

RUCKUS ICX 7750 Switch Hardware Installation Guide

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Document conventions

The following tables list the text and notice conventions that are used throughout this guide.

TABLE 1 Text conventions

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

Notes, cautions, and warnings

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

NOTE

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



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. |
| Italics text | Identifies a variable. |
| value | In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, --show WWN. |
| [] | 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. In Fibre Channel products, square brackets may be used instead for this purpose. |
| 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: docs@ruckuswireless.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 Small Cell Alarms Guide SC Release 1.3
 - Part number: 800-71306-001
 - Page 88

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 Ruckus Support Portal user account. Other technical documentation content is available without logging into 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 Networks 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, and Asia Pacific, toll-free numbers are available at <https://support.ruckuswireless.com/contact-us> and Live Chat is also available.

Self-service resources

The Support Portal at <https://support.ruckuswireless.com/contact-us> 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)—<https://support.ruckuswireless.com/documents>
- [Community Forums](https://forums.ruckuswireless.com/ruckuswireless/categories)—<https://forums.ruckuswireless.com/ruckuswireless/categories>
- [Knowledge Base Articles](https://support.ruckuswireless.com/answers)—<https://support.ruckuswireless.com/answers>
- [Software Downloads and Release Notes](https://support.ruckuswireless.com/software)—<https://support.ruckuswireless.com/software>
- [Security Bulletins](https://support.ruckuswireless.com/security)—<https://support.ruckuswireless.com/security>

Preface

Contacting Ruckus Customer Services and Support

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

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What's new in this document

The following table includes descriptions of new information added to this edition.

TABLE 2 Summary of enhancements added to this edition

| Feature | Description | Described in |
|---------------------------------|--|---|
| 10G-SFPP-TX transceiver support | Added guidelines for using the 10G-SFPP-TX transceiver | "10G-SFPP-TX-A transceiver support" |
| Power and cooling | Added information on fan speeds and temperature thresholds | "Monitoring power and cooling" |

About this Document

What's new in this document

Ruckus ICX 7750 Overview

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- Supported expansion module 15
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Ruckus ICX 7750 features

The Ruckus ICX 7750 is a high-density aggregation switch that offers both 1/10 and 10/40 Gigabit Ethernet (GbE) line rates, low latency cut-through switching, and up to 2.56 Tbps throughput for campus LAN and classic Ethernet data center environments.

The Ruckus ICX 7750 switch features:

- Comprehensive support for a range of 1 GbE, 10 GbE, and 40 GbE optics (refer to the Ruckus Optics Family Data Sheet).
- Dual redundant, hot-swappable 504 W AC or DC power supplies available with intake or exhaust airflow.
- Optional 6-port 10/40 GbE QSFP+ expansion/stacking module.
- Four hot-swappable fan units available with intake or exhaust airflow.
- One Gigabit Ethernet port (RJ-45) and one serial management port (mini-USB) to configure and manage the switch through the CLI.
- One USB port for the transfer of software and configuration files from an external disk drive.

Ruckus ICX 7750 orderable models

The Ruckus ICX 7750 consists of three orderable models, as shown in [Table 3](#).

TABLE 3 Ruckus ICX 7750 orderable switch models

| Model | Description |
|--------------|---|
| ICX 7750-26Q | Ruckus ICX 7750 with 26 10/40 GbE QSFP+ ports. No power supplies, fan units, or expansion module (must be ordered separately). Advanced software. No optics. |
| ICX 7750-48F | Ruckus ICX 7750 with 48 1/10 GbE SFP+ ports and six 10/40 GbE QSFP+ ports. No power supplies, fan units, or expansion module (must be ordered separately). Advanced software. No optics. |
| ICX 7750-48C | Ruckus ICX 7750 with 48 1/10 GbE RJ-45 ports and six 10/40 GbE QSFP+ ports. No power supplies, fan units, or expansion module (must be ordered separately). Advanced software. No optics. |

Ruckus ICX 7750 customizable models

The Ruckus ICX 7750 base systems do not ship with power supplies or fans. Fans and power supplies are ordered separately to allow for building the system that meets your network needs. [Table 4](#) lists the available power supplies, fans, and the expansion module.

Ruckus ICX 7750 Overview

Views of the Ruckus ICX 7750 switch

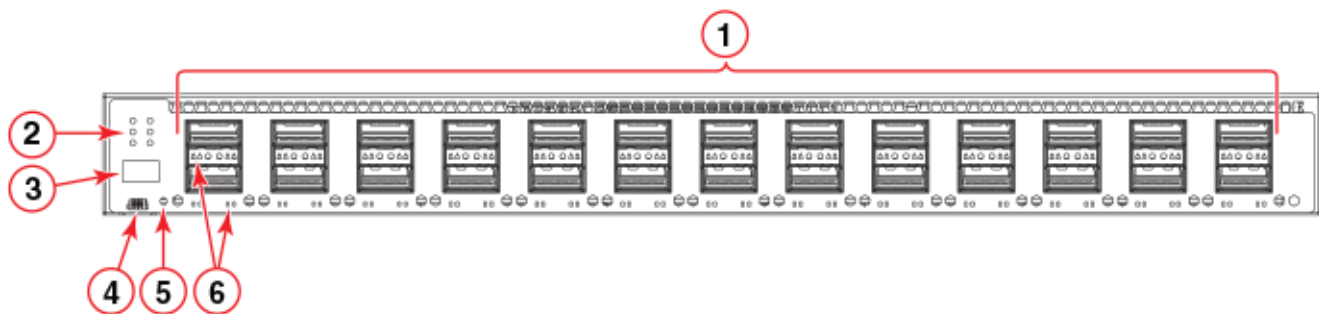
TABLE 4 SKUs for creating custom Ruckus ICX 7750 switch models

| SKUs | Description |
|----------------|--|
| RPS9+E | 504 W AC power supply; power-supply-side exhaust (port-side intake) airflow. |
| RPS9+I | 504 W AC power supply; power-supply-side intake (port-side exhaust) airflow. |
| RPS9DC+E | 504 W DC power supply; power-supply-side exhaust (port-side intake) airflow. |
| RPS9DC+I | 504 W DC power supply; power-supply-side intake (port-side exhaust) airflow. |
| ICX 7750-FAN-E | Ruckus ICX 7750 kit of four fans, exhaust airflow. |
| ICX 7750-FAN-I | Ruckus ICX 7750 kit of four fans, intake airflow. |
| ICX 7750-6Q | Ruckus ICX 7750 6-port QSFP+ expansion/stacking module. |

Views of the Ruckus ICX 7750 switch

Figure 1 shows the front view of the Ruckus ICX 7750-26Q switch.

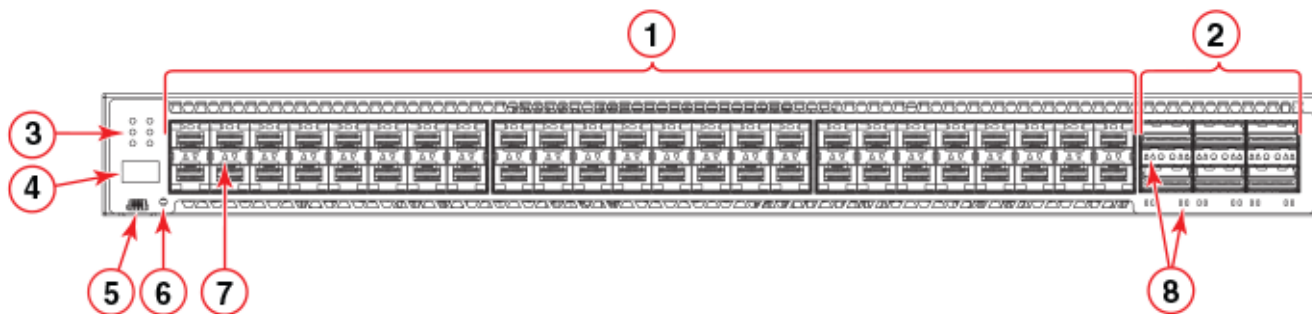
FIGURE 1 Front view of the Ruckus ICX 7750-26Q



- | | |
|--|-------------------|
| 1 QSFP+ ports XL1/1 - XL1/20 and XL2/1 - XL2/6 | 4 Console port |
| 2 System LEDs | 5 Reset button |
| 3 Stack unit ID display | 6 QSFP+ port LEDs |

Figure 2 shows the front view of the Ruckus ICX 7750-48F switch.

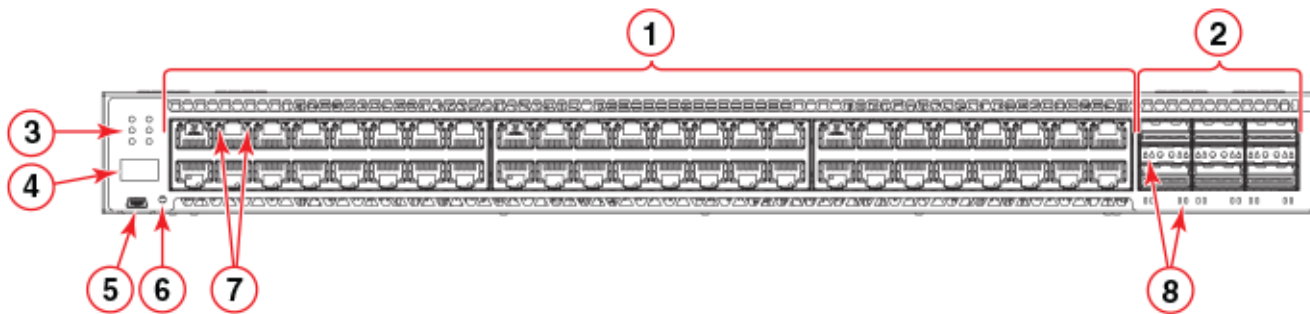
FIGURE 2 Front view of the Ruckus ICX 7750-48F



- | | | | |
|---|---------------------------|---|-----------------|
| 1 | SFP+ ports 1/1 - 1/48 | 5 | Console port |
| 2 | QSFP+ ports XL2/1 - XL2/6 | 6 | Reset button |
| 3 | System LEDs | 7 | SFP+ port LEDs |
| 4 | Stack unit ID display | 8 | QSFP+ port LEDs |

Figure 3 shows the front view of the Ruckus ICX 7750-48C switch.

FIGURE 3 Front view of the Ruckus ICX 7750-48C



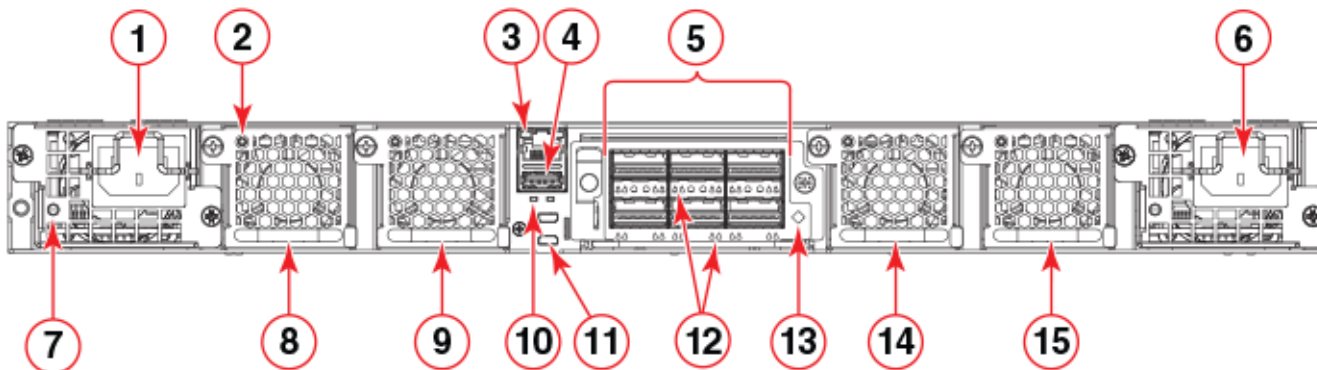
- | | | | |
|---|----------------------------------|---|---------------------|
| 1 | 10GBase-T RJ-45 ports 1/1 - 1/48 | 5 | Console port |
| 2 | QSFP+ ports XL2/1 - XL2/6 | 6 | Reset button |
| 3 | System LEDs | 7 | 10GBase-T port LEDs |
| 4 | Stack unit ID display | 8 | QSFP+ port LEDs |

Figure 4 shows the rear view of the Ruckus ICX 7750 switch.

Ruckus ICX 7750 Overview

Ruckus ICX 7750 slot and Ethernet port numbering

FIGURE 4 Rear view of the Ruckus ICX 7750



- | | |
|---|--|
| 1 Power supply unit 2 | 9 Fan tray 3 |
| 2 Fan tray LED | 10 UP and DN port LEDs |
| 3 Management port | 11 Control path UP and DN ports (currently not used) |
| 4 USB port | 12 QSFP+ module LEDs |
| 5 6-port 10/40 GbE QSFP+ expansion module | 13 Expansion module power LED |
| 6 Power supply unit 1 | 14 Fan tray 2 |
| 7 Power supply unit 2 LED | 15 Fan tray 1 |
| 8 Fan tray 4 | |

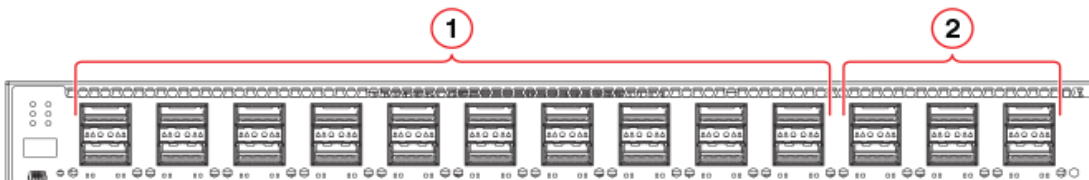
Ruckus ICX 7750 slot and Ethernet port numbering

Many CLI commands require users to enter port numbers as part of the command syntax, and many **show** command outputs display port numbers. The port numbers are entered and displayed in stack-unit/slot number/port number format.

The Ruckus ICX 7750 contains the following slots and Ethernet ports:

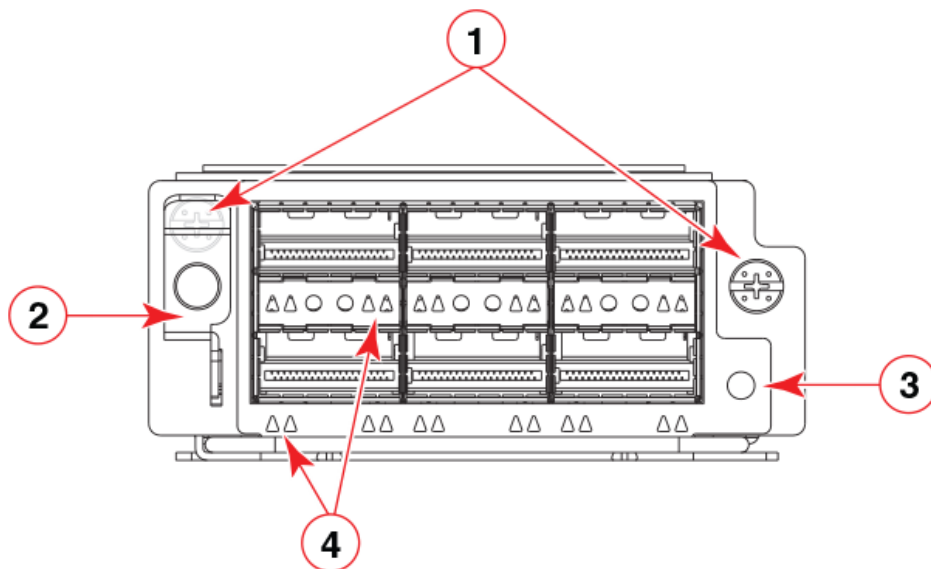
- Slot 1 and Slot 2 are located on the front of the Ruckus ICX 7750-26Q device. Slot 1 contains 10/40 GbE QSFP+ ports XL1/1 through XL1/20; odd port numbers on the top row with port XL1/1 on the left and port XL1/20 on the right. Slot 2 contains 10/40 GbE QSFP+ ports XL2/1 through XL2/6; ports XL2/1, XL2/3, and XL2/5 are on the top row (left to right), and ports XL2/2, XL2/4, and XL2/6 are on the bottom row (left to right).

FIGURE 5 Ruckus ICX 7750-26Q slot numbering



- | | |
|----------|----------|
| 1 Slot 1 | 2 Slot 2 |
|----------|----------|

FIGURE 9 10/40 GbE QSFP+ expansion module



- 1 Assembly screws
- 2 Release lever latch
- 3 Expansion module power LED
- 4 QSFP+ slot LEDs

Supported transceivers and cables

For a list of supported transceivers and cables, refer to the Ruckus Optics Family Data Sheet.

High-power 40 GbE optic support

Certain 40 GbE transceivers require higher power to operate. Cooling and power considerations limit the use of these optics in the Ruckus ICX 7750 switch. These optics include the 40GBASE-LR4, 40GBASE-LM4, 40GBASE-SR-BIDI, and 40GBASE-ER4 transceivers.

Table 5 indicates the port range limitations for these optics based on airflow direction and switch model.

