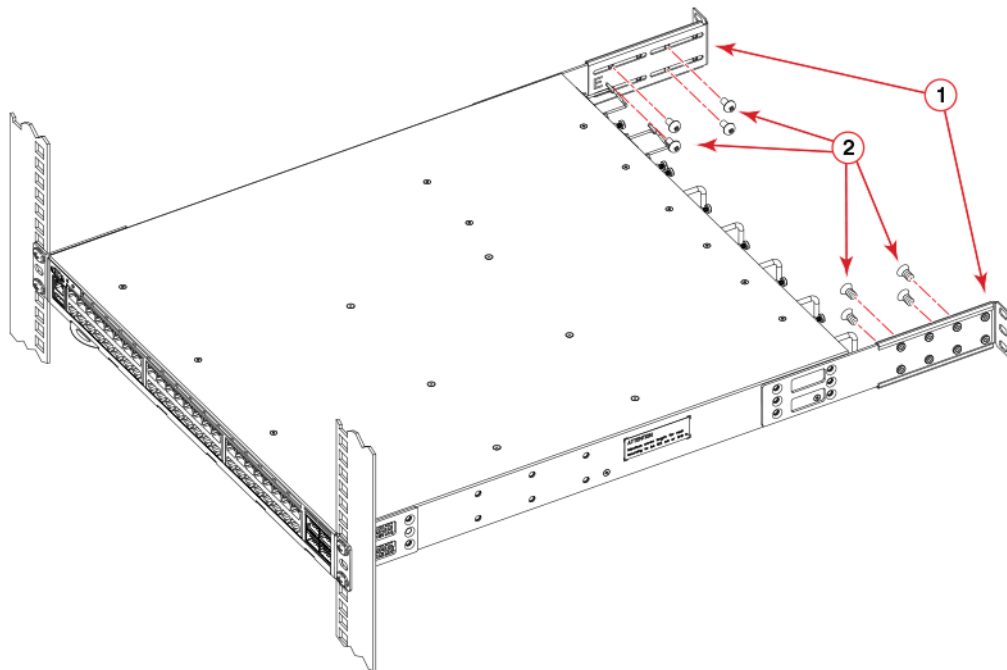
1	Rear brackets	2	Screws, 6-32 x 1/4-in., panhead Phillips

FIGURE 20 Attaching the Medium or Long rear Brackets to the Extensions
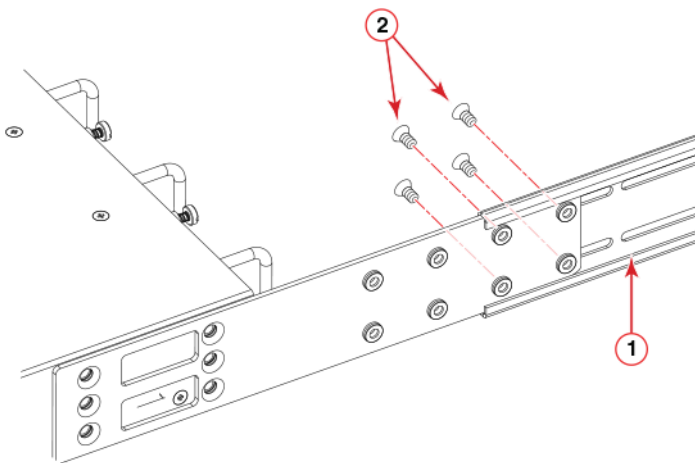
1	Rear bracket, medium or long	2	Screws, 6-32 x 1/4-in., panhead Phillips

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 21. 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 21 Attaching the Rear Brackets to the Rack Posts
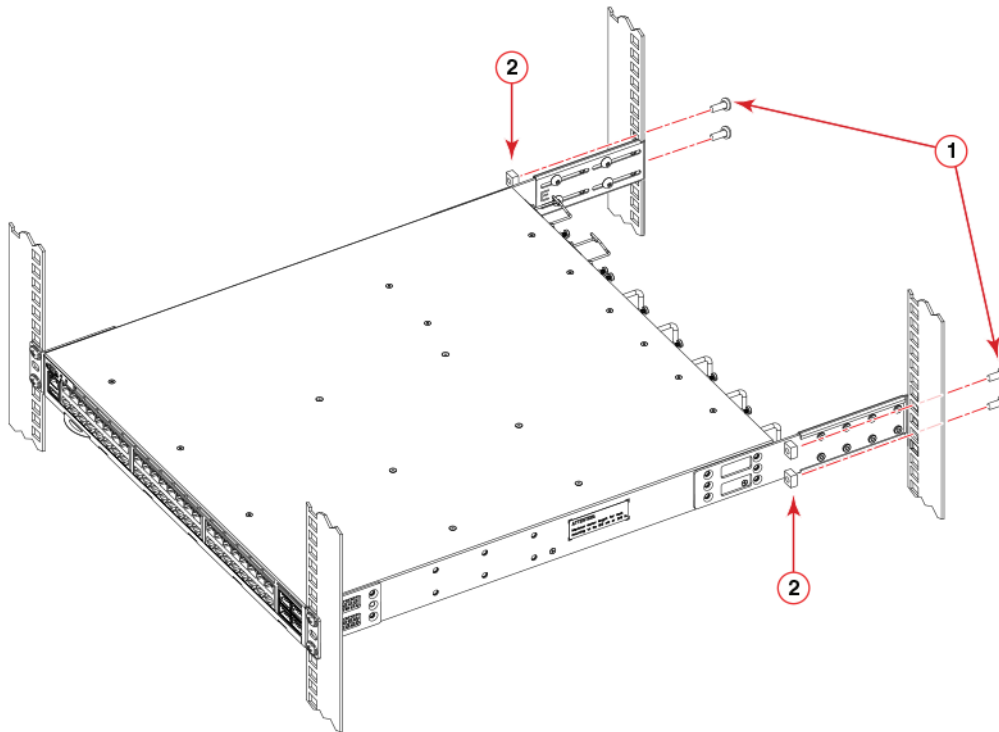
| 1 | Screws, 10-32 x 5/8-in., panhead Phillips | 2 | Retainer nuts, 10-32 |

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**
> 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 31

2. "Attaching the Extensions to the Front of the Device" on page 31

3. "Installing the Device in the Rack" on page 32

4. "Attaching the Rear Brackets to the Extensions at the Front of the Device" on page 33

5. "Attaching the Rear Brackets to the Front Rack Posts" on page 34

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 22.

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 22 Attaching the Front Brackets to the Rear of the Device
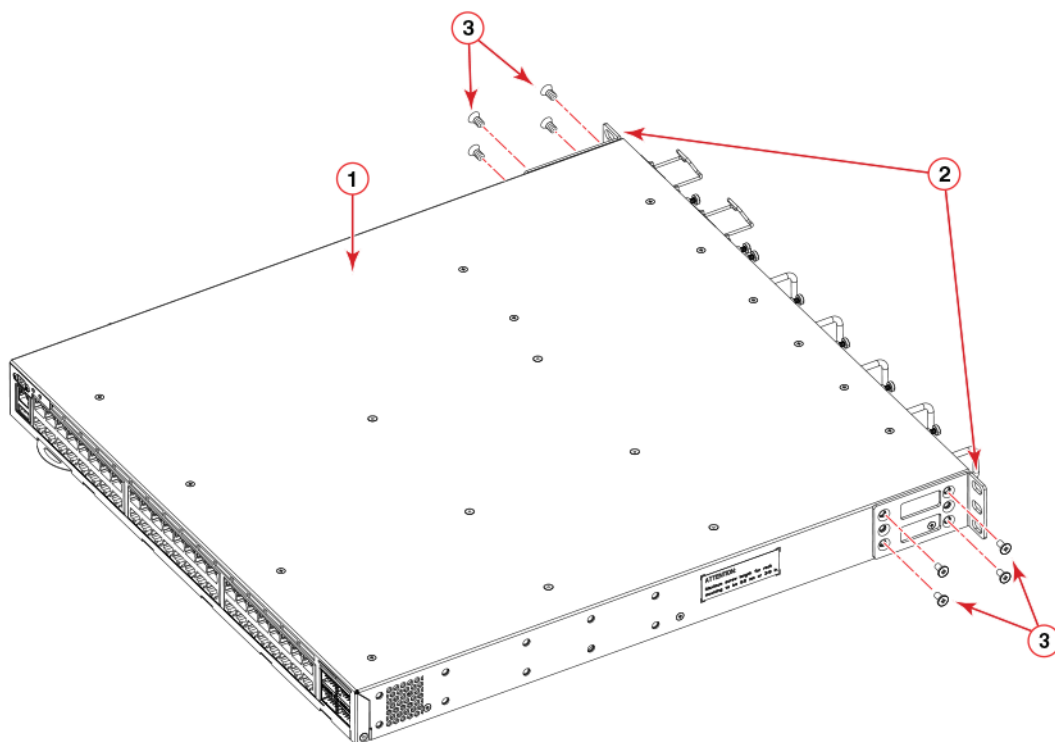
1	Device	3	Screws, 8-32 x 5/16-in., flathead Phillips
2	Front brackets		

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. Position the right extension along the side of the device as shown in Figure 23.

2. Attach the bracket using four 8-32 x 5/16-in. flathead screws.

3. Repeat Step 1 and Step 2 to attach the left front 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 23 Attaching the Bracket Extensions to the Device
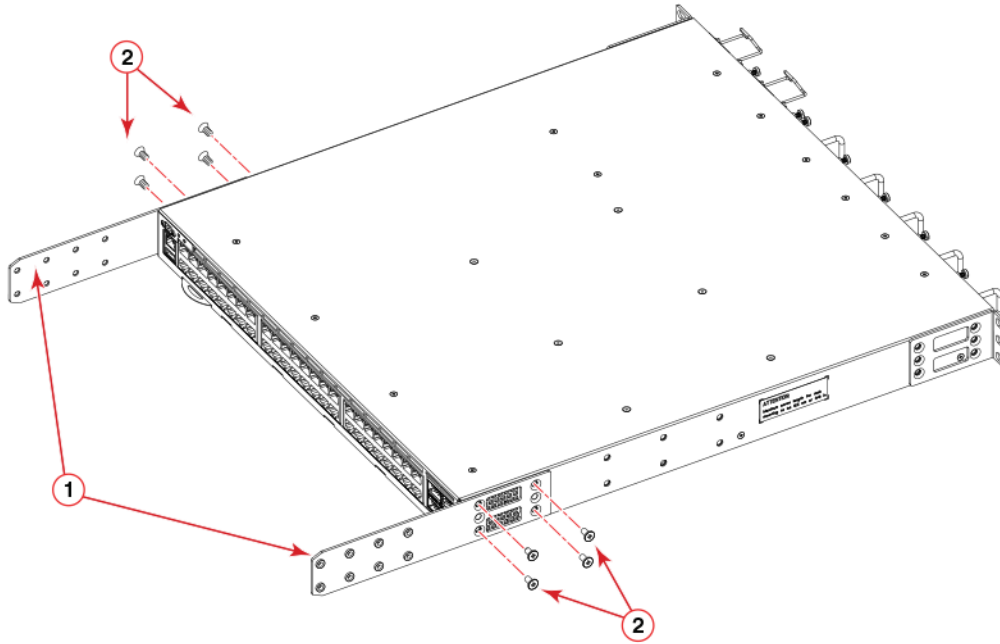
1	Extension brackets	2	Screws, 8-32 x 5/16-in., flathead Phillips

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 24, 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 24 Positioning the Device in the Rack
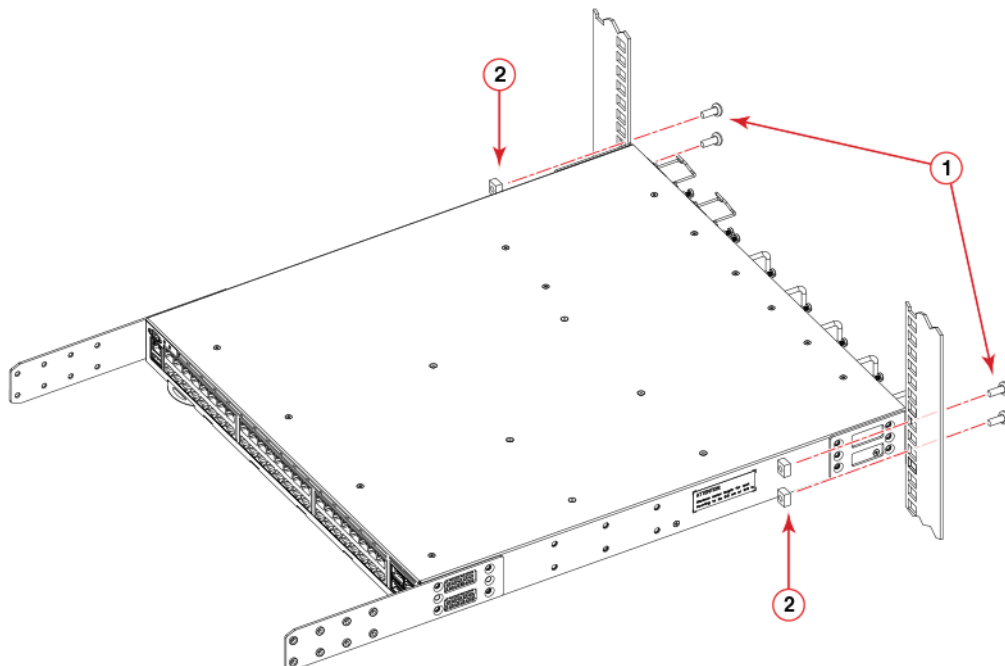
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

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. Slide the right rear bracket onto the right extension, as shown in Figure 25.

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

    Refer to Figure 26 for the positioning of the medium or long brackets and screws.

