

Ruckus ICX 7450 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

There are no enhancements in this edition.

About this Document

What's new in this document

Ruckus ICX 7450 Overview

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Ruckus ICX 7450 features

The Ruckus ICX 7450 is a high-density aggregation switch that offers 10/100 Mbps Ethernet, 1/10 Gigabit Ethernet (GbE), and 10/40 GbE line rates, low latency cut-through switching, and up to 336 Gbps throughput for campus LAN and classic Ethernet data center environments.

The Ruckus ICX 7450 switch features:

- Comprehensive support for a range of 1 GbE, 10 GbE, and 40 GbE optics (refer to the latest [Ruckus Optics Family Data Sheet](#))
- Dual redundant, hot-swappable power supplies available with intake or exhaust airflow (250 W AC or 510 W DC for non-PoE switches, and 1000 W AC or 510 W DC for PoE switches)
- ICX 7450-24P and ICX 7450-48P copper ports support PoE, PoE+, High PoE, and PoH
- ICX 7450-48F SFP ports support 1 GbE transceivers
- ICX 7450-32ZP copper ports support PoE, PoE+, High PoE, and PoH
- 1 GbE SFP module with four 10M/100M/1 GbE SFP ports
- 10 GbE SFP+ module with four 1/10 GbE SFP+ ports
- 10 GbE copper module with four 1/10 GbE RJ-45 ports
- Two 40 GbE QSFP+ or four 10 GbE SFP+ stacking ports (supporting stacking for up to twelve switches)
- Dual redundant, hot-swappable fan trays 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 7450 customizable switches

The Ruckus ICX 7450 base systems do not ship with power supplies, fans, stacking modules, or media expansion modules. Fans, power supplies, and expansion modules are ordered separately to allow for building the system that meets your network needs. [Table 2](#) lists the available power supplies, fans, and expansion modules.

TABLE 2 SKUs for creating custom Ruckus ICX 7450 switches

Part	Description
ICX7400-4X1GF	Ruckus ICX 7450 4-port 10M/100M/1 Gbe SFP expansion module
ICX7400-4X10GF	Ruckus ICX 7450 4-port 1/10 GbE SFP+ uplink / stacking expansion module
ICX7400-4X10GC	Ruckus ICX 7450 4-port 1/10 GbE copper expansion module

Ruckus ICX 7450 Overview

Views of the Ruckus ICX 7450 switch

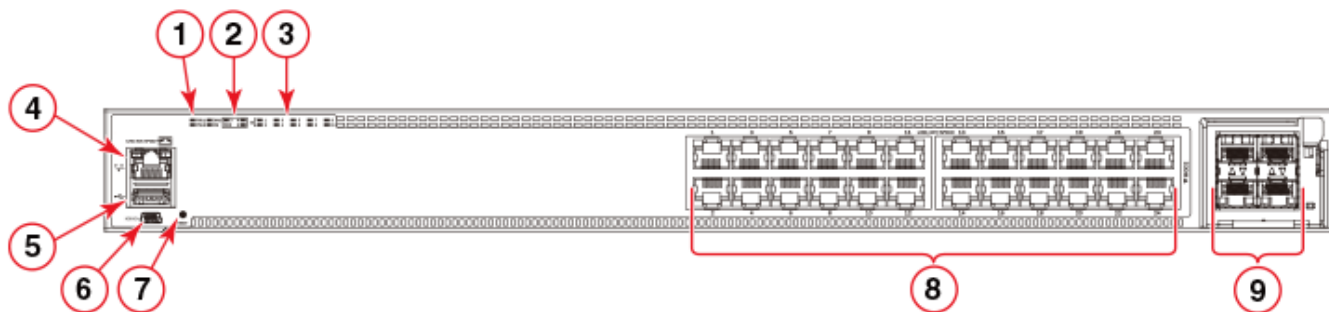
TABLE 2 SKUs for creating custom Ruckus ICX 7450 switches (Continued)

Part	Description
ICX7400-1X40GQ	Ruckus ICX 7450 1-port 40 GbE QSFP+ data uplink / stacking module
RPS15-E	Ruckus ICX non-PoE 250 W AC PSU, power-supply-side exhaust (port-side intake) airflow
RPS15-I	Ruckus ICX non-PoE 250 W AC PSU, power-supply-side intake (port-side exhaust) airflow
RPS16-E	Ruckus ICX PoE+ 1000 W AC PSU, power-supply-side exhaust (port-side intake) airflow
RPS16-I	Ruckus ICX PoE+ 1000 W AC PSU, power-supply-side intake (port-side exhaust) airflow
RPS16DC-E	Ruckus ICX 510 W DC PSU, power-supply-side exhaust (port-side intake) airflow
RPS16DC-I	Ruckus ICX 510 W DC PSU, power-supply-side intake (port-side exhaust) airflow
ICX-FAN10-E	Ruckus ICX 7450 power-supply-side exhaust airflow fan (two fans required with two power supplies)
ICX-FAN10-I	Ruckus ICX 7450 power-supply-side intake airflow fan (two fans required with two power supplies)
CC-MINIUSB-RJ45	Console cable, male mini-USB to male RJ-45
ICX7450-RMK	FRU, Rack mount kit, 2-post, ICX 7450
XBR-R000295	FRU, Universal rack mount kit, 4-post 24-32-inch depth rack, DX6740T/VDX6740T-1G
PCEURO	Power Cord for RPS15/16, European version
PCUK	Power Cord for RPS15/16, United Kingdom version
PC AUS	Power Cord for use in Australia
PC JAPAN	Power Cord for RPS15/16, Japan version
PC CHINA2-IEC309	Power Cord, China, IEC309 TO C13, 10A, 250V
PC SWISS-C1312G-HF	Power Cord, Swiss, SEV1011 TO C13, 10A, 250V, halogen free
PC INDIA	6-foot AC power cord for India

Views of the Ruckus ICX 7450 switch

Figure 1 shows the front view of the Ruckus ICX 7450-24 switch.

FIGURE 1 Front view of the Ruckus ICX 7450-24



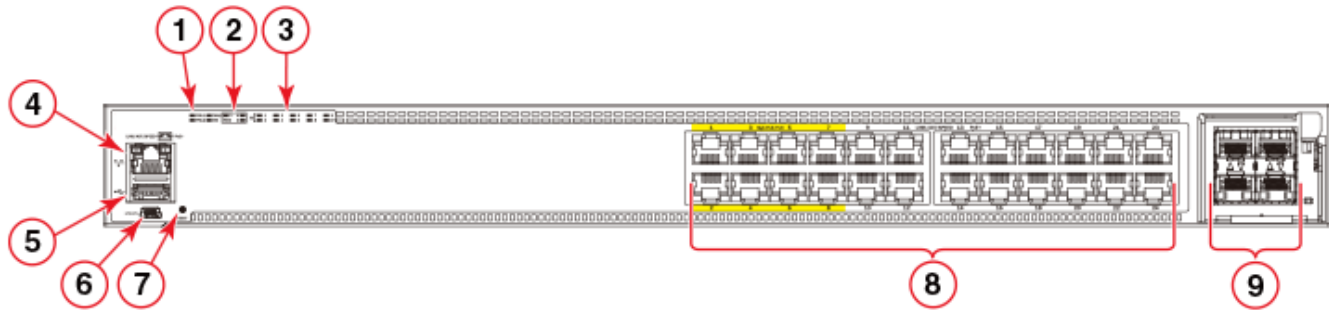
- | | |
|------------------------------|--|
| 1 System LEDs | 6 Mini-USB console port |
| 2 Media/Stacking module LEDs | 7 Reset button |
| 3 Stack unit ID display | 8 10/100/1000Base-T RJ-45 ports 1/1/1 - 1/1/24 |
| 4 Management port (RJ-45) | 9 SFP/SFP+ (1/2/1 - 1/2/4) & QSFP+ (1/2/1) |
| 5 USB port (for flash drive) | |

Figure 2 shows the front view of the Ruckus ICX 7450-24P switch.

NOTE

PoE/PoE+ power is available to ports 1-24. High PoE/PoH is limited to ports 1-8.

FIGURE 2 Front view of the Ruckus ICX 7450-24P



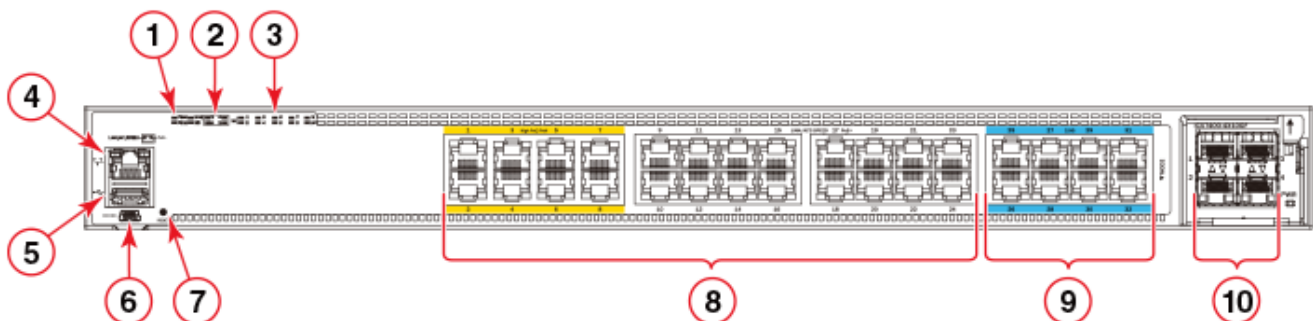
- | | |
|------------------------------|--|
| 1 System LEDs | 6 Mini-USB console port |
| 2 Media/Stacking module LEDs | 7 Reset button |
| 3 Stack unit ID display | 8 10/100/1000Base-T RJ-45 ports 1/1/1 - 1/1/24 |
| 4 Management port (RJ-45) | 9 SFP/SFP+ (1/2/1 - 1/2/4) & QSFP+ (1/2/1) |
| 5 USB port (for flash drive) | |

Figure 3 shows the front view of the Ruckus ICX 7450-32ZP switch.

NOTE

PoE/PoE+ power is available to ports 1-32. High PoE/PoH is limited to ports 1-8.

FIGURE 3 Front view of the Ruckus ICX 7450-32ZP



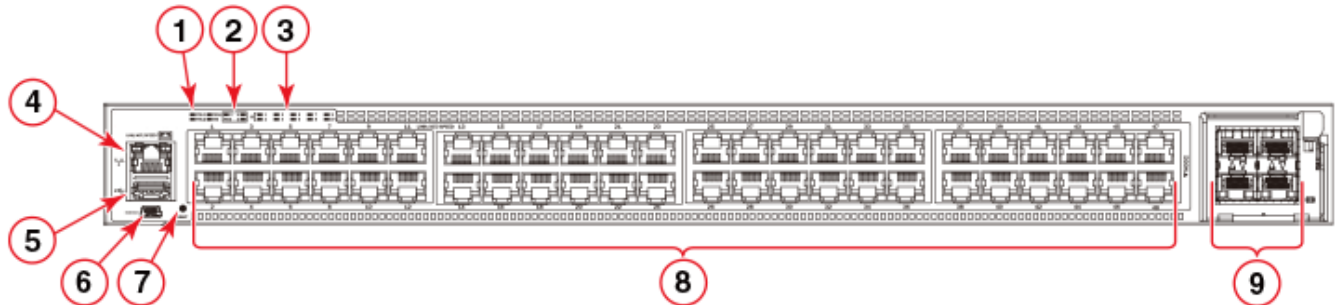
- | | |
|------------------------------|--|
| 1 System LEDs | 6 Mini-USB console port |
| 2 Media/Stacking module LEDs | 7 Reset button |
| 3 Stack unit ID display | 8 10/100/1000Base-T RJ-45 ports 1/1/1 - 1/1/24 |
| 4 Management port (RJ-45) | 9 100M/1G/2.5GBase-T RJ-45 ports 1/1/25 - 1/1/32 |
| 5 USB port (for flash drive) | 10 SFP+ ports 1/2/1 - 1/2/4 |

Ruckus ICX 7450 Overview

Views of the Ruckus ICX 7450 switch

Figure 4 shows the front view of the Ruckus ICX 7450-48 switch.

FIGURE 4 Front view of the Ruckus ICX 7450-48



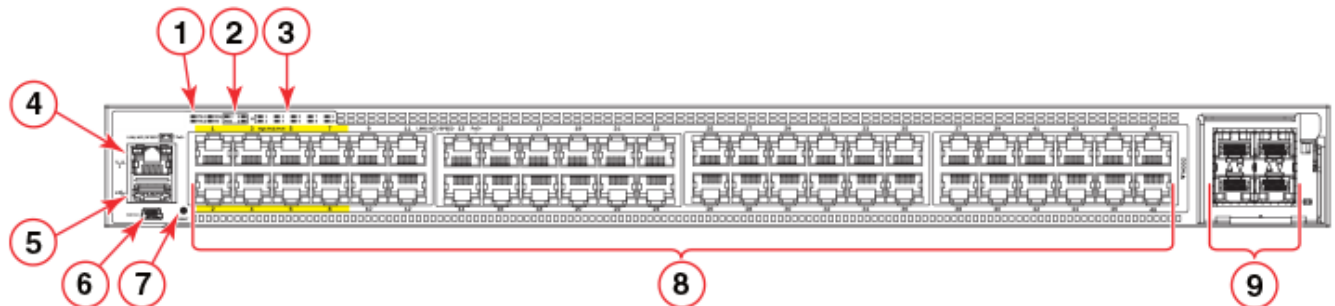
- | | | | |
|---|----------------------------|---|--|
| 1 | System LEDs | 6 | Mini-USB console port |
| 2 | Media/Stacking module LEDs | 7 | Reset button |
| 3 | Stack unit ID display | 8 | 10/100/1000Base-T RJ-45 ports 1/1/1 - 1/1/48 |
| 4 | Management port (RJ-45) | 9 | SFP+ ports 1/2/1 - 1/2/4 |
| 5 | USB port (for flash drive) | | |

Figure 5 shows the front view of the Ruckus ICX 7450-48P switch.

NOTE

PoE/PoE+ power is available to ports 1-48. High PoE/PoH is limited to ports 1-8.

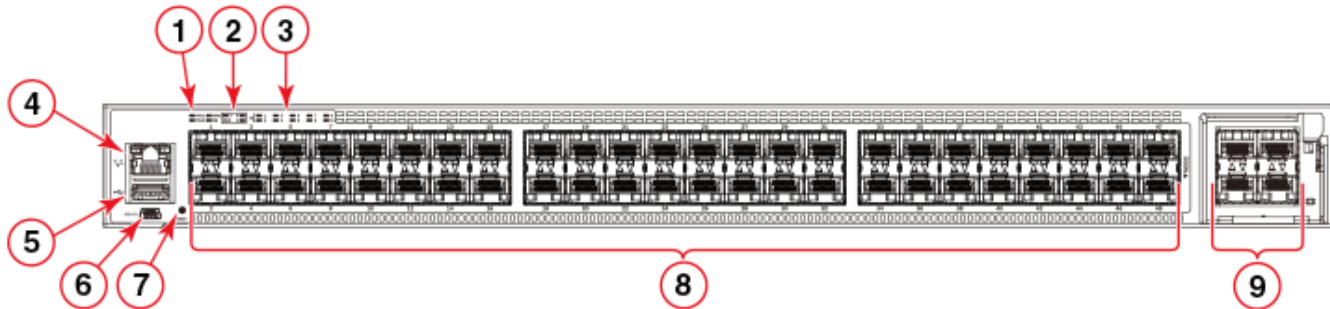
FIGURE 5 Front view of the Ruckus ICX 7450-48P



- | | | | |
|---|----------------------------|---|--|
| 1 | System LEDs | 6 | Mini-USB console port |
| 2 | Media/Stacking module LEDs | 7 | Reset button |
| 3 | Stack unit ID display | 8 | 10/100/1000Base-T RJ-45 ports 1/1/1 - 1/1/48 |
| 4 | Management port (RJ-45) | 9 | SFP+ ports 1/2/1 - 1/2/4 |
| 5 | USB port (for flash drive) | | |

Figure 6 shows the front view of the Ruckus ICX 7450-48F switch.

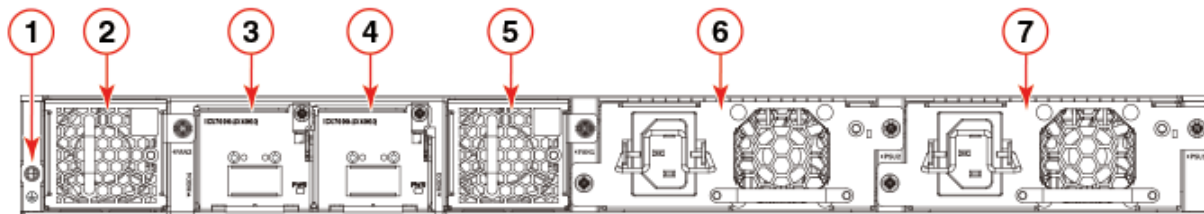
FIGURE 6 Front view of the Ruckus ICX 7450-48F



- | | |
|------------------------------|--------------------------------|
| 1 System LEDs | 6 Mini-USB console port |
| 2 Media/Stacking module LEDs | 7 Reset button |
| 3 Stack unit ID display | 8 SFP port LEDs 1/1/1 - 1/1/48 |
| 4 Management port (RJ-45) | 9 SFP+ ports 1/2/1 - 1/2/4 |
| 5 USB port (for flash drive) | |

Figure 7 shows the rear view of the Ruckus ICX 7450 switch.

FIGURE 7 Rear view of the Ruckus ICX 7450



- | | |
|------------------------------|-----------------------|
| 1 Grounding terminal | 5 Fan tray 1 |
| 2 Fan tray 2 | 6 Power supply unit 2 |
| 3 Uplink / Stacking module 4 | 7 Power supply unit 1 |
| 4 Uplink / Stacking module 3 | |

Ruckus ICX 7450 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.

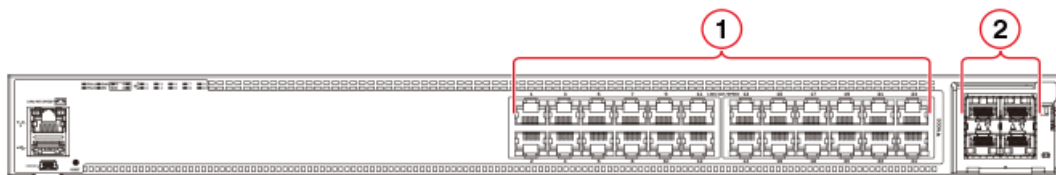
Ruckus ICX 7450 Overview

Ruckus ICX 7450 slot and Ethernet port numbering

The Ruckus ICX 7450 contains the following slots and Ethernet ports:

- Slot 1 and Slot 2 are located on the front of the Ruckus ICX 7450-24 and ICX 7450-24P devices. Slot 1 contains 1 GbE RJ-45 ports 1/1/1 through 1/1/24, with odd port numbers on the top row and port 1/1/1 on the left. Slot 2 contains 1/10 GbE SFP+ ports 1/2/1 and 1/2/3 on the top row (left to right), and ports 1/2/2 and 1/2/4 on the bottom row (left to right). Refer to the following figure.

