



TECHNICAL SPECIFICATIONS

# Ruckus ICX 7650 Switch Technical Specifications

Part Number: 53-1005302-01  
Publication Date: 21 December 2017

Copyright © 2017, Brocade Communications Systems, Inc. All Rights Reserved.

Brocade, Brocade Assurance, the B-wing symbol, ClearLink, DCX, Fabric OS, HyperEdge, ICX, MLX, MyBrocade, OpenScript, VCS, VDX, Vplane, and Vyatta are registered trademarks, and Fabric Vision is a trademark of Brocade Communications Systems, Inc., in the United States and/or in other countries. Other brands, products, or service names mentioned may be trademarks of others.

Notice: This document is for informational purposes only and does not set forth any warranty, expressed or implied, concerning any equipment, equipment feature, or service offered or to be offered by Brocade. Brocade reserves the right to make changes to this document at any time, without notice, and assumes no responsibility for its use. This informational document describes features that may not be currently available. Contact a Brocade sales office for information on feature and product availability. Export of technical data contained in this document may require an export license from the United States government.

The authors and Brocade Communications Systems, Inc. assume no liability or responsibility to any person or entity with respect to the accuracy of this document or any loss, cost, liability, or damages arising from the information contained herein or the computer programs that accompany it.

The product described by this document may contain open source software covered by the GNU General Public License or other open source license agreements. To find out which open source software is included in Brocade products, view the licensing terms applicable to the open source software, and obtain a copy of the programming source code, please visit <http://www.brocade.com/support/oscd>.

# Contents

---

## Ruckus ICX 7650 Specifications

System specifications .....	5
Ethernet .....	5
LEDs .....	6
Other .....	6
Weight and physical dimensions .....	6
Environmental requirements .....	7
Power supply specifications (per PSU) .....	7
Power consumption (typical configuration) .....	7
Power consumption (maximum configuration) .....	8
Power consumption (modules) .....	8
Data port specifications (Ethernet) .....	9
Serial port specifications (pinout - mini-USB) .....	9
Serial port specifications (pinout RJ-45) .....	9
Serial port specifications (protocol) .....	10
Memory specifications .....	10
Regulatory compliance (EMC) .....	10
Regulatory compliance (safety) .....	11
Regulatory compliance (environmental) .....	11



# Ruckus ICX 7650 Specifications

• System specifications .....	5
• Ethernet .....	5
• LEDs .....	6
• Other .....	6
• Weight and physical dimensions .....	6
• Environmental requirements .....	7
• Power supply specifications (per PSU) .....	7
• Power consumption (typical configuration) .....	7
• Power consumption (maximum configuration) .....	8
• Power consumption (modules) .....	8
• Data port specifications (Ethernet) .....	9
• Serial port specifications (pinout - mini-USB) .....	9
• Serial port specifications (protocol) .....	10
• Memory specifications .....	10
• Regulatory compliance (EMC) .....	10
• Regulatory compliance (safety) .....	11
• Regulatory compliance (environmental) .....	11

## 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.
Fans	Dual redundant, hot-swappable fan unit with intake or exhaust airflow
Cooling	Forced-air cooling front-to-back or back-to-front
System architecture	Non-blocking shared-memory switch
System processors	BCM58712D with quad-core ARM Cortex-A57 processor running at 1.6 GHz

## Ethernet

These are standard modules for shipping bundles. For Ruckus ICX 7650 non-bundled switches, expansion modules need to be ordered separately.