2. Attach the brackets using four 6-32 x 1/4-in. screws.

3. Repeat Step 1 and Step 2 to attach the left rear bracket to the left extension.

4. 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 25 Attaching the Rear Brackets to the Extensions at the Front of the Device
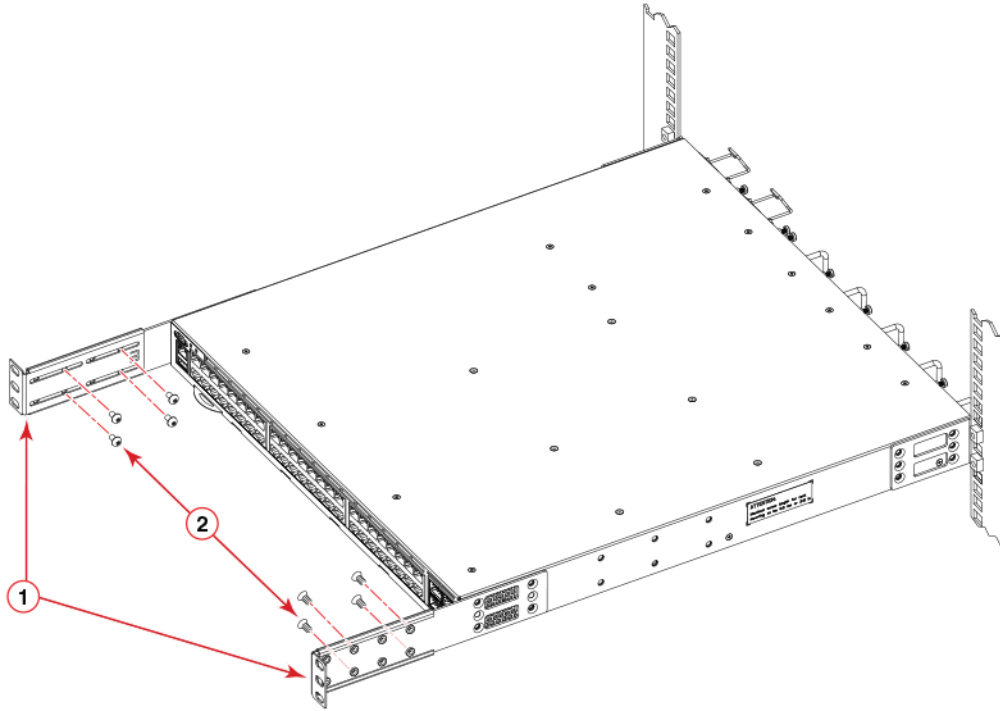
| 1 | Rear brackets, short | 2 | Screws, 6-32 x 1/4-in., panhead Phillips |

FIGURE 26 Attaching the Medium or Long Rear Brackets to the Extensions
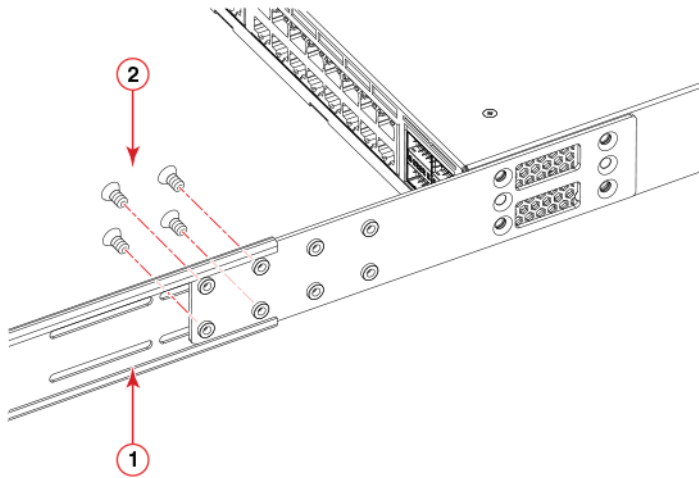
| 1 | Rear bracket, medium or long | 2 | Screws, 6-32 x 1/4-in., panhead Phillips |

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 27. 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 27 Attaching the Rear Brackets to the Front Rack Posts
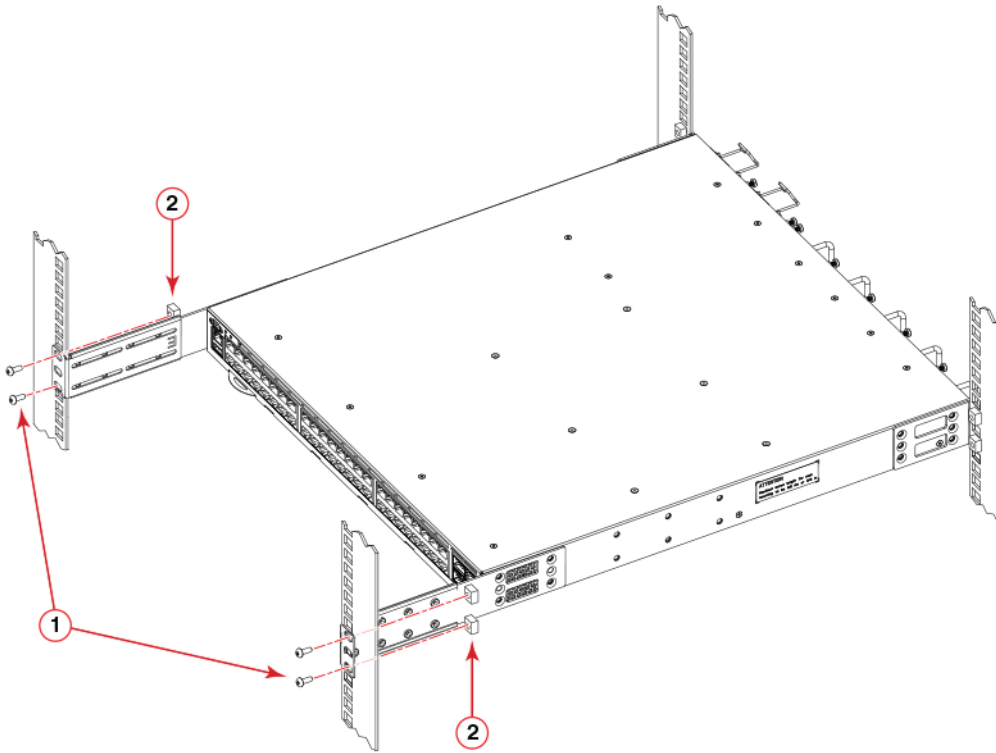
1	Screws, 10-32 x 5/8-in., panhead Phillips	2	Retainer nuts, 10-32

Connecting Devices in a Stack

The Ruckus ICX 7850 can operate as a standalone device or as a member of a stack. 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.

You can mix any Ruckus ICX 7850 models together in a stack. A stack cannot contain other device types.

Stacking Ports

There are eight 100-GbE QSFP28 ports on the front panel of the Ruckus ICX 7850 that can be used as stacking ports.

The following figure shows the stacking ports on the Ruckus ICX 7850-32Q.

FIGURE 28 Ruckus ICX 7850-32Q Stacking Ports
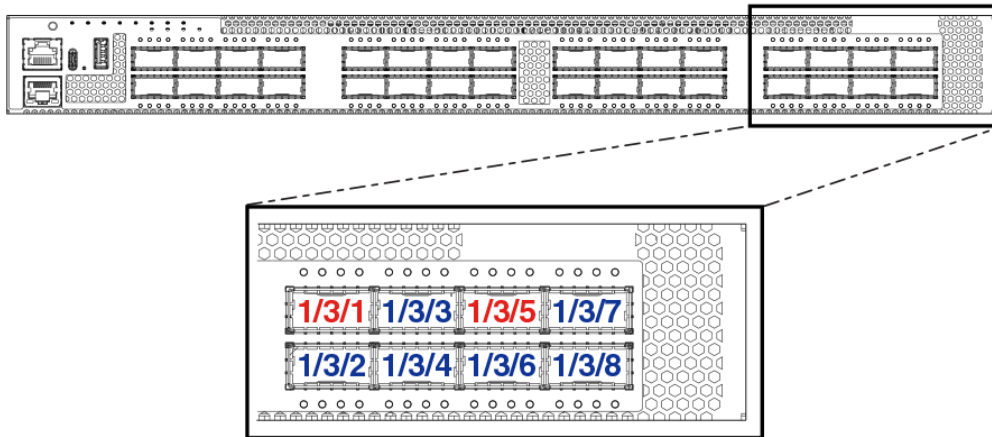
The 100-GbE ports 1/3/1 and 1/3/5 are default stacking ports. Default stacking ports have the capability to accept special stacking packets during a CLI-initiated command sequence of the Secure Setup utility.

The following figure shows the stacking ports on the Ruckus ICX 7850-48F and ICX 7850-48FS.

FIGURE 29 Ruckus ICX 7850-48F and ICX 7850-48FS Stacking Ports
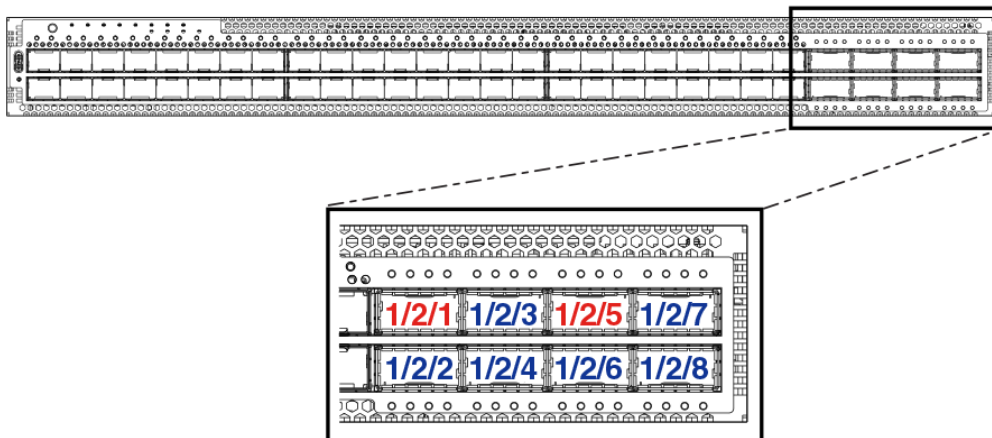
The 100-GbE ports 1/2/1 and 1/2/5 are default stacking ports. Default stacking ports have the capability to accept special stacking packets during a CLI-initiated command sequence of the interactive-setup utility.

Stacking Configuration Requirements

Before configuring the 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*.

Stacking Cables

Use QSFP28 direct-attached copper stacking cables or QSFP28 optics with fiber cables to connect the Ruckus ICX 7850 devices in a stack.

> NOTE
> Stacking cables are not included in the shipping carton and must be ordered separately.

Stack Size

A traditional stack can contain a maximum of twelve Ruckus ICX 7850 devices that are any combination of 7850-32Q, 7850-48F, or 7850-48FS. A stack cannot contain other device types.

Stacking Topologies

Both linear and ring topologies are supported in a stack. In a linear stack topology, there is a connection between each switch that carries two-way communications across the stack.

For example, in a four-unit stack using a linear topology, unit 1 connects to unit 2, unit 2 to unit 3, and unit 3 to unit 4.

Figure 30 shows a supported three-unit linear stacking topology using the 100-GbE stacking ports on Ruckus ICX 7850-48FS switches.

FIGURE 30   100-GbE Linear Stacking Topology
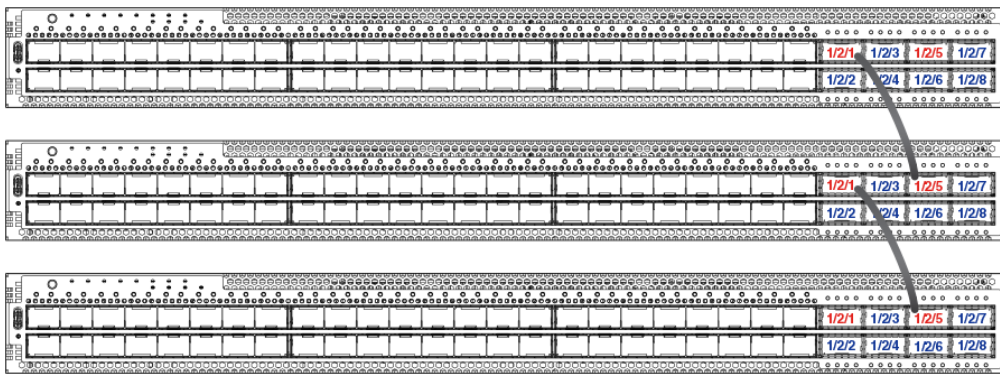
In a ring stack topology, there is an extra connection between the logical first and last devices, forming a "ring" or "closed-loop." The closed-loop connection provides a redundant path for the stack link, so if one link fails, stack communications can be maintained.

For example, in a three-unit stack using a ring topology, unit 1 connects to unit 2, unit 2 connects to unit 3, and unit 3 connects to unit 1.

Figure 31 shows a supported ring stacking topology using the 100-GbE stacking ports on Ruckus ICX 7850-48F switches.

FIGURE 31 100-GbE Ring Stacking Topology
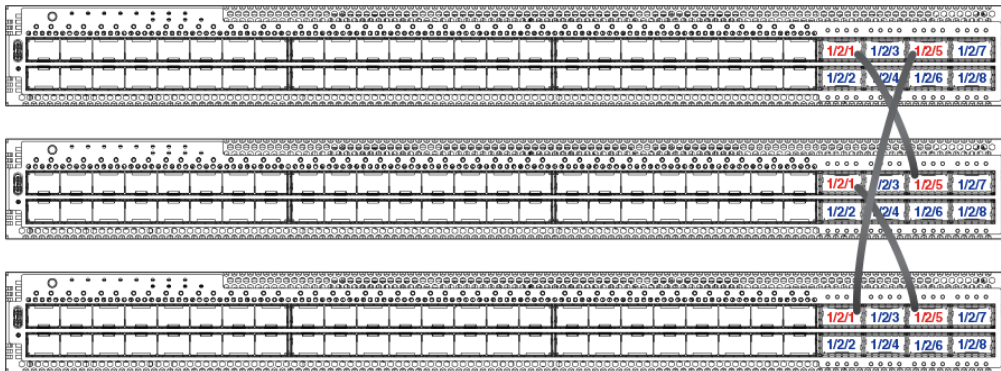
Interactive-Setup Utility

Stack interactive-setup lets you easily configure your entire stack through the active controller, which propagates the configuration to all stack members. Stack interactive-setup is the most secure way to build a traditional stack and gives you the most control over how your stack is built. The stack interactive-setup utility can also discover new links between existing stack units, enlarge a stacking trunk, or change a chain topology to a ring. The utility provides an option for users to change member IDs interactively.