TABLE 5 Ruckus ICX 7750 high-power 40GbE optics support

| Model | Airflow | Front panel ports | Optional 40 GbE module ports |
|--------------|---------|---|------------------------------|
| ICX 7750-26Q | Exhaust | 1/1/1 through 1/1/20 1/2/1 through 1/2/6 | 1/3/5 and 1/3/6 |
| | Inlet | 1/2/5 and 1/2/6 | 1/3/5 and 1/3/6 |
| ICX 7750-48F | Exhaust | 1/2/1 and 1/2/6 | 1/3/5 and 1/3/6 |
| | Inlet | 1/2/5 and 1/2/6 | 1/3/5 and 1/3/6 |
| ICX 7750-48C | Exhaust | 1/2/1 and 1/2/6 | 1/3/5 and 1/3/6 |
| | Inlet | 1/2/5 and 1/2/6 | 1/3/5 and 1/3/6 |

The Ruckus ICX 7750 also supports 40GBASE-SR-BD bi-directional (BiDi) QSFP+ transceivers with duplex LC optics. The 40 GbE BiDi optics support two 20 GbE channels over duplex fiber cable, with the transmit and receive of each channel operating at two wavelengths on a single fiber.

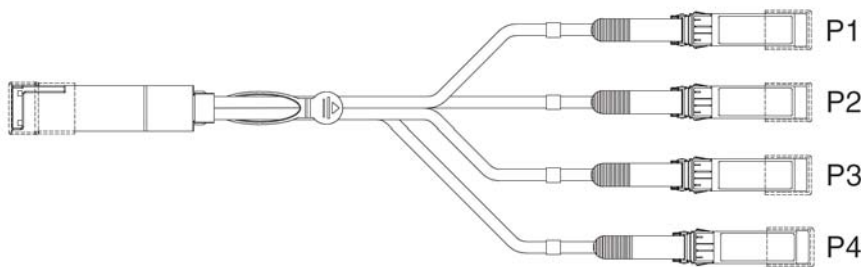
The 40 GbE BiDi transceivers enable 40 GbE links to be supported on installed 10 GbE duplex fiber infrastructure. This optic has the same port limitations as the LR4 optic.

Breakout cables

The Ruckus ICX 7750 can support the following breakout cables on certain 40 GbE ports:

- QSFP+ to 4 SFP+ (4x10 GbE) direct-attach copper breakout cables, lengths of 1, 3, and 5 m
- 4x10 GbE QSFP+ SR4 compatible with 10GBase-SR SFP+ using 1, 2, 3, 5, 7, 10, 15, and 100 m lengths of fiber cable

FIGURE 10 QSFP+ to 4 SFP+ (4x10 GbE) breakout cable



The Ruckus ICX 7750 ports available for breakout are shown for each model in [Table 6](#).

TABLE 6 Ruckus ICX 7750 40 GbE breakout ports

| Model | Front panel Slot 1 ports | Front panel Slot 2 ports | Rear module Slot 3 ports |
|--------------|--------------------------|--------------------------|--------------------------|
| ICX 7750-26Q | 1/1/5 through 1/1/16 | 1/2/1 through 1/2/6 | 1/3/1 through 1/3/6 |
| ICX 7750-48F | N/A | 1/2/1 through 1/2/6 | 1/3/1 through 1/3/6 |
| ICX 7750-48C | N/A | 1/2/1 through 1/2/6 | 1/3/1 through 1/3/6 |

QSFP+ to SFP+ adapter support

The Ruckus ICX 7750 supports a third-party QSFP+ to SFP+ adapter for cost-effective connections between 40 GbE QSFP+ ports and 10 GbE hardware using standard SFP+ optical cabling rather than breakout cables.

An SFP+ transceiver (SR, LR, or USR) inserted in the QSFP+ to SFP+ adapter behaves as if it is connected to the first of the 4 breakout ports on the 40 GbE QSFP+ interface with no other ports available in the breakout. The 4x10 GbE breakout mode must be configured on the QSFP+ interface.

10G-SFPP-TX-A transceiver support

The 10G-SFPP-TX-A transceiver consumes significantly more power than typical 10G transceivers. This section provides guidelines for deploying the 10G-SFPP-TX-A transceiver within the power capabilities of the supported ICX 7750-48F switch.

If the guidelines in this section are not followed, there is a risk of system instability and/or reboot.

Follow the guidelines provided in [Table 7](#) to avoid a power violation.

For each 10G-SFPP-TX-A installed, another SFP+ slot MUST be left empty.

Ruckus ICX 7750 Overview
Supported transceivers and cables

For example: If you are using four 10G-SFP-TX-A, you must leave four SFP+ ports empty.

TABLE 7 Ruckus ICX 7750 10G-SFP-TX-A transceiver support

| Model | 10G-SFP-TX-A installed location | For each 10G-SFP-TX-A inserted, this many SFP+ ports must remain unused. |
|--------------|-----------------------------------|--|
| ICX 7750-48F | Port Group #1 1/1/1 to 1/1/32 | 1 |
| | Port Group ~2 1/1/33 to 1/1/48 | 1 |

Installing the Ruckus ICX 7750

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CAUTION
Procedures in this manual are intended for qualified service personnel.

Shipping carton contents

Ruckus ICX 7750 devices ship with all of the following items included in the shipping carton. When unpacking the device, verify that the contents of the shipping carton is complete, if any items are missing, contact the place of purchase.

- The Ruckus ICX 7750 device
- An accessory kit containing the following items:
 - Rack mounting kit containing two L-shaped mounting brackets and two sets of eight sink-head screws
 - Two-post rack kit containing four rack-mounting screws and four cage nuts
 - One grounding kit, containing one grounding lug and one grounding screw
 - Two Micro-HDMI to RJ45 stack control-path cables (currently not used)
 - One control-path cable holder kit, containing one cable holder and one screw
 - One console cable (Mini-USB to RJ45)
 - One RJ45-to-DB9 adapter
 - China ROHS sheet
 - Read Me First document

Installation and safety considerations

You can install the Ruckus ICX 7750 in the following ways:

- As a standalone unit on a flat surface.
- In an EIA rack using a fixed-rail rack mount kit. The optional 4-post universal rack mount kit can be ordered from your switch retailer to support up to a 30-inch deep rack. The 4-post rack mount kit includes mid-mount and rear-mount brackets.
- In a 2-post Telco rack using a flush mount rack kit. The 2-post rack mount ears are included with the switch.

Electrical considerations

To install and operate the switch successfully, ensure compliance with the following requirements:

- 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 switch nameplate.
- The power supply standards are met.

Environmental considerations

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

- Because the Ruckus ICX 7750 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 and power supply module FRU kit to determine the correct configuration.
- The ambient air temperature does not exceed 50°C (122°F) while the Ruckus ICX 7750-26Q or Ruckus ICX 7750-48F switch is operating, or 40°C (104°F) while the Ruckus ICX 7750-48C switch is operating.

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 surface.

The site should meet the following requirements:

- Maintain the operating environment as specified in ["Environmental considerations"](#) on page 20.
- Allow a minimum of 3 in. of space between the front and the back of the device and walls or other obstructions for proper airflow.
- Allow at least 3 in. of space at the front and back of the device for the twisted-pair, fiber-optic, and power cabling.
- Allow access for installing, cabling, and maintaining the devices.
- Allow the status LEDs to be clearly visible.
- Allow for twisted-pair cables to be routed away from power lines, fluorescent lighting fixtures, and other sources of electrical interference, such as radios and transmitters.
- Allow for the unit to be connected to a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, 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 switch 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 ongoing basis, particularly if the switch is installed in a closed or multi rack assembly.
- The additional weight of the switch 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 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 cables and record the devices to which they are connected.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.

Installation tasks

Follow the steps listed in [Table 8](#) to install your device. Details for each of these steps are provided on the pages indicated.

TABLE 8 Installation tasks

| Task number | Task | Where to find more information |
|-------------|---|--|
| 1 | Ensure that the physical environment that will host the device has the proper cabling and ventilation. | "Installation and safety considerations" on page 20 |
| 2 | If customizing a Ruckus ICX 7750 baseline chassis: 1 Install at least one power supply unit. 2 Install at least three fans. 3 Install an expansion module. | "Installing and replacing a power supply unit" on page 38 "Installing or replacing the fan tray" on page 65 "Installing or replacing an expansion module" on page 67 |
| 3 | Install the device in an equipment rack. | "Installing the device in a rack" on page 24 |

TABLE 8 Installation tasks (Continued)

| Task number | Task | Where to find more information |
|-------------|--|--|
| 4 | Attach a terminal or PC to the device. This will enable you to configure the device through the command line interface (CLI). | "Grounding the system" on page 37 |
| 5 | Plug the device into a nearby power source that adheres to the regulatory requirements outlined in this manual. | "Powering on the system" on page 38 |
| 6 | Assign a password for additional access security. No default password is assigned to the CLI. | Ruckus FastIron Management Configuration Guide |
| 7 | 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 Management Configuration Guide |
| 8 | Connect network equipment to the system. | "Connecting network devices" on page 43 |
| 9 | Test IP connectivity to other devices by pinging them and tracing routes. | Ruckus FastIron Management Configuration Guide |
| 10 | Continue configuring the device using the CLI. | Ruckus FastIron Management Configuration Guide |
| 11 | Secure access to the device. | Ruckus FastIron Management Configuration Guide |

Installation precautions

Follow all precautions when installing a device.

General precautions



DANGER

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



CAUTION

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



CAUTION

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



CAUTION

Never leave tools inside the device.



DANGER

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

Lifting precautions



DANGER

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

Power precautions



CAUTION

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



DANGER

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



CAUTION

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



DANGER

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



CAUTION

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



CAUTION

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.

DC-DC power source cautions



CAUTION

For DC systems, use grounding wire of at least 12 American Wire Gauge (AWG). The grounding wire should be attached to the DC input connector (as shown in [Figure 30](#)); the other end connects to the building ground.



CAUTION

For the DC input circuit to the system, make sure there is a 20 Amp circuit breaker, minimum 60 VDC, double pole, on the input terminal block to the power supply. The input wiring for connection to the product should be copper wire, 12 AWG, marked VW-1, and rated minimum 90°C.

Installing the device in a rack



DANGER

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

NOTE

You need a #2 Phillips screwdriver for installation.

Before mounting the switch in a rack, pay particular attention to the following factors:

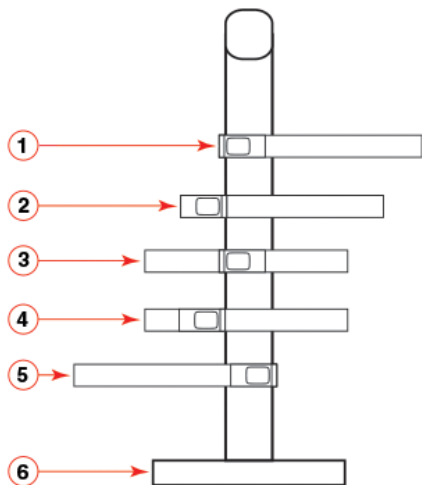
- Temperature: Because the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (Refer to “[Environmental considerations](#)” on page 20.)
- Mechanical loading: Do not place 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 four-post rack, you can order a four-post rack kit with the part number XBR-R000295. For the procedure to install this kit, refer to “[Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks \(XBR-R000295\)](#)” on page 26.

Two-post rack mount installation

The Ruckus ICX 7750 can be installed in a two-post rack in various mounting positions, as shown in [Figure 11](#).

FIGURE 11 Two-post rack mounting positions



- | | |
|-----------------------|--------------------------|
| 1 Front flush mount | 4 Reverse mid-mount |
| 2 Reverse-front mount | 5 Rear mount |
| 3 Front mid-mount | 6 2-post rack, side view |

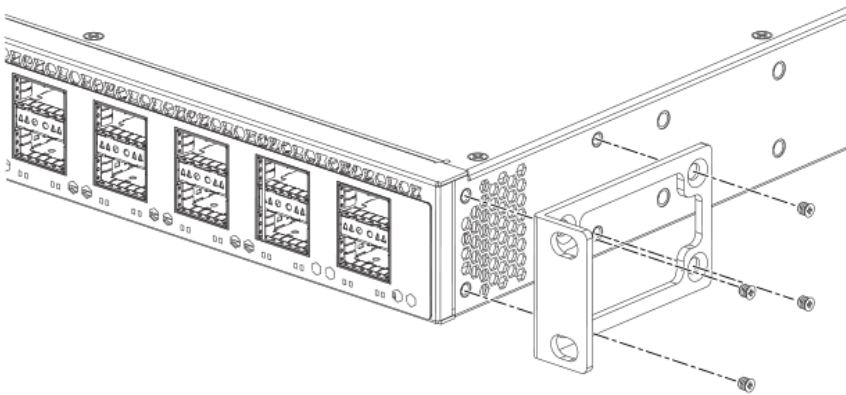
NOTE

Use the following procedure when installing the Ruckus ICX 7750 in a two-post Telco rack only. If an ICX 7750 device is to be installed into a standard four-post rack, make sure that the correct rack mount kit has been purchased. For four-post racks, follow the procedures in ["Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks \(XBR-R000295\)"](#) on page 26.

Use the following steps to mount the Ruckus ICX 7750 in a two-post rack.

1. Remove the rack mount kit from the shipping carton. The kit contains the following items:
 - Two L-shaped mounting brackets
 - Eight 8-32 x 5/16 in., panhead Phillips screws
2. Attach the mounting brackets to the sides of the device as illustrated in [Figure 12](#) using the 8-32 x 5/16 in. screws.

FIGURE 12 Attaching the mounting brackets for a Ruckus ICX 7750

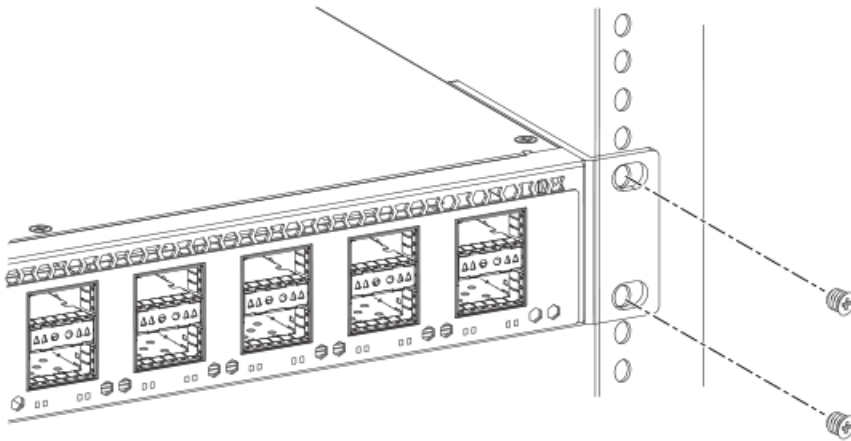


3. Position the device in the rack, providing temporary support under the switch until the rail kit is secured to the rack.
4. Attach the front right bracket to the rail rack using two 10-32 x 5/8 in. screws and the appropriate round-hole or square-hole retainer nuts.
5. Repeat [step 4](#) to attach the left front bracket to the left front rack rail and tighten all 10-32 x 5/8 in. screws to a torque of 25 in-lb (29 cm-kg). Refer to [Figure 13](#).

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FIGURE 13 Installing the Ruckus ICX 7750 in a 2-post rack



Proceed to ["Grounding the system"](#) on page 37.

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

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

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 the hardware installation guide for your product for more information.

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

Time and items required

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

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

- Clamps or other means of temporarily supporting the device in the rack

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

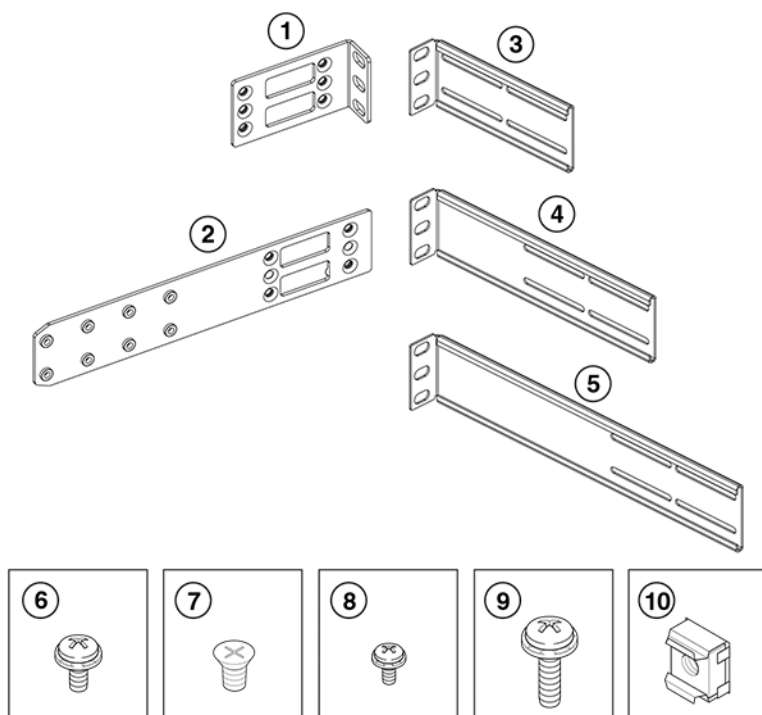


CAUTION
Use the screws specified in the procedure. Using longer screws can damage the device.

Parts list

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

FIGURE 14 Rack kit parts



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

Flush-front mounting the device in the rack



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

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

NOTE

The illustrations in the rack installation procedures show a 1U device, but the instructions are the same for a 1.5U or 2U device. The illustrations in the rack installation procedures are for reference only and may not show the actual device.