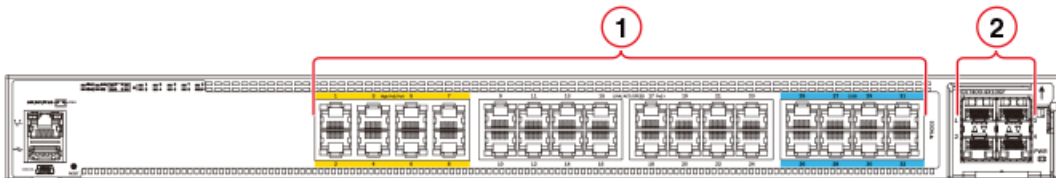
FIGURE 8 Ruckus ICX 7450-24 and ICX 7450-24P slot numbering



1 Slot 1 - 1GBase-T RJ-45 ports 1/1/1 - 1/1/24 2 Slot 2 - SFP+ ports 1/2/1 - 1/2/4

- Slot 1 and Slot 2 are located on the front of the Ruckus ICX 7450-32ZP devices. Slot 1 contains 1 GbE RJ-45 ports 1/1/1 through 1/1/24 and 2.5 GbE RJ-45 ports 1/1/25 through 1/1/32, with odd port numbers on the top row and port 1/1/1 on the left. Slot 2 contains 1/10 GbE SFP+ ports 1/2/1 and 1/2/3 on the top row (left to right), and ports 1/2/2 and 1/2/4 on the bottom row (left to right). Refer to the following figure.

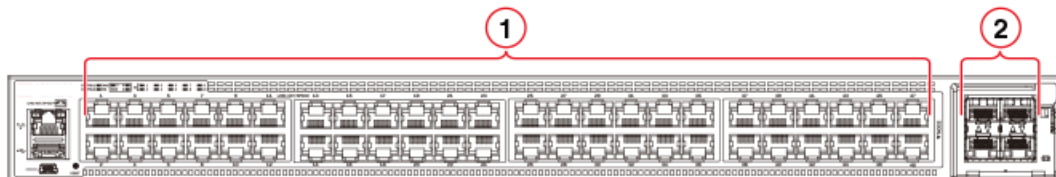
FIGURE 9 Ruckus ICX 7450-32ZP slot numbering



1 Slot 1 - 1GBase-T RJ-45 ports 1/1/1 - 1/1/32 2 Slot 2 - SFP+ ports 1/2/1 - 1/2/4

- Slot 1 and Slot 2 are located on the front of the Ruckus ICX 7450-48 and ICX 7450-48P devices. Slot 1 contains 1 GbE RJ-45 ports 1/1/1 through 1/1/48, with odd port numbers on the top row and port 1/1/1 on the left. Slot 2 contains 1/10 GbE SFP+ ports 1/2/1 and 1/2/3 on the top row (left to right), and ports 1/2/2 and 1/2/4 on the bottom row (left to right). Refer to the following figure.

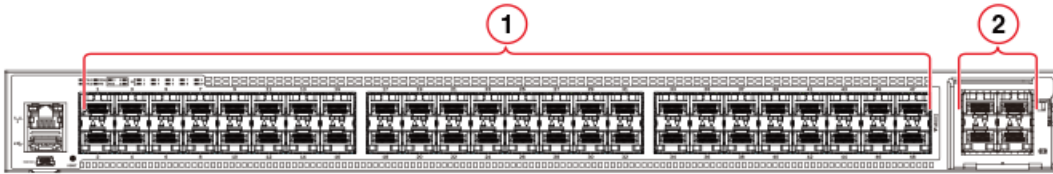
FIGURE 10 Ruckus ICX 7450-48 and ICX 7450-48P slot numbering



1 Slot 1 - 1GBase-T RJ-45 ports 1/1/1 - 1/1/48 2 Slot 2 - SFP+ ports 1/2/1 - 1/2/4

- Slot 1 and Slot 2 are located on the front of the Ruckus ICX 7450-48F device. Slot 1 contains 1 GbE SFP ports 1/1/1 through 1/1/48, with odd port numbers on the top row and port 1/1/1 on the left. Slot 2 contains 1/10 GbE SFP+ ports 1/2/1 and 1/2/3 on the top row (left to right), and ports 1/2/2 and 1/2/4 on the bottom row (left to right). Refer to the following figure.

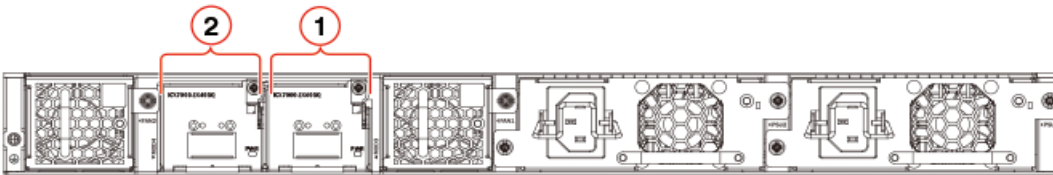
FIGURE 11 Ruckus ICX 7450-48F slot numbering



- 1 Slot 1 - SFP ports 1/1/1 - 1/1/48 2 Slot 2 - SFP+ ports 1/2/1 - 1/2/4

- Slot 3 is located on the rear of the Ruckus ICX 7450 switch and with a single-port module installed contains 40 GbE QSFP+ stacking/data port 1/3/1. With a 4-port module installed, Slot 3 contains 1/10 GbE SFP+ ports 1/3/1 and 1/3/3 on the top row (left to right), and ports 1/3/2 and 1/3/4 on the bottom row (left to right). Refer to [Figure 12](#).
- Slot 4 is also located on the rear of the Ruckus ICX 7450 switch and with a single-port module installed contains 40 GbE QSFP+ stacking/data port 1/4/1. With a 4-port module installed, Slot 4 contains 1/10 GbE SFP+ ports 1/4/1 and 1/4/3 on the top row (left to right), and ports 1/4/2 and 1/4/4 on the bottom row (left to right). Refer to [Figure 12](#).

FIGURE 12 Ruckus ICX 7450 rear slot numbering



- 1 Slot 3 - 40 GbE QSFP+ stacking/data port 1/3/1 2 Slot 4 - 40 GbE QSFP+ stacking/data port 1/4/1
or 1/10 GbE SFP+ data ports 1/3/1 - 1/3/4 or 1/10 GbE SFP+ data ports 1/4/1 - 1/4/4

Supported expansion modules

A 4-port 1 GbE SFP expansion module can be installed in the slots shown in [Table 3](#) on page 18 and [Table 5](#) on page 18. The expansion module supports 1 GbE optics (refer to the [Ruckus Optics Family Data Sheet](#)).

A 4-port 1/10 GbE SFP+ expansion module can be purchased and installed in the slots shown in [Table 3](#) on page 18 and [Table 5](#) on page 18. The expansion module supports 1 GbE and 10 GbE optics (refer to the [Ruckus Optics Family Data Sheet](#)).

A 4-port 1/10 GbE copper expansion module can be installed in the slots shown in [Table 3](#) on page 18 and [Table 5](#) on page 18. The expansion module supports 1 GbE and 10 GbE copper wired connections.

A 1-port 40 GbE QSFP+ expansion module can be installed in the slots shown in [Table 3](#) on page 18 and [Table 5](#) on page 18. The expansion module supports 40 GbE optics. This module can be used for data uplink or stacking.

Modules are supported in slots where “Yes” is indicated.

TABLE 3 Ruckus ICX 7450-24 and 24P expansion slots and supported media modules

Module	Slot 2		Slot 3		Slot 4	
	Media	Supported	Media	Supported	Media	Supported
ICX7400-4X1GF	4X1G	4X10M/100M	4X1G	4X100M	4X1G	4X100M
	Yes	Yes	No	No	No	No
ICX7400-4X10GF	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-4X10GC	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-1X40GQ	40G	4X10G	40G	4X10G	40G	4X10G
	Yes	No	Yes	No	Yes	No

TABLE 4 Ruckus ICX 7450-32ZP expansion slots and supported media modules

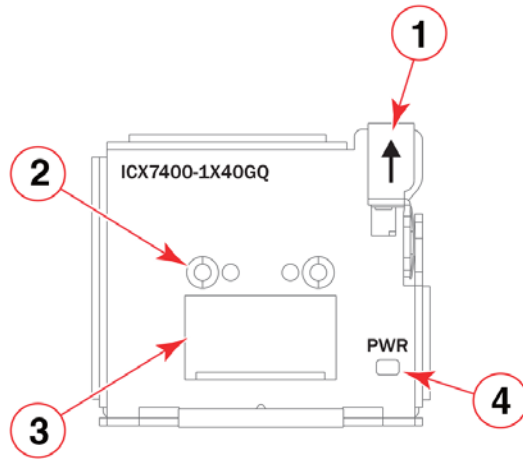
Module	Slot 2		Slot 3		Slot 4	
	Media	Supported	Media	Supported	Media	Supported
ICX7400-4X10GF	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-4X10GC	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-1X40GQ	40G	4X10G	40G	4X10G	40G	4X10G
	No	No	Yes	No	Yes	No

TABLE 5 Ruckus ICX 7450-48, 48P and 48F expansion slots and supported media modules

Module	Slot 2		Slot 3		Slot 4	
	Media	Supported	Media	Supported	Media	Supported
ICX7400-4X1GF	4X1G	4X10M/100M	4X1G	4X100M	4X1G	4X100M
	Yes	Yes	No	No	No	No
ICX7400-4X10GF	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-4X10GC	4X10G	4X1G	4X10G	4X1G	4X10G	4X1G
	Yes	Yes	Yes	Yes	Yes	Yes
ICX7400-1X40GQ	40G	4X10G	40G	4X10G	40G	4X10G
	No	No	Yes	No	Yes	No

Instructions for installing or replacing an expansion module or service module are described in ["Replacing an expansion module or service module"](#) on page 80.

FIGURE 13 40 GbE QSFP+ expansion module



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

NOTE

Pull the release lever down before removing a media or stacking module.

Supported transceivers and cables

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

QSFP+ 40GBase-SR-BD support

The Ruckus ICX 7450 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 transceiver is for data only, it is not supported for stacking.

Ruckus ICX 7450 Overview
Supported transceivers and cables

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• Installing the device on a desktop.....	26
• Installing the device in a rack.....	26
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CAUTION
Procedures in this manual are intended for qualified service personnel.

Shipping carton contents

Ruckus ICX 7450 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 7450 device
- An accessory kit containing the following items:
 - Rack mounting kit containing two L-shaped mounting brackets and two sets of eight sink-head screws
 - Two-post rack kit containing four rack-mounting screws and four cage nuts
 - Four rubber feet
 - One grounding kit, containing one grounding lug and one grounding screw
 - One US AC power cord, shielded (included only with devices with pre-installed power supplies)
 - One console cable (Mini-USB to RJ45)
 - One RJ45-to-DB9 adapter
 - Installed filler panels for the PSU slot, expansion module slots, or fan tray slot where such modules are not supplied for the switch
 - China ROHS sheet
 - Read Me First document

NOTE

A stacking cable is not included in the shipping carton and must be ordered separately.

Installation and safety considerations

You can install the Ruckus ICX 7450 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 and support various mounting positions (refer to [Figure 15](#)).

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 7450 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 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 22.
- The Ruckus ICX 7450 should be installed with its top and bottom covers parallel to the floor. The Ruckus ICX 7450 should not be installed upside down.
- 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 6](#) to install your device. Details for each of these steps are provided on the pages indicated.

Installing the Ruckus ICX 7450

Installation precautions

TABLE 6 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 22
2	If customizing a Ruckus ICX 7450 baseline chassis: 1 Install at least one power supply unit. 2 Install at least one fan. 3 Install an expansion module.	"Installing and replacing a power supply unit" on page 56 "Installing or replacing the fan assembly" on page 80 "Installing or replacing an expansion module or service module" on page 81
3	Install the device on a desktop, or a rack	"Installing the device on a desktop" on page 26 "Installing the device in a rack" on page 26
4	Connect devices in a stack.	"Connecting devices in a stack" on page 51
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 55
6	Attach a terminal or PC to the device. This will enable you to configure the device through the command line interface (CLI).	"Attaching a PC or terminal" on page 59
7	Assign a password for additional access security. No default password is assigned to the CLI.	<i>Ruckus FastIron Management Configuration Guide</i>
8	Before attaching equipment to the device, you must configure an interface IP address to the subnet on which the device will be located. Initial IP address configuration is performed using the CLI with a direct serial connection.	<i>Ruckus FastIron Management Configuration Guide</i>
9	Connect network equipment to the system.	"Connecting network devices" on page 61
10	Test IP connectivity to other devices by pinging them and tracing routes.	<i>Ruckus FastIron Management Configuration Guide</i>
11	Continue configuring the device using the CLI.	<i>Ruckus FastIron Management Configuration Guide</i>
12	Secure access to the device.	<i>Ruckus FastIron Management Configuration Guide</i>

Installation precautions

Follow all precautions when installing a device.

General precautions



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.

**CAUTION**

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

Lifting precautions

**CAUTION**

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.

**CAUTION**

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.

**CAUTION**

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 system, 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 52](#)); the other end connects to the building ground.

Installing the Ruckus ICX 7450

Installing the device on a desktop



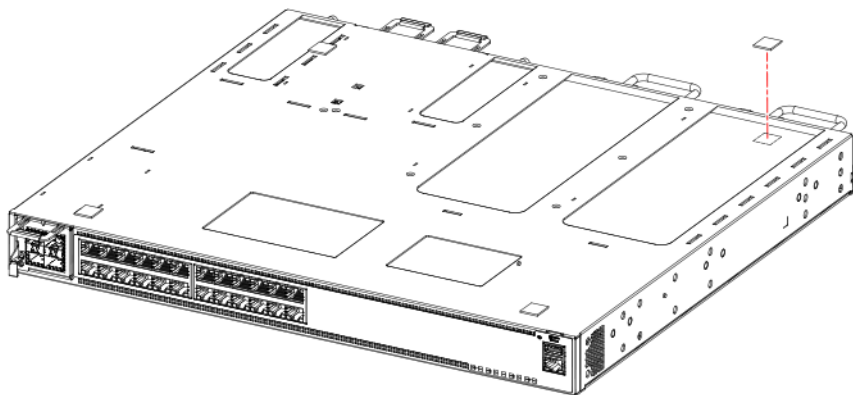
CAUTION

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 on a desktop

Complete the following steps to install the Ruckus ICX 7450 on a desktop or other flat surface.

FIGURE 14 Attaching the adhesive feet



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

Installing the device in a rack



CAUTION

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

NOTE

You need a #2 Phillips screwdriver for installation.

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

- Temperature: Because the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (Refer to [“Environmental considerations”](#) on page 22.)
- 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.

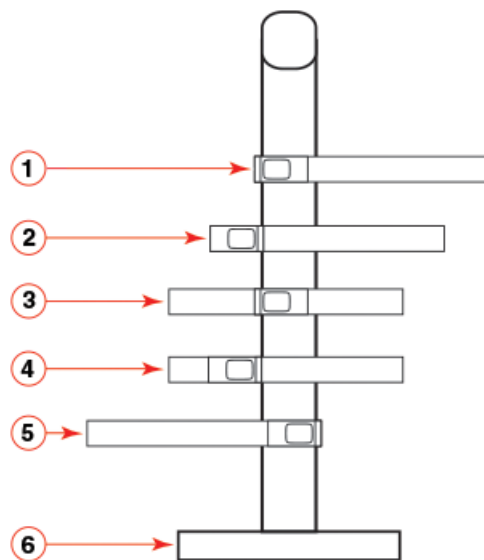
- Grounding: Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to the mains electricity supply.

To mount the product into a four-post rack, you can order one of two four-post rack kits with the part number XBR-R000295 or XBR-000296. For the procedures to install these kits, refer to [“Installing the 1U, 1.5U, and 2U Universal Kit for Four-Post Racks \(XBR-R000295\)”](#) on page 29 and [“Installing the Universal Four-Post Rack Kit \(XBR-R000296\)”](#) on page 40.

Two-post rack mount installation

The Ruckus ICX 7450 can be installed in a two-post rack in various mounting positions, as shown in [Figure 15](#).

FIGURE 15 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 Two-post rack, side view |

NOTE

Use the following procedure when installing the Ruckus ICX 7450 in a two-post rack. 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 29 or [“Installing the Universal Four-Post Rack Kit \(XBR-R000296\)”](#) on page 40.

Use the following steps to mount the Ruckus ICX 7450 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 16](#) using the 8-32 x 5/16 in. screws.

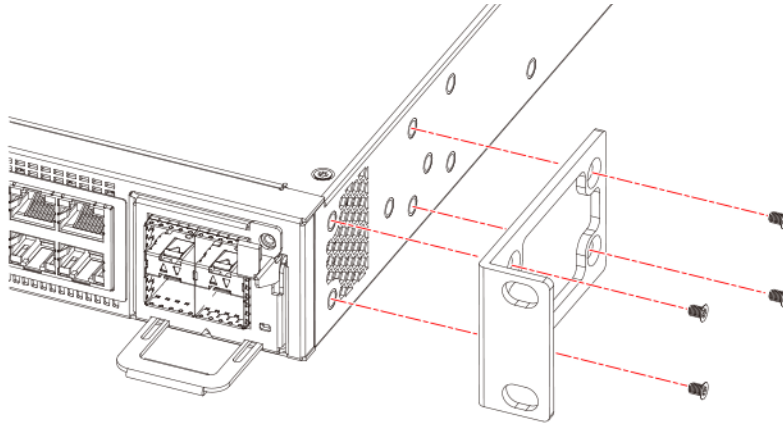
NOTE

Be sure to use only the screws included in the Ruckus ICX 7450 kit.

Installing the Ruckus ICX 7450

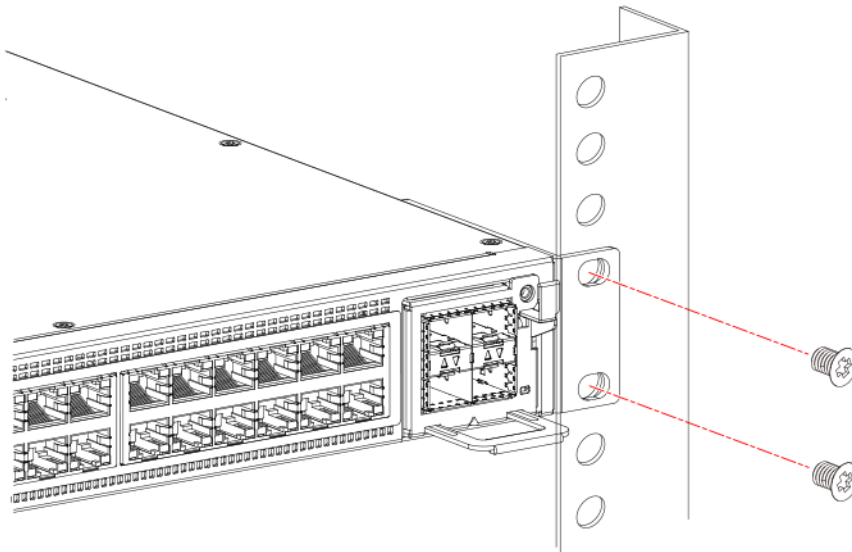
Two-post rack mount installation

FIGURE 16 Attaching the mounting brackets for a Ruckus ICX 7450



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 17](#).

FIGURE 17 Installing the Ruckus ICX 7450 in a 2-post rack



Proceed to ["Attaching a PC or terminal"](#) on page 59.

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.