The **stack interactive-setup** command, entered in privileged EXEC mode, is used to initiate the utility. Ruckus recommends that you make all physical connections and run **stack interactive-setup** on the active controller of a stack or on a standalone unit that will become the active controller.

The interactive-setup utility starts discovery in both upstream and downstream directions. The discovery process produces a list of upstream and downstream devices that are available to join the stack. Assuming the top unit is the Active Controller, the cabling depicted is recommended so that units are discovered and numbered sequentially, starting from the Active Controller at the top. Refer to the *Ruckus FastIron Stacking Configuration Guide* for more information on interactive-setup discovery.

Zero-Touch Provisioning

Stack zero-touch provisioning (ZTP) is the automatic discovery of stack members. When stack zero-touch provisioning is enabled, the system performs stack interactive-setup every three minutes in the background, without any prompts to the user or opportunities for user input. The resulting configuration is similar to running stack interactive-setup and accepting all recommended values. Stack zero-touch provisioning can detect new links between existing units and can discover new clean units (without startup-config flash), but it cannot change existing unit IDs.

Stack zero-touch provisioning is enabled by entering **stack zero-touch-enable** in global configuration mode. Refer to the *Ruckus FastIron Stacking Configuration Guide* for more information on stack zero-touch provisioning.

> NOTE
> Ruckus recommends the use of stack interactive-setup in preference to stack zero-touch provisioning because the interactive-setup utility allows you more flexibility when selecting units, assigning, IDs, or configuring a linear-topology trunk. Stack interactive-setup also makes connection errors easier to spot.

Support for Two-Unit Stack Linear Trunks

FastIron release 08.0.90 and later releases support a linear-topology trunk in a two-unit stack. A two-unit stack can form a linear topology with a trunk containing all stacking ports, instead of dividing the ports into the two directions of a ring topology. The linear-topology trunk provides the same redundancy as a two-unit ring because of trunk load balancing. Furthermore, a linear topology trunk doubles the bandwidth of the stacking ports between two units.

In a two-unit ring topology, only one direction is used even though there are two paths for a unit to reach the other unit. In contrast, a linear-topology trunk uses all ports to reach the other unit.

> NOTE
> In a ring of more than two units, all directions of any unit are fully utilized because each direction is to a different unit. Therefore, the linear-topology trunk is not supported in a stack of more than two units.

FIGURE 32   ICX 7850-48FS Two-Unit Stack with Linear-Topology Trunk (Eight Ports)
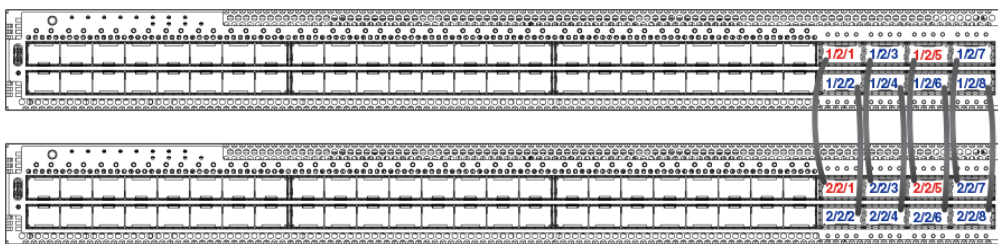
> NOTE
> For more information about stacking, refer to the *Ruckus FastIron Stacking Configuration Guide*.

Initial Setup and Verification

Providing Power to the Device

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

1. Install alternating-current (AC) power supplies in the switch. Refer to "Power Supplies" on page 59.

2. Connect AC power cables to the power supply connectors on the rear panel.

   NOTE
   The equipment should be installed near a power source and in an easily accessible location.

3. Connect the power cables to the 100-240 VAC power source. The power sources should be on separate circuits to protect against power failure. Ensure that the power cords have a minimum service loop of 6 inches available and are routed to avoid stress.

   NOTE
   Power is supplied to the device as soon as the first power supply is connected.

4. After the device has booted, verify that the power and status LEDs are green.

   The power supply LEDs display amber until power-on self-test (POST) is complete, and then change to green. The switch usually requires several minutes to boot and complete POST.

   NOTE
   To turn the system off, simply unplug the power cables.

For more information about how to interpret LEDs and run diagnostics tests, refer to "Diagnostic Tests and Monitoring" on page 57.

Establishing a First-Time Serial Connection

To assign an IP address, you must have access to the command line interface (CLI). The CLI is a text-based interface that can be accessed through a direct serial connection to the device and through Telnet connections. The CLI is described in detail in the *Ruckus FastIron Management Configuration Guide*.

Access the CLI by connecting to the RJ-45 or USB Type-C console port. After you assign an IP address, you can access the system through Telnet, or Ruckus Network Advisor.

Perform the following steps to access the device through a serial connection.

1. Connect the serial cable to the RJ-45 or USB Type-C console port on the front of the Ruckus ICX 7850 switch and to an RS-232 serial port on the workstation using the RJ-45-to-DB9 adapter included in the shipping carton or a USB Type-C serial console port cable.

   For port pinout information for the console ports, refer to "Serial Port Specifications (Pinout - USB Type-C)" on page 74 and "Serial Port Specifications (Pinout RJ-45)" on page 75.

2. Disable any serial communication programs running on the workstation such as synchronization programs.

3. Open a terminal emulator application such as HyperTerminal on a Windows PC, or TERM, TIP, or Kermit in a UNIX environment, and configure the application as follows:

    -   In a Windows environment

        -   Baud: 9600 bps

        -   Data bits: 8

        -   Parity: None

        -   Stop bits: 1

        -   Flow control: None

    -   In a UNIX environment using TIP, enter the following string at the prompt:

        ```
        tip /dev/ttyb -9600
        ```

        If ttyb is already in use, use ttya instead and enter the following string at the prompt:

        ```
        tip /dev/ttya -9600
        ```

Establishing an Out-of-Band Management Port Connection

The Gigabit Ethernet management port (RJ-45) on the Ruckus ICX 7850 front panel provides an out-of-band network connection to the device. After you assign an IP address, you can access the Ruckus ICX 7850 from anywhere in the attached network using Telnet, a web browser, or other network management tools, such as Ruckus Network Advisor. To prevent unauthorized access, Ruckus recommends that the management port only be connected to a secure private network.

To manage the Ruckus ICX 7850 switch through its management port, connect the port to the Ethernet network using Category 5 or better cable. Management of the Ruckus ICX 7850 is described in detail in the *Ruckus FastIron Management Configuration Guide*.

Installing Transceivers and Cables

Precautions Specific to Transceivers and Cables

> **DANGER**
> *All fiber-optic interfaces use Class 1 lasers.*

> **DANGER**
> *Laser radiation. Do not view directly with optical instruments. Class 1M laser products.*

> **DANGER**
> *Use only optical transceivers that are qualified by Ruckus and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 60825 and EN60825. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.*

> **DANGER**
> *For safety reasons, the ESD wrist strap should contain a series 1 megohm resistor.*

> **CAUTION**
> **Before plugging a cable to any port, be sure to discharge any static charge stored on the cable by touching the electrical contacts to ground surface.**

Cleaning the Fiber-Optic Connectors

To avoid problems with the connection between the fiber-optic transceiver (SFP/SFP+/SFP28 or QSFP+/QSFP28) 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 a fiber-optic transceiver connector, make sure to keep the protective covering in place.

Managing Cables

Cables can be organized and managed in a variety of ways, for example, using cable channels on the sides of the rack or patch panels to minimize cable management. Follow these recommendations:

> **NOTE**
> You should not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.

> ⚡ **CAUTION**
> **Before plugging a cable to any port, be sure to discharge any static charge stored on the cable by touching the electrical contacts to ground surface.**

- Plan for rack space required for cable management before installing the switch.
- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- For easier maintenance, label the fiber-optic cables and record the devices to which they are connected.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.
- Use hook and loop style straps to secure and organize fiber-optic cables.
- The minimum bend radius for a 50 micron cable is 2 inches under full tensile load and 1.2 inches with no tensile load.

Installing a Fiber-Optic Transceiver

To monitor the transceivers, the **show media** command output shows the transceiver information for all interfaces on the device. Ruckus provides support for third-party transceivers, but may require a Ruckus transceiver be used for troubleshooting.

Support will not be provided if there is an issue with a third-party transceiver.

> **NOTE**
> Ruckus-branded removable media devices are recommended for proper operation of the device.

You can install a new transceiver in a slot while the device is powered on and running. For ports not configured in breakout mode, a fixed speed can also be set using the CLI (refer to the *Ruckus FastIron Management Configuration Guide*). Port speed changes are dynamic and do not require a system reboot.

> **ATTENTION**
> Any mismatch between a transceiver and port speed in "fixed speed" mode causes the port to be disabled. Note that the autonegotiation of link speed with a link partner is not supported on any port.

Installed transceivers are validated against a predefined list and categorized as Qualified, Unqualified, or Unsupported. Qualified transceivers operate normally. Unqualified transceivers are allowed to operate, but a log message is generated to inform the user. Unsupported transceivers are rejected and a port fault log message is generated.

Before installing a fiber-optic transceiver, have an ESD wrist strap available with a plug for connection to the ESD connector on the device.

> ⚡ **DANGER**
> *For safety reasons, the ESD wrist strap should contain a series 1 megohm resistor.*

DANGER
Laser radiation. Do not view directly with optical instruments. Class 1M laser products.

Use the following steps to install a 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. Remove any protector plugs from the transceivers and the ports.

4. Making sure that the bail (wire handle) is in the unlocked position, place the transceiver in the correctly oriented position on the port, as shown in Figure 33.

5. Slide the transceiver into the port until you feel it click into place; then close the bail. Transceivers are keyed to prevent incorrect insertion.

NOTE
Each fiber-optic transceiver has a 10-pad gold-plated edge connector on the bottom. The correct position to insert a fiber-optic transceiver in the upper row of ports is with the gold-plated edge down. The correct position to insert a fiber-optic transceiver in the lower row of ports is with the gold-plated edge up.

FIGURE 33 Installing an SFP+ Transceiver in a Port Slot
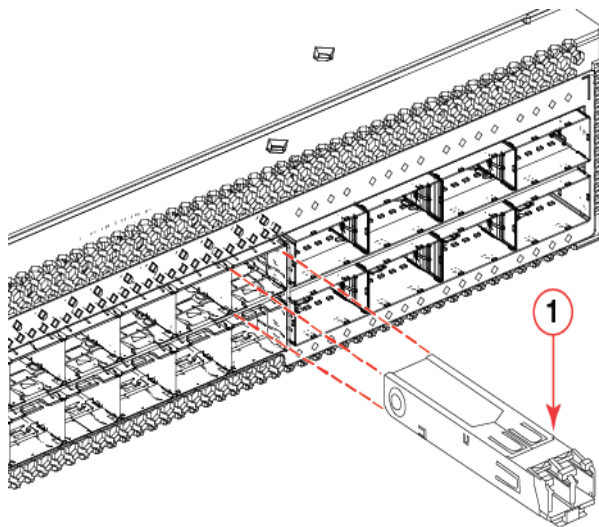
1   SFP+ transceiver

Replacing a Fiber-Optic Transceiver

You can remove a fiber-optic transceiver from a slot and replace it with a new one while the Ruckus ICX 7850 switch is powered on and running.

While removing a fiber-optic transceiver, be sure to wear an ESD wrist strap that is connected to ground.

> **DANGER**
> *For safety reasons, the ESD wrist strap should contain a series 1 megohm resistor.*

Use the following steps to remove a fiber-optic transceiver from a slot.

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 fiber cable connector from the port connector.

3. Unlock the fiber-optic transceiver by pulling the bail latch forward, away from the front of the slot.

   NOTE
   The QSFP28 transceivers do not have bails, but pull tabs. Always use the pull tab to insert or remove the QSFP28 transceivers, because the transceiver may be hot.

   NOTE
   The bail latch or pull tab may be attached to either the top or the bottom of the fiber-optic transceiver.

4. Grasp the bail latch and pull the fiber-optic transceiver out of the slot.

5. Store the fiber-optic transceiver in a safe, static-free place or in an anti-static bag.

6. Install a new fiber-optic transceiver in the slot.

Connecting Network Devices

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

Connecting a Network Device to a Fiber Port

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

For information about transceivers supported on the Ruckus ICX 7850 switch, refer to the Ruckus Optics Family Data Sheet.

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

- Install a fiber-optic transceiver (SFP/SFP+/SFP28 or QSFP28). Refer to "Installing a Fiber-Optic Transceiver" on page 44.
- Cable the fiber-optic transceiver.

Cabling a Fiber-Optic Transceiver

Use 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.

2. Before cabling a fiber-optic transceiver, Ruckus strongly recommends cleaning the cable connectors and the port connectors. For more information, refer to "Cleaning the Fiber-Optic Connectors" on page 43.

3. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tab locks into place.

4. Observe the link and activity LEDs to determine if the network connections are functioning properly. For more information about the LED indicators, refer to "LED Activity Interpretation" on page 49.