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

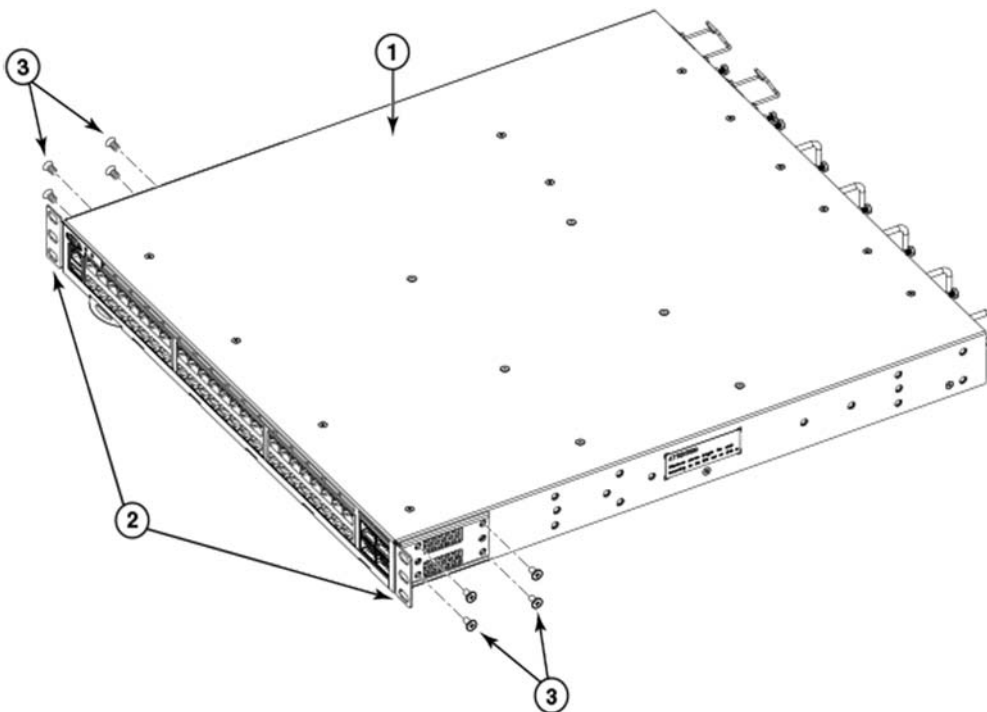
1. "Attaching the front brackets" on page 28
2. "Attaching the extension brackets to the device" on page 29
3. "Installing the device in the rack" on page 29
4. "Attaching the rear brackets to the extensions" on page 30
5. "Attaching the rear brackets to the rack posts" on page 31

Attaching the front brackets

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

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

FIGURE 15 Attaching the front brackets



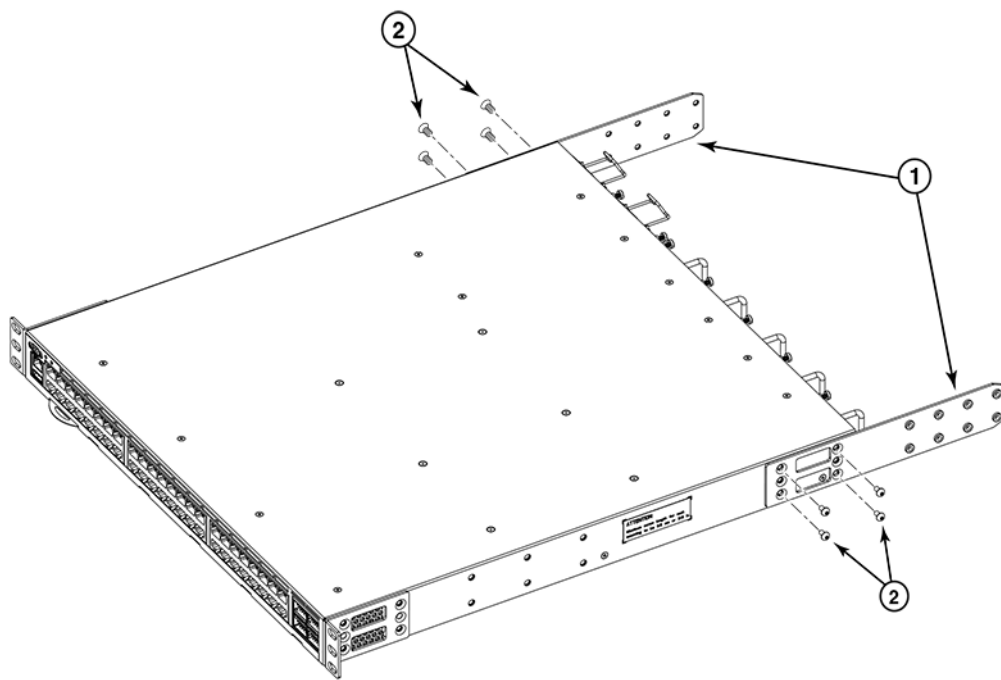
- 1 Device
- 2 Screws, 8-32 x 5/16-in., flathead Phillips
- 3 Front brackets

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

FIGURE 16 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.

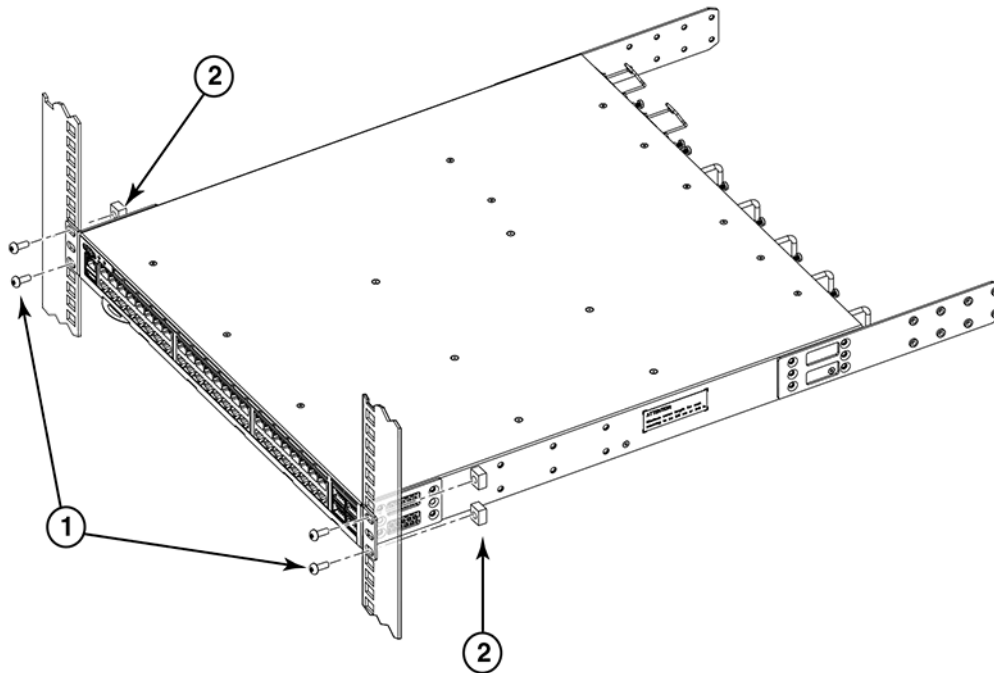
1. Position the device in the rack, as shown in [Figure 17](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower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

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3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 17 Positioning the device in the rack



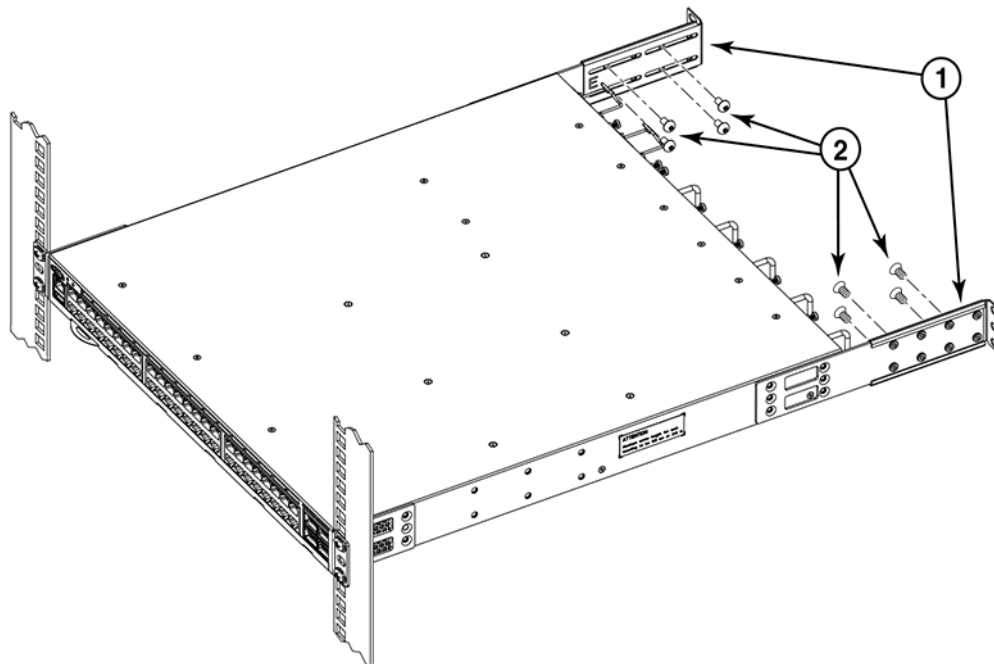
- 1 Screws, 10-32 x 5/8-in., panhead Phillips 2 Retainer nuts, 10-32

Attaching the rear brackets to the extensions

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

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 18](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 19](#) for the positioning of the medium or long brackets and screws.
3. Attach the brackets using four 6-32 x 1/4-in. panhead screws.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left extension.
5. 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 (1.0 cm-kg).

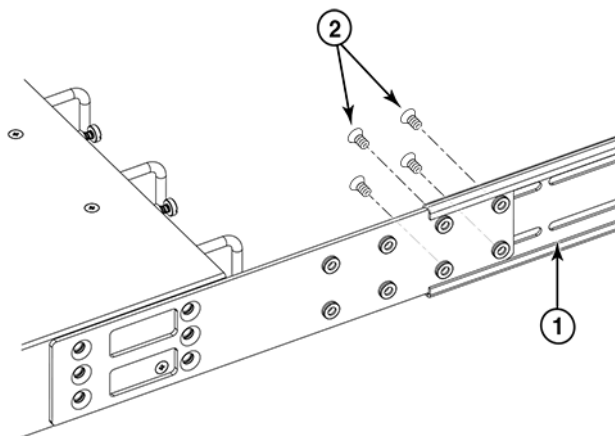
FIGURE 18 Attaching the rear brackets to the extensions



1 Rear brackets

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

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



1 Rear bracket, medium or long

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

Attaching the rear brackets to the rack posts

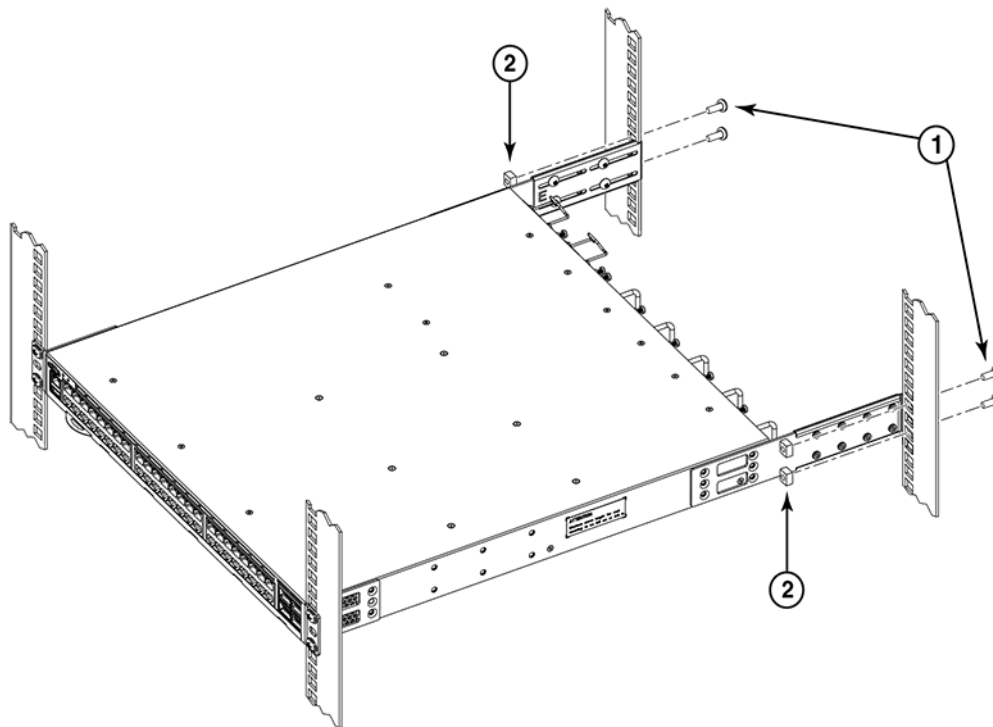
Complete the following steps to attach the rear brackets to the rack posts.

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

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FIGURE 20 Attaching the rear brackets to the rack posts



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

2 Retainer nuts, 10-32

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

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



CAUTION

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

NOTE

The illustrations in the rack installation procedures show a 1U device, but the instructions are the same for a 1.5U or 2U device. The illustrations in the rack installation procedures are for reference only and may not show the actual device.

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

1. [“Attaching the front brackets to the rear of the device”](#) on page 33
2. [“Attaching the extensions to the front of the device”](#) on page 33
3. [“Installing the device in the rack”](#) on page 34
4. [“Attaching the rear brackets to the extensions at the front of the device”](#) on page 35
5. [“Attaching the rear brackets to the front rack posts”](#) on page 36

Attaching the front brackets to the rear of the device

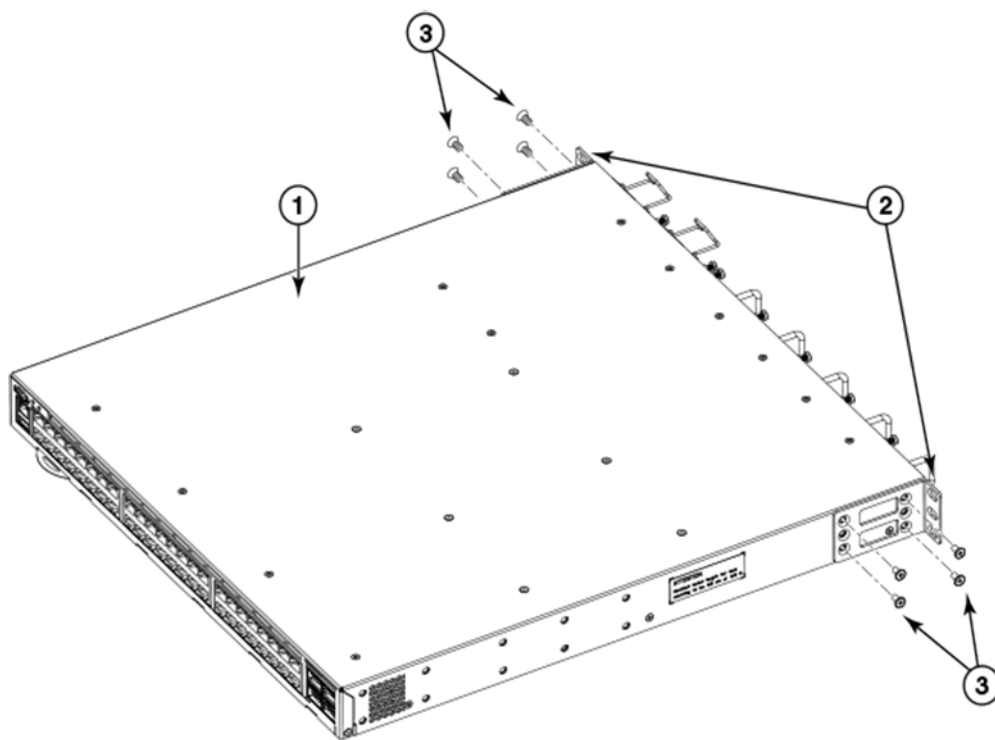
NOTE

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

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

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



- 1 Device
- 2 Front brackets

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

Attaching the extensions to the front of the device

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

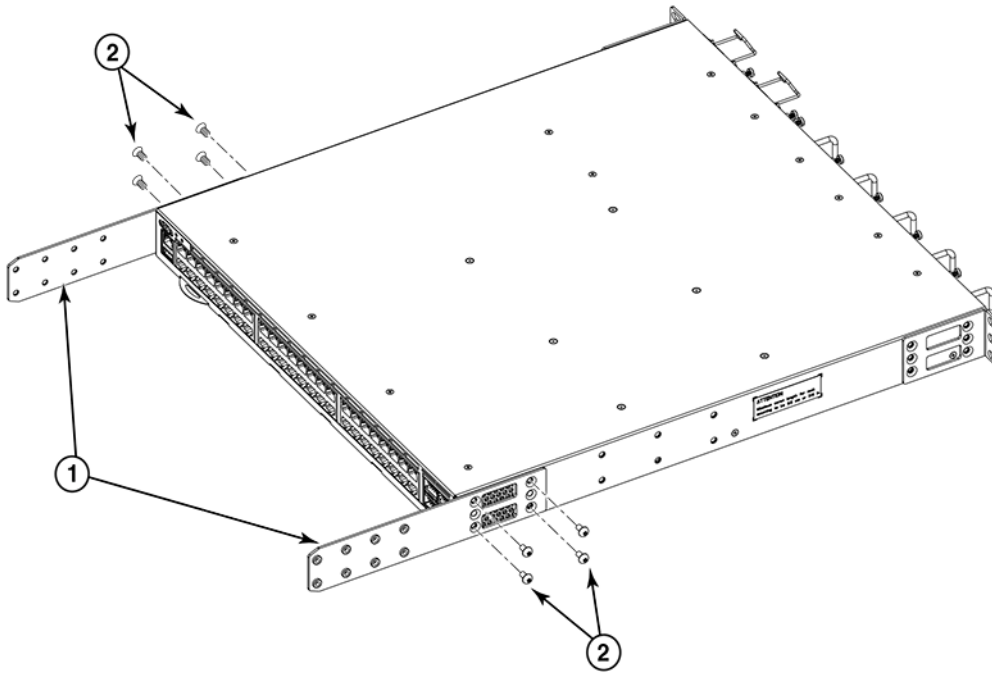
1. Select the proper length extension bracket for your rack depth.
2. Position the right extension along the side of the device as shown in [Figure 22](#).
3. Attach the bracket using four 8-32 x 5/16-in. flathead screws.