System component	Description	Maximum ports supported
100 GbE QSFP28 ports	40/100 GbE QSFP28 stacking or uplink port	2 (Module 3)
40 GbE QSFP+ ports	40 GbE QSFP+ stacking or uplink port	2 (Module 3)
10 GbE SFP+ ports	10 GbE SFP+ port	24 (ICX 7650-48F)
1 GbE SFP ports	1 GbE SFP port	24 (ICX 7650-48F)

## Ruckus ICX 7650 Specifications

### LEDs

System component	Description	Maximum ports supported
10 GbE RJ-45 ports	100M/1/2.5/5/10 GbE RJ-45 port	24 (ICX 7650-48ZP)
1 GbE RJ-45 ports	10/100/1000 Mbps RJ-45 port	24 (ICX 7650-48ZP) 48 (ICX 7650-48P)
Ethernet management port	10/100/1000 Mbps RJ-45 port	1

## LEDs

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

## Other

System component	Description
Serial cable	1 (RJ-45 to RJ-45)
RJ-45 to DB9 adapter	1
AC power cord	IEC 320-C14

## Weight and physical dimensions

Model	Height	Width	Depth	Weight (with basic modules)
ICX 7650-48ZP	4.37 cm 1.72 inches	44.00 cm 17.32 inches	40.64 cm 16 inches	8.01 kg 17.82 lb
ICX 7650-48P	4.37 cm 1.72 inches	44.00 cm 17.32 inches	40.64 cm 16 inches	7.50 kg 16.5 lb
ICX 7650-48F	4.37 cm 1.72 inches	44.00 cm 17.32 inches	40.64 cm 16 inches	7.10 kg 15.62 lb

## Environmental requirements

Condition	Operational	Non-operational
Ambient Temperature	0°C to 45°C (32°F to 113°F) at sea level	-40°C to 70°C (-40°F to 158°F)
Relative Humidity (non-condensing)	10% to 90% at 50°C (122°F)	10% to 90% at 70°C (158°F)
Altitude (above sea level)	0 to 3,048 m (10,000 ft)	0 to 12,000 m (39,370 ft)
Shock	20 G, 11 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	1 G sine, 0.4 grms random, 5-500 Hz	2.4 G sine, 1.1 grms random, 5-500 Hz
Airflow	Nominal: 10-25 cfm, Maximum: 54-72 cfm.	N/A
Heat dissipation (+/- 5%)	NOTE: Refer to "Power consumption (typical configuration)" on page 7 and "Power consumption (maximum configuration)" on page 8 for detailed information on heat dissipation.	N/A
Operating noise	ICX 7650-48ZP: 56.4 dBA ICX 7650-48P: 46.7 dBA ICX 7650-48F: 48.3 dBA	N/A

## Power supply specifications (per PSU)

Power supply model	Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Input line protection	Maximum inrush current
RPS15-E	250 W	100-240V~	50-60Hz	4.0A	Fuses	35A
RPS15-I	250 W	100-240V~	50-60Hz	4.0A	Fuses	35A
RPS16-E	1000 W	100-240V~	50-60Hz	11.8A	Fuses	35A
RPS16-I	1000 W	100-240V~	50-60Hz	11.8A	Fuses	35A

## 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.

ICX7650-48ZP: 24 1-Gig+24 2.5-Gig and Slot2: Empty, Slot3: 2x40GQ 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	Minimum number of power supplies	Notes
ICX 7650-48ZP	120.46 W 411.14 BTU/hr	118.59 W 404.76 BTU/hr	1 x 1000 W AC	1 PSU, no PoE load.
	130.57 W 445.65 BTU/hr	128.32 W 437.97 BTU/hr	2 x 1000 W AC	2 PSUs, no PoE load
ICX 7650-48P	129.7 W 443 BTU/hr	143 W 488 BTU/hr	1 x 1000 W AC	1 PSU, no PoE load.
	128.2 W 438 BTU/hr	141.1 W 482 BTU/hr	1 x 1000 W AC	2 PSUs, no PoE load

## Ruckus ICX 7650 Specifications

Power consumption (maximum configuration)

Model name (Input power $\pm 5\%$ )	@100 VAC Input	@200 VAC Input	Minimum number of power supplies	Notes
ICX 7650-48F	141.4 W 420 BTU/hr	139.6 W 477 BTU/hr	1 x 250 W AC	1 PSU
	152.8 W 522 BTU/hr	151.6 W 518 BTU/hr	1 x 250 W AC	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.