NOTE
To verify that a Ruckus ICX 7850 switch can reach another device through the network, use the **ping** command at any level of the CLI. For more information, refer to the *Ruckus FastIron Management Configuration Guide*.

Monitoring the Device

LED Activity Interpretation

System activity and status can be determined through the activity of the LEDs on the switch.

There are three possible LED states: off (no light), a steady light, and a flashing light. Flashing lights may be slow, fast, or flickering. The LED colors are either green or amber.

Sometimes, the LEDs flash either of the colors during boot, POST, or other diagnostic tests. This is normal; it does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

Ruckus ICX 7850 Port-Side LEDs

The Ruckus ICX 7850-32Q has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PWR and PWR2
- One SYS (system) bicolor status LED (green and amber)
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- One CLD (cloud management) bicolor status LED (green and amber)
- One UPDATE (software update) bicolor status LED (green and amber)
- Five status mode LEDs (green) selected by pressing the status mode button:
  - STAT: Port LEDs indicate link and traffic activity.
  - SPD: Port LEDs indicate the link speed.
  - ID: Port LEDs indicate the stack unit ID when the switch is in stacking mode, or the PE ID when in SPX mode.
  - USB: Indicates files are being copied to a USB drive connected to the USB port.
- Four bicolor status LEDs (green and amber) for each of the 32 QSFP28 ports that indicate the status of the ports in 100 GbE mode, 40 GbE mode, 4x25 GbE mode, and 4x10 GbE mode. The LED indication is dependent on the mode set by the status mode button.

Figure 34 shows the LEDs on the Ruckus ICX 7850-32Q front panel.

FIGURE 34 Ruckus ICX 7850-32Q Front-Panel LEDs
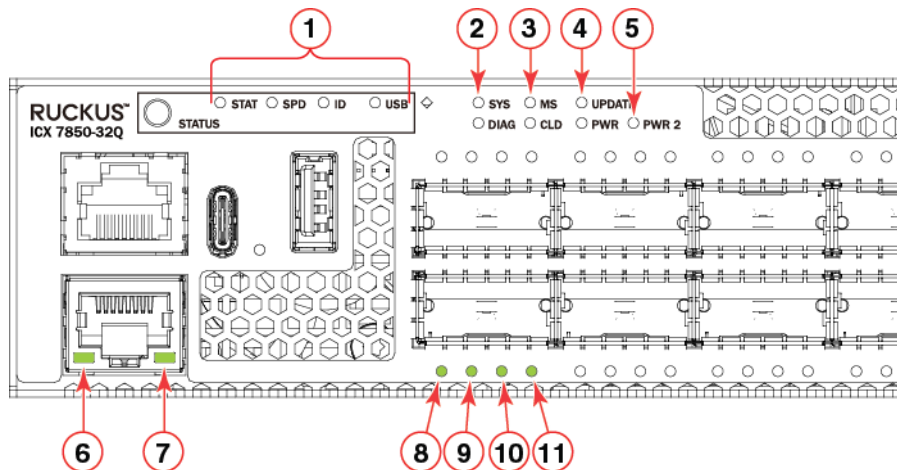
1	Mode status LEDs: STAT, SPD, ID, USB	7	Management port speed LED
2	SYS (system status) and DIAG (diagnostic) status LEDs	8	QSFP28 port 100/40 GbE or 4x25/10 GbE mode lane 1 link/activity LED
3	MS (stacking configuration) status and CLD (cloud management) LEDs	9	QSFP28 port 4x25/10 GbE mode lane 2 link/activity LED
4	UPDATE (software update) and PWR (PSU 1) status LEDs	10	QSFP28 port 4x25/10 GbE mode lane 3 link/activity LED
5	PWR2 (PSU 2) status LED	11	QSFP28 port 4x25/10 GbE mode lane 4 link/activity LED
6	Management port link/activity LED		

The Ruckus ICX 7850-48F has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity

- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PWR and PWR2

- One SYS (system) bicolor status LED (green and amber)

- One DIAG (diagnostic) bicolor status LED (green and amber)

- One MS (stacking configuration) bicolor status LED (green and amber)

- One CLD (cloud management) bicolor status LED (green and amber)

- One UPDATE (software update) bicolor status LED (green and amber)

- Five status mode LEDs (green) selected by pressing the status mode button:

  - STAT: Port LEDs indicate link and traffic activity.

  - SPD: Port LEDs indicate the link speed.

  - ID: Port LEDs indicate the stack unit ID when the switch is in stacking mode, or the PE ID when in SPX mode.

  - USB: Indicates files are being copied to a USB drive connected to the USB port.

- 48 bicolor (green and amber) status LEDs for SFP28 ports 1-48. The LED indication is dependent on the mode set by the status mode button.

- Four bicolor status LEDs (green and amber) for each of the 8 QSFP28 ports that indicate the status of the ports in 100 GbE mode, 40 GbE mode, 4x25 GbE mode, and 4x10 GbE mode. The LED indication is dependent on the mode set by the status mode button.

shows the LEDs on the Ruckus ICX 7850-48F front panel.

FIGURE 35 Ruckus ICX 7850-48F Front-Panel LEDs
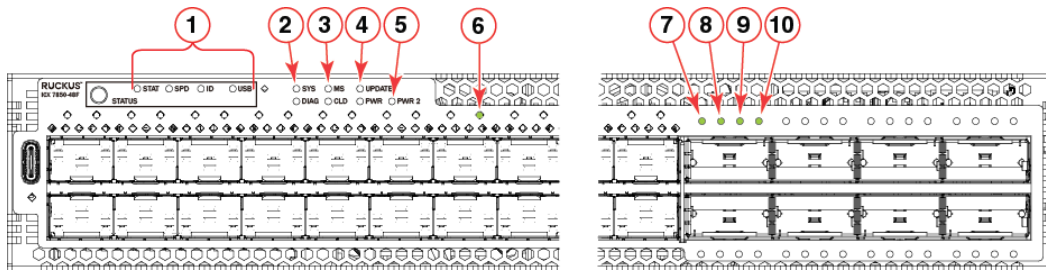
1	Mode status LEDs: STAT, SPD, ID, USB	6	SFP28 ports 1-48 status LEDs
2	SYS (system status) and DIAG (diagnostic) status LEDs	7	QSFP28 port 100/40 GbE or 4x25/10 GbE mode lane 1 link/activity LED
3	MS (stacking configuration) status and CLD (cloud management) LEDs	8	QSFP28 port 4x25/10 GbE mode lane 2 link/activity LED
4	UPDATE (software update) and PWR (PSU 1) status LEDs	9	QSFP28 port 4x25/10 GbE mode lane 3 link/activity LED
5	PWR2 (PSU 2) status LED	10	QSFP28 port 4x25/10 GbE mode lane 4 link/activity LED

The Ruckus ICX 7850-48FS has the following LEDs on the front panel:

- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PWR and PWR2.

- One SYS (system) bicolor status LED (green and amber)

- One DIAG (diagnostic) bicolor status LED (green and amber)

- One MS (stacking configuration) bicolor status LED (green and amber)

- One CLD (cloud management) bicolor status LED (green and amber)

- One UPDATE (software update) bicolor status LED (green and amber)

- Four status mode LEDs (green) selected by pressing the status mode button:

  - STAT: Port LEDs indicate link and traffic activity.

  - SPD: Port LEDs indicate the link speed.

  - ID: Port LEDs indicate the stack unit ID when the switch is in stacking mode, or the PE ID when in SPX mode.

  - USB: Indicates files are being copied to a USB drive connected to the USB port.

- 48 bicolor (green and amber) status LEDs for SFP+ ports 1-48. The LED indication is dependent on the mode set by the status mode button.

- Four bicolor status LEDs (green and amber) for each of the 8 QSFP28 ports that indicate the status of the ports in 100 GbE mode, 40 GbE mode, 4x25 GbE mode, and 4x10 GbE mode. The LED indication is dependent on the mode set by the status mode button.

shows the LEDs on the Ruckus ICX 7850-48FS front panel.

FIGURE 36 Ruckus ICX 7850-48FS Front-Panel LEDs
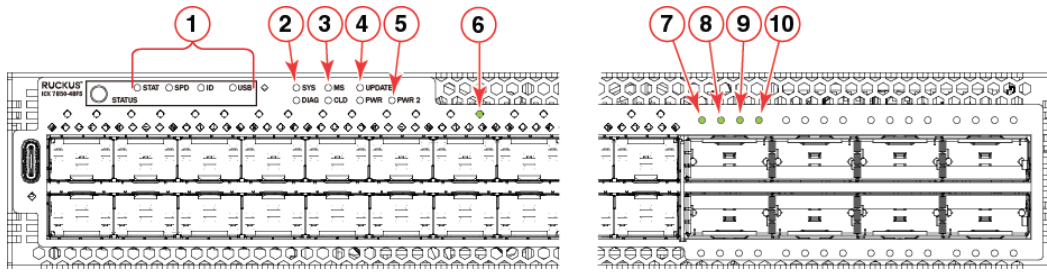
1	Mode status LEDs: STAT, SPD, ID, USB	6	SFP+ ports 1-48 status LEDs
2	SYS (system) and DIAG (diagnostic) status LEDs	7	QSFP28 port 100/40 GbE or 4x25/10 GbE mode lane 1 link/activity LED
3	MS (stacking configuration) status and CLD (cloud management) LEDs	8	QSFP28 port 4x25/10 GbE mode lane 2 link/activity LED
4	UPDATE (software update) and PWR (PSU 1) status LEDs	9	QSFP28 port 4x25/10 GbE mode lane 3 link/activity LED
5	PWR2 (PSU 2) status LED	10	QSFP28 port 4x25/10 GbE mode lane 4 link/activity LED

Ruckus ICX 7850 Nonport-Side LEDs

The Ruckus ICX 7850-32Q has the following LEDs on the rear panel:

- Power supply LEDs: Two single-color status LEDs (green) on each installed power supply
- Fan assembly LEDs: One bicolor status LED (green and amber) on each installed fan assembly

Figure 37 shows the LEDs on the rear panel of the Ruckus ICX 7850-32Q.

FIGURE 37 Ruckus ICX 7850-32Q Rear-Panel LEDs
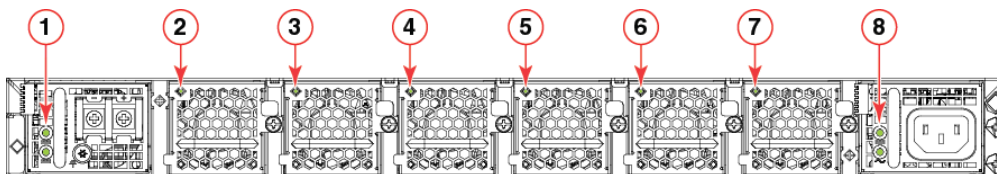
1	PSU2 input (lower) and output (upper) status LEDs	5	FAN3 fan assembly LED
2	FAN6 fan assembly LED	6	FAN2 fan assembly LED
3	FAN5 fan assembly LED	7	FAN1 fan assembly LED
4	FAN4 fan assembly LED	8	PSU1 input (lower) and output (upper) status LEDs

The Ruckus ICX 7850-48F and ICX 7850-48FS have the following LEDs on the rear panel:

- Two management port single-color status LEDs (green) for speed and link/activity
- Power supply LEDs: Two single-color status LEDs (green) on each installed power supply
- Fan assembly LEDs: One bicolor status LED (green and amber) on each installed fan assembly

Figure 37 shows the LEDs on the rear panel of the Ruckus ICX 7850-48F and ICX 7850-48FS.

FIGURE 38 Ruckus ICX 7850-48F and ICX 7850-48FS Rear-Panel LEDs
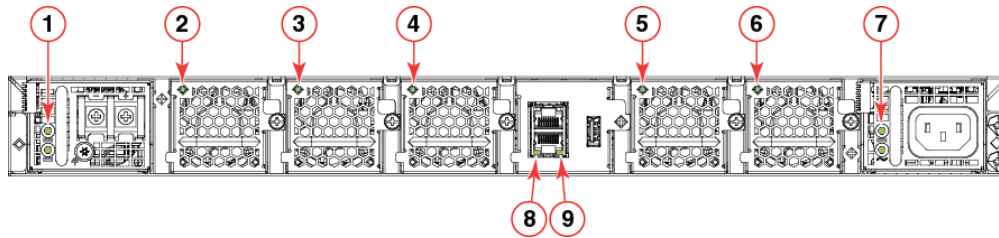
1	PSU2 input (lower) and output (upper) status LEDs	6	FAN1 fan assembly LED
2	FAN5 fan assembly LED	7	PSU1 input (lower) and output (upper) status LEDs
3	FAN4 fan assembly LED	8	Management port link/activity LED
4	FAN3 fan assembly LED	9	Management port speed LED
5	FAN2 fan assembly LED		

Status Mode Button and LEDs

The status mode button is used to select the corresponding status indicated by the port status LEDs. Each press of the status mode button selects the next mode in the following sequence.

1. STAT: Port LEDs indicate link and traffic activity (the default mode).

2. SPD: Port LEDs indicate the link speed.

3. ID: Port LEDs indicate the stack unit ID when the switch is in stacking mode, or the PE ID when in SPX mode.

4. USB: Indicates files are being copied to a USB drive connected to the USB port.

When in USB mode, pressing the status mode button for 5 seconds copies files, such as FastIron image and manifest files, configuration files, and Show Tech (supportsave) files from the switch to the USB drive. This capability must be enabled by using the **reverse-manifest enable** command in the CLI.

The switch system automatically copies files from an inserted USB drive to the system flash after a system reload. The USB drive must have the files preloaded. The status mode automatically selects USB mode when a USB auto-copy begins.

The following table describes the USB status mode LED for a file copy to or from a USB drive.