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4. Repeat Step 1 and Step 2 to attach the left front extension to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 22 Attaching the bracket extensions to the device



1 Extension brackets

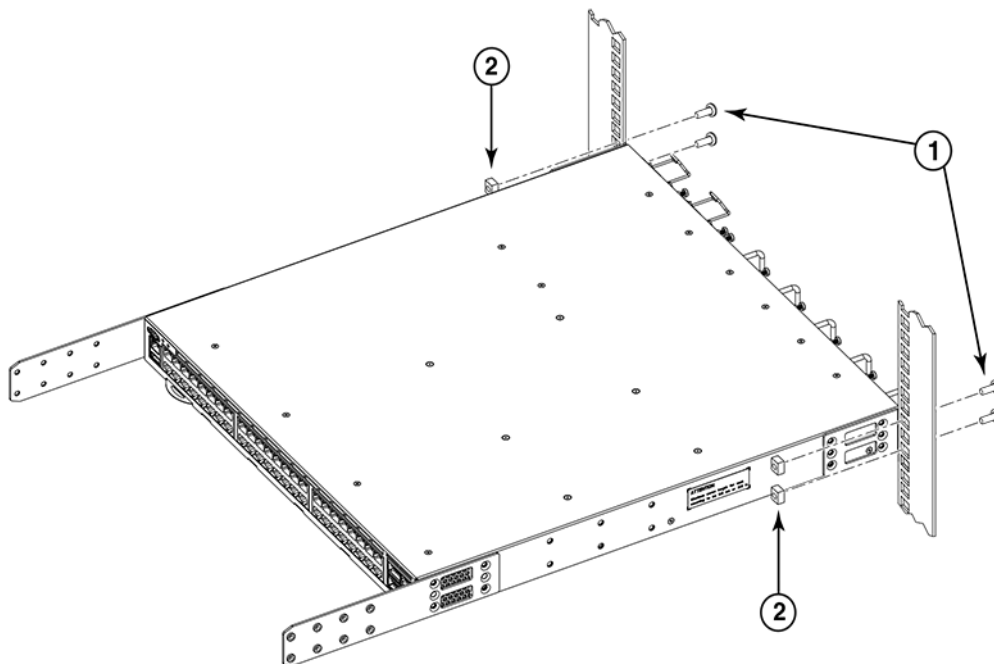
2 Screws, 8-32 x 5/16-in., flathead Phillips

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 23](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 23 Positioning the device in the rack



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

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

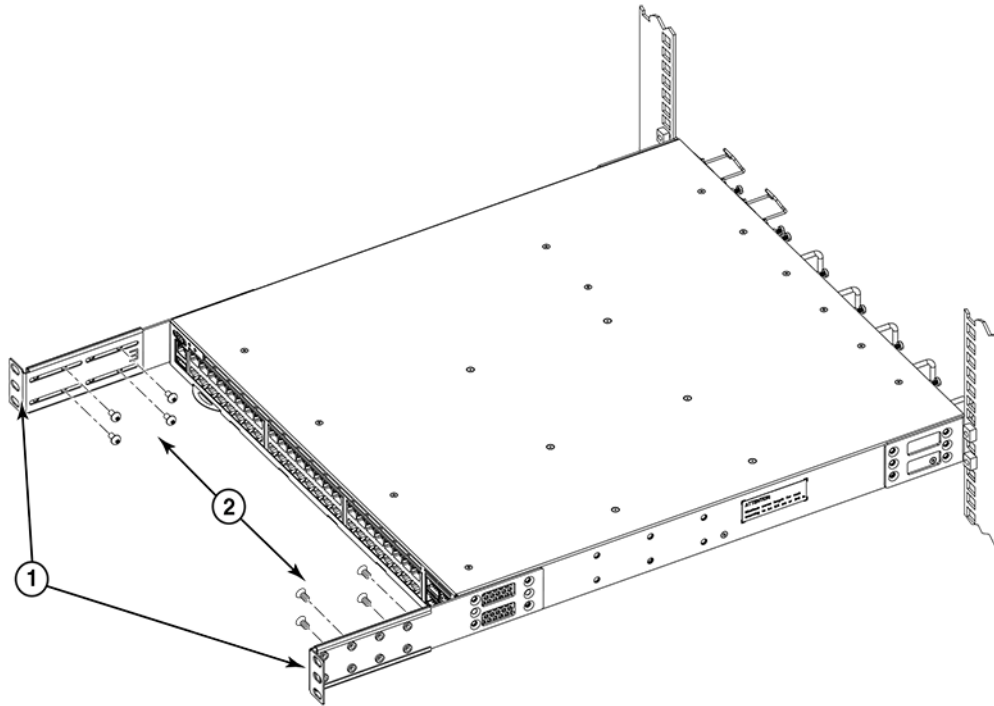
Complete the following steps to attach the rear brackets to the extensions. There are short and long front brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 24](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 25](#) for the positioning of the medium or long brackets and screws.
3. Attach the brackets using four 6-32 x 1/4-in. screws.
4. Repeat Step 2 and Step 3 to attach the left rear bracket to the left extension.
5. 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).

Installing the Ruckus ICX 7750

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

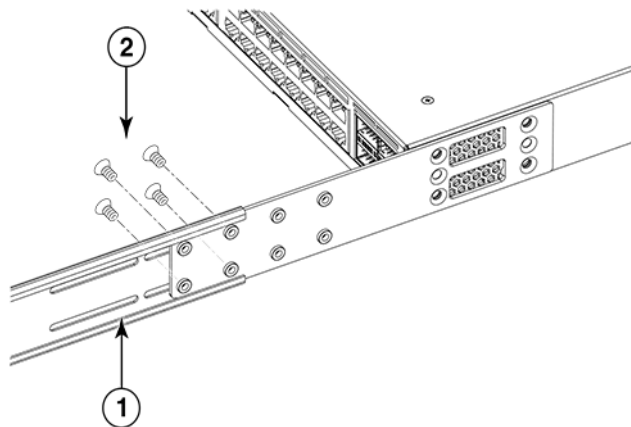
FIGURE 24 Attaching the rear brackets to the extensions at the front of the device



1 Rear brackets, short

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

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



1 Rear bracket, medium or long

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

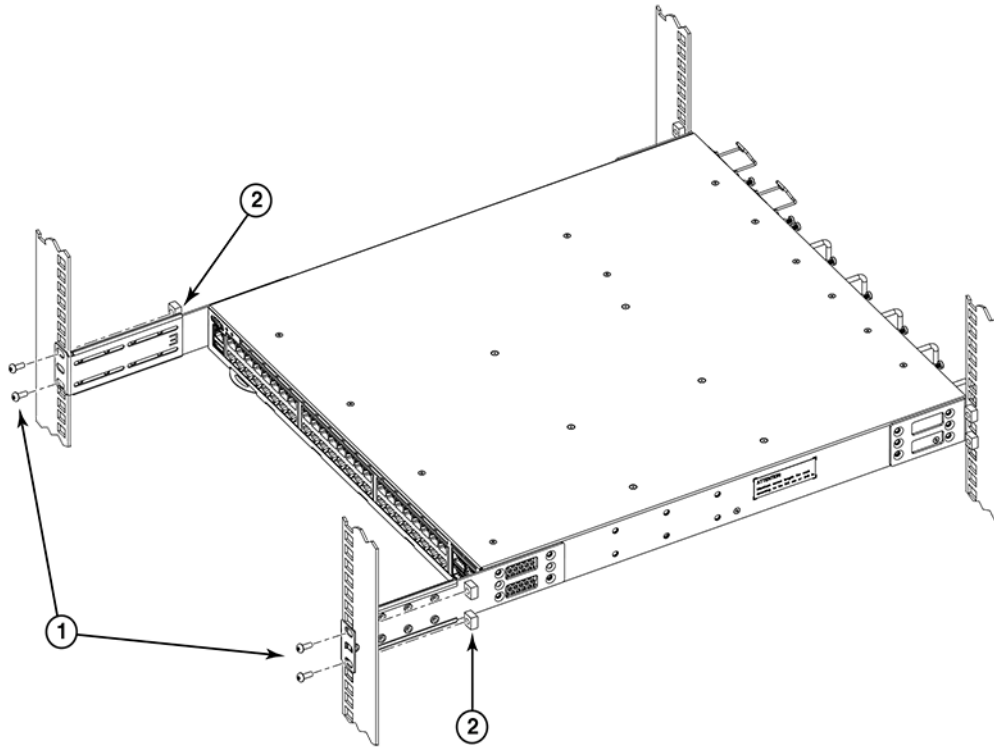
Attaching the rear brackets to the front rack posts

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

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

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

FIGURE 26 Attaching the rear brackets to the front rack posts

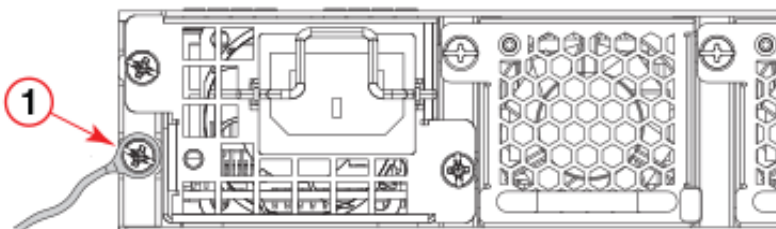


- 1 Screws, 10-32 x 5/8-in., panhead Phillips
- 2 Retainer nuts, 10-32

Grounding the system

The rear panel of the Ruckus ICX 7750 includes a single-screw grounding terminal. The surface area around this terminal is not painted to provide a good electrical connection. Before connecting power to the device, the grounding terminal must be connected to ground to ensure proper operation and to meet electromagnetic interference (EMI) and safety requirements.

FIGURE 27 Connecting the grounding terminal



- 1 Grounding terminal

Installing the Ruckus ICX 7750

Powering on the system

NOTE

Use the grounding lug and screw included in the Ruckus ICX 7750 grounding kit.

Perform the following steps to connect to the grounding terminal.

1. Ensure that the rack in which the Ruckus ICX 7750 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 6 American Wire Gauge (AWG). The 6 AWG wire and grounding lug should be crimped together using a proper tool.
4. Attach the 6 AWG stranded copper wire to the grounding terminal on the Ruckus ICX 7750 using the screw included in the grounding kit.
5. Attach the grounding wire to the grounding point on the rack.

Powering on the system

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

1. Install alternating-current (AC) and direct-current (DC) power supplies in the switch.
2. Attach AC or DC power cables to the power supply connectors on the rear panel.
3. Connect the power cables to the 100-240 VAC or -48 VDC power source.

NOTE

To turn the system off, simply unplug the power cable or cables.

NOTE

A power source should be installed near the equipment and should be easily accessible.

Power supplies

The Ruckus ICX 7750 supports alternating-current (AC) and direct-current (DC) power supplies. The Ruckus ICX 7750 is capable of running on one power supply and three fans. The second power supply and fourth fan provide redundancy.

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

NOTE

Ruckus recommends that the Ruckus ICX 7750-48C operate with two power supplies and four fan trays installed. If a power supply or fan tray fails, it must be replaced as soon as possible.

NOTE

AC and DC power supplies cannot be installed and used in the same device. Mismatched power supplies in the same device cause continual reboot on power up.

Installing and replacing a power supply unit

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 supply provides enough power for the device.
- The airflow direction of the power supply must match that of the installed fan trays. 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.



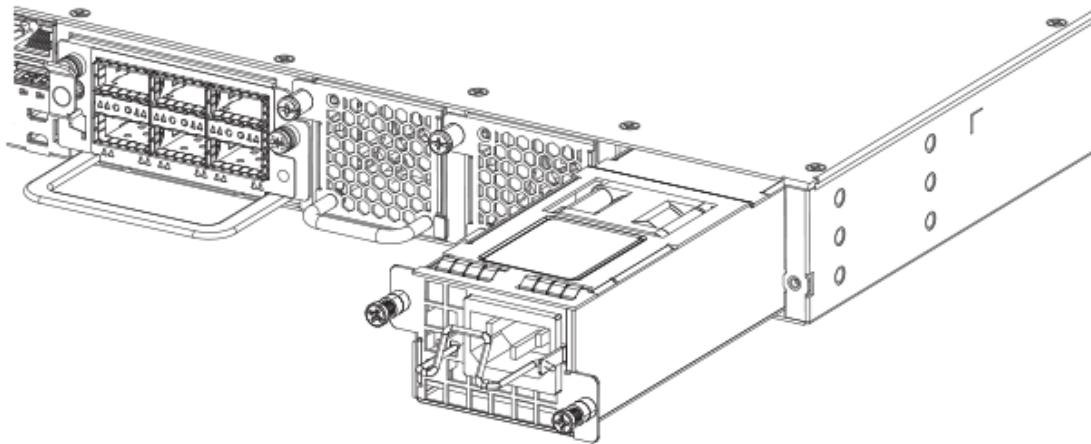
CAUTION

For Ruckus ICX 7750 devices, be sure that the airflow direction of the power supply unit matches that of installed fan trays. The power supplies and fan trays are clearly labeled with either a green arrow with an “E”, or an orange arrow with an “I.”

Installing an AC power supply

Use the following steps to install an AC power supply in the Ruckus ICX 7750.

FIGURE 28 Installing an AC power supply unit



1. If replacing a power supply, remove the previously installed power supply from the appropriate slot by removing the two screws with a Phillips screwdriver.
2. If installing a new power supply into a slot covered with a filler panel:
 - a. Using a Phillips screwdriver, unscrew the screws 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.

Installing the Ruckus ICX 7750

Power supplies

- When you are sure the power supply has properly engaged the connector, tighten the retainer screws to secure the power supply in the slot.

When the Ruckus ICX 7750 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 panel in place. If you run the device with an uncovered slot, the system will overheat.

Installing a DC power supply



CAUTION

All devices with DC power supplies (Ruckus ICX 7750) 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.

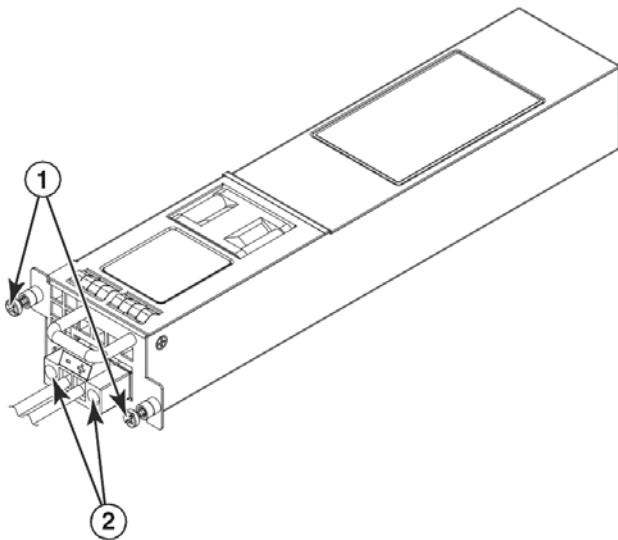
NOTE

AC and DC power supplies cannot be installed and used in the same device. Mismatched power supplies in the same device cause continual reboot on power up.

Use the following steps to install a DC power supply in the Ruckus ICX 7750.

- Remove the previously installed power supply from the appropriate slot by removing the chassis attachment screws located in the upper right and lower left of the power supply unit using a Phillips screwdriver. Refer to item 1 in [Figure 29](#).

FIGURE 29 DC power supply screws



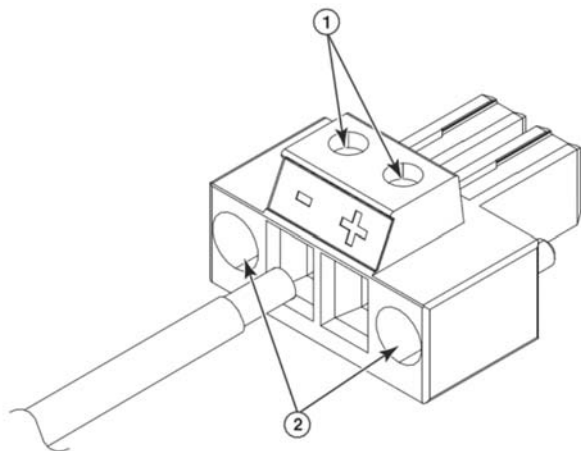
1 Chassis attachment screws

2 Assembly screws

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

4. Insert the DC power supply source wires into the DC wiring assembly, matching the terminals. Refer to [Figure 30](#).

FIGURE 30 DC power supply wiring assembly



1 Wire-tightening screws

2 Assembly screws

5. Use the wire-tightening screws to secure the wires.
6. Insert the DC power supply wiring assembly with the wires connected into the power supply and tighten the assembly screws. Refer to [Figure 30](#).
7. Using the handle on the power supply, hold the power supply level and guide it into the carrier rails on each side of the power supply slot. Gently push the power supply all the way into the slot, ensuring that it firmly engages with the connector.
8. When you are sure the power supply has properly engaged the connector, tighten the chassis attachment screws to secure the power supply in the slot.

When the Ruckus ICX 7750 is powered on, the power LED on the front of the device should turn green to confirm that the power supply is correctly installed and supplying power. Refer to [“Ruckus ICX 7750 front-panel LEDs”](#) on page 51.