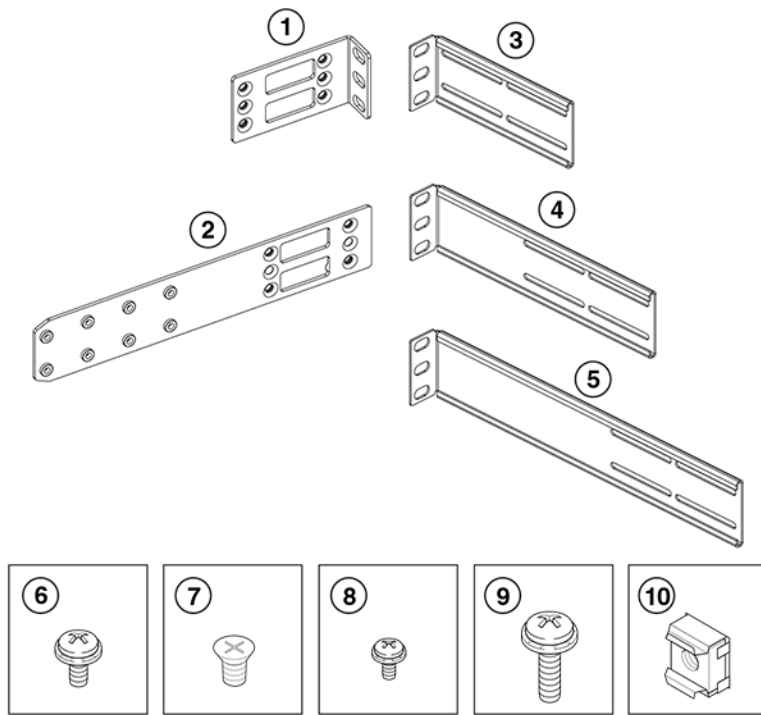
Parts list

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

Installing the Ruckus ICX 7450

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

FIGURE 18 Rack kit parts



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

Flush-front mounting the device in the rack



CAUTION

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

NOTE

The illustrations in the rack installation procedures 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:

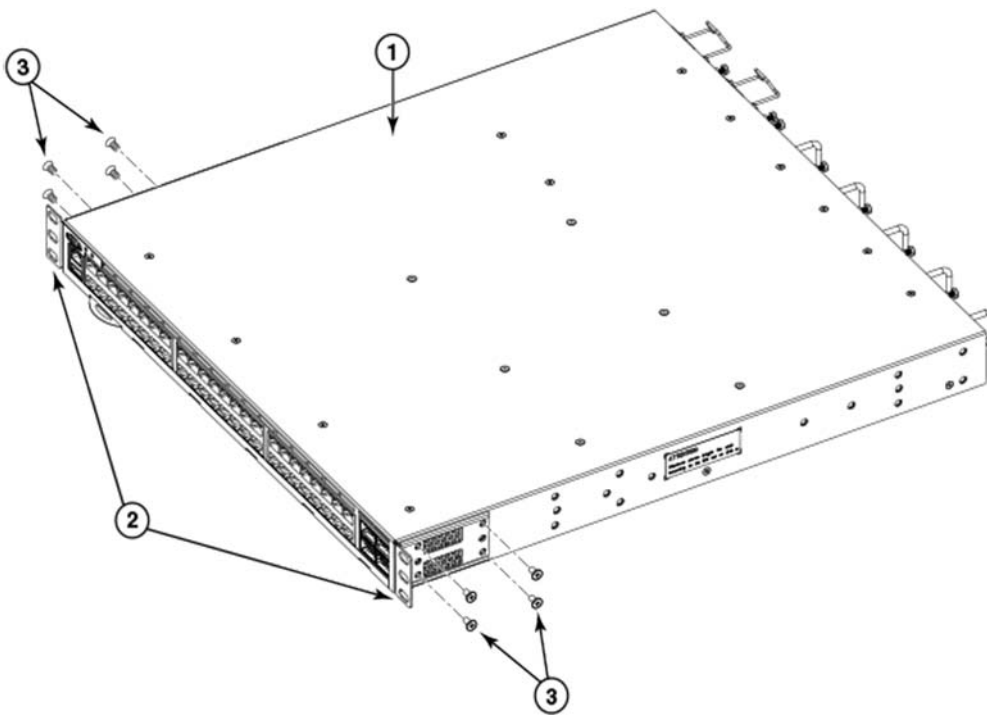
1. "Attaching the front brackets" on page 31
2. "Attaching the extension brackets to the device" on page 31
3. "Installing the device in the rack" on page 32
4. "Attaching the rear brackets to the extensions" on page 33
5. "Attaching the rear brackets to the rack posts" on page 34

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 19](#).
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 19 Attaching the front brackets



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

Attaching the extension brackets to the device

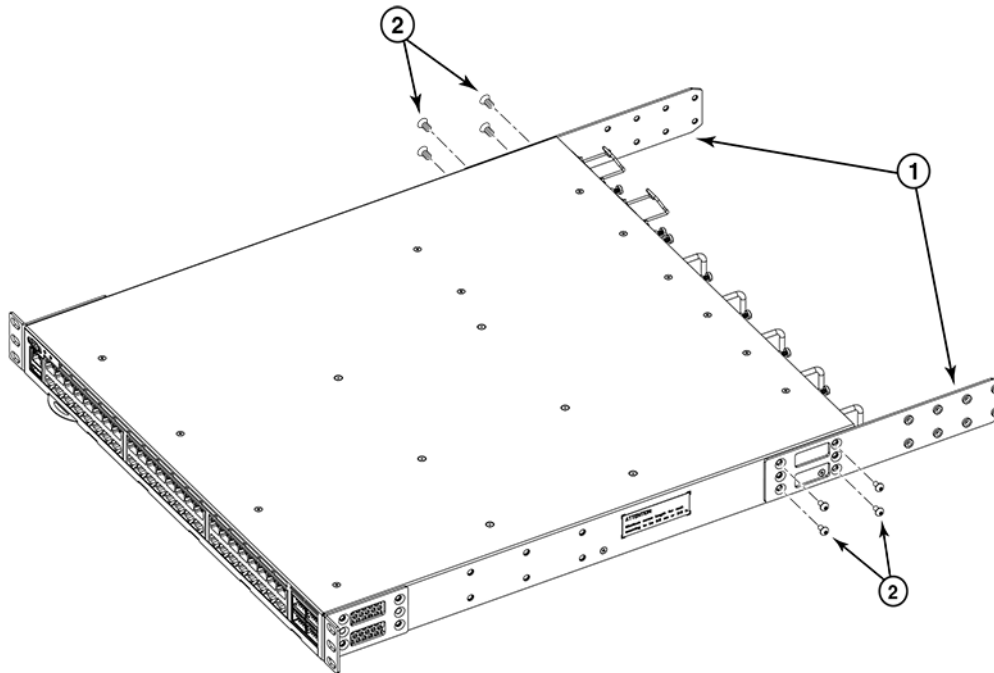
Complete the following steps to attach the extension brackets to the device. There are medium and long extension brackets that you can use for this step. Choose the correct extension bracket for the depth of your rack.

1. 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 20](#).
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).

Installing the Ruckus ICX 7450

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

FIGURE 20 Attaching the extension brackets to the device



1 Bracket extensions

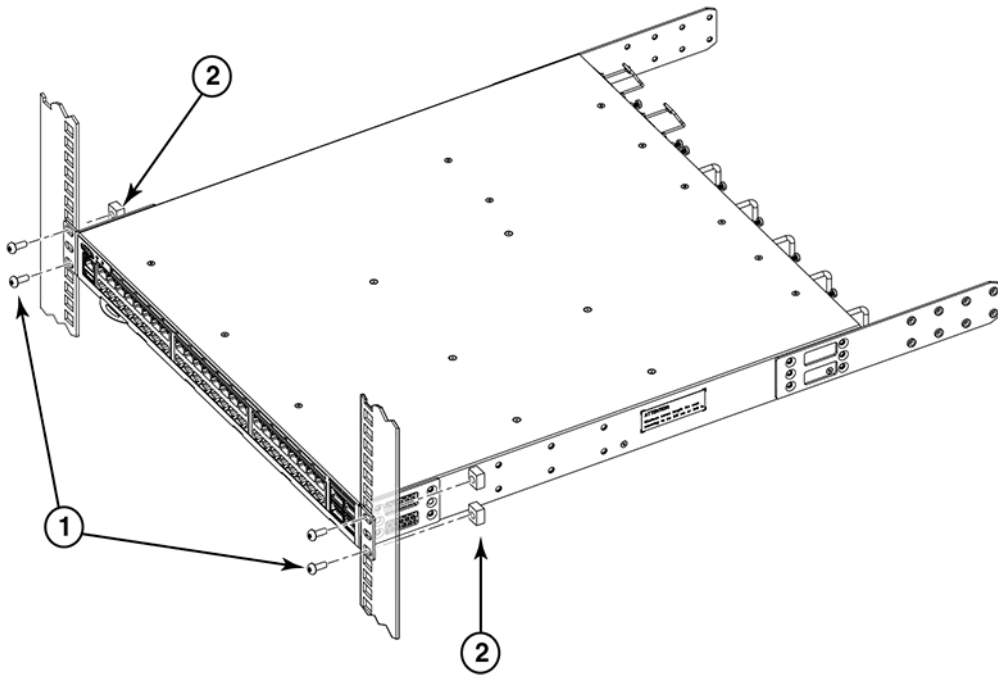
2 Screws, 8-32 x 5/16-in., flathead Phillips

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

FIGURE 21 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

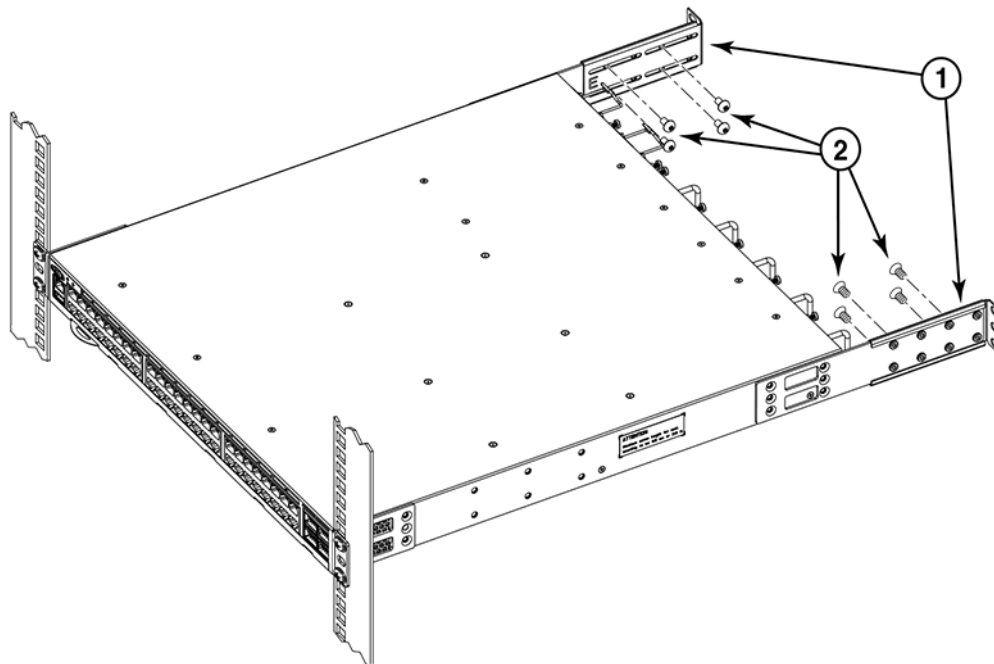
Complete the following steps to attach the rear brackets to the extensions. There are short and long rear brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

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 22](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 23](#) 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 (10 cm-kg).

Installing the Ruckus ICX 7450

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

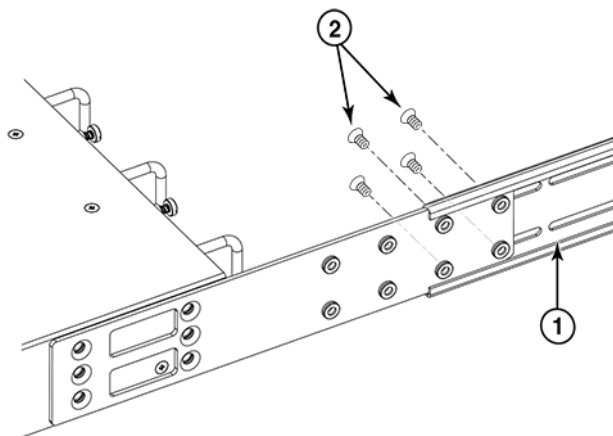
FIGURE 22 Attaching the rear brackets to the extensions



1 Rear brackets

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

FIGURE 23 Attaching the medium or long rear brackets to the extensions



1 Rear bracket, medium or long

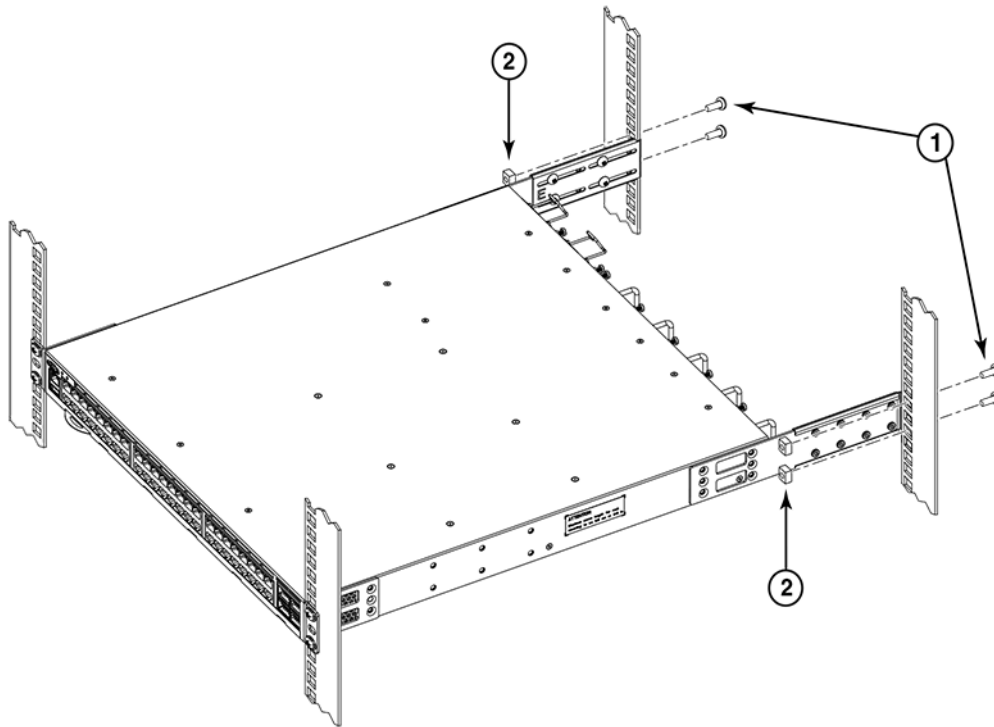
2 Screws, 6-32 x 1/4-in., panhead Phillips

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

FIGURE 24 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 36
2. [“Attaching the extensions to the front of the device”](#) on page 36
3. [“Installing the device in the rack”](#) on page 37
4. [“Attaching the rear brackets to the extensions at the front of the device”](#) on page 38
5. [“Attaching the rear brackets to the front rack posts”](#) on page 39

Installing the Ruckus ICX 7450

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

Attaching the front brackets to the rear of the device

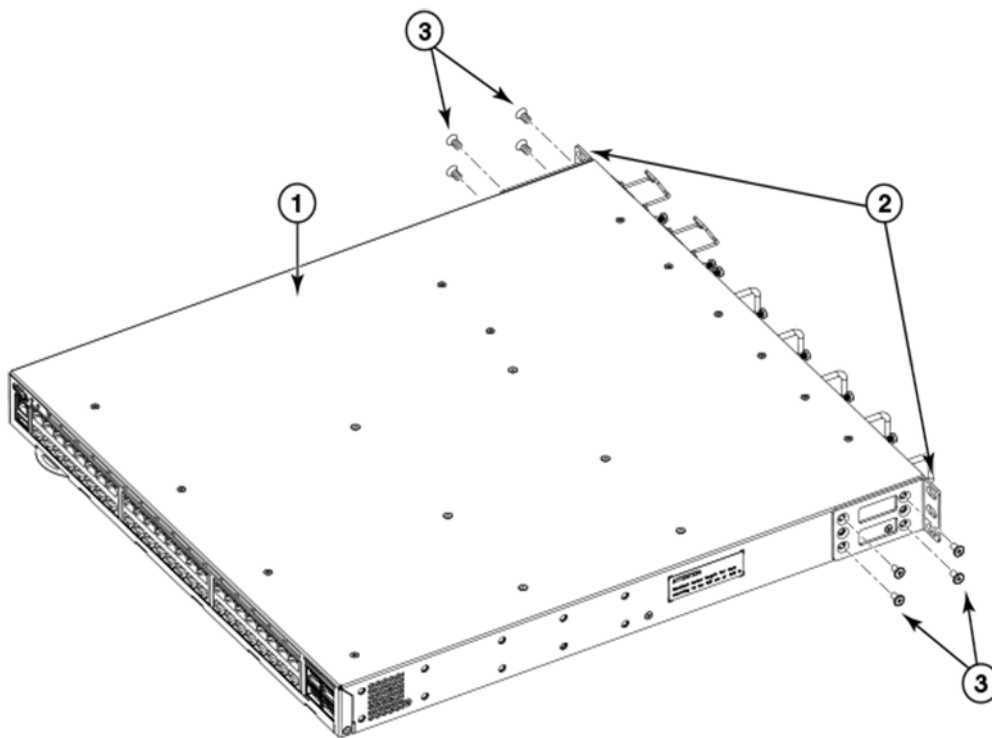
NOTE

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 25](#).
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 25 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

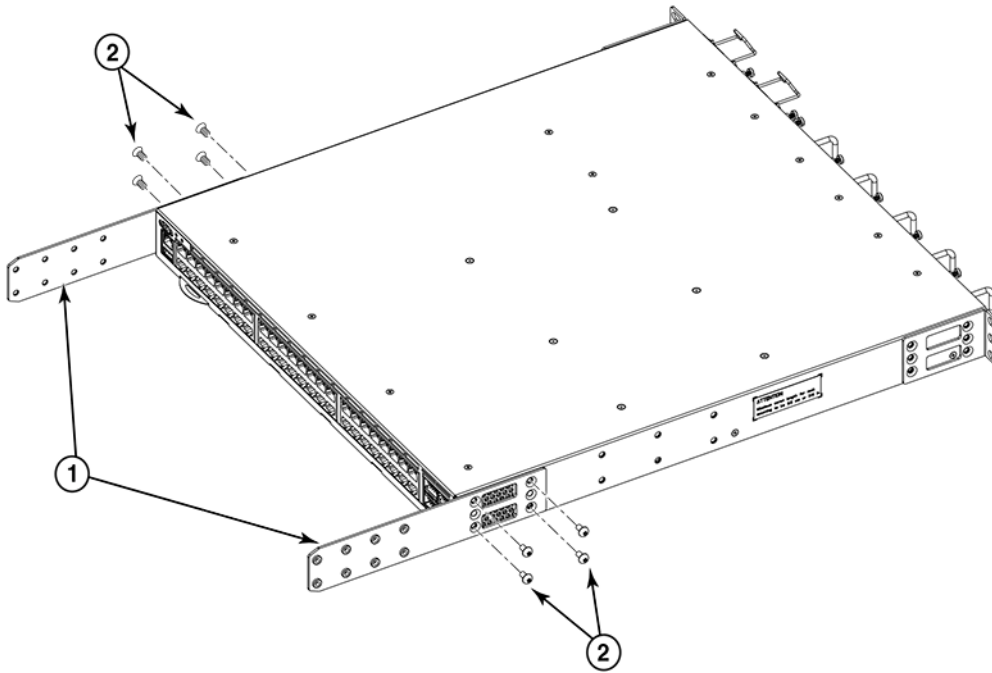
Attaching the extensions to the front of the device

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 26](#).
3. Attach the bracket using four 8-32 x 5/16-in. flathead screws.