TABLE 8 USB Mode LED (File Copy to or from USB)

LED State	Status of Hardware	Recommended Action
Blinking green	A 5-second button press has been detected and the USB copy has started. Or, a system flash upgrade has started from a USB drive.	No action required.
Steady green	A USB drive is plugged in, or a copy operation has completed.	No action required.
Steady amber	No USB device detected.	No action required.
Blinking amber	A USB copy operation has failed, there has been an application error, or the USB is present but there is a mount failure or access failure.	Contact Technical Support.

LED Patterns

The following tables describe the Ruckus ICX 7850 LED patterns.

TABLE 9   Management Port Left (Link/Activity) Status LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Not cabled or no link.	No action required.
Steady green	A link is up with no traffic.	No action required.
Blinking green	A link is up and packets are being transmitted or received.	No action required.

TABLE 10   Management Port Right (10/100/1000 Mbps) Status LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Not cabled or 10/100 Mbps link is up.	No action required.
Steady green	A 1000 Mbps link is up.	No action required.

TABLE 11   SYS LED

LED State	Status of Hardware	Recommended Action
Off (no light)	System is off or there is no power.	No action required.
Blinking green	Device is initializing.	No action required.
Steady green	The application software is up and running on the switch.	No action required.
Steady amber	The system is in boot mode.	No action required.
Blinking amber	The system has crashed and the watchdog timer has timed out. Or, the system has failed to boot a valid software image.	Contact Technical Support.

TABLE 12   DIAG LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Diagnostic is off.	No action required.
Blinking green	System self-diagnostic test is in progress.	No action required.
Steady green	System self-diagnostic test has successfully completed.	No action required.
Steady amber	System self-diagnostic test has detected a fault.	Contact Technical Support.

TABLE 13   MS LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Stacking mode is enabled and the switch is a stack member operating in slave mode, or the switch is operating in standalone mode.	No action required.
Blinking green	Device is initializing.	No action required.
Steady green	Stacking mode is enabled and the switch is the stack master.	No action required.
Steady amber	Stacking mode is enabled and the switch is the standby controller.	No action required.
Blinking amber	Stacking error. The switch is in a non-operating mode.	Contact Technical Support.

TABLE 14   UPDATE LED

LED State	Status of Hardware	Recommended Action
Off (no light)	System is running an earlier software image.	No action required.
Blinking green	The switch software is being updated through DHCP, USB/TFTP, ISSU, or from another unit in a stack.	No action required.
Steady green	The switch software has been successfully updated through DHCP, USB/TFTP, ISSU, or from another unit in a stack.	No action required.
Blinking amber	An error has occurred during a software update. Or, the system booted after image upgrade from a different partition/image as instructed by the user.	No action required.

TABLE 15   CLD LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Cloud management is disabled on the switch.	No action required.
Blinking green	The switch is trying to connect to a cloud management platform.	No action required.
Steady green	The switch is successfully connected to a cloud management platform.	No action required.
Steady amber	The switch has temporarily lost its connection to a cloud management platform.	No action required.
Blinking amber	The switch has encountered an error trying to connect to a cloud management platform.	Contact Technical Support.

TABLE 16   PWR and PWR2 LEDs

LED State	Status of Hardware	Recommended Action
Off (no light)	System is off or there is no power.	Verify the system is on and has completed booting.
Steady green	PSU is on and functioning properly.	No action required.
Steady amber	PSU is missing power or in a faulty state (such as PSU fan failure).	Verify that the PSU power cord is connected to a functioning power source. Replace the power supply.

TABLE 17   100 GbE, 40 GbE, 25 GbE, 10 GbE, 1 GbE Port Status LEDs

Status Mode	LED State	Status of Hardware	Recommended Action
STAT	Off (no light)	Not cabled.	No action required.
	Steady green	Link is up with no traffic.	No action required.
	Blinking green	Link is up and packets are being transmitted or received.	No action required.
	Steady amber	Packet errors have been detected on the port.	No action required.
	Blinking amber	Port is disabled by UDLD, LACP, or other error.	No action required.

TABLE 17   100 GbE, 40 GbE, 25 GbE, 10 GbE, 1 GbE Port Status LEDs (Continued)

Status Mode	LED State	Status of Hardware	Recommended Action
SPD	Off (no light)	No valid link on the port.	No action required.
	Steady green	Port is operating at its highest speed. • 100 GbE ports: 100 Gbps • 25 GbE ports: 25 Gbps • 10 GbE ports: 10 Gbps	No action required.
	Blinking green	Port is operating at its second highest speed. • 100 GbE ports: 40 Gbps • 25 GbE ports: 10 GbE • 10 GbE ports: 1 Gbps	No action required.
	Steady amber	Port is operating at its third highest speed. • 25 GbE ports: 1 Gbps	No action required.
ID	Steady green	The port number is the same as the stack ID. Or, the port number is the first digit of the PE ID.	No action required.
	Steady amber	The port number is the second digit of the PE ID. If the port number is 10, then the second digit or PE ID is 0.	No action required.
	Alternating amber/green	The port number indicates that the first and second digit of the PE ID are the same.	No action required.

TABLE 18   Power Supply Input LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Power supply is not receiving external power.	Verify that the power supply power cord is connected to a functioning power source.
Steady green	Power supply is receiving external power.	No action required.
Blinking green (with power cord connected)	Power supply has a fault.	Replace the power supply.

TABLE 19   Power Supply Output LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Power supply is not powered on.	Verify that the Power supply power cord is connected to a functioning power source.
Steady green	Power supply is on and functioning properly.	No action required.
Blinking green (with power cord connected)	Power supply has a fault.	Replace the power supply.

TABLE 20   Fan Assembly LED

LED State	Status of Hardware	Recommended Action
Off (no light)	Fan assembly is not powered on.	No action required.
Steady green	Fan assembly is on and functioning properly.	No action required.
Blinking green/amber	Fan assembly has a fault.	Replace fan assembly.

Diagnostic Tests and Monitoring

Ruckus FastIron software includes diagnostic tests to help you troubleshoot the hardware. System diagnostic software is designed to fulfill the purpose of offline diagnostics. In offline diagnostics, you must turn the diagnostic flags on or off to execute diagnostic tests during the next bootup.

The CLI commands for system diagnostic tests are **dm diag** and **dm alt-diag**. These diagnostic tests verify all available hardware components including:

- I2C devices
- EEPROM
- CPU packet
- Line rate

During system diagnostic testing, the system is completely under the control of the diagnostic software. All hardware components are verified, and results are displayed on the console. In cases where a failure is detected, results and corrective actions will be displayed. After the system diagnostic testing is complete, the system exits from the diagnostic mode and reloads the system for normal operation.

System diagnostic testing runs at link speeds of 1 Gbps, 10 Gbps, 25 Gbps, 40 Gbps, or 100 Gbps depending on the speed of the link being tested and the type of port.

The Ruckus device is engineered for reliability and requires no routine operational steps or maintenance. You can monitor the device by paying attention to the following information:

- The LEDs showing the status of system components
- A description of the operations that the device performs when you power it on

The following commands can be especially helpful in monitoring the health status of various device components. For details about these commands, refer to the *Ruckus FastIron Management Configuration Guide*.

- **show chassis**
- **show system**

Power Supplies

Power Supply Overview

The Ruckus ICX 7850 switch supports alternating-current (AC) and direct-current (DC) power supplies. The Ruckus ICX 7850 switch is capable of running on one power supply and four fan assemblies. The second power supply and fifth or sixth fan assembly provide redundancy.

If the power supply and fan assembly slots are unused, you must cover them with filler panels.

> **NOTE**
> Ruckus recommends that the Ruckus ICX 7850 switch operate with two power supplies and five fan assemblies installed. If a power supply or fan assembly fails, it must be replaced as soon as possible.

> **NOTE**
> AC and DC power supplies can be installed and used in the same device.

The power supplies in the Ruckus ICX 7850 switch chassis can be removed and replaced without special tools. The device can continue operating during the replacement.

The device supports the following types of power supplies:

- AC power supply with nonport-side air exhaust. This unit moves the air from the port side to the nonport side of the device.
- AC power supply with nonport-side air intake. This unit moves the air from the nonport side to the port side of the device.
- DC power supply with nonport-side air exhaust. This unit moves the air from the port side to the nonport side of the device.
- DC power supply with nonport-side air intake. This unit moves the air from the nonport side to the port side of the device.

FIGURE 39 AC Power Supply
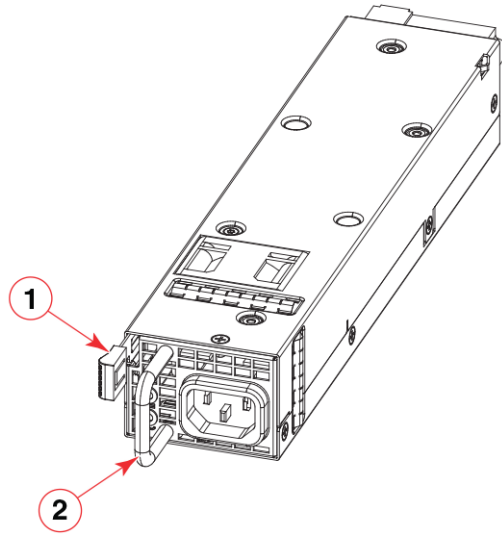
1	Release lever	2	Power supply handle

FIGURE 40 DC Power Supply
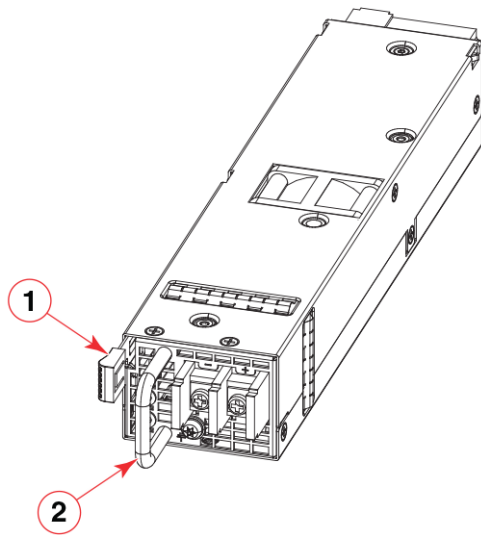
1	Release lever	2	Power supply handle

Precautions Specific to Power Supplies

⚠️ **DANGER**
Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

⚠ **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.

⚠ **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.

⚠ **CAUTION**
Ensure that the airflow direction of the power supply matches that of the installed fan assembly. The power supplies and fan assemblies are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

⚠ **CAUTION**
If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

⚠ **CAUTION**
Use a UL listed or CSA Certified DC power source to connect to a DC PSU.

Identifying the Airflow Direction

The power supply and fan assemblies are identified by the following airflow directions:

- **Intake power supply and fan assembly with an orange "I" label or without any label**: Pulls air from the nonport side of the switch and exhausts it out the port side.

- Nonport-side air intake
- Port-side air exhaust
- Back-to-front (nonport-side to port-side) airflow
- Part numbers ending with **-R**

- **Exhaust power supply and fan assembly with a green "E" label**: Pulls air from the port side of the switch and exhausts it out the nonport side.

- Nonport-side air exhaust
- Port-side air intake
- Front-to-back (port-side to nonport-side) airflow
- Part numbers ending with **-F**

Time and Items Required

Installing or removing and replacing a power supply should require less than five minutes to complete.

A new power supply (with the same airflow direction as the power supply being replaced) is required to replace a power supply.

Replacing a Power Supply

When installing or replacing a power supply unit, keep in mind the following:

- Power supplies can be swapped in or out while the device is running. The remaining power supplies provide enough power for the device.

- The airflow direction of the power supply must match that of the installed fan assemblies. All must be either exhaust or intake.

CAUTION
Power supplies are hot-swappable. However, they should be inserted or removed without a power cord being connected to a power source to avoid damage.

CAUTION
Ensure that the airflow direction of the power supply matches that of the installed fan assembly. The power supplies and fan assemblies are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

Inserting a New AC Power Supply

Use the following steps to install an AC power supply in the Ruckus ICX 7850 switch.

FIGURE 41 Installing an AC Power Supply Unit
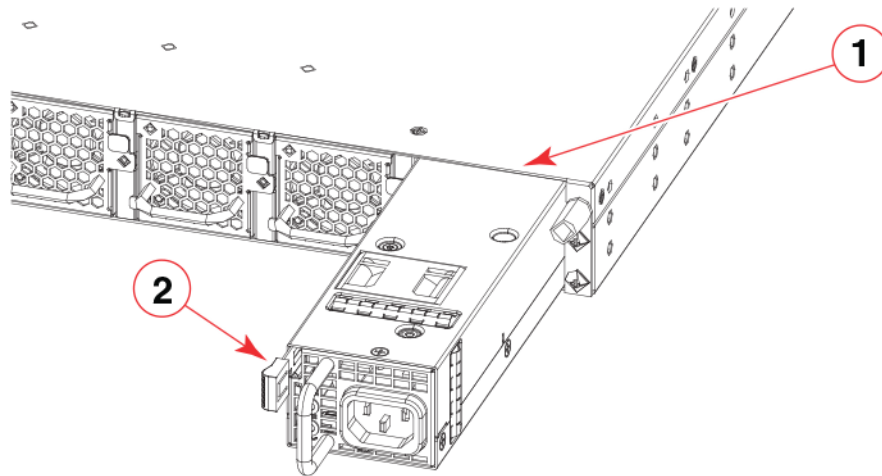
1	Power supply slot	2	Release lever

1. If replacing a power supply, remove the previously installed power supply from the appropriate slot by pressing the release lever and pulling the power supply handle.

2. If installing a new power supply into a slot covered with a filler panel:

   a. Press the release lever on the filler panel.

   b. Remove the filler panel.

3. Before opening the package that contains the power supply, touch the bag to the switch casing to discharge any potential static electricity. Ruckus recommends using an ESD wrist strap during installation.

4. Remove the power supply from the anti-static shielded bag.

5. Holding the power supply level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector and the release lever clicks into its locked position.