Attaching a PC or terminal

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 console port. After you assign an IP address, you can access the system through Telnet, or Ruckus Network Advisor.

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

1. Connect a PC or terminal to the console management port on the front of the Ruckus ICX 7750 using the mini-USB serial console port cable and, if required, the RJ-45-to-DB-9 adapter.

For port pinout information for the mini-USB serial console port, refer to [“Serial port specifications \(pinout mini-USB\)”](#) on page 76.

NOTE

You must run a terminal emulation program on the PC.

Installing the Ruckus ICX 7750

Connecting to the management port

2. Launch the terminal emulation program and set the following session parameters:
 - Baud: 9600 bps
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None

The console serial communication port serves as a connection point for management by a PC.

Connecting to the management port

The Gigabit Ethernet management port (RJ-45) on the Ruckus ICX 7750 rear panel provides an out-of-band network connection to the device. After you assign an IP address, you can access the Ruckus ICX 7750 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 7750 through its management port, connect the port to the management Ethernet network using Category 5 or better cable.

Management of the Ruckus ICX 7750 is described in detail in the Ruckus FastIron Management Configuration Guide.

Installing an SFP+ or a QSFP+ transceiver

To monitor the transceivers, the **show media** command output shows the transceiver information for all interfaces on the switch. 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

Passive SFP+ and QSFP+ removable media devices are not supported. Use of passive devices may lead to unstable networks if utilized. Ruckus-branded removable media devices are recommended for proper operation of the switch.

You can install a new transceiver in a slot while the device is powered on and running.

Before installing or removing a fiber-optic transceiver, have the following items available:

- The protective covering that you removed from the fiber-optic transceiver port when you initially installed the module.
- An ESD wrist strap with a plug for connection to the ESD connector on the router chassis.



CAUTION

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.

NOTE

When 10 GbE fiber-optic ports on the Ruckus ICX 7750 are disabled, the laser light remains on even though the port link is down.

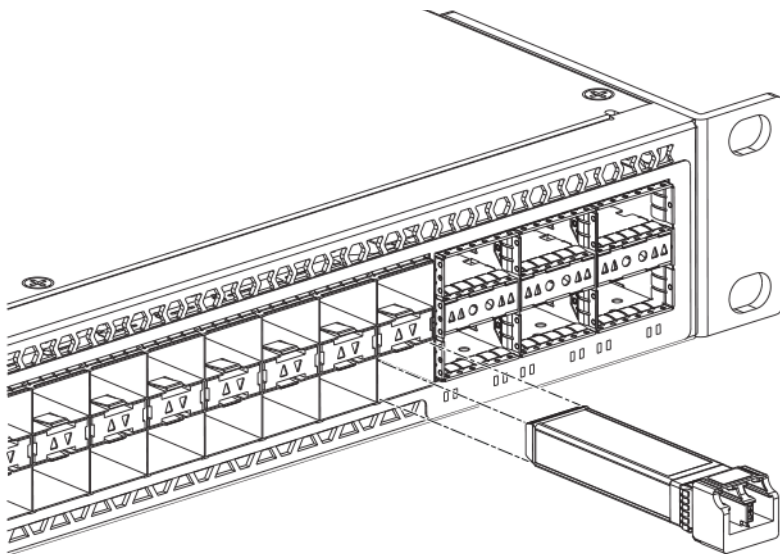
Use the following steps to install a transceiver:

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 31](#).
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 SFP+ transceiver has a 10-pad gold-plated edge connector on the bottom. The correct position to insert an SFP+ transceiver in the upper row of ports is with the gold-plated edge down. The correct position to insert an SFP+ transceiver in the lower row of ports is with the gold-plated edge up.

FIGURE 31 Installing an SFP+ transceiver in a port slot



Connecting network devices

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

Connectors

For port information, refer to [“Data port specifications \(Ethernet\)”](#) on page 76.

Connecting a network device to a copper port

For copper connections to another Ruckus device or any other devices, use straight-through or crossover UTP cabling.

Automatic MDI or MDIX detection

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

For more information about automatic MDI or MDIX detection and configuration details, refer to the Ruckus FastIron Management Configuration Guide.

Connecting a network device to a fiber port

For direct attachment from the device to a 1 GbE 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 Ruckus ICX 7750 devices, 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+ or QSFP+). Refer to [“Installing an SFP+ or a QSFP+ transceiver”](#) on page 42.
- 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 44.
3. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tabs lock 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 51.

NOTE

To verify that a Ruckus ICX 7750 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.

Cleaning the fiber-optic connectors

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

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

Connecting breakout cables to 40 GbE ports

A 40 GbE breakout cable can only be used on standalone Ruckus ICX 7750 devices to break out certain 40 GbE QSFP+ ports into four 10 GbE sub-ports. (Refer to "Breakout cables" on page 17.)

NOTE

Any previous configuration must be removed from a 40 GbE port before it can be broken out into sub-ports. Refer to the Ruckus FastIron Management Configuration Guide for more information.

NOTE

Stacking cannot be enabled on Ruckus ICX 7750 devices that have a breakout configuration on any 40 GbE ports, and vice versa.

Stacking Ruckus ICX 7750 switches

Ruckus ICX 7750 devices support chassis-class high availability stacking with hitless failover on six full-duplex 40 Gbps stacking ports.

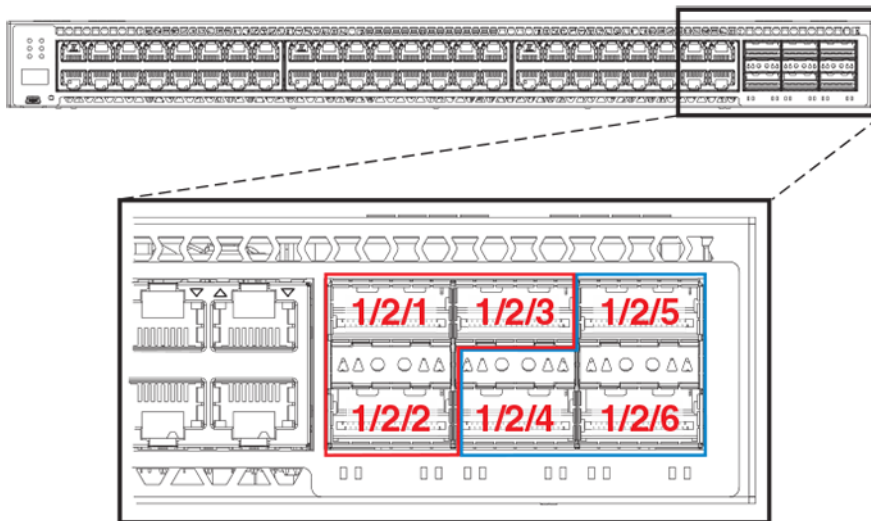
Ruckus ICX 7750 Switches can be stacked using standard full-40 Gbps QSFP+ ports per switch, providing a maximum stacking bandwidth of 480 Gbps.

Stacking ports

There are six QSFP+ ports on the front panel (slot 2) and six QSFP+ ports on the rear panel (slot 3) that can be used as stacking ports. Use either the front panel stacking ports or the rear panel stacking ports. No mixed combination of front and rear ports is allowed.

Figure 32 shows the Ruckus ICX 7750 stacking ports.

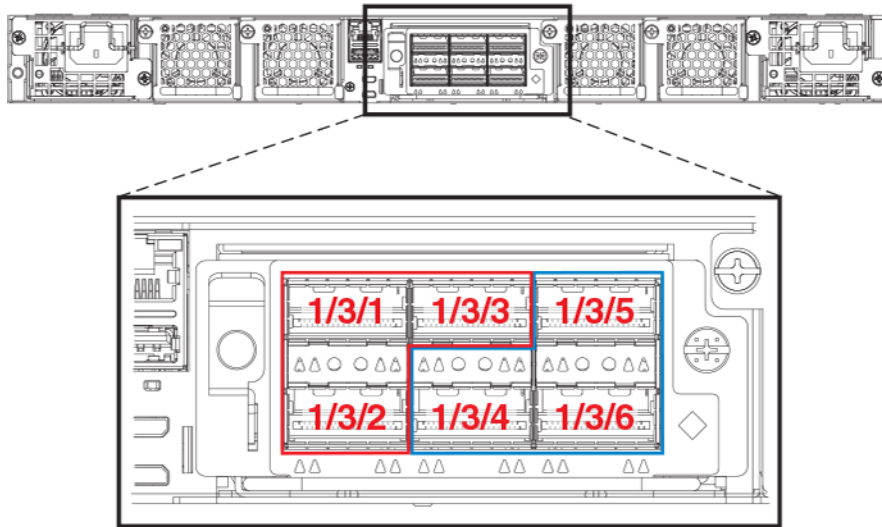
FIGURE 32 Front panel stacking ports



The available front panel stacking ports are 1/2/1 through 1/2/6.

Ports 1/2/1 and 1/2/4 are default stacking ports on the front panel. Default stacking ports have the capability to accept special stacking packets during a CLI-initiated command sequence of the Secure Setup utility. The default ports can be changed to ports 1/3/1 and 1/3/4 on the rear panel. No other default ports are allowed.

FIGURE 33 Rear panel stacking ports



The available rear panel stacking ports are ports 1/3/1 through 1/3/6.

NOTE

Unused stacking ports can be used as data ports. For example, you can elect to use only one default port as a stacking port and use the other default port as a data port. Furthermore, when a Ruckus ICX 7750-6Q stacking module is not configured for stacking, its ports can be used as data ports.

A stack connection can also be a trunked link consisting of multiple ports, which increases stacking bandwidth and provides resiliency. Up to two stack trunks are supported, and each trunk can include up to three ports.

Only ports that are in sequential order can be configured as a stacking trunk. A default port; that is, either port 1/2/1 or 1/2/4 in slot 2 or port 1/3/1 or 1/3/4 in slot 3, is always the first sequential port in a trunk.

Possible 3-port trunks:

- 1/2/1 to 1/2/3
- 1/2/4 to 1/2/6
- 1/3/1 to 1/3/3
- 1/3/4 to 1/3/6

Possible 2-port trunks:

- 1/2/1 to 1/2/2
- 1/2/4 to 1/2/5
- 1/3/1 to 1/3/2
- 1/3/4 to 1/3/5

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 FastIron Ethernet Switch Stacking Configuration Guide.

Stacking cables

Use QSFP+ direct attached active copper stacking cables or QSFP+ fiber optic cables to connect Ruckus ICX 7750 devices in a stack. The copper cable lengths for 40 GbE ports are 1 meter, 3 meters, and 5 meters.

Extended distance stacking

Because Ruckus ICX 7750 devices use Ethernet for the inter-switch stack connections, the deployment options are greatly increased. If standard copper stacking cables are used, the inter-switch connections can be up to 5 meters, which is usually sufficient for locally distributed stacks such as in top-of-rack (ToR) applications. For broader distribution, fiber-optic cables should be used, allowing a stack to be deployed across multiple physical locations such as the wiring closets of an office building.

NOTE

The use of 40GBASE-LR4 optics for extended distance stacking is supported only in the default stacking ports (1/2/1, 1/2/4, 1/3/1, or 1/3/4). Due to the limitation on the Ruckus ICX7750-48C and the ICX7750-48F, where 40GBASE-LR4 optics are supported only in ports 1/2/5, 1/2/6, 1/3/5, or 1/3/6, extended distance stacking is not supported for 40GBASE-LR4 optics.

Table 9 shows the approved optics and stacking distance combinations.

TABLE 9 Fiber-optic options and stacking distances

| Stacking cable option | Description | Maximum stacking distance |
|--------------------------------|---------------|--|
| 40GBase-SR4 fiber-optic cable | 40G QSFP-QSFP | 100 meter |
| 40GBase-ESR4 fiber-optic cable | 40G QSFP-QSFP | 300 meter (OM3 multimode fiber) 400 meter (OM4 multimode fiber) |
| 40GBase-LR4 fiber-optic cable | 40G QSFP-QSFP | 10 kilometers for ICX 7750-26Q device only |

Stack size

The Ruckus ICX 7750 supports up to 12 units in a stack. You can mix any number of Ruckus ICX 7750-26Q, Ruckus ICX 7750-48F, or Ruckus ICX 7750-48C devices together in a stack.

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.

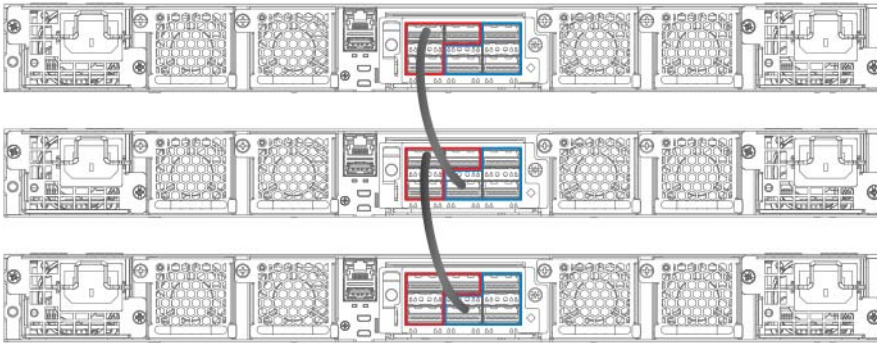
For example, in a three-unit stack using a linear topology, unit 1 connects to unit 2, and unit 2 connects to unit 3.

Figure 34 shows a supported rear panel linear stacking topology.

Installing the Ruckus ICX 7750

Stacking Ruckus ICX 7750 switches

FIGURE 34 Rear panel 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 35 shows a supported rear panel ring stacking topology.

FIGURE 35 Rear panel ring stacking topology

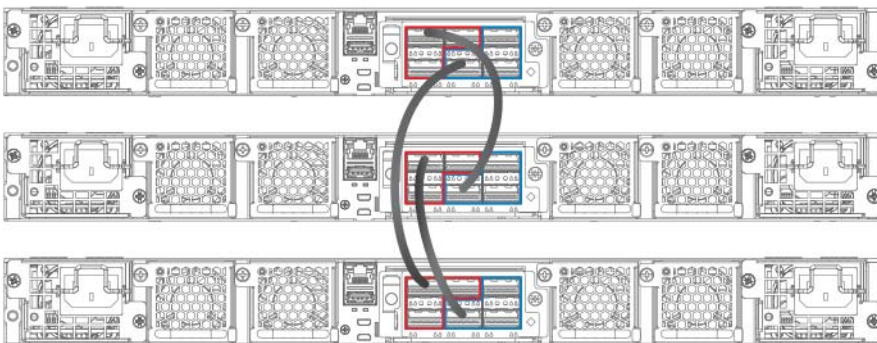


Figure 36 shows a supported front panel ring stacking topology.

FIGURE 36 Front panel ring stacking topology

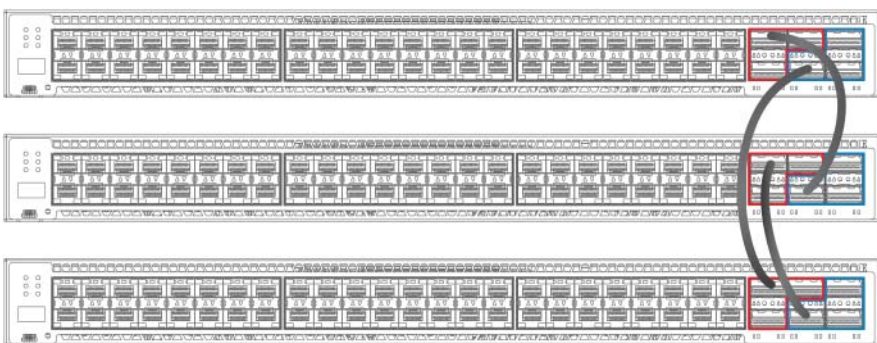
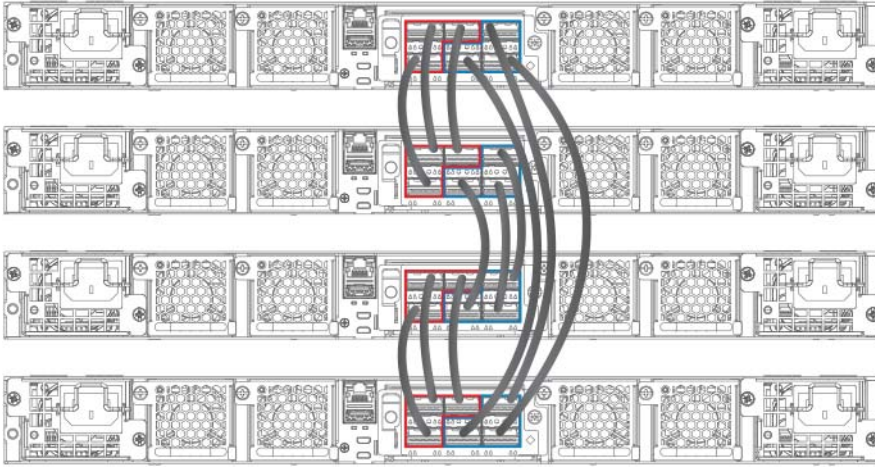


Figure 37 shows a supported rear panel ring trunk-stack topology.

FIGURE 37 Rear panel ring trunk-stack topology



NOTE

For more information about stacking, refer to the *Ruckus FastIron Stacking Configuration Guide*.

Installing the Ruckus ICX 7750
Stacking Ruckus ICX 7750 switches

Ruckus ICX 7750 Operation

- LED activity interpretation 51
- Ruckus ICX 7750 front-panel LEDs 51
- Ruckus ICX 7750 rear-panel LEDs 54
- LED patterns 55
- Diagnostic tests and monitoring 58
- Monitoring power and cooling 58

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.