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

FIGURE 26 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

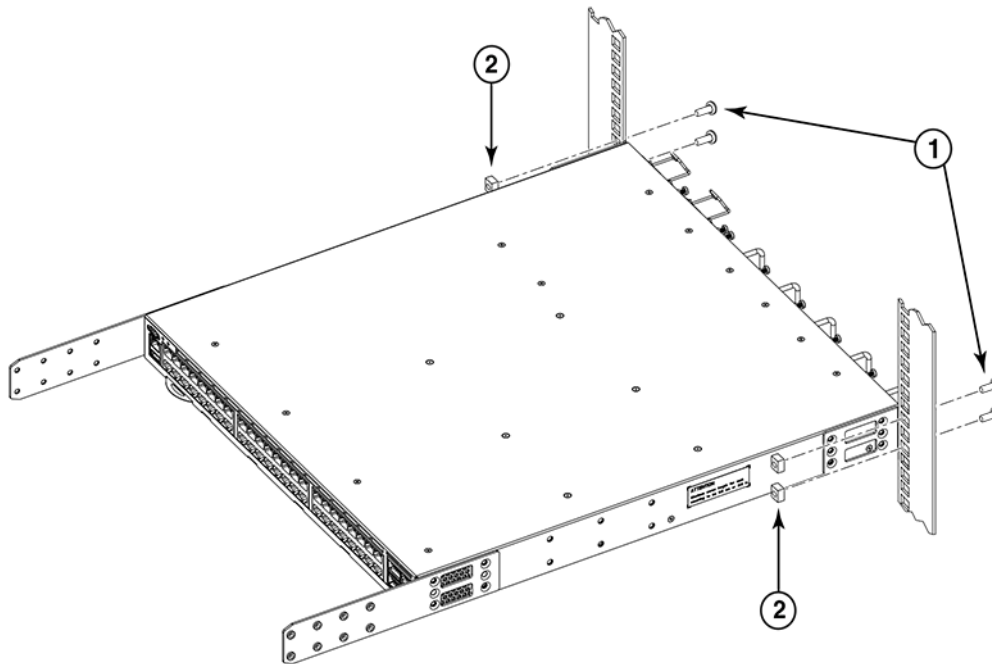
Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in [Figure 27](#), 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).

Installing the Ruckus ICX 7450

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

FIGURE 27 Positioning the device in the rack



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

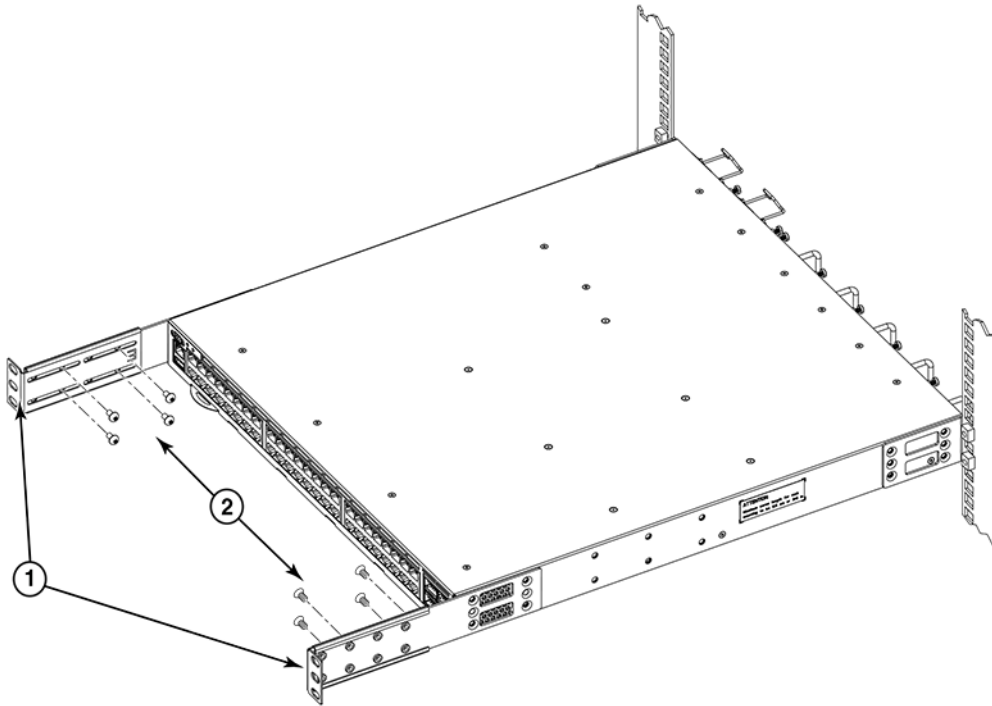
2 Retainer nuts, 10-32

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 28](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 29](#) 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).

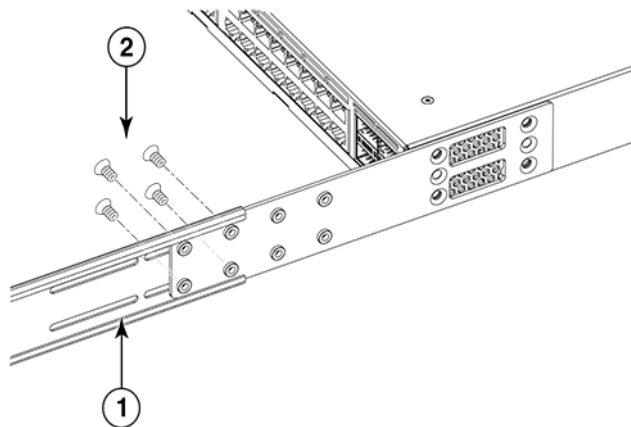
FIGURE 28 Attaching the rear brackets to the extensions at the front of the device



1 Rear brackets, short

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

FIGURE 29 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.

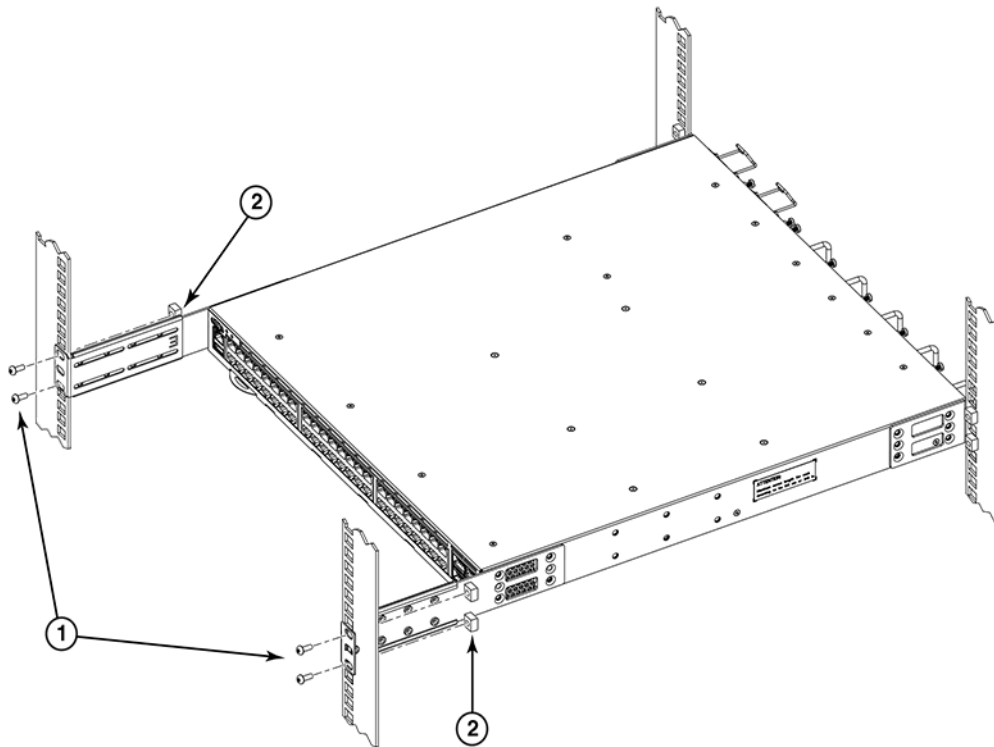
1. Attach the right rear bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in [Figure 30](#). Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left front rack post using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.

Installing the Ruckus ICX 7450

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

FIGURE 30 Attaching the rear brackets to the front rack posts



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

2 Retainer nuts, 10-32

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

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

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

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

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

NOTE

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

NOTE

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

Installation requirements

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

NOTE

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

TABLE 7 Space requirements

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

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

Review the installation and facility requirements for your product before mounting the device. Refer to ["Installation and safety considerations"](#) on page 22 for more information.

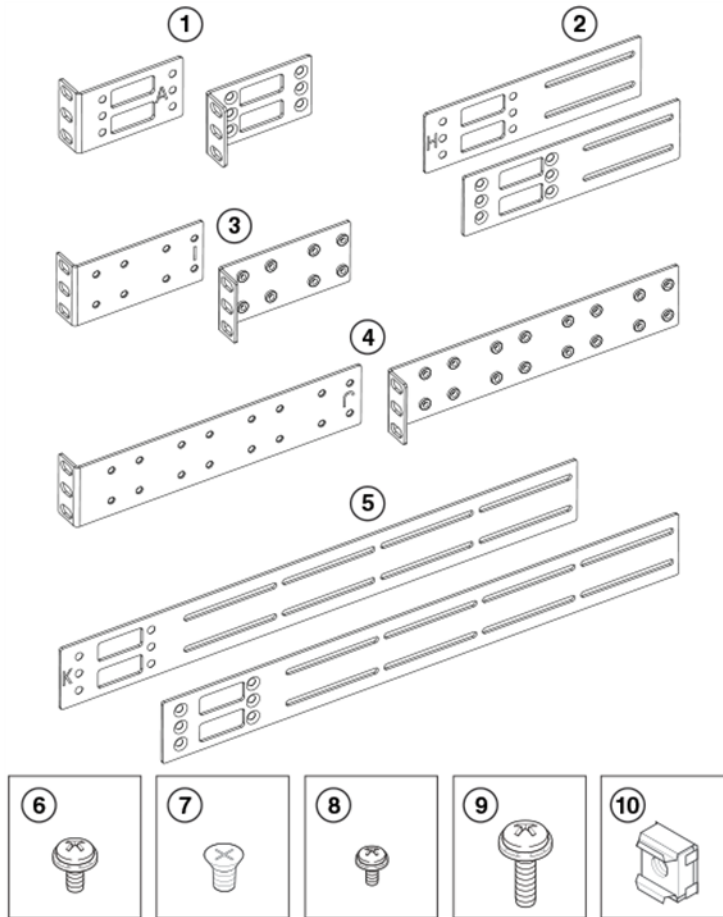
Time and items required

Allow 15 to 30 minutes to complete the installation.

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

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

FIGURE 31 Items in the Universal Four-Post Rack Kit



- | | | | |
|---|--------------------------------|----|--|
| 1 | Front brackets (2) | 6 | Screw, 8-32 x 5/16-in., panhead Phillips (8) |
| 2 | Extension brackets, medium (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, long (2) | 9 | Screw, 10-32 x 5/8-in., panhead Phillips (8) |
| 5 | Extension brackets, long (2) | 10 | Retainer nut, 10-32 (8) |

Ensure that the items listed and illustrated in [Figure 31](#) are included in the kit. Note that not all parts may be used with certain installations depending on the device type.



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

Flush-front mounting



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

NOTE

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

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

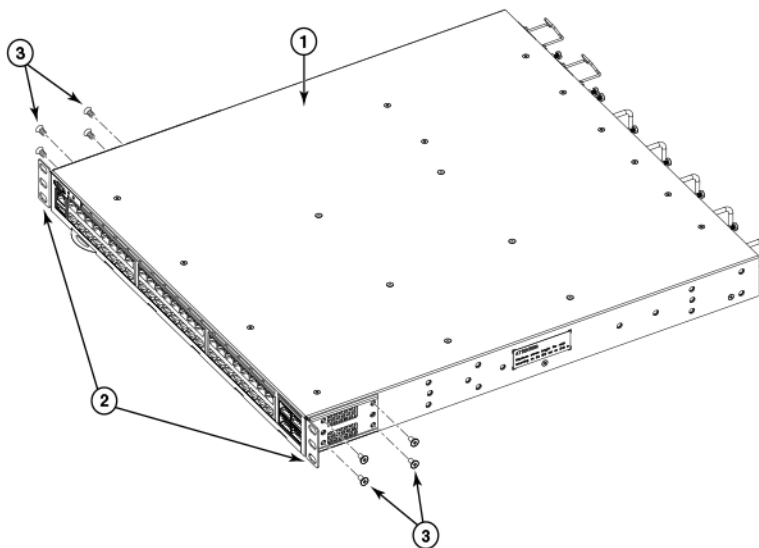
1. "Attaching the front brackets" on page 43
2. "Attaching the extension brackets to the device" on page 43
3. "Installing the device in the rack" on page 44
4. "Attaching the rear brackets to the extensions" on page 45
5. "Attaching the rear brackets to the rack posts" on page 46

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 32.
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat Step 1 and Step 2 to attach the left 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 32 Attaching the front brackets



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

Attaching the extension brackets to the device

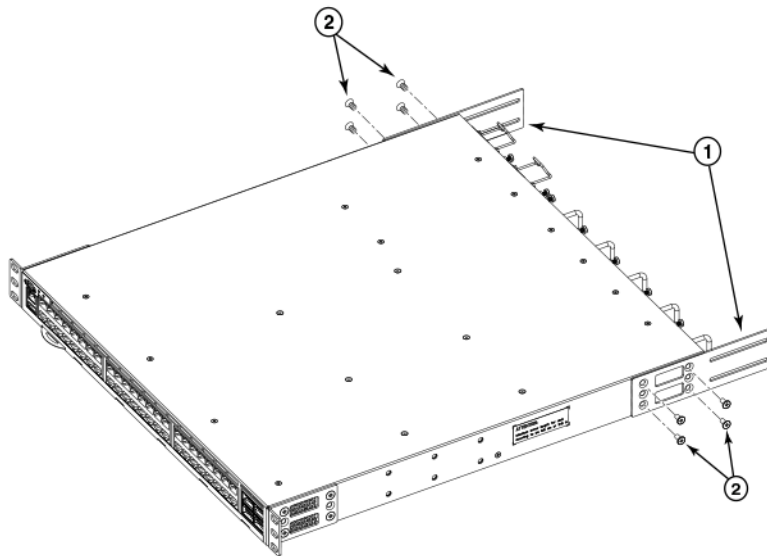
Complete the following steps to attach the extension brackets to the device. There are medium and long extension brackets that you can use for this step. Choose the correct extension bracket for the depth of your rack.

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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 33](#).
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 33 Attaching the extension brackets to the device



1 Extension brackets

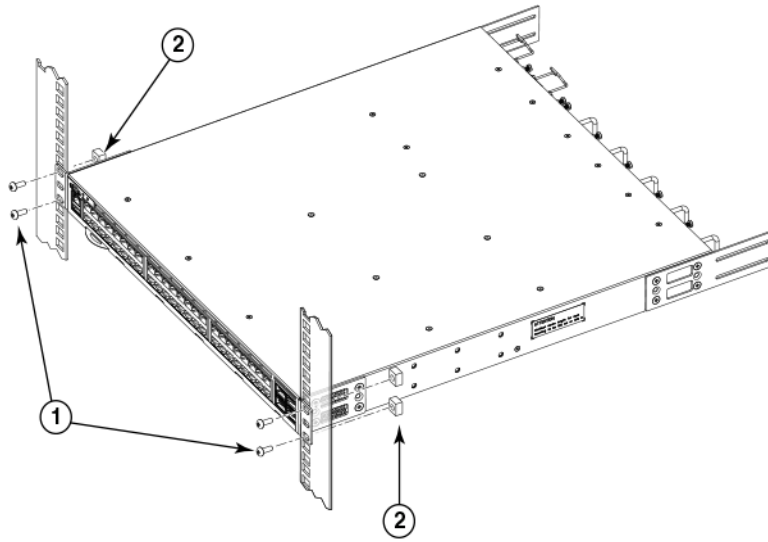
2 Screws, 8-32 x 5/16-in., flathead Phillips

Installing the device in the rack

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

1. Position the device in the rack, as shown in [Figure 34](#), providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 34 Positioning the device in the rack



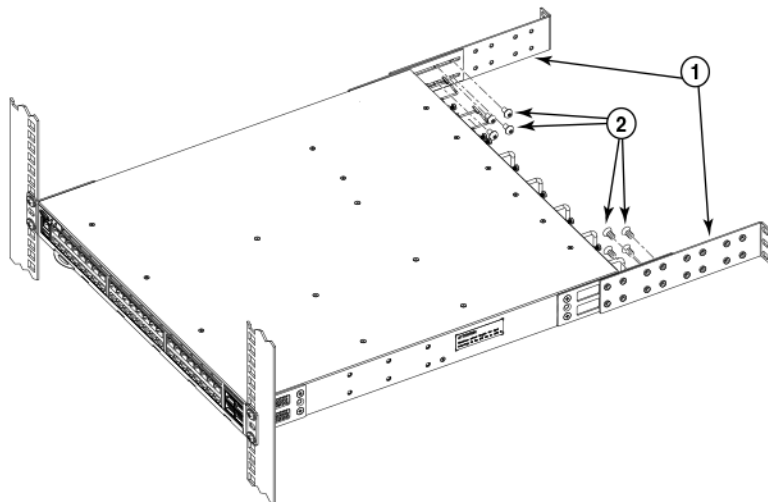
- 1 Screws, 10-32 x 5/8-in., panhead Phillips
- 2 Retainer nuts, 10-32

Attaching the rear brackets to the extensions

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

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension and attach to the extension by inserting four 6-32 x 1/4-in. panhead screws through the bracket holes. If possible, leave at least one empty vertical pair of holes between the screws for better support.
3. Repeat step 2 to attach the left rear bracket to the left extension.
4. Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

FIGURE 35 Attaching the rear brackets to the extensions



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

Installing the Ruckus ICX 7450

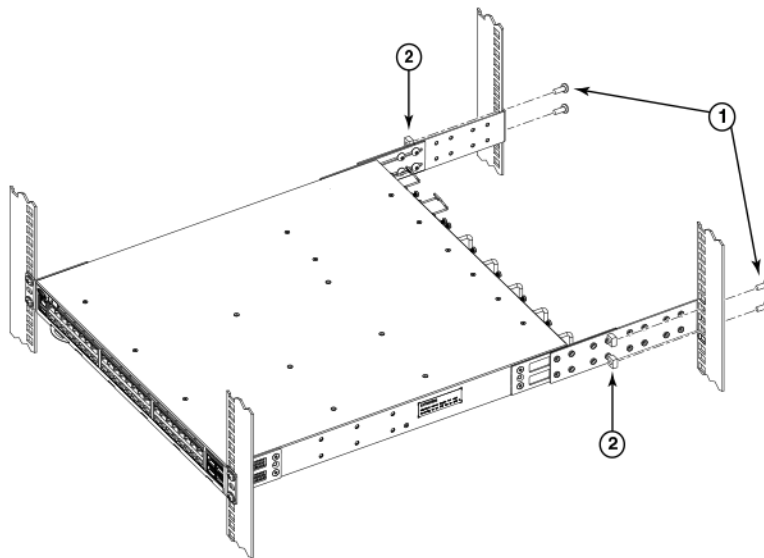
Installing the Universal Four-Post Rack Kit (XBR-R000296)

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

FIGURE 36 Attaching the rear brackets to the rack posts



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

2 Retainer nuts, 10-32

Flush-rear (recessed) mounting

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



CAUTION

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

NOTE

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

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

1. [“Attaching the front brackets to the rear of the device”](#) on page 47
2. [“Attaching the extensions to the front of the device”](#) on page 47
3. [“Installing the device in the rack”](#) on page 48
4. [“Attaching the rear brackets to the extensions at the front of the device”](#) on page 49