ICX7650-48ZP: 24 1-Gig + 24 10-Gig and Slot2: 4x10GF, Slot3: 2x100GQ are linked UP, 100% traffic and PoE load.

Model name (Input power $\pm 5\%$ )	@100 VAC input	@200 VAC input	Minimum number of power supplies	Notes
ICX 7650-48ZP	167.1 W 570.33 BTU/hr	164.06 W 559.95 BTU/hr	2 x 1000 W AC	1 PSU
	11853.08 W 6324.71 BTU/hr	1763.55 W 6019.14 BTU/hr	2 x 1000 W AC	2 PSUs required for PoE loading
ICX 7650-48P	998 W 3406 BTU/hr	958 W 3270 BTU/hr	1 x 1000 W AC	1 PSU
	1809 W 6174 BTU/hr	1769 W 6038 BTU/hr	1 x 1000 W AC	2 PSUs required for PoE loading
ICX 7650-48F	178.3 W 609 BTU/hr	175.7 W 606 BTU/hr	1 x 250 W AC	1 PSU
	196.4 W 670 BTU/hr	194.1 W 663 BTU/hr	1 x 250 W AC	2 PSUs

## Power consumption (modules)

Name	Description	Power consumption
ICX7600-4X10GF	4-port 1/10 GbE SFP+ expansion module	Typical = 12.96 W Maximum = 15.72 W
ICX7600-2X40GQ	2-port 40 GbE QSFP+ data uplink / stacking module	Typical = 5.64 W Maximum = 7.38 W
ICX7600-1X100GQ	1-port 100 GbE QSFP28 data uplink / stacking module	Typical = 5.64 W Maximum = 7.38 W
ICX-FAN12-E	Power-supply exhaust airflow fan (two fans required if two power supplies are used)	Typical = 4.68 W Maximum = 16.68 W
ICX-FAN12-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 7650-48ZP	100 GbE	2 (slot 3)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	40 GbE	2 (slot 3)	QSFP+ stacking ports, 40 Gbps, compatible with optical transceivers, or direct attached copper cable.
	10 GbE	24 (slot 1)	100M/1/2.5/5/10 GbE RJ-45 ports with PoE support
	1 GbE	24 (slot 1)	10/100M/1 GbE RJ-45 ports with PoE support
ICX 7650-48P	100 GbE	2 (slot 3)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	40 GbE	2 (slot 3)	QSFP+ stacking ports, 40 Gbps, compatible with optical transceivers, or direct attached copper cable.
	1 GbE	48 (slot 1)	10/100M/1 GbE RJ-45 ports with PoE support
ICX 7650-48F	100 GbE	2 (slot 3)	QSFP28 stacking ports, 40/100 Gbps, compatible with optical transceivers, or direct attached copper cable.
	40 GbE	2 (slot 3)	QSFP+ stacking ports, 40 Gbps, compatible with optical transceivers, or direct attached copper cable.
	10 GbE	24 (slot 1)	SFP+ ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers
	1 GbE	24 (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
ICX7600-1X100GQ	100 GbE	1 (slot 2)	Pluggable module with QSFP28 uplink port, compatible with optical transceivers, or direct attached copper cable
ICX7600-2X40GQ	40 GbE	2 (slot 2)	Pluggable module with QSFP+ uplink ports, compatible with optical transceivers, or direct attached copper cable
ICX7600-4X10GF	10 GbE	4 (slot 2)	Pluggable module with SFP+ uplink ports, compatible with ER, LR, LRM, SR, ZR, or USR optical transceivers

## 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)
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

Pin	Signal	Description
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	DDR4 2133 SO-DIMM	4 GB
Boot Flash	SPI Flash	16 MB
M.2 Flash Module	NAND flash	16 GB

## Regulatory compliance (EMC)

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

- EN 61000-3-3

## Regulatory compliance (safety)

- CAN/CSA-C22.2 No. 60950/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)