When the Ruckus ICX 7850 switch is powered on, the LEDs on the power supply rear panel should light up green to confirm that the power supply is correctly installed and supplying power.

> ⚠️ **CAUTION**
> **If you do not install a power supply in a slot, you must keep the slot filler panel in place. If you run the device with an uncovered slot, the system will overheat.**

Inserting a New DC Power Supply

> ⚠️ **CAUTION**
> **All devices with DC power supplies are intended for installation in restricted access areas only. A restricted access area is where access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.**

> **NOTE**
> This equipment installation must meet NEC/CEC code requirements. Consult local authorities for regulations.

Use the following steps to install a DC power supply in the Ruckus ICX 7850 switch.

⚠️ **CAUTION**
Use a UL listed or CSA Certified DC power source to connect to a DC PSU.

FIGURE 42 Installing a DC Power Supply Unit

1	Release lever	2	DC power supply terminals

1. Make sure DC power is disconnected at the circuit breaker before proceeding.

2. Prepare the power and safety grounding wires using the appropriate size wire. Crimp on ring lugs and heat shrink tubes for all three wires. Due to the limited space for the safety ground wire, Ruckus recommends using a 90-degree angled lug such as:

    *   TE Connectivity Solistrand "16-14HD 90 Ring 8," part number 184269-1 for 14 AWG wire

    *   PIDG 12-10 Ring #8, 90-DEG, part number 1958340-1 for 12 or 10 AWG wire

3. Remove the previously installed power supply from the appropriate slot by pressing the release lever and pulling the power supply handle.

4. Before opening the package that contains the DC power supply, touch the bag of the switch casing to discharge any potential static electricity. Ruckus recommends using an ESD wrist strap during installation.

5. Remove the DC power supply from the anti-static shielded bag.

6. Remove the DC terminals plastic cover.

7. Attach the safety grounding wire to the power supply using the safety ground screw.

8. Attach the DC power supply wires to the power supply DC power terminals, matching the polarity. Refer to Figure 43.

FIGURE 43 DC Power Supply Wiring Terminals
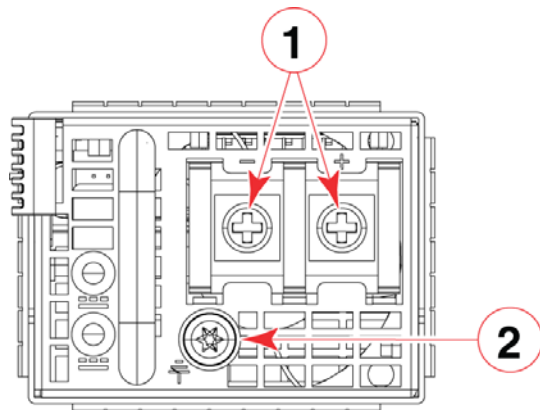
1	DC power terminals	2	Safety ground screw

9. Make sure the screws are tight with no wire touching the ground screw.

10. Using the handle on the power supply, hold the power supply level and guide it into the power supply slot. Gently push the power supply all the way into the slot, ensuring that it firmly engages with the connector and the release lever clicks into its locked position.

When the Ruckus ICX 7850 switch is powered on, the power LED on the front of the device lights up green to confirm that the power supply is correctly installed and supplying power. Refer to "LED activity interpretation" on page 45.

Grounding the Ruckus ICX 7850 Switch

The rear panel of the Ruckus ICX 7850 switch includes a dual-screw grounding terminal for chassis grounding. The surface area around this terminal is not painted to provide a good electrical connection. Before connecting power to the device, connect the grounding lug to ground the chassis if required by your local building code or regulatory compliance.

FIGURE 44 Connecting the Grounding Terminal
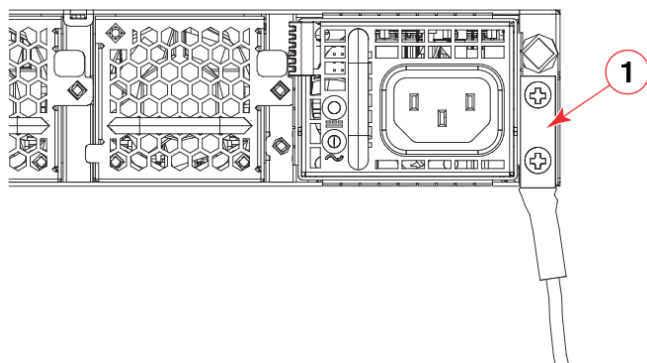
1	Grounding terminal

⚠️ **CAUTION**
For the installation of a Ruckus device with AC or DC systems, use a ground wire of at least 10 AWG. The ground wire should have an agency-approved crimped connector (provided with the device) attached to one end, with the other end attached to building ground. The connector must be crimped with the proper tool, allowing it to be connected to both ground screws on the enclosure. Before crimping the ground wire into the provided ground lug, ensure that the bare copper wire has been cleaned and antioxidant is applied to the bare wire. In addition, anti-rotation devices or lock washers must be used with all screw connections for the grounding wire.

Perform the following steps to connect to the grounding terminal.

1. Ensure that the rack in which the Ruckus ICX 7850 switch is mounted is properly grounded and in compliance with local regulations.

2. Ensure that there is a good electrical connection to the grounding point on the rack (no paint or isolating surface treatment).

3. Crimp the included grounding lug to a grounding wire of at least 10 American Wire Gauge (AWG). The 10 AWG wire and grounding lug should be crimped together using a proper tool.

4. Attach the 10 AWG stranded copper wire to the grounding terminal on the Ruckus ICX 7850 switch using the screws, flat washers, and lock washers included in the grounding kit.

5. Attach the grounding wire to a grounding point.

    NOTE
    The terminal for the connection of a grounding conductor is not to be used with an aluminum conductor.

    NOTE
    To ensure adequate bonding when attaching the ground lug, a minimum of 20 in-lb (2.76 Nm) of torque is required to be applied to the mounting hardware used to attach the ground lug.

Fan Assemblies

Fan Assembly Overview

The Ruckus ICX 7850-32Q switch includes six redundant, hot-swappable fan assemblies. The Ruckus ICX 7850-48F and ICX 7850-48FS switches include five redundant, hot-swappable fan assemblies. The fifth fan assembly provides redundancy, and for the Ruckus ICX 7850-32Q, the sixth fan provides support for low acoustic and high-temperature environments.

If power supply and fan assembly slots are unused, you must cover them with filler panels.

> NOTE
> Ruckus recommends that the Ruckus ICX 7850 switch operates with two power supplies and five fan assemblies installed. If a power supply or fan assembly fails, it must be replaced as soon as possible.

The fan assemblies in the Ruckus ICX 7850 switch chassis can be removed and replaced without special tools. The device can continue operating during the replacement.

The device supports the following types of fan assemblies:

- Fan assembly with nonport-side air exhaust: This unit moves the air from the port side to the nonport side of the device.

- Fan assembly supply with nonport-side air intake: This unit moves the air from the nonport side to the port side of the device.

FIGURE 45 Fan Assembly
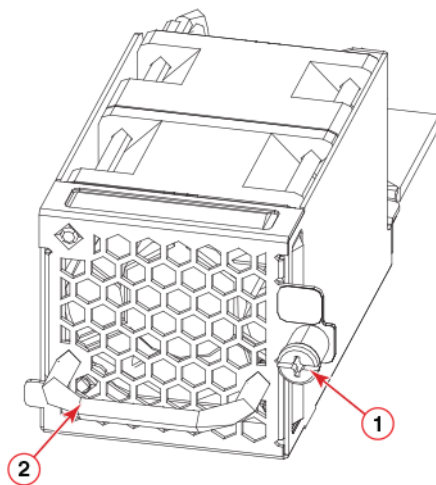
| 1 | Captive screw | 2 | Fan assembly handle |

Precautions Specific to Fan Assemblies

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

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.

CAUTION
Ensure that the airflow direction of the power supply unit matches that of the installed fan assembly. The power supplies and fan assemblies are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

CAUTION
If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

Identifying the Airflow Direction

The power supply and fan assemblies are identified by the following airflow directions:

- **Intake power supply and fan assembly with an orange "I" label or without any label**: Pulls air from the nonport side of the switch and exhausts it out the port side.

- Nonport-side air intake
- Port-side air exhaust
- Back-to-front (nonport-side to port-side) airflow
- Part numbers ending with **-R**

- **Exhaust power supply and fan assembly with a green "E" label**: Pulls air from the port side of the switch and exhausts it out the nonport side.

- Nonport-side air exhaust
- Port-side air intake
- Front-to-back (port-side to nonport-side) airflow
- Part numbers ending with **-F**

Time and Items Required

Installing or removing and replacing a fan assembly should require less than five minutes to complete.

The following items are required to replace a fan assembly:

- New fan assembly (must have the same airflow direction as the fan assembly being replaced)
- #1 Phillips screwdriver

Replacing a Fan Assembly

When installing or replacing a fan assembly unit, keep in mind the following:

- Fan assemblies can be swapped in or out while the device is running. The remaining fan assemblies provide enough airflow for the device.
- The airflow direction of the fan assembly must match that of the installed fan assemblies. All must be either exhaust or intake.

⚠ **CAUTION**
Ensure that the airflow direction of the power supply unit matches that of the installed fan assemblies. The power supplies and fan assemblies are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

Inserting a New Fan Assembly

Use the following steps to install a fan assembly in the Ruckus ICX 7850 switch.

FIGURE 46 Installing a Fan Assembly
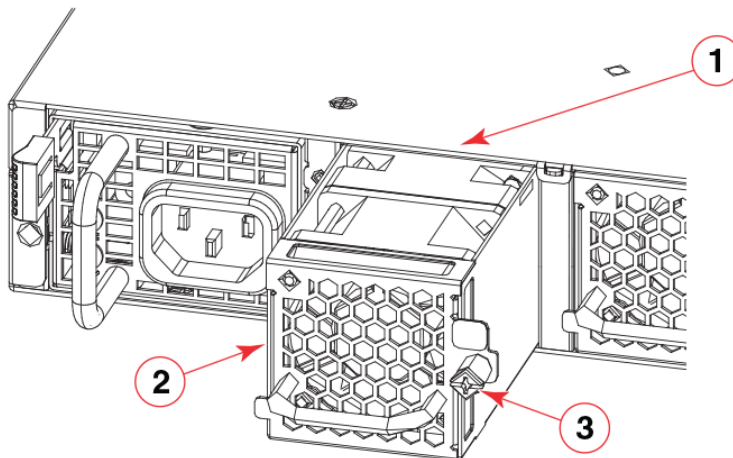
1	Fan assembly slot	3	Captive screw
2	Fan assembly		

1. If replacing a fan assembly:

   a. Using a Phillips screwdriver, unscrew the captive screw on the fan assembly.

   b. Remove the fan assembly from the chassis by pulling the handle on the fan assembly out and away from the chassis.

   c. Ensure that the replacement fan assembly has the same part number and airflow label as the fan assembly being replaced.

2. If installing a new fan assembly into a slot covered with a filler panel:

    a. Using a Phillips screwdriver, unscrew the captive screw on the filler panel.

    b. Remove the filler panel.

3. Before opening the package that contains the new fan assembly, touch the bag to the switch casing to discharge any potential static electricity. It is recommended that you wear an ESD wrist strap during installation.

4. Remove the fan assembly from the anti-static shielded bag.

    NOTE
    Do not force the installation. If the fan assembly does not slide in easily, ensure that it is correctly oriented before continuing.

5. Holding the fan assembly level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.

6. When you are sure the fan assembly has properly engaged the connector, tighten the captive screw to secure the fan assembly in the slot.

    NOTE
    The fans are controlled automatically by the device.

When a fan assembly is installed in a slot, the power LED on the fan assembly lights up green to confirm that the fan assembly is correctly installed and running. Refer to "LED Patterns" on page 54.