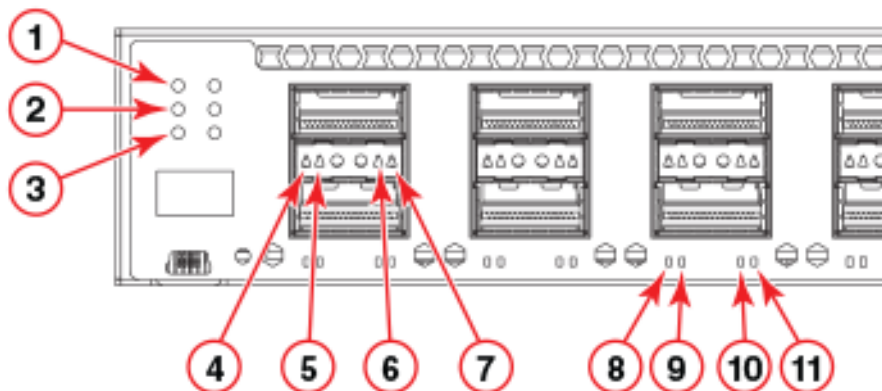
Ruckus ICX 7750 front-panel LEDs

The Ruckus ICX 7750-26Q has the following LEDs on the front panel:

- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG LED bicolor status LED (green and amber)
- One MS LED bicolor status LED (green and amber)
- One HA LED bicolor status LED (green and amber)
- One RDNT LED bicolor status LED (green and amber)
- Four bicolor status LEDs (green and amber) for each of the 26 QSFP+ ports that indicate the status of the ports in 40 GbE mode and 4x10 GbE breakout mode

Figure 38 shows the LEDs on the Ruckus ICX 7750-26Q front panel.

FIGURE 38 Ruckus ICX 7750-26Q front-panel LEDs



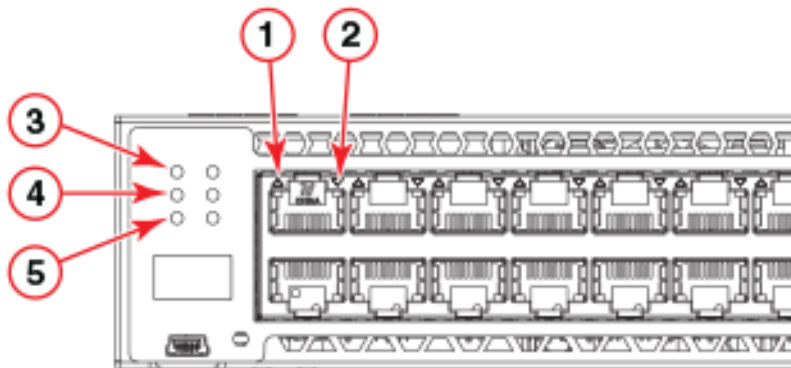
- | | | | |
|---|---|----|--|
| 1 | PSU1 and PSU2 status LEDs (PSU1 corresponds to the right power supply slot on the rear panel and PSU2 corresponds to the left power supply slot, as viewed from the rear) | 7 | Upper slot 10 GbE mode lane 4 link/activity LED |
| 2 | MS and DIAG status LEDs | 8 | Lower slot 40 GbE mode link/activity LED or 10 GbE mode lane 1 link/activity LED |
| 3 | HA and RDNT status LEDs | 9 | Lower slot 10 GbE mode lane 2 link/activity LED |
| 4 | Upper slot 40 GbE mode link/activity LED or 10 GbE mode lane 1 link/activity LED | 10 | Lower slot 10 GbE mode lane 3 link/activity LED |
| 5 | Upper slot 10 GbE mode lane 2 link/activity LED | 11 | Lower slot 10 GbE mode lane 4 link/activity LED |
| 6 | Upper slot 10 GbE mode lane 3 link/activity LED | | |

The Ruckus ICX 7750-48C has the following LEDs on the front panel:

- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG LED bicolor status LED (green and amber)
- One MS LED bicolor status LED (green and amber)
- One HA LED bicolor status LED (green and amber)
- One RDNT LED bicolor status LED (green and amber)
- 48 1/10 GbE bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation
- Four bicolor status LEDs (green and amber) for each of the six QSFP+ ports that indicate the status of the ports in 40 GbE mode and 4x10 GbE breakout mode

Figure 39 shows the LEDs on the Ruckus ICX 7750-48C front panel. The up-arrow port status LEDs for the 1/10 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 39 Ruckus ICX 7750-48C front-panel LEDs



- | | | | |
|---|--|---|-------------------------|
| 1 | Upper 1/10 GbE port LEDs | 4 | MS and DIAG status LEDs |
| 2 | Lower 1/10 GbE port LEDs | 5 | HA and RDNT status LEDs |
| 3 | PSU1 and PSU2 status LEDs (PSU1 corresponds to the right power supply slot on the rear panel and PSU2 corresponds to the left power supply slot, as viewed from the rear) | | |

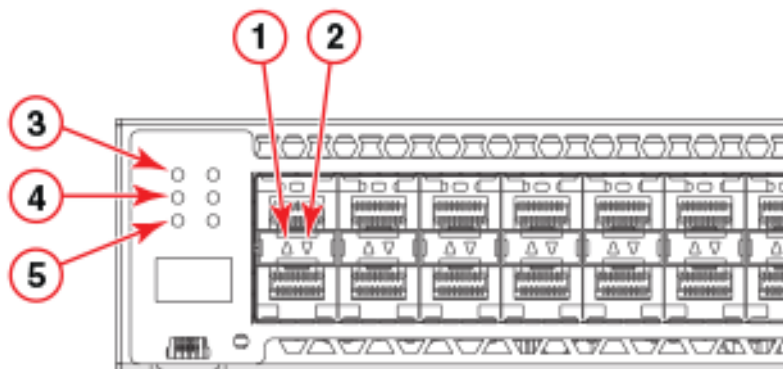
The Ruckus ICX 7750-48F has the following LEDs on the front panel:

- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG LED bicolor status LED (green and amber)
- One MS LED bicolor status LED (green and amber)
- One HA LED bicolor status LED (green and amber)
- One RDNT LED bicolor status LED (green and amber)
- 48 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) that indicate the 1 GbE or 10 GbE mode of operation
- Four bicolor status LEDs (green and amber) for each of the six QSFP+ ports that indicate the status of the ports in 40 GbE mode and 4x10 GbE breakout mode

Figure 40 shows the LEDs on the Ruckus ICX 7750-48F front panel.

The up-arrow port status LEDs for the 10 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 40 Ruckus ICX 7750-48F front-panel LEDs



- | | | | |
|---|--|---|-------------------------|
| 1 | Upper 1/10 GbE port LEDs | 4 | MS and DIAG status LEDs |
| 2 | Lower 1/10 GbE port LEDs | 5 | HA and RDNT status LEDs |
| 3 | PSU1 and PSU2 status LEDs (PSU1 corresponds to the right power supply slot on the rear panel and PSU2 corresponds to the left power supply slot, as viewed from the rear) | | |

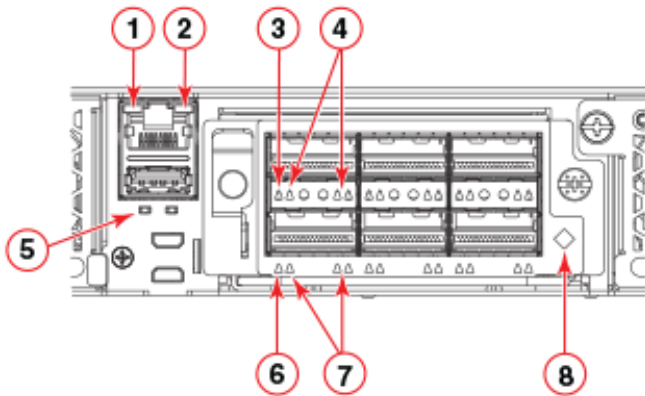
Ruckus ICX 7750 rear-panel LEDs

The Ruckus ICX 7750 has the following LEDs on the rear panel:

- Two Management port status LEDs
- Two stack control path port LEDs (currently not used)
- Expansion module LEDs:
 - One Power LED bicolor status LED (green and amber)
 - Four bicolor status LEDs (green and amber) for each of the six QSFP+ ports that indicate the status of the ports in 40 GbE mode and 4x10 GbE breakout mode
- Power supply LEDs: One status LED on each installed power supply
- Fan tray LEDs: One status LED on each installed fan tray

Figure 41 shows the LEDs on the rear panel of the Ruckus ICX 7750.

FIGURE 41 Ruckus ICX 7750 rear-panel LEDs



- | | | | |
|---|---|---|---|
| 1 | Management port 10/100 Mbps link/activity LEDs | 5 | UP port (left) and DN port (right) link status LEDs |
| 2 | Management port 1000 Mbps link/activity LEDs | 6 | Lower slot 40 GbE mode link/activity LED or 10 GbE mode lane 1 link/activity LEDs |
| 3 | Upper slot 40 GbE mode link/activity LED or 10 GbE mode lane 1 link/activity LEDs | 7 | Lower slot 10 GbE mode lanes 2, 3, and 4 link/activity LEDs |
| 4 | Upper slot 10 GbE mode lanes 2, 3, and 4 link/activity LEDs | 8 | Expansion module power LED |

LED patterns

The following tables describe the Ruckus ICX 7750 LED patterns.

TABLE 10 PSU1 and PSU2 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. | Verify that the PSU power cord is connected to a functioning power source. Replace power supply. |

TABLE 11 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 is successfully completed. | No action required. |
| Steady amber | System self-diagnostic test has detected a fault. | Contact support. |

TABLE 12 MS LED

| LED state | Status of hardware | Recommended action |
|----------------|---|---------------------|
| Off (no light) | Stacking mode is enabled and the switch is a stack member, or the switch is operating in standalone mode. | 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 in slave mode. | No action required. |

TABLE 13 RDNT LED

| LED state | Status of hardware | Recommended action |
|----------------|---|---------------------|
| Off (no light) | System does not have redundant fans or PSUs installed. | No action required. |
| Steady green | System is operating in redundant mode. | No action required. |
| Steady amber | System has redundant fans and PSUs, but software has disabled redundant mode. | No action required. |

TABLE 14 Management port left (link) status LED

| LED state | Status of hardware | Recommended action |
|----------------|--------------------|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady green | A link is up. | No action required. |

TABLE 15 Management port right (activity) status LED

| LED state | Status of hardware | Recommended action |
|----------------|---|---------------------|
| Off (no light) | Not cabled or no packets are being transmitted or received. | No action required. |
| Blinking green | There is traffic and packets are being transmitted or received. | No action required. |

TABLE 16 1/10 GbE RJ-45 port LEDs

| LED state | Status of hardware | Recommended action |
|----------------|--|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady green | Link is up in 10 GbE mode. | No action required. |
| Blinking green | There is 10 GbE traffic and packets are being transmitted or received. | No action required. |
| Steady amber | Link is up in 1 GbE mode. | No action required. |
| Blinking amber | There is 1 GbE traffic and packets are being transmitted or received. | No action required. |

TABLE 17 1/10 GbE SFP+ port LEDs

| LED state | Status of hardware | Recommended action |
|----------------|--|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady green | Link is up in 10 GbE mode. | No action required. |
| Blinking green | There is 10 GbE traffic and packets are being transmitted or received. | No action required. |
| Steady amber | Link is up in 1 GbE mode. | No action required. |
| Blinking amber | There is 1 GbE traffic and packets are being transmitted or received. | No action required. |

TABLE 18 40 GbE mode QSFP+ port LEDs (left-side LED)

| LED state | Status of hardware | Recommended action |
|----------------|--|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady green | Link is up in 40 GbE mode. | No action required. |
| Blinking green | There is 40 GbE traffic and packets are being transmitted or received. | No action required. |

TABLE 19 4x10 GbE mode QSFP+ port LEDs

| LED state | Status of hardware | Recommended action |
|----------------|--|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady amber | Port lane link is up in 10 GbE mode. | No action required. |
| Blinking amber | There is 10 GbE traffic and packets are being transmitted or received. | No action required. |

TABLE 20 10/100/1000 Mbps UP and DN Ethernet port LEDs

| LED state | Status of hardware | Recommended action |
|----------------|---|---------------------|
| Off (no light) | Not cabled. | No action required. |
| Steady green | Link is up in 1 GbE mode. | No action required. |
| Blinking green | There is 1 GbE traffic and packets are being transmitted or received. | No action required. |
| Steady amber | Link is up in 10/100 Mbps mode. | No action required. |
| Blinking amber | There is 10/100 Mbps traffic and packets are being transmitted or received. | No action required. |

TABLE 21 Power supply unit LED

| LED state | Status of hardware | Recommended action |
|--|--|--|
| Off (no light) | PSU is not powered on. | Verify that the PSU power cord is connected to a functioning power source. |
| Steady green | PSU is on and functioning properly. | No action required. |
| Blinking green (with power cord connected) | External AC input parameters are within an acceptable range but there is no DC output or it is disabled. | Replace the power supply. |
| Steady amber | PSU has no DC output. | Replace the power supply. |

TABLE 22 Expansion module power LED

| LED state | Status of hardware | Recommended action |
|----------------|--|---------------------|
| Off (no light) | Module is not powered on. | No action required. |
| Steady green | Module is on and functioning properly. | No action required. |
| Steady amber | Module is on and booting up. | No action required. |

TABLE 23 Fan tray LED

| LED state | Status of hardware | Recommended action |
|----------------|-----------------------------|---------------------|
| Off (no light) | Fan tray is not powered on. | No action required. |

TABLE 23 Fan tray LED (Continued)

| LED state | Status of hardware | Recommended action |
|--------------|--|---------------------|
| Steady green | Fan tray is on and functioning properly. | No action required. |
| Steady amber | Fan tray has nonfunctioning fans. | Replace fan tray. |

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
- EEPROMS
- CPU packet
- Test MAC alignment
- 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 10 Gbps and 40 Gbps (QSFP+ ports) depending on the speed of the link being tested and the type of port.

Monitoring power and cooling

If the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and use the show chassis command to verify that the temperature is below the shutdown threshold. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact Ruckus Technical Support for assistance.

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

- The warning level is the temperature at which the device generates a syslog message. It is configurable up to 100°C (212°F).
- The shutdown level is the temperature at which the device reboots. It is set by the device and is not configurable. When the device temperature reaches the shutdown level, it generates a warning message that the device's temperature is over the shutdown level and the device shuts down in two minutes. The system restarts 120 seconds after the device reaches the temperature shutdown level.

The switch fans have two speeds, low and high. The fan speed settings are set by the device, and are not configurable. During system bootup, the fans run at high speed. After bootup, the fans operate at low speed when the temperature of the switch is below the high limit temperature that is specified in the following table. If the switch reaches the high limit temperature, the fans operate at high speed until the switch reaches the low limit temperature specified in the table, at which time the fans decrease to low speed. If the switch reaches or exceeds the critical (shutdown) temperature for two minutes, the switch shuts down.

TABLE 24 Temperature Thresholds

| Model | Low limit temperature | Low limit temperature | Critical (shutdown) temperature |
|--------------|-----------------------|-----------------------|---------------------------------|
| ICX 7750-26Q | 53°C (127°F) | 61°C (142°F) | 81°C (178°F) |
| ICX 7750-48F | 50°C (122°F) | 58°C (136°F) | 82°C (180°F) |
| ICX 7750-48C | 57°C (135°F) | 70°C (158°F) | 85°C (185°F) |

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

```

ICX7750-26Q Router#show chassis
The stack unit 1 chassis info:
Power supply 1 (AC - Regular) present, status ok
  Model Number:   BRCD-10G
  Serial Number:  CUB2V15P05C
  Firmware Ver:   2.2
Power supply 1 Fan Air Flow Direction:  Front to Back
Power supply 2 (AC - Regular) present, status ok
  Model Number:   BRCD-10G
  Serial Number:  CUB2V15P01X
  Firmware Ver:   2.2
Power supply 2 Fan Air Flow Direction:  Front to Back
Fan 1 ok, speed (auto): [[1]]<->2
Fan 2 ok, speed (auto): [[1]]<->2
Fan 3 ok, speed (auto): [[1]]<->2
Fan 4 ok, speed (auto): [[1]]<->2
Fan controlled temperature: 36.5 deg-C
Fan speed switching temperature thresholds:
  Speed 1: NM<----->61      deg-C
  Speed 2:      53<-----> 81 deg-C (shutdown)
Fan 1 Air Flow Direction:  Front to Back
Fan 2 Air Flow Direction:  Front to Back
Fan 3 Air Flow Direction:  Front to Back
Fan 4 Air Flow Direction:  Front to Back
CPU Temperature Readings:
  Current temperature : 29.0 deg-C
Left Fan Temperature Readings:
  Current temperature : 36.5 deg-C
Right Fan Temperature Readings:
  Current temperature : 34.5 deg-C
Module Fan Temperature Readings:
  Current temperature : 35.5 deg-C
Left PSU Temperature Readings:
  Current temperature : 31.0 deg-C
Right PSU Temperature Readings:
  Current temperature : 29.0 deg-C
Left Front Temperature Readings:
  Current temperature : 30.0 deg-C
Middle Front Temperature Readings:
  Current temperature : 31.0 deg-C
Right Front Temperature Readings:
  Current temperature : 28.0 deg-C
  Warning level.....: 50.0 deg-C
  Shutdown level.....: 81.0 deg-C
Boot Prom MAC : 609c.9fd7.bd80
Management MAC: 609c.9fd7.bd80
ICX7750-26Q Router#

```


Managing the Ruckus ICX 7750

- [Hardware maintenance schedule](#) 61
- [Replacing a copper or fiber-optic module](#) 61
- [FRU removal and replacement procedures](#) 62
- [Replacing a power supply unit](#) 63
- [Replacing fan trays](#) 65
- [Replacing an expansion module](#) 66



CAUTION
The procedures in this chapter are for qualified service personnel.