5. "Attaching the rear brackets to the front rack posts" on page 50

Attaching the front brackets to the rear of the device

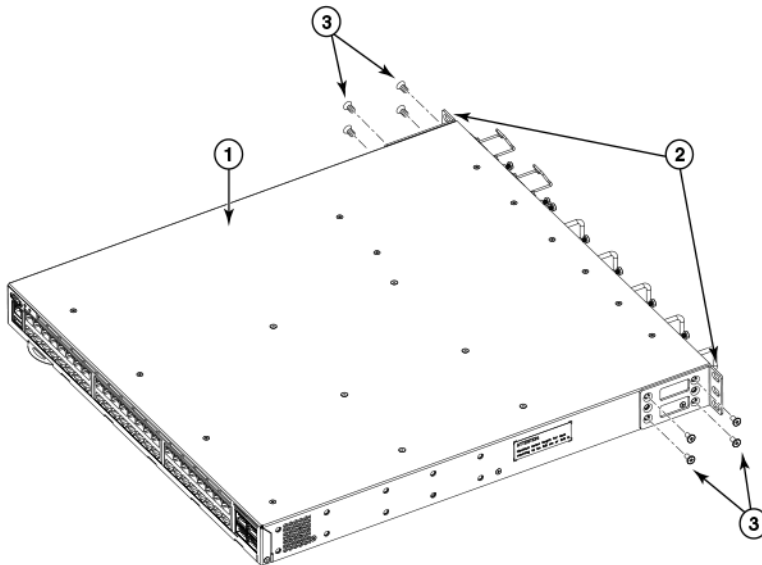
NOTE

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 37](#).
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 37 Attaching the front brackets to the rear of the device



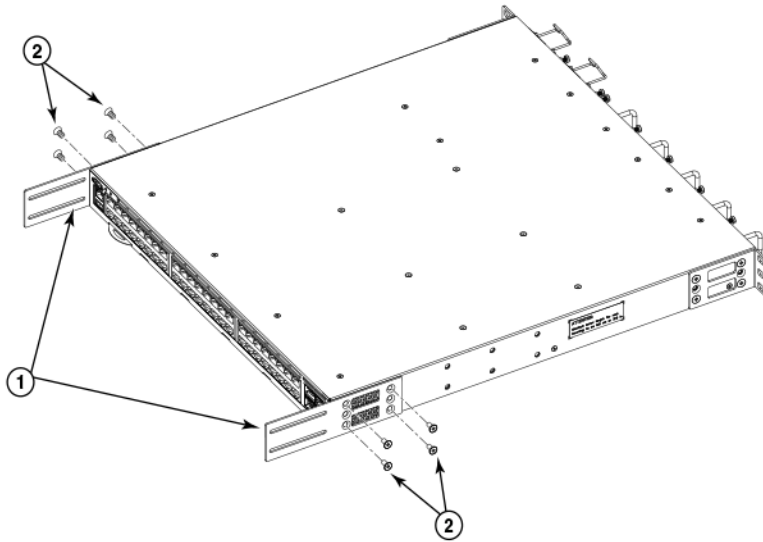
- | | | | |
|---|-------------------|---|--|
| 1 | The Ruckus device | 3 | Screws, 8-32 x 5/16-in., flathead Phillips |
| 2 | Front brackets | | |

Attaching the extensions to the front of the device

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

1. 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 38](#).
3. Attach the bracket using four 8-32 x 5/16-in. flathead screws.
4. Repeat step 1 and step 2 to attach the left front extension to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

FIGURE 38 Attaching the bracket extensions to the device



1 Extension brackets

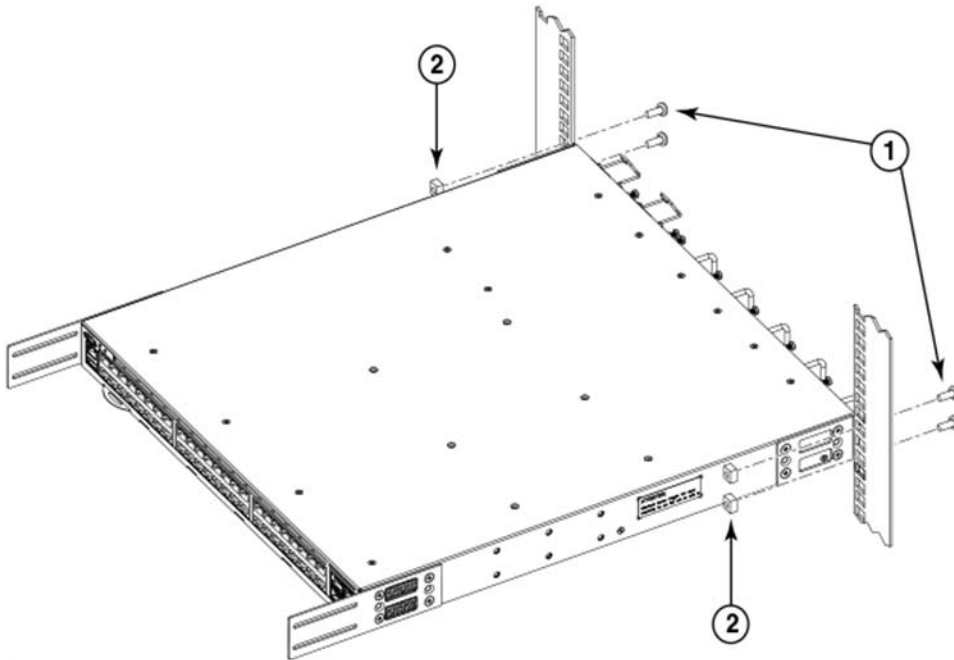
2 Screws, 8-32 x 5/16-in., flathead Phillips

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 39](#), 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 39 Positioning the device in the rack



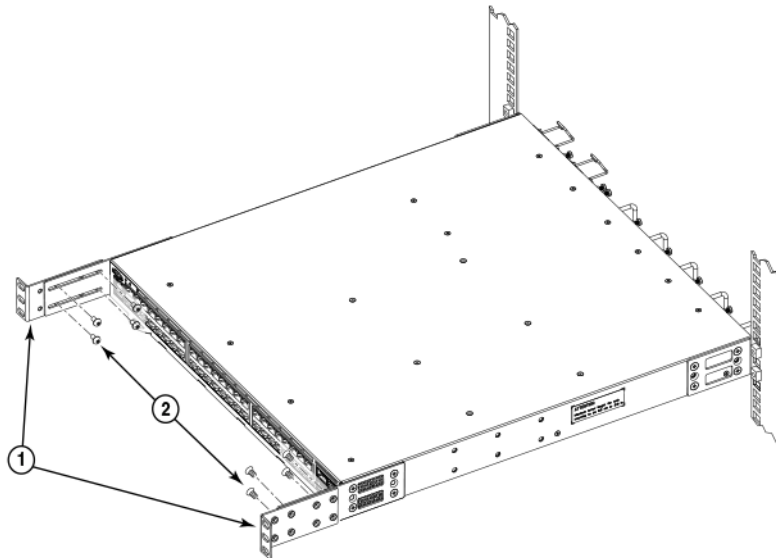
- 1 Screws, 10-32 x 5/8-in., panhead Phillips 2 Retainer nuts, 10-32

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.

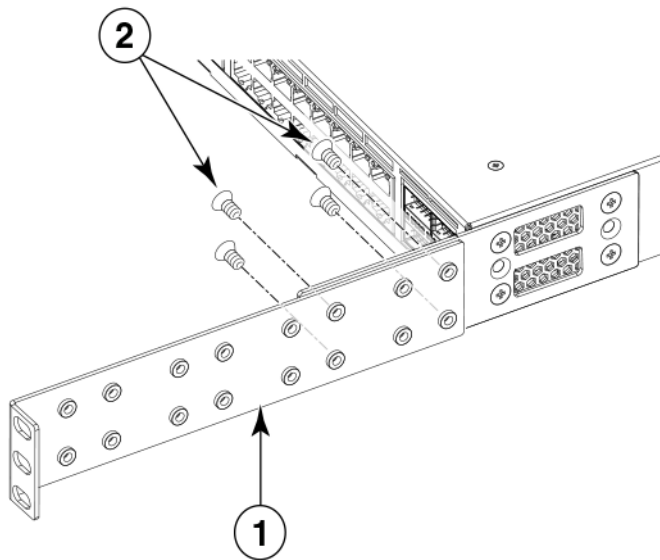
1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension, as shown in [Figure 40](#).
The short rear brackets are shown. Use the first and third vertical pairs of holes for the screws.
Refer to [Figure 41](#) for the positioning of the short or long brackets and screws.
3. Attach the brackets using four 6-32 x 1/4-in. screws.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left extension.
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).

FIGURE 40 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 41 Attaching the short or long rear brackets to the extensions



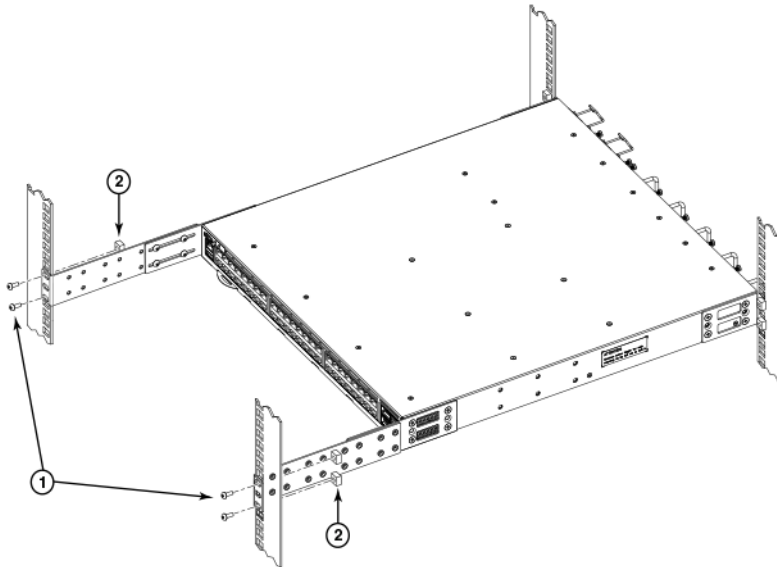
- 1 Rear bracket, short or long
- 2 Screws, 6-32 x 1/4-in., panhead Phillips

Attaching the rear brackets to the front rack posts

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

1. Attach the right rear bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in [Figure 42](#). 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 42 Attaching the rear brackets to the front rack posts



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

Connecting devices in a stack

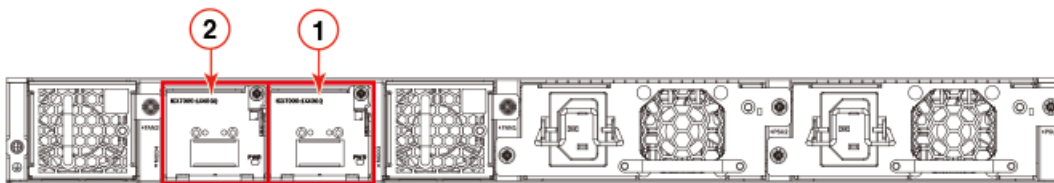
The Ruckus ICX 7450 can operate as a standalone device or as a member of a stack. A stack is a group of devices—Ruckus stackable units and their connected stacking links—that are connected so that the stack is managed as a single entity.

You can mix any Ruckus ICX 7450 models together in a stack. A stack cannot contain other device types.

Stacking ports

There are two QSFP+ ports on the rear panel that can be used as stacking ports. The following figure shows these ports in slot 3 and slot 4 (right to left).

FIGURE 43 Stacking ports (rear panel)

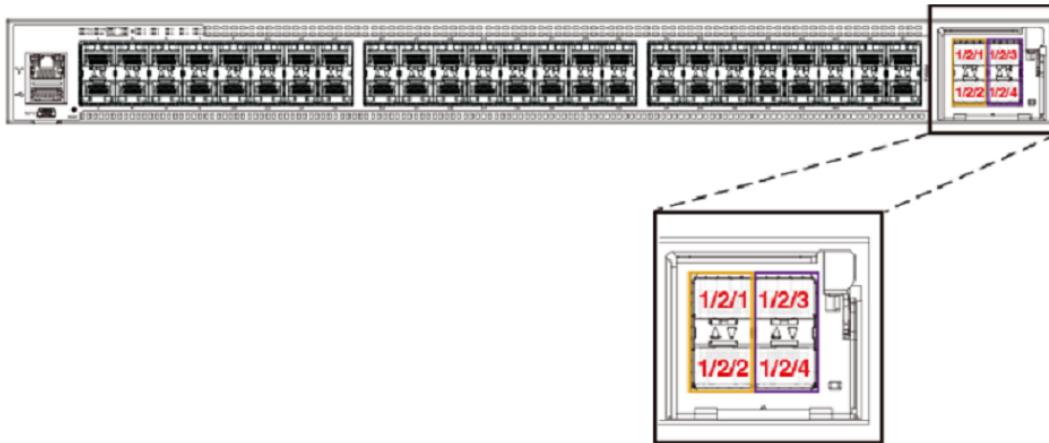


- 1 Module 3 - 40 GbE QSFP+ stacking port 1/3/1
- 2 Module 4 - 40 GbE QSFP+ stacking port 1/4/1

Ports 1/3/1 and 1/4/1 are default stacking ports. Default stacking ports have the capability to accept special stacking packets during a CLI-initiated command sequence of the Secure Setup utility.

The 4x10 GbE SFP+ ports on the front panel can also be used as stacking ports. The following figure shows these ports in slot 2. 10 GbE stacking is not supported in slots 3 and 4. The 4x10 GbE copper module (ICX7400-4X10GC) does not support stacking.

FIGURE 44 Stacking ports (front panel)



Default stacking ports can be changed to Ports 1/2/1 and 1/2/3 if a 4x10 GbE SFP+ module is installed in slot 2. Refer to the *Ruckus FastIron Stacking Configuration Guide* for more information on configuring 4x10 Gbps stacking ports.

NOTE

40 Gbps stacking on the rear panel and 4x10 Gbps stacking on the front panel cannot be configured at the same time

Stacking configuration requirements

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

Stacking cables

Use QSFP+ direct attached copper stacking cables or QSFP+ optics with fiber cables to connect the Ruckus ICX 7450 devices in a stack. The copper cable lengths for 40 GbE ports are 0.5 meter, 1 meter, 3 meters, or 5 meters.

NOTE

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

Stack size

A traditional stack can contain a maximum of twelve Ruckus ICX 7450 devices. A stack cannot contain other device types.

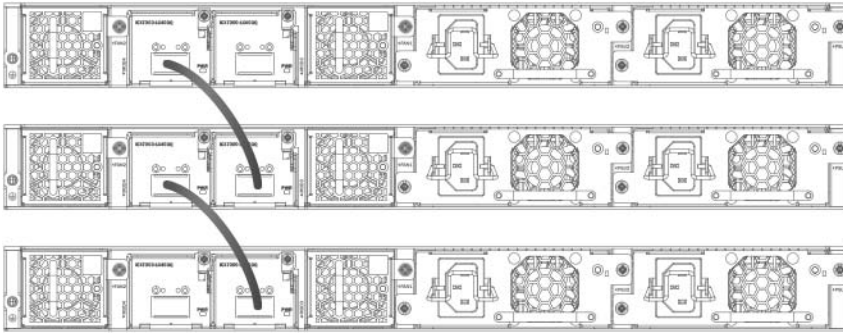
Stacking topologies

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

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

Figure 45 shows a supported rear panel linear stacking topology.

FIGURE 45 Rear panel linear stacking topology

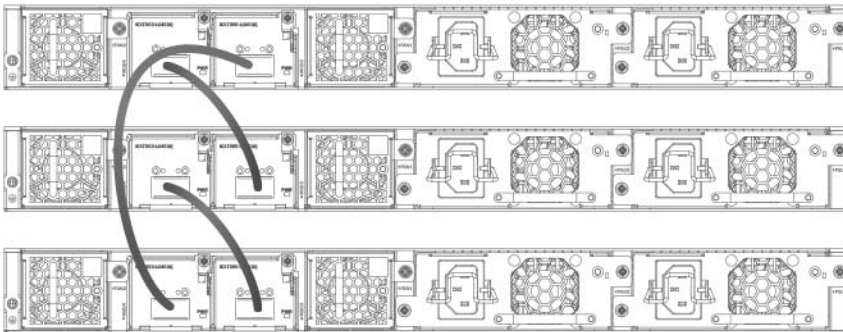


In a ring stack topology, there is an extra connection between the logical first and last devices, forming a “ring” or “closed-loop.” The closed-loop connection provides a redundant path for the stack link, so if one link fails, stack communications can be maintained.

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 46 shows a supported rear panel ring stacking topology.

FIGURE 46 Rear panel ring stacking topology



The following figures show linear and ring stacking using slot 2 on the front panel. Only the ICX7400-4X10GF module supports stacking using slot 2.

Figure 47 shows a supported front panel linear stacking topology.

FIGURE 47 Front panel linear stacking topology

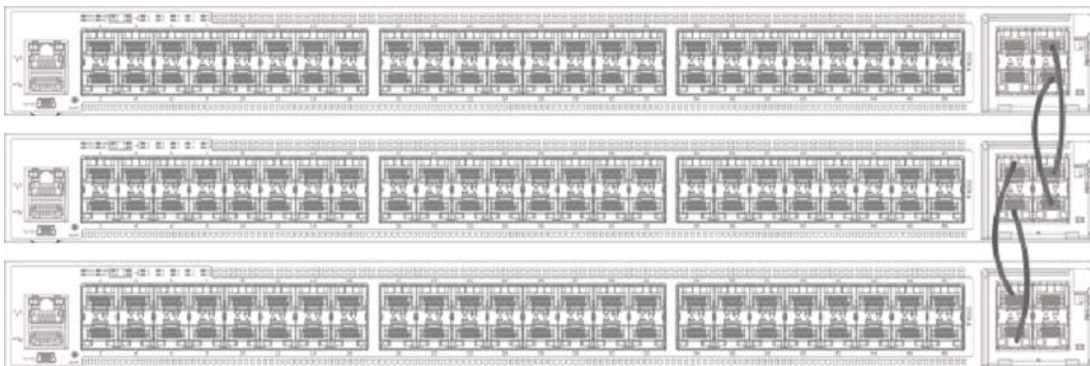
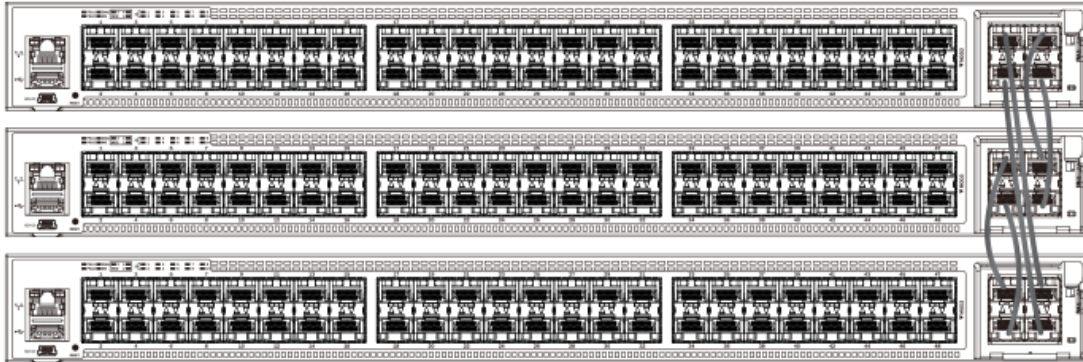


Figure 48 shows a supported front panel ring stacking topology.