> ⚠️ **CAUTION**
> **If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.**

Ruckus ICX 7850 Specifications

System Specifications

System Component	Description
Enclosure	Stackable up to 12 switches per stack, chassis-mountable (1U) in a standard 4-post rack
Power Supplies	Dual redundant, hot-swappable power supplies supported with 650 W AC intake or exhaust airflow or 650 W DC intake or exhaust airflow
Fan Assemblies	Dual redundant, hot-swappable fan assemblies with intake or exhaust airflow
Cooling	Forced-air cooling front-to-back or back-to-front
System Architecture	Non-blocking shared-memory switch
System Processors	Broadcom BCM58712D, quad-core, ARM-based A57 CPU

Ethernet

System Component	Description	Maximum Ports Supported
100 GbE QSFP28 Ports	40/100 GbE QSFP28 stacking or uplink port	32 (ICX 7850-32Q) 8 (ICX 7850-48F and ICX 7850-48FS)
25 GbE SFP28 Ports	1/10/25 GbE SFP28 port	48 (ICX 7850-48F)
10 GbE SFP+ Ports	1/10 GbE SFP+ port	48 (ICX 7850-48FS)
Ethernet Management Port	10/100/1000 Mbps RJ-45 port	1

LEDs

System Component	Description
Switch Status and Management	Seven LED types indicate switch status: PWR and PWR2 (power supply units) DIAG (diagnostics) SYS (system status) MS (stacking configuration) CLD (cloud management) UPDATE (software update) STAT, SPD, ID, USB status mode
Ports	LEDs indicate port status or switch ID based on the status mode selection

Other

System Component	Description
Serial Cable	1 (RJ-45 to RJ-45)
RJ-45 to DB9 Adapter	1
AC Power Cord	IEC 320-C14

Weight and Physical Dimensions

Model	Height	Width	Depth	Weight (with Basic Modules)
ICX 7850-32Q	4.37 cm 1.72 inches	44.00 cm 17.32 inches	44.45 cm 17.5 inches	9.1 kg 20 lb
ICX 7850-48F	4.37 cm 1.72 inches	44.00 cm 17.32 inches	44.45 cm 17.5 inches	8.8 kg 19.4 lb
ICX 7850-48FS	4.37 cm 1.72 inches	44.00 cm 17.32 inches	44.45 cm 17.5 inches	9.1 kg 20 lb

Environmental Requirements

Condition	Operational	Non-operational
Ambient Temperature	0°C to 45°C (32°F to 113°F) at sea level	-40°C to 70°C (-40°F to 158°F)
Relative Humidity (non-condensing)	10% to 90% at 50°C (122°F)	10% to 90% at 70°C (158°F)
Altitude (above sea level)	0 to 3,048 m (10,000 ft)	0 to 12,000 m (39,370 ft)
Shock	20 G, 11 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	1 G sine, 0.4 grms random, 5-500 Hz	2.4 G sine, 1.1 grms random, 5-500 Hz
Airflow	Nominal: 21-30 cfm, Maximum: 100-110 cfm.	N/A

Condition	Operational	Non-operational
Heat Dissipation (+/- 5%)	**NOTE:** Refer to "Power Consumption (Typical Configuration)" on page 73 and "Power Consumption (Maximum Configuration)" on page 73 for detailed information on heat dissipation.	N/A
Operating Noise	ICX 7850-32Q: 50.6 dBA ICX 7850-48F: 50.3 dBA ICX 7850-48FS: 50.3 dBA	N/A

Power Supply Specifications (per PSU)

Power Supply Model	Maximum Output Power Rating (DC)	Input Voltage	Input Line Frequency	Maximum Input Current	Input Line Protection	Maximum Inrush Current
RPS19-E	650 W	100-240V	50-60Hz	9 A	Fuses	25A
RPS19-I	650 W	100-240V	50-60Hz	9 A	Fuses	25A
RPS19DC-E	650 W	-48 - -60V	-	16.5 A	Fuses	25A
RPS19DC-I	650 W	-48 - -60V	-	16.5 A	Fuses	25A

Power Consumption (Typical Configuration)

All 10-GbE, 25-GbE, or 100-GbE ports are linked up (no other port links), loading with 10 percent traffic rate. Four fan FRUs, fans at nominal speed.

Model Name (Input Power ±5%)	@100 VAC Input	@200 VAC Input	@-48 VDC Input	Minimum Number of Power Supplies	Notes
ICX 7850-32Q	328 W 1119 BTU/hr	333.4 W 1138 BTU/hr	329.8 W 1126 BTU/hr	1 x 650 W AC	1 PSU
	336.5 W 1149 BTU/hr	384.2 W 1311 BTU/hr	339.1 W 1158 BTU/hr	2 x 650 W AC	2 PSUs
ICX 7850-48F	267.8 W 913.9 BTU/hr	289.7 W 988.7 BTU/hr	285 W 972.8 BTU/hr	1 x 650 W AC	1 PSU
	282.4 W 963.7 BTU/hr	357.9 W 1221 BTU/hr	297.7 W 1016 BTU/hr	1 x 650 W AC	2 PSUs
ICX 7850-48FS	325 W 1109 BTU/hr	328 W 1119 BTU/hr	322.9 W 1102 BTU/hr	1 x 650 W AC	1 PSU
	336.5 W 1149 BTU/hr	405.2 W 1383 BTU/hr	333.7 W 1139 BTU/hr	1 x 650 W AC	2 PSUs

Power Consumption (Maximum Configuration)

All 10-GbE, 25-GbE, or 100-GbE ports are linked up (no other port links), loading with 100 percent traffic rate. Two PSUs, five fan FRUs, fans at high speed.

Model Name (Input Power ±5%)	@100 VAC Input	@200 VAC Input	@-48 VDC Input	Minimum Number of Power Supplies	Notes
ICX 7850-32Q	474.1 W 1618 BTU/hr	470.6 W 1606 BTU/hr	480.8 W 1641 BTU/hr	2 x 650 W AC	1 PSU
	479.6 W 1637 BTU/hr	517.3 W 1766 BTU/hr	482.8 W 1648 BTU/hr	2 x 650 W AC	2 PSUs required
ICX 7850-48F	393.3 W 1342 BTU/hr	386.4 W 1319 BTU/hr	400.8 W 1368 BTU/hr	1 x 650 W AC	1 PSU
	396.2 W 1352 BTU/hr	437.2 W 1492 BTU/hr	404.9 W 1382 BTU/hr	1 x 650 W AC	2 PSUs required
ICX 7850-48FS	439.9 W 1501 BTU/hr	433.1 W 1478 BTU/hr	427.8 W 1460 BTU/hr	1 x 650 W AC	1 PSU
	443.1 W 1512 BTU/hr	490 W 1672 BTU/hr	438.7 W 1497 BTU/hr	1 x 650 W AC	2 PSUs

Data Port Specifications (Ethernet)

Model Name	Port Type	Number (in Module)	Description
ICX 7850-32Q	100 GbE	12 (slot 1)	QSFP28 ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	100 GbE	12 (slot 2)	QSFP28 ports, 40 /100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	100 GbE	8 (slot 3)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
ICX 7850-48F	100 GbE	8 (slot 2)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	25 GbE	48 (slot 1)	SFP28 ports, 1/10/25 Gbps, compatible with optical transceivers, or direct attached copper cable.
ICX 7850-48FS	100 GbE	8 (slot 2)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	10 GbE	48 (slot 1)	SFP+ ports, 1/10 Gbps, compatible with optical transceivers, or direct attached copper cable.

Serial Port Specifications (Pinout - USB Type-C)

Pin	Signal	Description
A1	USB-C_GND	Ground
A2	Reserved	Not used
A3	Reserved	Not used
A4	USB_TYPE_C_5V_IN	5 V bus power
A5	USB-C_CC1	Configuration channel
A6	USB-C_AD1+	Data A positive

Pin	Signal	Description
A7	USB-C_AD1-	Data A negative
A8	Reserved	Not used
A9	USB_TYPE_C_5V_IN	5 V bus power
A10	Reserved	Not used
A11	Reserved	Not used
A12	USB-C_GND	Ground
B1	USB-C_GND	Ground
B2	Reserved	Not used
B3	Reserved	Not used
B4	USB_TYPE_C_5V_IN	5 V bus power
B5	Reserved	Not used
B6	USB-C_BD2+	Data B positive
B7	USB-C_BD2-	Data B negative
B8	Reserved	Not used
B9	USB_TYPE_C_5V_IN	5 V bus power
B10	Reserved	Not used
B11	Reserved	Not used
B12	USB-C_GND	Ground

Serial Port Specifications (Pinout RJ-45)

Pin	Signal	Description
1	Not supported	N/A
2	Not supported	N/A
3	UART1_TXD	Transmit data to ICX
4	GND	Logic ground
5	Not supported	N/A
6	UART1_RXD	Receive data from ICX
7	Not supported	N/A
8	Not supported	N/A

Serial Port Specifications (Protocol)

Parameter	Value
Baud	9600
Data bits	8
Parity	None

Parameter	Value
Stop bits	1
Flow control	None

Memory Specifications

Memory	Type	Size
Main memory	DDR4 2133 SO-DIMM	4 GB
Boot Flash	SPI Flash (dual boot)	16 MB
SATA SSD Flash	NAND flash	32 GB

Regulatory Compliance (EMC)

- FCC Part 15, Subpart B (Class A)
- EN 55032 (CE mark) (Class A)
- EN 55024 (CE mark) (Immunity) for Information Technology Equipment
- ICES-003 (Canada) (Class A)
- AS/NZ 55032 (Australia/New Zealand) (Class A)
- VCCI (Japan) (Class A)
- EN 300 386
- CNS 13438 (BSMI) (Taiwan) (Class A)
- KN 32 (South Korea) (Class A)
- KN 35 (South Korea) (Class A)
- TCVN 7189 / TCVN 7317 (Vietnam) (Class A)
- EN 61000-3-2
- EN 61000-3-3

Regulatory Compliance (Safety)

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

Regulatory Compliance (Environmental)

- 2014/35/EU and 2014/30/EU
- 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)

Regulatory Statements

USA (FCC CFR 47 Part 15 Warning)

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may 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 his own expense.

> **NOTE**
> Changes or modifications made to this device which are not expressly approved by Ruckus could void the user's authority to operate the equipment.

Industry Canada Statement

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

English translation of above statement

This Class A digital apparatus complies with Canadian ICES-003.

Europe and Australia (CISPR 32 Class A Warning)

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

Germany (Noise Warning)

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 52 dB(A) gemäss EN ISO 7779.

English translation of above statement

Machine noise information regulation - 3. GPSGV, the highest sound pressure level value is 52 dB(A) in accordance with EN ISO 7779.

Japan (VCCI)

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

English translation of above statement

This is 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 may arise. When such trouble occurs, the user may be required to take corrective actions.

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 .

English translation of above statement

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.

China

 China-CCC Warning statements

在维修的时候一定要断开所有电源 (English translation"disconnect all power sources before service")

 For non tropical use:

安全说明和标记	汉文	"仅适用于非热带气候条件下安全使用。"
	藏文	《སྲིལཁིཾུཤལ/ ཅིལཁ/ ཕ ཚ༠/ སྱ སྲིཁ༠ན/ མིརིལཁེཥ ༠/ ཚ༠ཅཐཅ༠ཏ/ ཚ༠སྱས༠ཥ/ སྱ སྲ༠ཥ༠ཚ ཚ༠ར༠ཚ ས༠ སྤ ཅཐ/ ཞ༠ཚ/,··)》
	蒙古文	"ཚ་བའི་ས་ཁྱལ་གྱི་གནམ་ག་གཤིས་མིན་པའི་ས་ཁྱལ་ལོ་ན་ར་ཞེན་མེད་བེད་སྤྱོད་བྱས་འཐུས།"
	壮文	Dan hab yungh youq gij dienheiq diuzgen mbouj dwg diegndat haenx ancienz sawjyungh.
	维文	غەيرى ئىسسىق بەلباغ ھاۋا كلىماتى شارائتىدىلا بىخەتەر ئىشلەتكىلى بولىدۇ

 For altitude 2000 meter and below:

安全说明和标记	汉文	仅适用于海拔2000m以下地区安全使用。
	藏文	《2000m ཚ་ས༠/ ཚ༠སུས༠ཚཚ ཧ༠སིཚ༠ཅ/ སྲཚ སྱཐཚ༠ ཚ༠ཅ/ ཚ ཚ༠སྱས༠ཥ ཚ༠ར༠ཚ ས༠ སྤ ཅཐ/ ཞ༠ཚ/,··)》
	蒙古文	"ཀུ་མཚའི་ཏོས་ལས་མཛོ་ཚད་སྐྲ2000མ༠ན་གྱི་ས་ཁྱལ་ལོ་ན་ར་ཞེན་མེད་བེད་སྤྱོད་བྱས་འཐུས།" ”
	壮文	Dan hab yungh youq gij digih haijbaz 2000m doxroengz haenx ancienz sawjyungh.
	维文	دېڭىز يۈزىدىن 2000 مېتر تۆۋەن رايونلاردىلا بىخەتەر، ئىشلەتكىلى بولىدۇ

Warning for Class A:

声　明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这

种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of above statement

This is a 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.

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。

English translation of above statement

Warning: This is a 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：乙太網交換機 Equipment name	型號（型式）：ICX7850 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)
電路板組件 PCBA	-	○	○	○	○	○
風扇 FAN	-	○	○	○	○	○
散熱器 Heatsink	○	○	○	○	○	○
機殼 Chassis	-	○	○	○	○	○
組合線 Cable ass'y	○	○	○	○	○	○
電源供應器 Power Supply	-	○	○	○	○	○
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.						

Cautions and Danger Notices

Cautions

A caution calls your attention to a possible hazard that can damage equipment.

"Vorsicht" weist auf die Gefahr einer möglichen Beschädigung des Gerätes hin.

Une mise en garde attire votre attention sur un risque possible d'endommagement de l'équipement. Ci-dessous, vous trouverez les mises en garde utilisées dans ce manuel.

Un mensaje de precaución le advierte sobre un posible peligro que pueda dañar el equipo. Las siguientes son precauciones utilizadas en este manual.

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

VORSICHT	Falls dieses Gerät verändert oder modifiziert wird, ohne die ausdrückliche Genehmigung der für die Einhaltung der Anforderungen verantwortlichen Partei einzuholen, kann dem Benutzer der weitere Betrieb des Gerätes untersagt werden.
MISE EN GARDE	Les éventuelles modifications apportées à cet équipement sans avoir été expressément approuvées par la partie responsable d'en évaluer la conformité sont susceptibles d'annuler le droit de l'utilisateur à utiliser cet équipement.
PRECAUCIÓN	Si se realizan cambios o modificaciones en este dispositivo sin la autorización expresa de la parte responsable del cumplimiento de las normas, la licencia del usuario para operar este equipo puede quedar anulada.

⚠ **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**
Make sure the airflow around the front, sides, 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 the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

VORSICHT	Vergewissern Sie sich, dass die Luftstromrichtung des Netzteils der eingebauten Lüftereinheit entspricht. Die Netzteile und Lüftereinheiten sind eindeutig mit einem grünen Pfeil und dem Buchstaben "E" oder einem orangefarbenen Pfeil mit dem Buchstaben "I" gekennzeichnet.
MISE EN GARDE	Veillez à ce que le sens de circulation de l'air du bloc d'alimentation corresponde à celui du tiroir de ventilation installé. Les blocs d'alimentation et les tiroirs de ventilation sont étiquetés d'une flèche verte avec un "E " ou d'une flèche orange avec un " I ".
PRECAUCIÓN	Asegúrese de que la dirección del flujo de aire de la unidad de alimentación se corresponda con la de la bandeja del ventilador instalada. Los dispositivos de alimentación y las bandejas del ventilador están etiquetadas claramente con una flecha verde y una "E" o con una flecha naranja y una "I".