Hardware maintenance schedule

Ruckus ICX 7750 switch hardware components require minimal maintenance. Ruckus recommends cleaning the fiber-optic connectors on a fiber-optic port and the connected fiber cable each time you disconnect the cable.

Replacing a copper or fiber-optic module

You can remove an SFP+, or QSFP+ transceiver from a slot and replace it with a new one while the Ruckus ICX 7750 is powered on and running.

This section provides information about the following tasks:

- Removing a copper or fiber-optic module
- Cabling a fiber-optic module
- Cleaning the fiber-optic connectors

Removing a copper or fiber-optic module

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

Before removing a fiber-optic transceiver, have the following items available:

- The protective covering that you removed from the fiber-optic transceiver port when you initially installed the module.
- An ESD wrist strap with a plug for connection to the ESD connector on the router chassis.



CAUTION
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.

NOTE

When 10 GbE fiber-optic ports on the Ruckus ICX 7750 are disabled, the laser light remains on even though the port link is down.

To remove a copper or fiber-optic module from a transceiver slot, do the following.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack).
2. Disconnect the copper or fiber cable connector from the port connector.
3. Unlock the copper or fiber-optic module by pulling the bail latch forward, away from the front panel of the module.

NOTE

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

NOTE

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

4. Grasp the bail latch and pull the copper or fiber-optic module out of the port.
5. Store the copper or fiber-optic module in a safe, static-free place or in an anti-static bag.
6. Install a new copper or fiber-optic module in the port.

Cabling a fiber-optic module

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.

NOTE

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 62.

2. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tabs lock into place.
3. Observe the link and active LEDs to determine if the network connections are functioning properly.

Cleaning the fiber-optic connectors

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

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

FRU removal and replacement procedures

The field-replaceable units (FRUs) in the Ruckus ICX 7750 can be removed and replaced by using a #1 Phillips screwdriver. The switches can continue operating during the FRU replacement if the conditions specified in these procedures are followed. This covers both the power supply unit (PSU) FRUs and fan FRUs.

NOTE

This document describes how to change FRUs for units with either an air intake or air exhaust. You must replace a failed FRU with a FRU of the same type. This applies to both power supplies and fans. A new FRU must have the same part number (P/N) as the FRU being replaced. The manufacturing P/N is located on the top of the FRU.

If a mismatched power source or fan tray is installed by mistake, a warning is sent to the console. The warning messages will be similar to the following:

- For a fan mismatch: [WARNING, Ruckus ICX 7750, MISMATCH in Fan Air Flow direction. Replace FRU with fan air flows in the same direction.
- For a power supply: [WARNING, Ruckus ICX 7750, MISMATCH in PSU Air Flow direction. Replace PSU with air flows in the same direction

You can use external labels as a guide. The power supplies and fan trays are labeled with an airflow symbol on the faceplate to indicate whether the assembly takes in or exhausts air. The symbol also appears on the top of the FRU. All FRUs in a chassis must have the same label affixed so that airflow direction is consistent. [Figure 42](#) illustrates examples of the airflow labels.

FIGURE 42 Examples of airflow symbols



The green E symbol indicates an exhaust FRU. This unit pulls air in from the front of the switch and exhausts it out the rear side. This is called front-to-back airflow or forward airflow.

The orange I symbol indicates an intake FRU. This unit pulls air in from the rear side of the switch and exhausts it out the front side. This is called back-to-front airflow or reverse airflow.

The **show chassis** command displays a device's airflow direction: Front-to-Back or Back-to-Front.

Replacing a power supply unit



CAUTION

Remove the power cord from a power supply before you install it in or remove it from the device. Otherwise, the power supply or the device could be damaged as a result. (The device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source.)



CAUTION

For the Ruckus ICX 7750 devices, be sure 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."

NOTE

Maintain all power supply and fan trays in operational condition to provide redundancy.



CAUTION

Because the cooling system relies on pressurized air, do not leave any of the power supply and fan tray slots empty longer than two minutes while the switch is operating. If a power supply or fan tray fails, leave it in the switch until it can be replaced.



CAUTION

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

Table 21 on page 57 describes the Ruckus ICX 7750 power supply status LED colors, behaviors, and actions required, if any.

Determining the need to replace a power supply

Use one of the following methods to determine the status of the power supplies:

- Check the PSU1 and PSU2 LEDs on the switch front panel or power supply status LED (refer to “LED patterns” on page 55).
- Enter the **show chassis** command at the prompt to display power supply status.

Time and items required

Replacing a power supply in the Ruckus ICX 7750 should take less than two minutes to complete.

You need the following items to replace a power supply in a Ruckus ICX 7750:

- A new power supply (must have the same part number and the same airflow label as the power supply being replaced)
- A #1 Phillips screwdriver

Replacing a power supply

Complete the following steps to replace a power supply in a Ruckus ICX 7750.

1. To leave the Ruckus ICX 7750 in service while replacing a power supply, verify that the other power supply (the one not being replaced) has been powered on for at least four seconds and has a steady green status LED.
2. 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.
3. Remove the power supply from the anti-static shielded bag.
4. Ensure that the replacement power supply has the same part number and airflow label as the power supply being replaced.
5. Unplug the power cord from the power supply that is being replaced.
6. Using the Phillips screwdriver, unscrew the two captive screws on the power supply.
7. Remove the power supply from the chassis by pulling the handle on the power supply out and away from the chassis.

NOTE

Do not force the installation. If the power supply does not slide in easily, ensure that the power supply is correctly oriented before continuing.

8. 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.

9. When you are sure the power supply has properly engaged the connector, tighten the retainer screws to secure the power supply in the slot.
10. Plug the power cord into the power supply to power on the unit.
The power supply will immediately attempt to power up.
11. Verify that the LED on the new power supply displays steady green while the Ruckus ICX 7750 is operating. If the LED is not steady green, ensure that the power supply is securely installed and seated properly. Alternatively, check the PSU1 and PSU2 LEDs on the switch front panel (refer to “[LED patterns](#)” on page 55).

You can enter the **show chassis** command at the command line prompt to display power supply status.

Replacing fan trays



CAUTION

For the Ruckus ICX 7750 devices, be sure that the airflow direction of the fan tray matches that of the installed power supply unit. The power supplies and fan trays are clearly labeled with either a green arrow with an “E”, or an orange arrow with an “I.”

The Ruckus ICX 7750 includes four redundant, hot-swappable fan units. However, it can run on one power supply and three fans. In that case, the empty power supply and fan slot must be covered using the filler panels.

NOTE

Maintain all power supply and fan trays in operational condition to provide redundancy.



CAUTION

Because the cooling system relies on pressurized air, do not leave any of the power supply and fan tray slots empty longer than two minutes while the switch is operating. If a power supply or fan tray fails, leave it in the switch until it can be replaced.

NOTE

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

Determining the need to replace a fan tray

Enter the **show chassis** command in the command line interface to display fan status.

Time and items required

Replacing a fan tray in the Ruckus ICX 7750 should take less than two minutes to complete.

You need the following items to replace a fan tray in the Ruckus ICX 7750:

- A new fan tray (must have the same part number and the same airflow label as the fan tray being replaced; refer to [Figure 42](#) on page 63 for the location of the airflow label)
- A #1 Phillips screwdriver

Installing or replacing the fan tray

Complete the following steps to install or replace a fan tray in a Ruckus ICX 7750.

Managing the Ruckus ICX 7750

Replacing an expansion module

1. If replacing a fan tray:
 - a. Using a Phillips screwdriver, unscrew the captive screw on the fan tray.
 - b. Remove the fan tray from the chassis by pulling the handle on the fan tray out and away from the chassis.
 - c. Ensure that the replacement fan tray has the same part number and airflow label as the fan tray being replaced.
2. If installing a new fan tray 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 tray, 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 tray from the anti-static shielded bag.

NOTE

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

5. Holding the fan tray 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 tray has properly engaged the connector, tighten the captive screw to secure the fan tray in the slot.

NOTE

The fans are controlled automatically by the device.

7. Verify correct installation by running the **show chassis** command.



CAUTION

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

Replacing an expansion module

The Ruckus ICX 7750 includes a rear-panel slot for a 6-port QSFP+ 40 GbE expansion module. If not installed, the empty expansion module slot must be covered using the filler panel.



CAUTION

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

Time and items required

Replacing an expansion module in the Ruckus ICX 7750 should take less than two minutes to complete.

You need the following items to replace an expansion module in the Ruckus ICX 7750:

- A new expansion module
- A #1 Phillips screwdriver

Installing or replacing an expansion module

NOTE

The Ruckus ICX 7750 must be powered off before installing or replacing an expansion module.

Complete the following steps to install or replace an expansion module in the Ruckus ICX 7750.

1. If replacing an expansion module:
 - a. Pull the release latch lever on the module into its open position.
 - b. Using a Phillips screwdriver, unscrew the two captive screws on the expansion module.
 - c. Remove the expansion module from the chassis by pulling the handle on the expansion module out and away from the chassis.
2. If installing a new expansion module into a slot covered with a filler panel:
 - a. Using a Phillips screwdriver, unscrew the captive screws on the filler panel.
 - b. Remove the filler panel.
3. Before opening the package that contains the new expansion module, 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 expansion module from the anti-static shielded bag.

NOTE

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

5. Holding the expansion module 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 expansion module has properly engaged the connector, tighten the captive screws to secure the expansion module in the slot.
7. Push the release latch lever on the module into its closed position.
8. Verify correct installation by running the **show chassis** command.



CAUTION

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

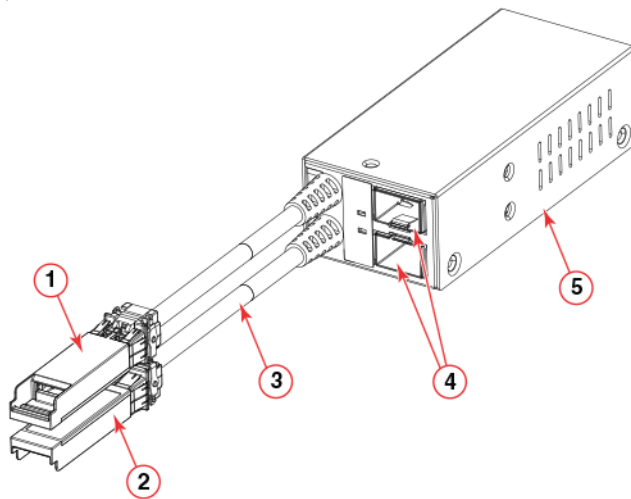
Ruckus LRM Adaptor Module

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LRM adaptor module

To support the use of Long-Reach Multimode (LRM) optics on the ICX7150, ICX7250, and ICX7750 platforms an adaptor is required. The LRM adaptor module is equipped with two 280 mm Twinax “tails” and two corresponding SFP+ sockets that operate independently of each other. Power for each of the SFP+ sockets and for the adaptor is provided via the Twinax connections so no external power supply is required.

FIGURE 43 LRM adaptor module



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

The LRM adaptor module is shipped with either one or two LRM optics (10G-SFPP-LRM) depending on the model purchased.

LRM module part numbers

TABLE 25 LRM module models

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

LRM adaptor module specifications

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

On the front panel two LEDs indicate the power and link status of each connection:

- LED off: No power
- Amber: Power applied, no link
- Steady green: Link up
- Blinking green: Link activity

The LRM adaptor module is not configurable, all configuration is applied to the switch port. The status of the LRM module can be determined via the command `show lrm-adapter ethernet x/y/z`.

NOTE

The LRM module requires software release 8.0.61 or later to be installed on the host switch.

ICX platform support for the LRM module

TABLE 26 ICX platform support for the LRM module

| Platform | Total number of modules supported | Total number of LRM connections |
|---------------------------|---|---------------------------------|
| ICX7150-C12P | 1 | 2 |
| ICX7150-24 and -48 models | 2 | 4 |
| ICX7150-48ZP | 4 | 8 |
| ICX7250-24 and -48 models | 4 | 8 |
| ICX7450-4X10GF module | Not applicable. LRM optics are supported natively | |
| ICX7650-48F | Not applicable. LRM optics are supported natively | |
| ICX7750-48F | 6 | 12 (see note below) |

NOTE

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

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

Unpacking the LRM module

When unpacking the LRM adaptor, verify that the contents of the shipping carton is complete. Save the shipping carton and packaging in the event you need to return the shipment.

- One LRM adaptor
- One or two L-shaped mounting brackets (depending on the model purchased)

- One or two 10G-SFP-ARM optics (depending on the model purchased)
- China-RoHS Hazardous/Toxic Substance statement

Ruckus LRM Adaptor Module
Unpacking the LRM module

Ruckus ICX 7750 Specifications

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System specifications

| System component | Description |
|---------------------|---|
| Enclosure | 1U; stackable chassis mountable in a standard 2 or 4-post rack |
| Power supplies | Dual, redundant, hot-swappable 504 W AC or DC with intake or exhaust airflow |
| Fans | Four redundant, hot-swappable fan units with intake or exhaust airflow |
| Cooling | Forced-air cooling front-to-back or back-to-front |
| System architecture | Nonblocking shared memory switch ICX 7750-26Q: 26 10/40 GbE QSFP+ ports ICX 7750-48F: 48 1/10 GbE SFP+ ports and six 10/40 GbE QSFP+ ports ICX 7750-48C: 48 1/10 GbE RJ-45 ports and six 10/40 GbE QSFP+ ports |
| System processors | System processor 1.5 GHz Freescale P2041 |

Ethernet

| System component | Description |
|--------------------------|--------------------------------|
| SFP GbE ports | 40/10/1 GbE optical and copper |
| Ethernet management port | 1 |

LEDs

| System component | Description |
|------------------------------|--|
| Switch status and management | Nine LED states to indicate switch and module status (green and amber) |
| Port status | Five LED states to indicate port status (green and amber) |

Other

| System component | Description |
|-------------------------------|--|
| Serial cable | Mini-USB to RJ-45 |
| RJ-45 to DB9 adapter | 1 |
| Stack Control-Path Cable | Two Micro-HDMI to RJ-45 (currently not used) |
| Control-Path Cable Holder Kit | One cable holder and one screw |

Weight and physical dimensions

| Model | Height | Width | Depth | Empty weight | Fully loaded weight |
|--------------|---------|----------|----------|--------------|---------------------|
| ICX 7750-26Q | 4.37 cm | 44.00 cm | 40.64 cm | 5.60 kg | 8.80 kg |
| | 1.72 in | 17.32 in | 16.00 in | 12.30 lb | 19.40 lb |
| ICX 7750-48F | 4.37 cm | 44.00 cm | 40.64 cm | 5.90 kg | 9.10 kg |
| | 1.72 in | 17.32 in | 16.00 in | 13.00 lb | 20.10 lb |
| ICX 7750-48C | 4.37 cm | 44.00 cm | 43.10 cm | 7.00 kg | 10.20 kg |
| | 1.72 in | 17.32 in | 16.97 in | 15.40 lb | 22.50 lb |

Environmental requirements

| Condition | Operational | Non-operational |
|------------------------------------|--|--|
| Ambient temperature | ICX 7750-26Q: -5° to 50°C (23° to 122°F) ICX 7750-48F: -5° to 50°C (23° to 122°F) ICX 7750-48C: -5° to 40°C (23° to 104°F) | -40° to 60°C (-40° to 140°F) |
| Relative humidity (non-condensing) | ICX 7750-26Q and ICX 7750-48F: 10% to 90% at 50°C (122°F) ICX 7750-48C: 10% to 90% at 40°C (104°F) | 10% to 90% at 60°C (140°F) |
| Altitude (above sea level) | 0 to 3000 m (10,000 feet) | 12,000 m (39,000 feet) |
| Shock | 20 G, 11 ms, half-sine wave | 30 G, 11 ms, half-sine wave |
| Vibration | 1 G sine, 0.4 grms random, 5-500 Hz | 2.4 G sine, 1.12 grms random, 5-500 Hz |

| Condition | Operational | Non-operational |
|------------------|---|-----------------|
| Airflow | ICX 7750-26Q: Back-to-Front: Maximum. - 55 cfm, Typical - 25 cfm Front-to-Back: Maximum. - 62 cfm, Typical - 29 cfm ICX 7750-48F: Back-to-Front: Maximum. - 55 cfm, Typical - 25 cfm Front-to-Back: Maximum. - 61 cfm, Typical - 29 cfm ICX 7750-48C: Back-to-Front: Maximum. - 55 cfm, Typical - 32 cfm Front-to-Back: Maximum. - 62 cfm, Typical - 36 cfm | N/A |
| Heat dissipation | Refere to the power consumption tables. | 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 |
|--------------------|----------------------------------|--|--|-----------------------|-----------------------|---|
| RPS9 | 504 W | 100-240 VAC (nominal) 100-264 VAC (range) | 50/60 Hz (nominal) 47 - 63 Hz (range) | 7 A | Line fused | 30 A peak cold or warm start for <10 ms 10 A peak for cycles 10 ms - 150 ms Less than fuse rating for >150 ms |
| RPS9DC | 504 W | -48 VDC (nominal) -40 to -60 VDC (range) | NA | 15 A | -Ve fused | 25 A peak cold or warm start for <10 ms Less than 15 A after 150 ms |

Power consumption (typical configuration)

All ports linked and up. 50% traffic with 64-byte packets. Fans at normal speed.

| Model name | @100 VAC input | @200 VAC input | @-48 VDC input | Minimum number of power supplies | Notes |
|--------------|----------------------|----------------------|----------------------|----------------------------------|--------------------------|
| ICX 7750-26Q | 277 W 945 BTU/hr | 274 W 935 BTU/hr | 274 W 935 BTU/hr | 1 AC or DC | Fan speed is at nominal. |
| ICX 7750-48F | 254 W 867 BTU/hr | 250 W 853 BTU/hr | 250 W 853 BTU/h | 1 AC or DC | Fan speed is at nominal. |
| ICX 7750-48C | 510 W 1740 BTU/hr | 511 W 1744 BTU/hr | 511 W 1744 BTU/hr | 1 AC or DC | Fan speed is at nominal. |