FIGURE 48 Front panel ring stacking topology



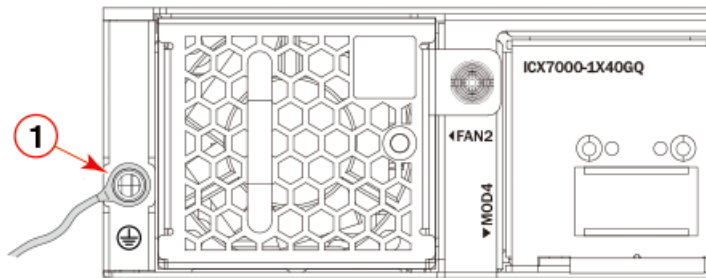
NOTE

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

Grounding the system

The rear panel of the Ruckus ICX 7450 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 49 Connecting the grounding terminal



1 Grounding terminal

NOTE

Use the grounding lug and screw included in the Ruckus ICX 7450 grounding kit.

Perform the following steps to connect to the grounding terminal.

1. Ensure that the rack in which the Ruckus ICX 7450 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 12 American Wire Gauge (AWG). The 12 AWG wire and grounding lug should be crimped together using a proper tool.
4. Attach the 12 AWG stranded copper wire to the grounding terminal on the Ruckus ICX 7450 using the screw included in the grounding kit.

- Attach the grounding wire to the grounding point on the rack.

NOTE

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

Powering on the system

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

- Install alternating-current (AC) and direct-current (DC) power supplies in the switch.
- Attach AC or DC power cables to the power supply connectors on the rear panel.
- Connect the power cables to the 100-240 VAC or 40-72 VDC power source.

NOTE

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

NOTE

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

Power supplies

The Ruckus ICX 7450 supports alternating-current (AC) and direct-current (DC) power supplies. The Ruckus ICX 7450 is capable of running on one power supply and one fan. The second power supply and second fan provide redundancy.

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

NOTE

Ruckus recommends that the Ruckus ICX 7450 switch operates with two power supplies and two 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.

Power supply usage

The Ruckus ICX 7450-24P, ICX 7450-32ZP, and ICX 7450-48P models support specific AC or DC power supply inputs and numbers of POE, POE+, High PoE, and PoH ports.

TABLE 8 AC power supply and PoE usage

Model	Maximum PoE output power draw (Watts)	Maximum number of PoE ports supported (15.4W)	Maximum number of PoE+ ports supported (30W)	Maximum number of High PoE ports supported (60W)	Maximum number of PoH ports supported (95W)
ICX 7450-24P	748 Watts	24	24	8	7
ICX 7450-32ZP	748 Watts	32	24	8	7
ICX 7450-48P	748 Watts	48	24	8	7

Installing the Ruckus ICX 7450

Power supplies

TABLE 9 DC power supply and PoE usage

Model	Maximum power draw from DC line input (Watts)	Maximum number of PoE ports supported (15.4W)	Maximum number of PoE+ ports supported (30W)	Maximum number of High PoE ports supported (60W)	Maximum number of PoH ports supported (95W)
ICX 7450-24P	258.5 Watts	16	8	4	2
ICX 7450-32ZP	258.5 Watts	16	8	4	2
ICX 7450-48P	258.5 Watts	16	8	4	2

Using a second power supply

In the event of an AC power loss or power supply failure, a redundant power supply (second power supply) can be installed as a backup power source to a switch. Each power supply provides a load-sharing and redundant power source (up to 250 W AC or 510 W DC for non-PoE switches, and 1000 W AC or 510 W DC for PoE switches).

Ruckus recommends that you pay attention to the PoE, PoE+, High PoE, and PoH port configuration (referred to as PoE in this section) of the switch when using a redundant power supply. When using a single power supply, a PoE switch has a maximum number of supported PoE ports. Ruckus recommends that when a redundant power source is used for a PoE switch, that the maximum number of PoE ports supported by the switch must not exceed that which can be supported by a single power supply.

For example, a Ruckus ICX 7450-24P has two power supplies installed. If you increase the maximum number of PoE ports that can be supported, and if the primary power supply fails, the redundant power supply cannot guarantee the device is protected by backup power. The redundant power supply will not have enough power to sustain the failed primary power supply. In this case, the device can go down even with the redundant power supply connected.

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.



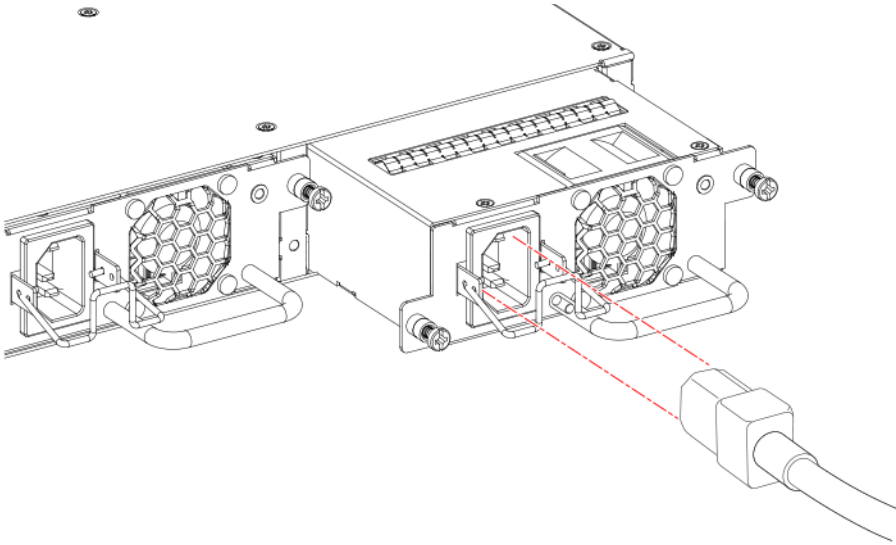
CAUTION

For Ruckus ICX 7450 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 7450.

FIGURE 50 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.
6. 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 7450 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
Empty fan and power supply slots must be covered using filler panels.

Installing a DC power supply

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.

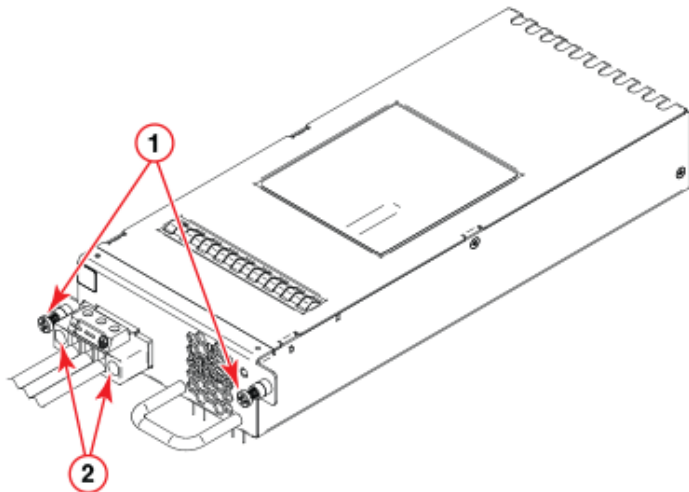
Use the following steps to install a DC power supply in the Ruckus ICX 7450.

Installing the Ruckus ICX 7450

Power supplies

1. 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 flat-head screwdriver. Refer to item 1 in [Figure 51](#).

FIGURE 51 DC power supply screws

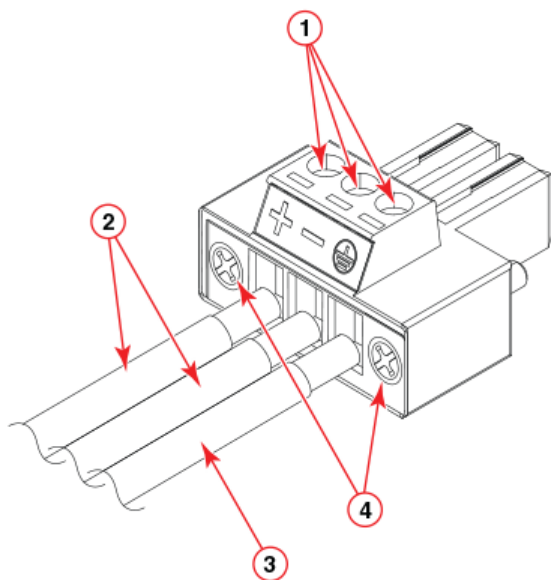


1 Chassis attachment screws

2 Assembly screws

2. 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.
3. 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 52](#).

FIGURE 52 DC power supply wiring assembly



1 Wire-tightening screws

3 Earth ground wire

2 DC power source wires

4 Assembly screws

5. Use the wire-tightening screws to secure the wires.
6. Insert the earth ground wire into the ground terminal on the DC wiring assembly. Refer to [Figure 52](#).

NOTE

This equipment installation must meet NEC/CEC Code requirements. Consult local authorities for regulations.

7. Insert the DC power supply wiring assembly with the wires connected into the power supply and tighten the assembly screws. Refer to [Figure 52](#).
8. 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.
9. 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 7450 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 7450 front-panel LEDs](#)" on page 63.

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 7450 using the mini-USB serial console port cable.

For port pinout information for the mini-USB serial console port, refer to "[Serial port specifications \(pinout - mini-USB\)](#)" on page 89.

NOTE

You must run a terminal emulation program on the PC.

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

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

Connecting to the management port

The Gigabit Ethernet management port (RJ-45) on the Ruckus ICX 7450 front panel provides an out-of-band network connection to the device. After you assign an IP address, you can access the Ruckus ICX 7450 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 7450 through its management port, connect the port to the management Ethernet network using Category 5 or better cable.

Management of the Ruckus ICX 7450 is described in detail in the *Ruckus FastIron Management Configuration Guide*.

Installing an SFP or SFP+ transceiver



DANGER

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



CAUTION

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

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 switch

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

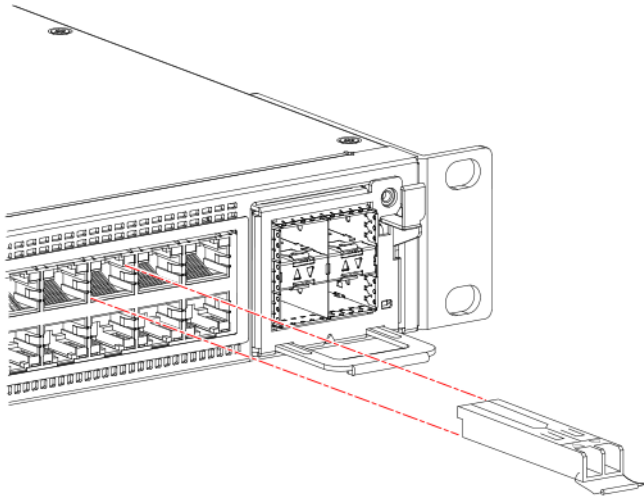
Complete the following steps to install an SFP or SFP+ transceiver.

1. Remove any protector plugs from the transceivers and the ports.
2. Making sure that the bail (wire handle) is in the unlocked position, place the SFP or SFP+ transceiver in the correctly oriented position on the port, as shown in [Figure 53](#).
3. Slide the SFP or SFP+ transceiver into the port until you feel it click into place; then close the bail.

NOTE

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

FIGURE 53 Installing an SFP or 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 pinouts, refer to ["Serial port specifications \(pinout - mini-USB\)"](#) on page 89.

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, 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 7450 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 SFP+). Refer to ["Installing an SFP or SFP+ transceiver"](#) on page 60.
- 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 62.
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 63.

NOTE

To verify that a Ruckus ICX 7450 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, 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 connector, make sure to keep the protective covering in place.

Ruckus ICX 7450 Operation

- LED activity interpretation 63
- Ruckus ICX 7450 front-panel LEDs 63
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- LED patterns 70
- Diagnostic tests and monitoring 73

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 7450 front-panel LEDs

The Ruckus ICX 7450-24 has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- Three MOD (media expansion module) monocolour status LEDs (green)
- Ten stack ID (stack identifier) monocolour indicator LEDs (green)
- 24 1 GbE port status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

1G SFP module LEDs:

- Four 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

10G SFP+ module LEDs:

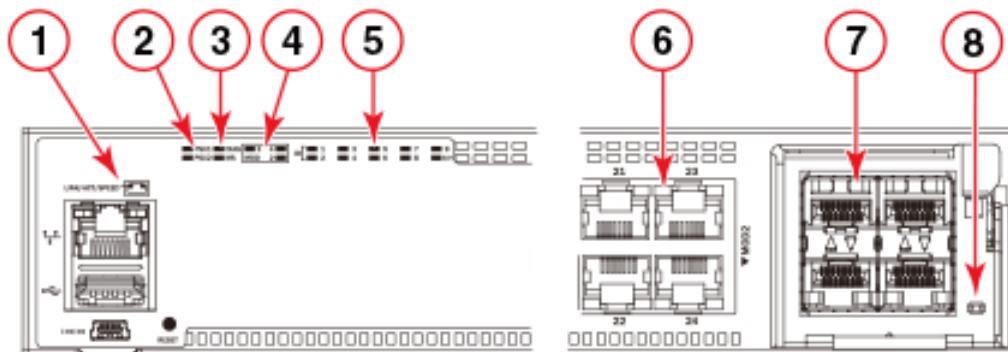
- Four 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- Four 40 GbE QSFP+ port bicolor status LEDs (green for 1x40 GbE and amber for 4x10 GbE) which indicate 1x40 GbE or 4x10 GbE mode of operation

Figure 54 shows the LEDs on the Ruckus ICX 7450-24 front panel. The up-arrow port status LEDs for the 1 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 54 Ruckus ICX 7450-24 front-panel LEDs



- | | |
|---|--|
| 1 Management port speed and link/activity LEDs | 5 Stack ID LEDs
Indicates stack unit identifier (1-12). |
| 2 PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. | 6 Ports 1-24 speed/link/activity LED |
| 3 DIAG (diagnostic) status LED and MS (stacking configuration) status LED | 7 MOD2 1/10 GbE module speed and link/activity LEDs |
| 4 MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. | 8 MOD2 1/10 GbE power LED |

The Ruckus ICX 7450-24P has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- Three MOD (media expansion module) monicolor status LEDs (green)
- Ten stack ID (stack identifier) monicolor indicator LEDs (green)
- 24 1 GbE port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation
- 24 PoE+ port monicolor status LEDs (green for providing power to attached device)

1G SFP module LEDs:

- Four 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

10G SFP+ module LEDs:

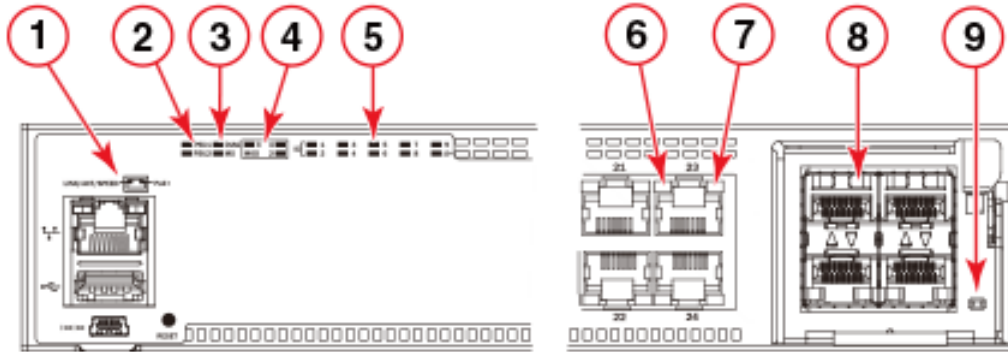
- Four 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- Four 40 GbE QSFP+ port bicolor status LEDs (green for 1x40 GbE and amber for 4x10 GbE) which indicate 1x40 GbE or 4x10 GbE mode of operation

Figure 55 shows the LEDs on the Ruckus ICX 7450-24P front panel. The up-arrow port status LEDs for the 1 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 55 Ruckus ICX 7450-24P front-panel LEDs



- | | |
|---|--|
| <ol style="list-style-type: none"> 1 Management port speed and link/activity LEDs 2 PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. 3 DIAG (diagnostic) status LED and MS (stacking configuration) status LED 4 MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. 5 Stack ID LEDs
Indicates stack unit identifier (1-12). | <ol style="list-style-type: none"> 6 Ports 1-24 speed and link/activity LEDs 7 PoE power LEDs. The PoE indicator is on if a port is providing power to the connected device, and off if it is not supplying power. 8 MOD2 1/10 GbE module speed and link/activity LEDs 9 MOD2 1/10 GbE power LED |
|---|--|

NOTE

PoE/PoE+ power is available to ports 1-24. High PoE/PoH is limited to ports 1-8.

The Ruckus ICX 7450-32ZP has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- Three MOD (media expansion module) monicolor status LEDs (green)
- Ten stack ID (stack identifier) monicolor indicator LEDs (green)
- 24 1 GbE port bicolor status LEDs for ports 1-24 (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation
- 8 2.5 GbE port bicolor status LEDs for ports 25-32 (green for 2.5 GbE and amber for 100/1000 Mbps Ethernet) which indicate 2.5 GbE, 1 GbE, or 100 Mbps Ethernet mode of operation
- 32 PoE+ port monicolor status LEDs (green for providing power to attached device)

Ruckus ICX 7450 Operation

Ruckus ICX 7450 front-panel LEDs

10G SFP+ module LEDs:

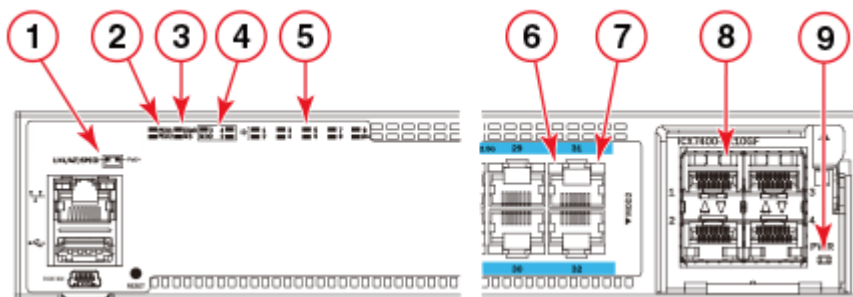
- Four 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- Four 40 GbE QSFP+ port bicolor status LEDs (green for 1x40 GbE and amber for 4x10 GbE) which indicate 1x40 GbE or 4x10 GbE mode of operation

Figure 56 shows the LEDs on the Ruckus ICX 7450-32ZP front panel. The up-arrow port status LEDs for the 1 GbE and 2.5 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 56 Ruckus ICX 7450-32ZP front-panel LEDs



- | | | | |
|---|---|---|---|
| 1 | Management port speed and link/activity LEDs | 6 | Ports 1-32 speed and link/activity LEDs |
| 2 | PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. | 7 | PoE power LEDs. The PoE indicator is on if a port is providing power to the connected device, and off if it is not supplying power. |
| 3 | DIAG (diagnostic) status LED and MS (stacking configuration) status LED | 8 | MOD2 10 GbE module speed and link/activity LEDs |
| 4 | MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. | 9 | MOD2 10 GbE module power LED |
| 5 | Stack ID LEDs
Indicates stack unit identifier (1-12). | | |

NOTE

PoE/PoE+ power is available to ports 1-32. High PoE/PoH is limited to ports 1-8.