CAUTION
To protect the serial port from damage, keep the cover on the port when not in use.

VORSICHT	Um den seriellen Anschluss vor Beschädigungen zu schützen, sollten Sie die Abdeckung am Anschluss belassen, wenn er nicht verwendet wird.
MISE EN GARDE	Mettre le bouchon de protection sur le port série lorsqu'il ne sert pas pour éviter de l'endommager.
PRECAUCIÓN	Para evitar que se dañe el puerto serie, mantenga la cubierta colocada sobre el puerto cuando no lo utilice.

CAUTION
Never leave tools inside the chassis.

VORSICHT	Lassen Sie keine Werkzeuge im Chassis zurück.
MISE EN GARDE	Ne laissez jamais d'outils à l'intérieur du châssis.
PRECAUCIÓN	No deje nunca herramientas en el interior del chasis.

CAUTION
If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

VORSICHT	Falls kein Modul oder Netzteil im Steckplatz installiert wird, muss die Steckplatztafel angebracht werden. Wenn ein Steckplatz nicht abgedeckt wird, läuft das System heiß.
MISE EN GARDE	Si vous n'installez pas de module ou de bloc d'alimentation dans un slot, vous devez laisser le panneau du slot en place. Si vous faites fonctionner le châssis avec un slot découvert, le système surchauffera.
PRECAUCIÓN	Si no instala un módulo o un fuente de alimentación en la ranura, deberá mantener el panel de ranuras en su lugar. Si pone en funcionamiento el chasis con una ranura descubierta, el sistema sufrirá sobrecalentamiento.

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

VORSICHT	Verwenden Sie die in der Anleitung aufgeführten Schrauben. Mit längeren Schrauben wird das Gerät möglicherweise beschädigt.
MISE EN GARDE	Utilisez les vis mentionnées dans les instructions. L'utilisation de vis plus longues peut endommager l'appareil.
PRECAUCIÓN	Utilice los tornillos especificados en el procedimiento. Si utiliza tornillos de mayor longitud, podría dañar el dispositivo.

CAUTION
Do not install the device in an environment where the operating ambient temperature might exceed 45°C (113°F).

VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 45° C (113° F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 45° C (113° F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 45° C (113° F).

CAUTION
Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the manufacturer's instructions.

VORSICHT	Es besteht Explosionsgefahr, wenn ein unzulässiger Batterietyp eingesetzt wird. Verbrauchte Batterien sind entsprechend den geltenden Vorschriften zu entsorgen.
MISE EN GARDE	Risque d'explosion en cas de remplacement de la pile par un modèle incorrect. Débarrassezvous des piles usagées conformément aux instructions.
PRECAUCIÓN	Riesgo de explosión si se sustituye la batería por una de tipo incorrecto. Deshágase de las baterías usadas de acuerdo con las instrucciones.

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

VORSICHT	Bei diesem Verfahren muss das Gerät ausgeschaltet und von der Fabric getrennt sein.
MISE EN GARDE	Au cours de cette procédure, l'appareil doit être éteint et déconnecté du réseau.
PRECAUCIÓN	El dispositivo debe estar apagado y desconectado del fabric durante este procedimiento.

CAUTION
Power supplies are hot-swappable. However, they should be inserted or removed without a power cord being connected to a power source to avoid damage.

VORSICHT	Netzteile sind hot-swap-fähig. Sie sollten jedoch eingesetzt oder entfernt werden, ohne dass ein Stromkabel mit einer Stromquelle verbunden ist, um Beschädigungen zu vermeiden.
MISE EN GARDE	Les unités d'alimentation sont permutables à chaud. Cependant, et pour éviter tout dommage, elles doivent être insérées ou retirées sans cordon d'alimentation relié à une source d'alimentation.
PRECAUCIÓN	Los proveedores de energía son deslizables por calor. Sin embargo deben insertarse o extraerse sin ningún cable de alimentación conectado a la fuente de alimentación para evitar daños.

CAUTION
Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

VORSICHT	Statische Elektrizität kann das System und andere elektronische Geräte beschädigen. Um Schäden zu vermeiden, entnehmen Sie elektrostatisch empfindliche Geräte erst aus deren antistatischer Schutzhülle, wenn Sie bereit für den Einbau sind.
MISE EN GARDE	L'électricité statique peut endommager le châssis et les autres appareils électroniques. Pour éviter tout dommage, conservez les appareils sensibles à l'électricité statique dans leur emballage protecteur tant qu'ils n'ont pas été installés.
PRECAUCIÓN	La electricidad estática puede dañar el chasis y otros dispositivos electrónicos. A fin de impedir que se produzcan daños, conserve los dispositivos susceptibles de dañarse con la electricidad estática dentro de los paquetes protectores hasta que esté listo para instalarlos.

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 Stromkreiszweiges 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
To avoid high voltage shock, do not open the device while the power is on.

VORSICHT	Das eingeschaltete Gerät darf nicht geöffnet werden, da andernfalls das Risiko eines Stromschlags mit Hochspannung besteht.
MISE EN GARDE	Afin d'éviter tout choc électrique, n'ouvrez pas l'appareil lorsqu'il est sous tension.
PRECAUCIÓN	Para evitar una descarga de alto voltaje, no abra el dispositivo mientras esté encendido.

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 Eingangsstromanschlüssen.
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 to any port, be sure to discharge any static charge 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
For the installation of a Ruckus device with AC or DC systems, use a ground wire of at least 6 AWG. The ground wire should have an agency-approved crimped connector (provided with the device) attached to one end, with the other end attached to building ground. The connector must be crimped with the proper tool, allowing it to be connected to both ground screws on the enclosure. Before crimping the ground wire into the provided ground lug, ensure that the bare copper wire has been cleaned and antioxidant is applied to the bare wire. In addition, anti-rotation devices or lock washers must be used with all screw connections for the grounding wire.

VORSICHT	Zur Installation eines Ruckus Geräts mit Gleich- oder Wechselstrom betriebenen muss zur Erdung ein Kabel der Stärke von mindestens 6 AWG verwendet werden. Das Erdungskabel muss an einem Ende mit einem zugelassenen Crimp-Anschluss (im Lieferumfang des Geräts) versehen sein und mit dem anderen Ende an die Gebäude-Erde angeschlossen werden. Der Anschluss muss mit einem geeigneten Werkzeug gecrimpt werden, damit er mit den beiden Erdungsschrauben auf dem Gehäuse verbunden werden kann. Bevor das Erdungskabel an die Erdungsöse angeschlossen wird, muss der blanke Kupferdraht gereinigt und mit einem Antioxidationsmittel behandelt werden. Außerdem müssen bei allen Schraubverbindungen des Erdungskabels Drehsicherungen oder Sicherungsscheiben verwendet werden.
MISE EN GARDE	Pour garantir la conformité de l'installation d'un dispositif Ruckus avec système alimentation CC ou CA, utilisez un câble de mise à la terre d'au moins 6 AWG. Le câble de mise à la terre doit être muni d'une cosse sertie homologuée (fournie avec l'appareil) à une extrémité, l'autre extrémité étant reliée à la terre. La cosse doit être sertie avec l'outil adéquat, ce qui permet de la relier aux deux vis de mise à la terre du boîtier. Avant de sertir le câble de mise à la terre dans la cosse fournie, assurez-vous que le fil de cuivre dénudé a été nettoyé et qu'un antioxydant a été appliqué. De plus, des dispositifs antirotation ou des rondelles de frein doivent être utilisés avec tous les raccords vissés au câble de mise à la terre.

PRECAUCIÓN	Para que la instalación de un dispositivo con sistemas de CA o CC, utilice un cable de conexión a tierra de calibre AWG 6 como mínimo. El cable de conexión a tierra debe disponer de un conector engarzado homologado (suministrado con el dispositivo) unido a un extremo de modo que el otro extremo se conecte a la toma de tierra. El conector se debe engarzar con la herramienta adecuada de forma que se pueda conectar a los dos tornillos de conexión a tierra del compartimento. Antes de engarzar el cable de conexión a tierra a la patilla de conexión a tierra proporcionada, asegúrese de limpiar y aplicar antioxidante al alambre pelado de cobre. Además, deben emplearse los seguros contra giro o las arandelas de sujeción en todas las uniones atornilladas del cable de toma de tierra.

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

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

CAUTION
To prevent damage to the chassis and components, never attempt to lift the chassis using the fan or power supply handles. These handles were not designed to support the weight of the chassis.

VORSICHT	Alle Geräte mit Wechselstromquellen sind nur zur Installation in Sperrbereichen bestimmt. Ein Sperrbereich ist ein Ort, zu dem nur Wartungspersonal mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer anderen Schutzvorrichtung Zugang hat.
MISE EN GARDE	Pour éviter d'endommager le châssis et les composants, ne jamais tenter de soulever le châssis par les poignées du ventilateur ou de l'alimentation. Ces poignées n'ont pas été conçues pour supporter le poids du châssis.
PRECAUCIÓN	Para prevenir daños al chasis y a los componentes, nunca intente levantar el chasis usando las asas de la fuente de alimentación o del ventilador. Tales asas no han sido diseñadas para soportar el peso del chasis.

Danger Notices

A danger notification calls your attention to a possible hazard that can cause injury or death. The following are the warnings used in this manual.

"Gefahr" weist auf eine mögliche Gefährdung hin, die zu Verletzungen oder Tod führen können. Sie finden die folgenden Warnhinweise in diesem Handbuch.

Un danger attire votre attention sur un risque possible de blessure ou de décès. Ci-dessous, vous trouverez les avertissements utilisés dans ce manuel.

Una señal de peligro le llama la atención sobre cualquier posible peligro que pueda ocasionar daños personales o la muerte. A continuación se dan las advertencias utilizadas en este manual.

DANGER
The procedures in this manual are for qualified service personnel.

GEFAHR	Die Verfahren in diesem Handbuch sind nur für qualifiziertes Wartungspersonal gedacht.
DANGER	Les procédures décrites dans ce manuel doivent être effectuées par le personnel de service qualifié uniquement.
PELIGRO	Los procedimientos de este manual se han hecho para personal de servicio cualificado.

DANGER
Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

GEFAHR	Stellen Sie sicher, dass die Stromkreise ordnungsgemäß geerdet sind. Benutzen Sie dann das mit dem Gerät gelieferte Stromkabel, um es an die Srromquelle anzuschließen.
DANGER	Vérifiez que les circuits de sources d'alimentation sont bien mis à la terre, puis utilisez lecordon d'alimentation fourni avec le dispositif pour le connecter à la source d'alimentation.
PELIGRO	Verifique que circuitos de la fuente de corriente están conectados a tierra correctamente; luego use el cordón de potencia suministrado con el instrumento para conectarlo a la fuente de corriente.

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
Be careful not to accidently 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 accidentellement insérer vos doigts dans le boîtier du ventilateur lorsque vous l'enlevez 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
For safety reasons, the ESD wrist strap should contain a series 1 megohm 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.

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 régulations 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
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
This device might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

GEFAHR	Dieses System ist möglicherweise mit mehr als einem Netzkabel ausgestattet. Trennen Sie stets die Verbindung aller Netzkabel, bevor Sie Wartungsarbeiten durchführen, um dieGefahr eines Stromschlags auszuschließen.
DANGER	Ce commutateur peut comporter plusieurs cordons d'alimentation. Pour réduire les risques de choc électrique, déconnectez tous les cordons d'alimentation avant d'effectuerl'entretien de l'appareil.
PELIGRO	Este conmutador podría tener más de un cable de alimentación. Para reducir el riesgo de sufrir una descarga eléctrica, desconecte todos los cables de alimentación antes de proceder con la reparación.

DANGER
Use safe lifting practices when moving the product.

GEFAHR	Beim Bewegen des Produktes ist auf eine sichere Hubtechnik zu achten.
DANGER	Utiliser des techniques de levage sûres pour déplacer le produit.
PELIGRO	Tenga mucho cuidado al levantar el producto para moverlo

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.

DANGER
All fiber-optic interfaces use Class 1 lasers.

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

DANGER
Laser radiation. Do not view directly with optical instruments. Class 1M laser products.

GEFAHR	Laserstrahlung! Schauen Sie nicht direkt mit optischen Instrumenten in den Laserstrahl herein. Klasse 1M Laserprodukte.
DANGER	Rayonnement de laser. Ne regardez pas directement avec les instruments optiques. Produits de laser de la classe 1M.
PELIGRO	Radiacion de Laser. No vea directamente con Instrumentos Opticos. Clase 1M de Productos de Laser.
危險	雷射輻射，勿以光學儀器直視等級１Ｍ雷射產品。
警告	レーザ放射 光学器具で直接ビームを見ないこと クラス１Ｍレーザ製品

DANGER
Use only optical transceivers that are qualified by Ruckus and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 60825 and EN60825. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

GEFAHR	Verwenden Sie nur optische Transceiver, die von Ruckus zugelassen sind und die die Anforderungen gemäß FDA Class 1 Radiation Performance Standards in 21 CFR, Unterkapitel I, sowie IEC 60825 und EN60825 erfüllen. Optische Produkte, die diese Normen nicht erfüllen, können Strahlen aussenden, die für das menschliche Auge gefährlich sind.
DANGER	Utilisez uniquement des émetteurs-récepteurs optiques certifiés par Ruckus et conformes aux exigences sur la puissance de rayonnement de catégorie 1 de la FDA définies au sous-chapitre 21 CFR I et à les normes IEC 60825 et EN60825. Les produits optiques non-conformes à ces normes sont susceptibles d'émettre une lumière dangereuse pour les yeux.
PELIGRO	Utilice sólo transceptores ópticos aprobados por Ruckus y que cumplan con las normas IEC 60825 y EN60825, y con los estándares de rendimiento Clase 1 de FDA definidos en el subcapítulo I de 21 CFR. Los productos ópticos que no cumplan con estos estándares pueden emitir luz dañina para los ojos.