Power consumption (maximum configuration)

All ports connected with optics to draw maximum power per MSA Optics Specification. Traffic at full rate or 100% throughput. Fans at full speed.

| Model name | @100 VAC input | @200 VAC input | @-48 VDC input | Minimum number of power supplies | Notes |
|--------------|----------------------|----------------------|----------------------|----------------------------------|--------------------|
| ICX 7750-26Q | 319 W 1088 BTU/hr | 350 W 1194 BTU/hr | 350 W 1194 BTU/hr | 1 AC or DC | Fans at high speed |
| ICX 7750-48F | 290 W 989 BTU/hr | 327 W 1116 BTU/hr | 327 W 1116 BTU/hr | 1 AC or DC | Fans at high speed |
| ICX 7750-48C | 558 W 1904 BTU/hr | 586 W 2000 BTU/hr | 586 W 2000 BTU/hr | 1 AC or DC | Fans at high speed |

Power consumption (modules)

| Module name | Module description | Power consumption |
|-------------|------------------------|--------------------------------------|
| ICX 7750-6Q | 6-port 10/40 GbE QSFP+ | Typical = 18.8 W Maximum = 25.9 W |

Data port specifications (Ethernet)

| Model | Port type | Number of ports | Description |
|--------------|-----------|-----------------|---|
| ICX 7750-26Q | 40 GbE | 26 | QSFP+, 10/40 Gbps, compatible with short range (SR) and long range (LR) optical SFP transceivers. |
| ICX 7750-48F | 40 GbE | 6 | QSFP+, 10/40 Gbps, compatible with short range (SR) and long range (LR) optical SFP transceivers. |
| | 10 GbE | 48 | SFP+, 1/10 Gbps, compatible with short range (SR) and long range (LR) optical SFP transceivers. |
| ICX 7750-48C | 40 GbE | 6 | QSFP+, 10/40 Gbps, compatible with short range (SR) and long range (LR) optical SFP transceivers. |
| | 10 GbE | 48 | 10GBASE-T, 1/10 Gbps, capable of auto-negotiating link speed. |

Serial port specifications (pinout mini-USB)

| Pin | Signal | Description |
|-----|----------|-------------------------|
| 1 | Reserved | Not used |
| 2 | UART0_RX | Data received by ICX |
| 3 | UART0_TX | Data transmitted by ICX |
| 4 | Reserved | Not used |
| 5 | 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 |
| Stop bits | 1 |
| Flow control | None |

Memory specifications

| Memory | Type | Size |
|-------------|-----------|-------|
| Main memory | DDR3 | 8 GB |
| Boot Flash | NOR Flash | 64 MB |
| eUSB Drive | USB | 2 GB |

Regulatory compliance (EMC)

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

Regulatory compliance (safety)

- CAN/CSA-C22.2 No. 60950/UL 60950 - Safety of Information Technology Equipment
- EN 60825 Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide
- EN 60950/IEC 60950 Safety of Information Technology Equipment
- CNS 14336-1 (BSMI) (Taiwan)

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)
- CNS 15663 (BSMI) (Taiwan)

Ruckus ICX 7750 Regulatory Statements

- USA (FCC CFR 47 Part 15 Warning) 79
- Industry Canada statement 79
- Europe and Australia (CISPR 22 Class A Warning) 79
- Germany (Noise Warning)..... 79
- Japan (VCCI) 80
- Korea 80
- China 81
- BSMI statement (Taiwan) 82

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 22 Class A 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.

Germany (Noise Warning)

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 53.0 dB(A) gemäss EN ISO 7779.

English translation of above statement

Machine noise information regulation - 3. GPSGV, the highest sound pressure level value is 53.0 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

A 급 기기 (업무용 방송통신기기): 이 기기는 업무용 (A 급) 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.

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.

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

| 設備名稱：乙太網交換機 Equipment name | | 型號（型式）：ICX7750-26Q, ICX7750-48C, ICX7750-48F 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 Polybrominat ed biphenyls (PBB) | 多溴二苯醚 Polybromin ated 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.

Ruckus ICX 7750 Cautions and Danger Notices

- [Cautions](#) 83
- [Danger notices](#) 87

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 | The procedures in this manual are for qualified service personnel. |
| VORSICHT | Die Verfahren in diesem Handbuch sind nur für qualifiziertes Wartungspersonal gedacht. |
| MISE EN GARDE | Les procédures décrites dans ce manuel doivent être effectuées par le personnel de service qualifié uniquement. |
| PRECAUCIÓN | Los procedimientos de este manual se han hecho para personal de servicio cualificado. |

| | |
|----------------------|--|
| CAUTION | All devices with DC power supplies (Ruckus ICX 7750) 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. |
| VORSICHT | Alle Geräte mit Gleichstromeingangsschaltung (Ruckus ICX 7750) 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. Er unterliegt außerdem der Kontrolle durch die für den Standort verantwortliche Stelle. |
| MISE EN GARDE | Tous les équipements dotés d'un bloc d'alimentation en courant continu (Ruckus ICX 7750) sont conçus pour l'installation dans des zones à accès réglementé uniquement. Une zone à accès réglementé est un local qui n'est accessible que par le personnel d'entretien à l'aide d'un outil, verrou ou clé conçus à cet effet, ou de tout autre accessoire de sécurité, et qui est contrôlé par l'autorité responsable de ce local. |
| PRECAUCIÓN | Todos aquellos dispositivos con fuentes de alimentación de CC (Ruckus ICX 7750) están diseñados para su instalación en zonas de acceso restringido solamente. Una zona de acceso restringido es un lugar al que sólo puede acceder personal de mantenimiento haciendo uso de una herramienta especial, una llave y un candado, o algún otro medio de seguridad, y que está controlado por la autoridad responsable. |

| | |
|----------------------|--|
| CAUTION | Do not install the device in an environment where the operating ambient temperature might exceed 50° C (122° F). |
| VORSICHT | Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 50° C (122° F) installiert werden. |
| MISE EN GARDE | N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 50° C (122° F). |
| PRECAUCIÓN | No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 50° C (122° F). |

Ruckus ICX 7750 Cautions and Danger Notices

Cautions

| | |
|----------------------|---|
| 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 | Use a separate branch circuit for each AC power cord, which provides redundancy in case one of the circuits fails. |
| VORSICHT | Es empfiehlt sich die Installation eines separaten Stromkreiszweiges für jede Wechselstrom-Elektrischsnur als Redundanz im Fall des Ausfalls eines Stromkreises. |
| MISE EN GARDE | Utilisez un circuit de dérivation différent pour chaque cordon d'alimentation C.A. 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 de CA, con lo que se proporcionará redundancia en caso de que uno de los circuitos falle. |

| | |
|----------------------|---|
| CAUTION | Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors. |
| VORSICHT | Stromkreise, Verdrahtung und Überlastschutz dürfen nicht durch das Gerät überbelastet werden. Addieren Sie die Nennstromleistung (in Ampere) aller Geräte, die am selben Stromkreis wie das Gerät installiert sind. Somit können Sie feststellen, ob die Gefahr einer Überbelastung der Versorgungsstromkreise vorliegt. Vergleichen Sie diese Summe mit der Nennstromgrenze des Stromkreises. Die Höchstnennströme (in Ampere) stehen normalerweise auf der Geräterückseite neben den 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 | 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 | Remove the power cord from a power supply before you install it in or remove it from the device. Otherwise, the power supply or the device could be damaged as a result. (The device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source.) |
| VORSICHT | Nehmen Sie vor dem Anschließen oder Abtrennen des Geräts das Stromkabel vom Netzteil ab. Ansonsten könnten das Netzteil oder das Gerät beschädigt werden. (Das Gerät kann während des Anschließens oder Annehmens des Netzteils laufen. Nur das Netzteil sollte nicht an eine Stromquelle angeschlossen sein.) |
| MISE EN GARDE | Enlevez le cordon d'alimentation d'un bloc d'alimentation avant de l'installer ou de l'enlever du dispositif. Sinon, le bloc d'alimentation ou le dispositif risque d'être endommagé. (Le dispositif peut être en train de fonctionner lorsque vous installez ou enlevez un bloc d'alimentation, mais le bloc d'alimentation lui-même ne doit pas être connecté à une source d'alimentation.) |
| PRECAUCIÓN | Retire el cordón de corriente del suministro de corriente antes de instalarlo o retirarlo del instrumento. De no hacerse así, el suministro de corriente o el instrumento podrían resultar dañados. (El instrumento puede estar encendido mientras se instala o retira un suministro de corriente, pero el suministro de corriente en sí no deberá conectado a la corriente). |

| | |
|----------------------|--|
| CAUTION | For the ICX 7750 devices, be sure 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 bei den ICX 7750-Geräten, dass die Luftstromrichtung des Netzteils der 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 | Pour les équipements de type ICX 7750, 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 | En el caso de dispositivos ICX 7750, 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". |

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| CAUTION | For the ICX 7750 devices, be sure that the airflow direction of the fan tray matches that of the installed power supply unit. 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 bei den ICX 7750-Geräten, dass die Luftstromrichtung der Lüftereinheit der des eingebauten Netzteils 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 | Pour les équipements de type ICX 7750, veillez à ce que le sens de circulation de l'air du tiroir de ventilation corresponde à celui du bloc d'alimentation 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 | En el caso de dispositivos ICX 7750, asegúrese de que la dirección del flujo de aire de la bandeja del ventilador se corresponda con la de la unidad de alimentación. 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". |

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| CAUTION | If you do not install a power supply in a slot, you must keep the slot panel in place. If you run the device with an uncovered slot, the system will overheat. |
| VORSICHT | Wenn Sie in einem Einschub kein Netzteil einsetzen, müssen Sie die Blende im Einschub lassen. Der Betrieb des Geräts mit einem offenen Einschub kann zur Überhitzung des Systems führen. |
| MISE EN GARDE | Si vous n'installez pas de bloc d'alimentation dans un emplacement, vous devez laisser le cache de protection en place. Si vous faites fonctionner l'équipement avec un emplacement vide, sans cache, le système risque de surchauffer. |
| PRECAUCIÓN | Si no hay ninguna fuente de alimentación instalada en una ranura, debe dejar la tapa correspondiente puesta en la ranura. Si pone en funcionamiento el dispositivo con una ranura descubierta, el sistema se sobrecalentará. |

Ruckus ICX 7750 Cautions and Danger Notices

Cautions

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| CAUTION | For the DC input circuit to the system of a Ruckus ICX 7750, make sure there is a UL-Listed 20 Amp circuit breaker, minimum 60 VDC, double pole, on the input lugs to the power supply. The input wiring for connection to the product should be Listed copper wire, 12 AWG, marked VW-1, and rated minimum 90°C. |
| VORSICHT | Bei der Gleichstromeingangsschaltung zum System eines Ruckus ICX 7750, muss sichergestellt werden, dass an den Eingangskabelschuhen zur Stromversorgung ein zweipoliger Schalter mit UL-Zulassung, 20 Ampere und mindestens 60 V Gleichstrom vorhanden ist. Die Eingangsleitung zum Anschluss an das Produkt sollte als Kupferdraht, 12 AWG, angegeben, als VW-1 gekennzeichnet und für mindestens 90°C bemessen sein. |
| MISE EN GARDE | Pour le circuit d'alimentation en courant continu du système Ruckus ICX 7750, vérifiez la présence d'un disjoncteur bipolaire homologué de 20 A, minimum 60 VCC, sur l'entrée de l'alimentation. Les câbles d'alimentation du produit doivent être des fils de cuivre homologués de section 2.1 mm ² (12 AWG), marqués VW-1 et testés à 90°C. |
| PRECAUCIÓN | Para el circuito de entrada de CC al sistema de un Ruckus ICX 7750, verifique que existe un disyuntor catalogado por UL de 20 amperios, 60 VCC como mínimo, bipolar, en las orejetas de entrada a la fuente de alimentación. El cableado de entrada para la conexión al producto deberá ser de cable de cobre catalogado, 12 AWG, marcado con VW-1, y tener una capacidad nominal mínima para 90°C. |

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| CAUTION | Before plugging a cable to any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface. |
| VORSICHT | Bevor Sie ein Kabel in einen Anschluss einstecken, entladen Sie jegliche im Kabel vorhandene elektrische Spannung, indem Sie mit den elektrischen Kontakten eine geerdete Oberfläche berühren. |
| MISE EN GARDE | Avant de brancher un câble à un port, assurez-vous de décharger la tension du câble en reliant les contacts électriques à la terre. |
| PRECAUCIÓN | Antes de conectar un cable en cualquier puerto, asegúrese de descargar la tensión acumulada en el cable tocando la superficie de conexión a tierra con los contactos eléctricos. |

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| CAUTION | For DC systems, use grounding wire of at least 12 American Wire Gauge (AWG). The grounding wire should be attached to the DC input connector (as shown in Figure 30); the other end connects to the building ground. |
| VORSICHT | Für Gleichstromsystem verwenden Erdungskabel von mindestens 12AWG (3.31 mm ²) (amerikanische Norm für Drahtquerschnitte). Der Erdungsdraht sollte DC-Eingang angeschlossen werden (wie in Figure 30 zeigen #14), das andere Ende verbindet sich mit dem Baugrund. |
| MISE EN GARDE | Pour les systèmes d'alimentation courant continu (C.C), utilisez un fil de mise à terre d'au moins de 12 AWG (ou 3.31mm ²). Le fil de mise à terre doit être relié au connecteur du circuit d'alimentation (voir Figure 30); l'autre extrémité se connecte à la prise terre du bâtiment. |
| PRECAUCIÓN | Para el sistema CC, utilice un cable de tierra de al menos 12 AWG (Ancho de cable de EEUU). El cable de tierra debe estar acoplado al conector de entrada de CC (según se muestra en la Figure 30); el otro extremo se conecta al suelo del edificio. |

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| 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. |

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| CAUTION | For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor. |
| VORSICHT | Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein. |
| MISE EN GARDE | Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm. |
| PRECAUCIÓN | Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio. |

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.

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| DANGER | Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the manufacturer's instructions. |
| GEFAHR | Es besteht Explosionsgefahr, wenn ein unzulässiger Batterietyp eingesetzt wird. Verbrauchte Batterien sind entsprechend den geltenden Vorschriften zu entsorgen. |
| DANGER | Risque d'explosion en cas de remplacement de la pile par un modèle incorrect. Débarrassezvous des piles usagées conformément aux instructions. |
| PELIGRO | Riesgo de explosión si se sustituye la batería por una de tipo incorrecto. Deshágase de las baterías usadas de acuerdo con las instrucciones. |

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| DANGER | Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over. |
| GEFAHR | Stellen Sie sicher, dass das Gestell die Unterbringung des Geräts auf angemessene Weise gesichert ist, so dass das Gestell nicht wackeln oder umfallen kann. |
| DANGER | 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. |
| PELIGRO | Verifique que el bastidor que alberga el instrumento está asegurado correctamente para evitar que pueda hacerse inestable o que caiga. |

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| 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. |

Ruckus ICX 7750 Cautions and Danger Notices

Danger notices

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| DANGER | If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device. |
| GEFAHR | Falls für die Installation ein anderes Stromkabel erforderlich ist (wenn das mit dem Gerät gelieferte Kabel nicht passt), müssen Sie sicherstellen, dass Sie ein Stromkabel mit dem Siegel einer Sicherheitsbehörde verwenden, die für die Zertifizierung von Stromkabeln in Ihrem Land zuständig ist. Das Siegel ist Ihre Garantie, dass das Stromkabel sicher mit Ihrem Gerät verwendet werden kann. |
| DANGER | Si l'installation nécessite un cordon d'alimentation autre que celui fourni avec le dispositif, assurez-vous d'utiliser un cordon d'alimentation portant la marque de l'organisation responsable de la sécurité qui définit les normes et réglementations pour les cordons d'alimentation dans votre pays. Cette marque vous assure que vous pouvez utiliser le cordon d'alimentation avec le dispositif en toute sécurité. |
| PELIGRO | Si la instalación requiere un cordón de corriente distinto al que se ha suministrado con el instrumento, verifique que usa un cordón de corriente que venga con la marca de la agencia de seguridad que defina las regulaciones para cordones de corriente en su país. Esta marca será su garantía de que el cordón de corriente puede ser utilizado con seguridad con el instrumento. |

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| 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 | Radiación de Laser. No vea directamente con Instrumentos Opticos. Clase 1M de Productos de Laser. |
| 危険 | 雷射輻射，勿以光學儀器直視等級 1 M 雷射產品。 |
| 警告 | レーザー放射 光学器具で直接ビームを見ないこと クラス 1 M レーザ製品 |

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| DANGER | Remove both power cords before servicing. |
| GEFAHR | Trennen Sie beide Netzkabel, bevor Sie Wartungsarbeiten durchführen. |
| DANGER | Retirez les deux cordons d'alimentation avant toute maintenance. |
| PELIGRO | Desconecte ambos cables de alimentación antes de realizar reparaciones. |

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| DANGER | To avoid high voltage shock, do not open the device while the power is on. |
| GEFAHR | Das eingeschaltete Gerät darf nicht geöffnet werden, da andernfalls das Risiko eines Stromschlags mit Hochspannung besteht. |
| DANGER | Afin d'éviter tout choc électrique, n'ouvrez pas l'appareil lorsqu'il est sous tension. |
| PELIGRO | Para evitar una descarga de alto voltaje, no abra el dispositivo mientras esté encendido. |



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