The Ruckus ICX 7450-48 has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- Three MOD (media expansion module) monicolor status LEDs (green)
- Ten stack ID (stack identifier) monicolor indicator LEDs (green)
- 48 1 GbE bicolor port status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

1G SFP module LEDs:

- Four 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

10G SFP+ module LEDs:

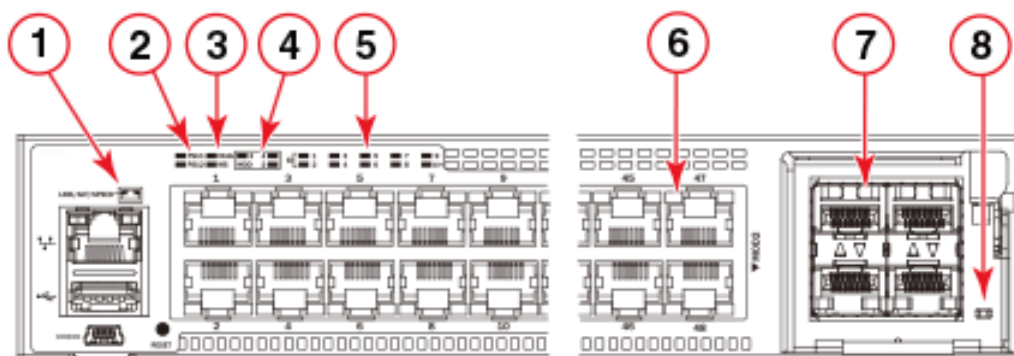
- Four 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- One 40 GbE QSFP+ port bicolor status LED (green for 1x40 GbE and amber for 4x10 GbE) which indicates 1x40 GbE mode of operation

Figure 57 shows the LEDs on the Ruckus ICX 7450-48 front panel. The up-arrow port status LEDs for the 1 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 57 Ruckus ICX 7450-48 front-panel LEDs



- | | |
|---|--|
| 1 Management port speed and link/activity LEDs | 5 Stack ID LEDs
Indicates stack unit identifier (1-12). |
| 2 PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. | 6 Ports 1-48 speed/link/activity LED |
| 3 DIAG (diagnostic) status LED and MS (stacking configuration) status LED | 7 MOD2 1/10 GbE module speed and link/activity LEDs |
| 4 MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. | 8 MOD2 1/10 GbE power LED |

The Ruckus ICX 7450-48P has the following LEDs on the front panel:

- Two management port status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG (diagnostic) bicolor status LED (green and amber)
- One MS (stacking configuration) bicolor status LED (green and amber)
- Three MOD (media expansion module) monocolour status LEDs (green)

Ruckus ICX 7450 Operation

Ruckus ICX 7450 front-panel LEDs

- Ten stack ID (stack identifier) monicolor indicator LEDs (green)
- 48 1 GbE port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation
- 48 PoE+ port monicolor status LEDs (green for providing power to attached device)

1G SFP module LEDs:

- Four 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

10G SFP+ module LEDs:

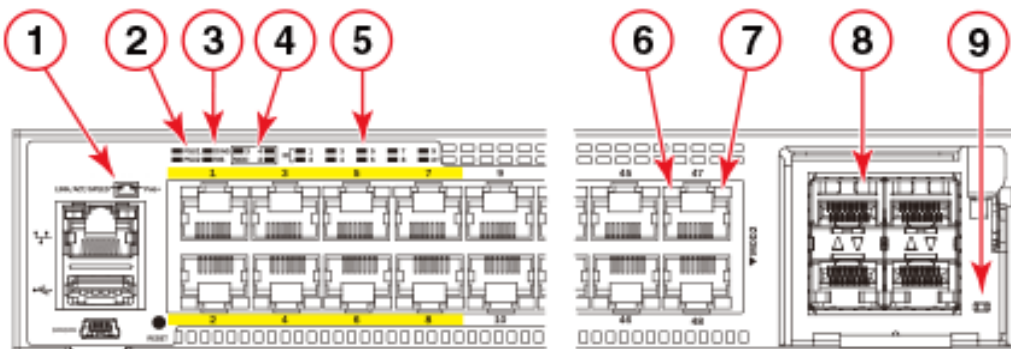
- Four 1/10 GbE SFP+ port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- One 40 GbE QSFP+ port bicolor status LED (green for 1x40 GbE and amber for 4x10 GbE) which indicates 1x40 GbE mode of operation

Figure 58 shows the LEDs on the Ruckus ICX 7450-48P front panel. The up-arrow port status LEDs for the 1 GbE ports correspond to the upper, odd-numbered ports; the down-arrow port status LEDs correspond to the lower, even-numbered ports.

FIGURE 58 Ruckus ICX 7450-48P front-panel LEDs



- | | |
|---|---|
| 1 Management port speed and link/activity LEDs | 6 Ports 1-48 speed and link/activity LEDs |
| 2 PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. | 7 PoE power LEDs. The PoE indicator is on if a port is providing power to the connected device, and off if it is not supplying power. |
| 3 DIAG (diagnostic) status LED and MS (stacking configuration) status LED | 8 MOD2 1/10 GbE module speed and link/activity LEDs |
| 4 MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. | 9 MOD2 1/10 GbE power LED |
| 5 Stack ID LEDs
Indicates stack unit identifier (1-12). | |

NOTE

PoE/PoE+ power is available to ports 1-48. High PoE/PoH is limited to ports 1-8.

The Ruckus ICX 7450-48F has the following LEDs on the front panel:

- Two management port monicolor status LEDs (green) for speed and link/activity
- Two power supply unit (PSU) bicolor status LEDs (green and amber) labeled PSU1 and PSU2
- One DIAG bicolor status LED (green and amber)
- One MS bicolor status LED (green and amber)
- Three MOD monicolor status LEDs (green)
- Ten stack ID (stack ID) monicolor status LEDs (green)
- 48 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) that indicate 1 GbE or 100 Mbps mode of operation

1G SFP module LEDs:

- Four 1 GbE SFP port bicolor status LEDs (green for 1 GbE and amber for 10/100 Mbps Ethernet) which indicate 1 GbE or 10/100 Mbps Ethernet mode of operation

10G SFP+ module LEDs:

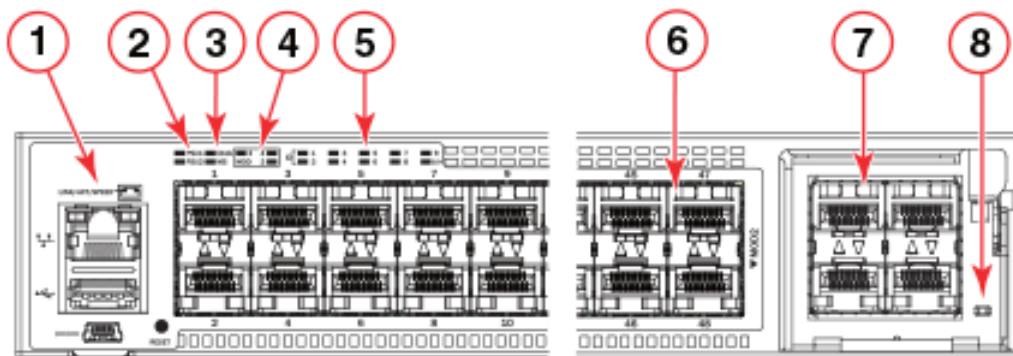
- Four 1/10 SFP+ GbE port bicolor status LEDs (green for 10 GbE and amber for 1 GbE) which indicate 1 GbE or 10 GbE mode of operation

40G QSFP+ module LEDs:

- One 40 GbE QSFP+ port bicolor status LED (green for 1x40 GbE and amber for 4x10 GbE) which indicates 1x40 GbE mode of operation

Figure 59 shows the LEDs on the Ruckus ICX 7450-48F 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 59 Ruckus ICX 7450-48F front-panel LEDs



- | | |
|---|--|
| 1 Management port speed and link/activity LEDs | 5 Stack ID LEDs
Indicates stack unit identifier (1-12). |
| 2 PSU1 and PSU2 status LEDs
PSU1 corresponds to the right power supply slot on the rear panel and PSU2 to the left power supply slot, as viewed from the rear. | 6 Ports 1-48 speed and link/activity LED |
| 3 DIAG (diagnostic) status LED and MS (stacking configuration) status LED | 7 MOD2 1/10 GbE module speed and link/activity LEDs |
| 4 MOD (media expansion module) LEDs. Module 2 is located on the right side of the front panel. Module 3 and 4 are the right and left stacking modules on the rear panel, as viewed from the rear. | 8 MOD2 1/10 GbE power LED |

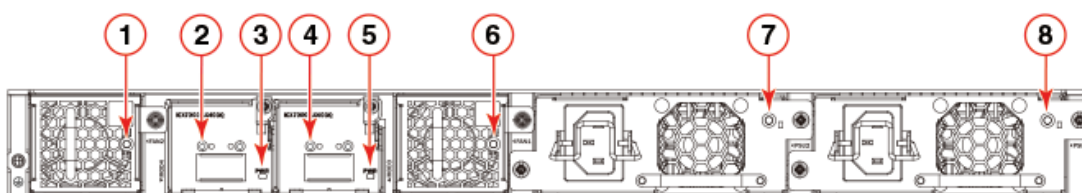
Ruckus ICX 7450 rear-panel LEDs

The Ruckus ICX 7450 has the following LEDs on the rear panel:

- Expansion module power LED: One bicolor status LED (green and amber)
- QSFP+ module LEDs: Four status LEDs (green) for the stacking port on the QSFP+ modules. Only the first LED is currently used, and indicates the status of the port in 40 GbE mode.
- Power supply LEDs: One bicolor status LED (green and amber) on each installed power supply
- Fan tray LEDs: One bicolor status LED (green and amber) on each installed fan tray

Figure 60 shows the LEDs on the rear panel of the Ruckus ICX 7450.

FIGURE 60 Ruckus ICX 7450 rear-panel LEDs



- | | |
|--|---------------------|
| 1 FAN2 fan tray LED | 5 MOD3 power LED |
| 2 MOD4 40 GbE QSFP+ link/activity LED for stacking | 6 FAN1 fan tray LED |
| 3 MOD4 power LED | 7 PSU2 status LED |
| 4 MOD3 40 GbE QSFP+ link/activity LED for stacking | 8 PSU1 status LED |

LED patterns

The following tables describe the Ruckus ICX 7450 LED patterns.

TABLE 10 Management port left (10/100/1000 Mbps) status LED

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

TABLE 11 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 at 1000 Mbps.	No action required.

TABLE 12 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 (such as PSU fan failure).	Verify that the PSU power cord is connected to a functioning power source. Replace power supply.

TABLE 13 DIAG LED

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

TABLE 14 MS LED

LED state	Status of hardware	Recommended action
Off (no light)	Stacking mode is enabled and the switch is a stack member operating in slave mode, or the switch is operating in standalone mode.	No action required.
Blinking green	Device is initializing.	No action required.
Steady green	Stacking mode is enabled and the switch is the stack master.	No action required.
Steady amber	Stacking mode is enabled and the switch is the standby controller.	No action required.
Blinking amber	Stacking mode is initializing and the switch is in stacking master arbitration/selection state.	No action required.

TABLE 15 MOD LED

LED state	Status of hardware	Recommended action
Off (no light)	Module is used for stacking or no module is installed. For stacking modules, this means that stacking mode is enabled and the switch is a stack member, or the switch is operating in standalone mode.	No action required.
Steady green	Module is operating normally. For stacking modules, this means that stacking mode is enabled and the switch is the stack master.	No action required.

TABLE 16 Stack ID 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	Indicates stack unit identifier. (Unit numbers 11 and 12 are shown by using the 10+ LED in combination with the 1 or 2 LED.)	No action required.

TABLE 17 10/100/1000 Mbps 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 1000 Mbps mode.	No action required.
Blinking green	There is 1000 Mbps 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 18 100/1000 Mbps and 2.5 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 2.5 GbE mode.	No action required.
Blinking green	There is 2.5 GbE traffic and packets are being transmitted or received.	No action required.
Steady amber	Link is up in 100/1000 Mbps mode.	No action required.
Blinking amber	There is 100/1000 Mbps traffic and packets are being transmitted or received.	No action required.

TABLE 19 RJ-45 PoE LEDs

LED state	Status of hardware	Recommended action
Steady green	Port is providing PoE ¹ power to a connected device.	No action required.
Off	Port is not providing PoE power.	No action required.

1. Indicates PoE, PoE+, High PoE, or PoH.

TABLE 20 100/1000 Mbps SFP module 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 100 Mbps mode.	No action required.
Blinking amber	There is 100 Mbps traffic and packets are being transmitted or received.	No action required.

TABLE 21 1/10 Gbps RJ-45 module 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 22 1/10 GbE SFP+ module 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 23 40 GbE mode QSFP+ module 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 (MOD2 data uplink mode or MOD3/MOD4 stacking mode).	No action required.
Blinking green	There is 40 GbE traffic and packets are being transmitted or received.	No action required.

TABLE 24 4x10 GbE mode QSFP+ module 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 (MOD2 data uplink mode).	No action required.
Blinking amber	There is 10 GbE traffic and packets are being transmitted or received.	No action required.

TABLE 25 Module power LED (all media, service and stacking modules)

LED state	Status of hardware	Recommended action
Off (no light)	Module is not receiving power.	Replace module.
Steady green	Module is on and functioning properly.	No action required.
Steady amber	Module is on and booting up.	No action required.

TABLE 26 Fan tray LED

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

Ruckus ICX 7450 Operation

Diagnostic tests and monitoring

- EEPROMS
- CPU packet
- Line rate

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

System diagnostic testing runs at link speeds of 10 Gbps or 40 Gbps (for MOD2 QSFP+ data uplink ports) or 40 Gbps (for MOD3/MOD4 QSFP+ stacking ports) depending on the speed of the link being tested and the type of port.

Managing the Ruckus ICX 7450

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- Hardware maintenance schedule 75
- Replacing a fiber-optic transceiver 75
- FRU removal and replacement procedures 77
- Replacing a power supply unit 77
- Replacing fan trays 79
- Replacing an expansion module or service module 80



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



CAUTION
Do not unscrew and remove the top cover of the Ruckus ICX 7450. There are no user-serviceable parts inside the Ruckus ICX 7450.

Temperature threshold levels

The fan speed settings are set by the Ruckus ICX 7450, and are not configurable.

Hardware maintenance schedule

Ruckus ICX 7450 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 fiber-optic transceiver

You can remove an SFP, SFP+, or QSFP+ transceiver from a slot and replace it with a new one while the Ruckus ICX 7450 is powered on and running.

This section provides information about the following tasks:

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

Removing a fiber-optic transceiver

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



CAUTION

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

To remove a fiber-optic transceiver from an SFP, SFP+, or QSFP+ 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 fiber cable connector from the port connector.
3. Unlock the fiber-optic transceiver by pulling the bail latch forward, away from the front of the slot.

NOTE

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, SFP+, or QSFP+ transceiver.

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

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.

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 76.

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, 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, 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 7450 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.



CAUTION

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 7450, MISMATCH in Fan Air Flow direction. Replace FRU with fan air flows in the same direction.
- For a power supply: [WARNING, Ruckus ICX 7450, 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 61](#) illustrates examples of the airflow labels.

FIGURE 61 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 7450 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 12](#) on page 71 describes the Ruckus ICX 7450 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 [Table 12](#) on page 71).
- 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 7450 should take less than two minutes to complete.

You need the following items to replace a power supply in a Ruckus ICX 7450:

- 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 7450.

1. To leave the Ruckus ICX 7450 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.



CAUTION

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 front-panel PSU LED for the new power supply displays steady green while the Ruckus ICX 7450 is operating. If the LED is not steady green, ensure that the power supply is securely installed and seated properly. For information about the PSU1 and PSU2 LEDs on the switch front panel, refer to [Table 12](#) on page 71.

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 7450 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 7450 includes two redundant, hot-swappable fan units. However, it can run on one power supply and one fan. 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.



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.

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 assembly in the Ruckus ICX 7450 should take less than two minutes to complete.

You need the following items to replace a fan assembly in the Ruckus ICX 7450:

Managing the Ruckus ICX 7450

Replacing an expansion module or service module

- A new fan assembly (must have the same part number and the same airflow label as the fan assembly being replaced; refer to [Figure 61](#) on page 77 for the location of the airflow label)
- A #1 Phillips screwdriver

Installing or replacing the fan assembly

Complete the following steps to install or replace a fan assembly in a Ruckus ICX 7450.

1. If replacing a fan assembly:
 - a. Using a Phillips screwdriver, unscrew the captive screw on the fan assembly.
 - b. Remove the fan assembly from the chassis by pulling the handle on the fan assembly out and away from the chassis.
 - c. Ensure that the replacement fan assembly has the same part number and airflow label as the fan assembly being replaced.
2. If installing a new fan assembly into a slot covered with a filler panel:
 - a. Using a Phillips screwdriver, unscrew the captive screw on the filler panel.
 - b. Remove the filler panel.
3. Before opening the package that contains the new fan 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.



CAUTION

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

Empty fan and power supply slots must be covered using filler panels.

Replacing an expansion module or service module

The Ruckus ICX 7450 includes one front-panel slot and two rear-panel slots for media expansion or service modules, including a 4-port SFP 1 GbE module, a 4-port SFP+ 10 GbE module, a 4-port Copper 10 GbE module, or a 1-port QSFP+ 40 GbE module. The slots in which these modules can be installed are listed in [Table 3](#) on page 18. If not installed, the empty expansion module slot must be covered using the filler panel.



CAUTION

Disassembling any part of the expansion module or service 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 or service module in the Ruckus ICX 7450 should take less than two minutes to complete.

You need the following items to replace an expansion module or service module in the Ruckus ICX 7450:

- A new expansion module or service module
- A #1 Phillips screwdriver

Installing or replacing an expansion module or service module

Complete the following steps to install or replace an expansion module or service module in the Ruckus ICX 7450.

1. Power off the switch.



CAUTION

The expansion modules are not hot-swappable.

2. 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.
3. 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.
4. 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.
5. Remove the expansion module from the anti-static shielded bag.



CAUTION

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

6. 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.
7. When you are sure the expansion module has properly engaged the connector, tighten the captive screws to secure the expansion module in the slot.
8. Push the release latch lever on the module into its closed position.
9. Power on the switch.
10. Verify correct installation by running the **show module** command.



CAUTION

Empty expansion module slots must be covered using filler panels.

Managing the Ruckus ICX 7450

Replacing an expansion module or service module

Ruckus ICX 7450 Specifications

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System specifications

System component	Description
Enclosure	Stackable up to 12 switches per stack, chassis-mountable in a standard 2 or 4-post rack
Power supplies	Dual redundant, hot-swappable power supplies supported with 250 W AC intake or exhaust airflow for non-PoE switches, 1000 W AC with intake or exhaust airflow for PoE switches, and 510 W DC intake or exhaust airflow for PoE or non-PoE switches. Shipping bundle has one power supply and one fan unit.
Fans	One dual redundant, hot-swappable fan unit with intake or exhaust airflow
Cooling	Forced-air cooling front-to-back or back-to-front
System architecture	<p>Non-blocking shared-memory switch</p> <p>ICX 7450-24: 24 1-GbE RJ-45 ports, four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit</p> <p>ICX 7450-24P: 24 1-GbE RJ-45 ports (supporting PoE, PoE+, High PoE, PoH), four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit</p> <p>ICX7450-32ZP: 24 1-GbE RJ-45 ports, 8 2.5-GbE RJ-45 ports (supporting PoE, PoE+, High PoE, PoH), four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit</p> <p>ICX 7450-48: 48 1-GbE RJ-45 ports, four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit.</p> <p>ICX 7450-48P: 48 1-GbE RJ-45 ports (supporting PoE, PoE+, High PoE, PoH), four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit.</p> <p>ICX 7450-48F: 48 1-GbE SFP ports, four 10-GbE SFP+ uplink ports, two 40-GbE QSFP+ stacking ports, one power supply, and one fan unit</p>
System processors	BCM56548 with dual-core ARM Cortex A9 processor running at 1 GHz

Ethernet

These are standard modules for shipping bundles. For Ruckus ICX 7450 non-bundled switches, expansion modules need to be ordered separately.

System component	Description	Maximum ports supported
40 GbE QSFP+ ports	1 40 GbE QSFP+ stacking or uplink port	3 (slot 2-4) for ICX 7450-24/24P 2 (slot 3-4) for ICX 7450-48/48P/48F/32ZP
10 GbE SFP+ ports	4 10 GbE SFP+ uplink ports	12 (slot 2-4)
10 GbE copper ports	4 10 GbE RJ-45 uplink ports	12 (slot 2-4)
1 GbE SFP ports (optional modules)	4 1 GbE SFP uplink ports	12 (slot 2-4)
1 GbE RJ-45 front-panel ports	24 1 GbE RJ-45 ports for ICX 7450-24/24P/32ZP 48 1 GbE RJ-45 ports for ICX 7450-48/48P	24/48 (slot 1)
2.5 GbE RJ-45 front-panel ports	8 2.5 GbE RJ-45 ports for ICX 7450-32ZP	8 (slot 1)
1 GbE SFP front-panel ports	48 1 GbE SFP for ICX 7450-48F	48 (slot 1)
Ethernet management port	1 RJ-45 port with 10/100/1000 Mbps auto-negotiating capability	N/A

LEDs

System component	Description
Switch status and management	Six LED types indicate switch status: PSU (power supply unit) DIAG (diagnostics) MS (stacking configuration) Stack ID (1-12) MOD (expansion module or service module) PWR (expansion module or service module power)
Ports	LEDs indicate port status (speed and link/activity) and PoE status (on and off)

Other

System component	Description
Serial cable	1 (Mini-USB to RJ-45)
RJ-45 to DB9 adapter	1
AC power cord, power clip	For ICX 7450-24, 24P, 48, 48P, and 48F units

Weight and physical dimensions

Model	Height	Width	Depth	Weight (with basic modules)	Fully loaded weight (no transceivers)
ICX 7450-24	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	6.40 kg 14.11 lb	8.57 kg 18.89 lb
ICX 7450-24P	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	6.90 kg 15.21 lb	9.02 kg 19.89 lb
ICX 7450-32ZP	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	7.14 kg 15.74 lb	8.91 kg 19.64 lb
ICX 7450-48	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	6.50 kg 14.33 lb	8.74 kg 19.20 lb
ICX 7450-48P	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	7.10 kg 15.65 lb	9.21 kg 20.30 lb
ICX 7450-48F	4.37 cm 1.72 inches	40.00 cm 17.32 inches	39.37 cm 15.50 inches	6.80 kg 14.99 lb	8.94 kg 19.71 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient Temperature	-5°C to 50°C (23°F to 122°F) NOTE: Maximum operation temperature of 50°C applies to sea level and decreases by 1°C for every 1000 feet altitude increase per NEBS rule. If Back-to-Front airflow is chosen and only a single fan is in service, maximum operation temperature decreases by 5°C.	-40°C to 70°C (-40°F to 158°F)
Relative Humidity (non-condensing)	10% to 90% at 50°C (122°F)	5% to 95% at 70°C (158°F)
Altitude (above sea level)	0 to 3,048 m (10,000 ft)	0 to 12,000 m (39,370 ft)
Shock	20 G, 11 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	1 G sine, 0.4 grms random, 5-500 Hz	2.4 G sine, 1.1 grms random, 5-500 Hz
Airflow	Nominal: 5-7 cfm, Maximum: 17-20 cfm.	N/A
Heat dissipation (+/- 5%)	NOTE: Refer to " Power consumption (typical configuration) " on page 86 and " Power consumption (maximum configuration) " on page 87 for detailed information on heat dissipation.	N/A

Ruckus ICX 7450 Specifications
Power supply specifications (per PSU)

Condition	Operational	Non-operational
Operating noise	ICX 7450-24: 46 dBA ICX 7450-24P: 49 dBA ICX 7450-32ZP: 47 dBA ICX 7450-48: 47 dBA ICX 7450-48P: 49 dBA ICX 7450-48F: 46 dBA	N/A
MTBF @ 25°C	ICX 7450-24: 399,973 Hours ICX 7450-24P: 317,719 Hours ICX 7450-32ZP: 568,376 Hours ICX 7450-48: 376,635 Hours ICX 7450-48P: 297,862 Hours ICX 7450-48F: 330,154 Hours	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
AC RPS15-E	250 W	100-240V~	50-60Hz	4.0A	Fuses	35A
AC RPS15-I	250 W	100-240V~	50-60Hz	4.0A	Fuses	35A
AC RPS16-E	1000 W	100-240V~	50-60Hz	11.8A	Fuses	35A
AC RPS16-I	1000 W	100-240V~	50-60Hz	11.8A	Fuses	35A
DC RPS16DC-E	510 W	40-72V	-	15.5A	Fuses	40A
DC RPS16DC-I	510 W	40-72V	-	15.5A	Fuses	40A

Power consumption (typical configuration)

All 1 G and two 10 G ports are linked up (no other port links), loading with 10 percent traffic rate and no PoE load. 2 fan FRUs, 4x10GC uplink, and no stacking module. Fans at nominal speed.

ICX7450-32ZP: 24 1-Gig+8 2.5-Gig and Slot1: Empty, Slot2: 4x10GF, Slot3: 4x10GF ports are linked UP, loading with 10% traffic rate. Two Fans at nominal speed.

Model name (Input power ±5%)	@100 VAC Input	@200 VAC Input	@-48VDC	Minimum number of power supplies	Notes
ICX 7450-24	88.5 W	87.6 W	80.6W	1 x 250 W AC	1 PSU
	302 BTU/hr	299 BTU/hr	276 BTU/hr	1 x 510 W DC	
	100.1 W	99.2 W	85.3W	1 x 250 W AC	2 PSUs
	342 BTU/hr	339 BTU/hr	291 BTU/hr	1 x 510 W DC	

Model name (Input power ±5%)	@100 VAC Input	@200 VAC Input	@-48VDC	Minimum number of power supplies	Notes
ICX 7450-24P	95.3 W 325 BTU/hr	94.1 W 321 BTU/hr	82.6W 282 BTU/hr	1 x 1000 W AC 1 x 510 W DC	1 PSU, no PoE load.
	112.9 W 386 BTU/hr	111.7 W 381 BTU/hr	87.58 W 291 BTU/hr	1 x 1000 W AC 1 x 510 W DC	2 PSUs, no PoE load
ICX 7450-32ZP	120.46 W 411.14 BTU/hr	118.59 W 404.76 BTU/hr	105.27 W 359.29 BTU/hr	1 x 1000 W AC 1 x 510 W DC	1 PSU, no PoE load.
	130.57 W 445.65 BTU/hr	128.32 W 437.97 BTU/hr	109.31 W 373.08 BTU/hr	2 x 1000 W AC 2 x 510 W DC	2 PSUs, no PoE load
ICX 7450-48	117.6 W 402 BTU/hr	115.9 W 442 BTU/hr	107.6 W 367 BTU/hr	1 x 250 W AC 1 x 510 W DC	1 PSU
	129.4 W 451 BTU/hr	128.4 W 438 BTU/hr	115.94 W 396 BTU/hr	1 x 250 W AC 1 x 510 W DC	2 PSUs
ICX 7450-48P	129.7 W 443 BTU/hr	143 W 488 BTU/hr	115.1W 393 BTU/hr	1 x 1000 W AC 1 x 510 W DC	1 PSU, no PoE load.
	128.2 W 438 BTU/hr	141.1 W 482 BTU/hr	118.82W 406 BTU/hr	1 x 1000 W AC 1 x 510 W DC	2 PSUs, no PoE load
ICX 7450-48F	141.4 W 420 BTU/hr	139.6 W 477 BTU/hr	129.2W 441 BTU/hr	1 x 250 W AC 1 x 510 W DC	1 PSU
	152.8 W 522 BTU/hr	151.6 W 518 BTU/hr	132.78W 474 BTU/hr	1 x 250 W AC 1 x 510 W DC	2 PSUs

Power consumption (maximum configuration)

All 1 G and two 10 G ports are linked up (no other port links), loading with 100 percent traffic rate and 100 percent PoE load. 2 PSUs, two fan FRUs, 4x10GC uplink, no stacking module, fans at high speed.

ICX7450-32ZP: 24 1-Gig + 8 2.5Gig and Slot1: Empty, Slot2: 4x10GF, Slot3: 4x10GF are linked UP, 100% traffic and PoE load.

Model name (Input power ±5%)	@100 VAC input	@200 VAC input	@-48VDC	Minimum number of power supplies	Notes
ICX 7450-24	119.7 W 409 BTU/hr	118.5 W 405 BTU/hr	113.8 W 388 BTU/hr	1 x 250 W AC 1 x 510 W DC	1 PSU
	134.9 W 461 BTU/hr	133 W 454 BTU/hr	125.24 W 428 BTU/hr	1 x 250 W AC 1 x 510 W DC	2 PSUs
ICX 7450-24P	947 W 3232 BTU/hr	919 W 3137 BTU/hr	387.2 W 1322 BTU/hr	1 x 1000 W AC 1 x 510 W DC	1 PSU
	1402 W 4785 BTU/hr	1374 W 4690 BTU/hr	669.06 W 2284 BTU/hr	2 x 1000 W AC 2 x 510 W DC	2 PSUs required for PoE loading

Ruckus ICX 7450 Specifications

Power consumption (modules)

Model name (Input power ±5%)	@100 VAC input	@200 VAC input	@-48VDC	Minimum number of power supplies	Notes
ICX 7450-32ZP	167.1 W 570.33 BTU/hr	164.06 W 559.95 BTU/hr	145.98 W 498.24 BTU/hr	2 x 1000 W AC 2 x 510 W DC	1 PSU
	11853.08 W 6324.71 BTU/hr	1763.55 W 6019.14 BTU/hr	698.79 W 2385.03 BTU/hr	2 x 1000 W AC 2 x 510 W DC	2 PSUs required for PoE loading
ICX 7450-48	154.4 W 527 BTU/hr	151.8 W 518 BTU/hr	146.1 W 499 BTU/hr	1 x 250 W AC 1 x 510 W DC	1 PSU
	168.8 W 576 BTU/hr	167.4 W 572 BTU/hr	156.68 W 535 BTU/hr	1 x 250 W AC 1 x 510 W DC	2 PSUs
ICX 7450-48P	998 W 3406 BTU/hr	958 W 3270 BTU/hr	421.4 W 1438 BTU/hr	1 x 1000 W AC 1 x 510 W DC	1 PSU
	1809 W 6174 BTU/hr	1769 W 6038 BTU/hr	704.12 W 2403 BTU/hr	1 x 1000 W AC 1 x 510 W DC	2 PSUs required for PoE loading
ICX 7450-48F	178.3 W 609 BTU/hr	175.7 W 606 BTU/hr	167.1W 570 BTU/hr	1 x 250 W AC 1 x 510 W DC	1 PSU
	196.4 W 670 BTU/hr	194.1 W 663 BTU/hr	177.64W 606 BTU/hr	1 x 250 W AC 1 x 510 W DC	2 PSUs

Power consumption (modules)

Name	Description	Power consumption
ICX7400-4X1GF	4-port 1 GbE SFP expansion module	Typical = 5.40 W Maximum = 5.76 W
ICX7400-4X10GF	4-port 1/10 GbE SFP+ expansion module	Typical = 12.96 W Maximum = 15.72 W
ICX7400-4X10GC	4-port 1/10 GbE copper expansion module	Typical = 18.72 W Maximum = 20.76 W
ICX7400-1X40GQ	1-port 40 GbE QSFP+ data uplink / stacking module	Typical = 5.64 W Maximum = 7.38 W
ICX-FAN10-E	Power-supply exhaust airflow fan (two fans required if two power supplies are used)	Typical = 4.68 W Maximum = 16.68 W
ICX-FAN10-I	Power-supply intake airflow fan (two fans required if two power supplies are used)	Typical = 4.68 W Maximum = 16.68 W

Data port specifications (Ethernet)

Model name	Port type	Number (in module)	Description
ICX 7450-24	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	4 (ICX7400-4X1GF)	SFP uplink ports, compatible with SX or LX optical transceivers
	1 GbE	24 (slot 1)	RJ-45 ports
ICX 7450-24P	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, 40 Gbps, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	4 (ICX7400-4X1GF)	SFP uplink ports, compatible with SX or LX optical transceivers
	1 GbE	24 (slot 1)	RJ-45 ports with PoE support
ICX 7450-32ZP	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, 40 Gbps, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable.
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	2.5 GbE	8 (slot 1)	RJ-45 ports with PoE support
	1 GbE	24 (slot 1)	RJ-45 ports with PoE support
ICX 7450-48	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	4 (ICX7400-4X1GF)	SFP uplink ports, compatible with SX or LX optical transceivers
	1 GbE	48 (slot 1)	RJ-45 ports
ICX 7450-48P	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	4 (ICX7400-4X1GF)	SFP uplink ports, compatible with SX or LX optical transceivers
	1 GbE	48 (slot 1)	RJ-45 ports with PoE support
ICX 7450-48F	40 GbE	2 (ICX7400-1X40GQ)	QSFP+ stacking ports, compatible with LR4 or SR4 optical transceivers, or direct attached copper cable
	10 GbE	4 (ICX7400-4X10GC)	SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	4 (ICX7400-4X1GF)	SFP uplink ports, compatible with SX or LX optical transceivers
	1 GbE	48 (slot 1)	SFP ports, compatible with 100Base-FX IR or LR SFP optic for SMF, 100Base-FX SFP optic MMF, 1000Base-BXD SFP optic SMF, 1000Base-BXU SFP optic SMF, 1000Base-LHA SFP optic SMF, 1000Base-LX SFP optic SMF, 1000Base-SX SFP optic MMF, 1000BASE-TX SFP Copper

Serial port specifications (pinout - mini-USB)

Pin	Signal	Description
1	Reserved	Not used
2	UART0_RX	Debug port (data received by ICX)
3	UART0_TX	Console port (data transmitted by ICX)

Ruckus ICX 7450 Specifications

Serial port specifications (pinout RJ-45)

Pin	Signal	Description
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	2 GB
Boot Flash	NOR Flash	8 MB
Compact Flash	eUSB NAND flash	2 GB
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

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)

Ruckus ICX 7450 Regulatory Statements

- USA (FCC CFR 47 Part 15 Warning) 93
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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.



CAUTION

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)： ICX7450-24, ICX7450-48, ICX7450-48F 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	-	○	○	○	○	○
<p>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.</p> <p>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.</p> <p>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.</p>						

型號: ICX7450-24

系列型號: ICX7450-24-40G-E, ICX7450-24-E, ICX7450-24P-E-RMT3, ICX7450-24P, ICX7450-24P-E, ICX7450-24P-40G-E, ICX7450-24P-E2

型號: ICX7450-48

系列型號: ICX7450-48-E, ICX7450-48P, ICX7450-48P-E, ICX7450-48P-E2, ICX7450-48P-E-RMT3, ICX7450-48P-STK-E, ICX7450-48P-STK-E-RMT3

型號: ICX7450-48F

系列型號: ICX7450-48F-E, ICX7450-48F-E-RMT3, ICX7450-48F-E2

Ruckus ICX 7450 Cautions and Danger Notices

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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	All devices with DC power supplies (Ruckus ICX 7450) 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 7450) 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 7450) 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 7450) 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).

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.

Ruckus ICX 7450 Cautions and Danger Notices

Cautions

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 Stromkreisweiges für jede Wechselstrom-Elektroschnur 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 Eingangstromanschlüssen.
MISE EN GARDE	Assurez-vous que le dispositif ne risque pas de surcharger les circuits d'alimentation, le câblage et la protection de surintensité. Pour déterminer le risque de surcharge des circuits d'alimentation, additionnez l'intensité nominale (ampères) de tous les dispositifs installés sur le même circuit que le dispositif en question. Comparez alors ce total avec la limite de charge du circuit. L'intensité nominale maximum en ampères est généralement imprimée sur chaque dispositif près des connecteurs d'entrée d'alimentation.
PRECAUCIÓN	Verifique que el instrumento no sobrecargue los circuitos de corriente, el cableado y la protección para sobrecargas. Para determinar la posibilidad de sobrecarga en los circuitos de suministros, añada las capacidades nominales de corriente (amp) de todos los instrumentos instalados en el mismo circuito que el instrumento. Compare esta suma con el límite nominal para el circuito. Las capacidades nominales de corriente máximas están generalmente impresas en los instrumentos, cerca de los conectores de corriente de entrada.

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

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	Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
VORSICHT	Falls dieses Gerät verändert oder modifiziert wird, ohne die ausdrückliche Genehmigung der für die Einhaltung der Anforderungen verantwortlichen Partei einzuholen, kann dem Benutzer der weitere Betrieb des Gerätes untersagt werden.
MISE EN GARDE	Les éventuelles modifications apportées à cet équipement sans avoir été expressément approuvées par la partie responsable d'en évaluer la conformité sont susceptibles d'annuler le droit de l'utilisateur à utiliser cet équipement.
PRECAUCIÓN	Si se realizan cambios o modificaciones en este dispositivo sin la autorización expresa de la parte responsable del cumplimiento de las normas, la licencia del usuario para operar este equipo puede quedar anulada.

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

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

CAUTION	For the ICX 7450 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 7450-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 7450, 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 7450, 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".

Ruckus ICX 7450 Cautions and Danger Notices

Cautions

CAUTION	For the ICX 7450 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 7450-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 7450, 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 7450, 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".

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.

CAUTION	For the DC input circuit to the system of a Ruckus ICX 7450 make sure there is a 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 7450, muss sichergestellt werden, dass an den Eingangskabelschuhen zur Stromversorgung ein zweipoliger Schalter mit 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 7450, vérifier la présence d'un disjoncteur bipolaire 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 mm² (12 AWG), marqués VW-1 et testés à 90°C.
PRECAUCIÓN	Para el circuito de entrada de CC al sistema de un Ruckus ICX 7450, verifique que existe un disyuntor catalogado por 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.

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.

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 52); 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 52 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 52); 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 52); el otro extremo se conecta al suelo del edificio.

CAUTION	Power supplies are hot-swappable. However, they should be inserted or removed without a power cord being connected to a power source to avoid damage.
VORSICHT	Netzteile sind hot-swap-fähig. Sie sollten jedoch eingesetzt oder entfernt werden, ohne dass ein Stromkabel mit einer Stromquelle verbunden ist, um Beschädigungen zu vermeiden.
MISE EN GARDE	Les unités d'alimentation sont permutables à chaud. Cependant, et pour éviter tout dommage, elles doivent être insérées ou retirées sans cordon d'alimentation relié à une source d'alimentation.
PRECAUCIÓN	Los proveedores de energía son deslizables por calor. Sin embargo deben insertarse o extraerse sin ningún cable de alimentación conectado a la fuente de alimentación para evitar daños.

CAUTION	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.

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

Ruckus ICX 7450 Cautions and Danger Notices

Danger notices

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.

DANGER	Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.
GEFAHR	Montieren Sie die Geräte im Gestell so tief wie möglich. Platzieren Sie das schwerste Gerät ganz unten, während leichtere Geräte je nach Gewicht (je schwerer desto tiefer) darüber untergebracht werden.
DANGER	Montez les dispositifs que vous installez dans un bâti ou support aussi bas que possible. Placez le dispositif le plus lourd en bas et le plus léger en haut, en plaçant tous les dispositifs progressivement de bas en haut du plus lourd au plus léger.
PELIGRO	Monte los instrumentos que instale en un bastidor lo más bajos posible. Ponga el instrumento más pesado en la parte inferior y los instrumentos progresivamente más livianos más arriba.

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

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

DANGER	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.

DANGER	Laser radiation. Do not view directly with optical instruments. Class 1M Laser Products.
GEFAHR	Laserstrahlung! Schauen Sie nicht direkt mit optischen Instrumenten in den Laserstrahl herein. Klasse 1M Laserprodukte.
DANGER	Rayonnement de laser. Ne regardez pas directement avec les instruments optiques. Produits de laser de la classe 1M.
PELIGRO	Radiacion de Laser. No vea directamente con Instrumentos Opticos. Clase 1M de Productos de Laser.
危険	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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