PRODUCT BROCHURE

Ruckus ICX 7850

IP Ethernet Switch for Converged Interconnect Networks

High performance switches for distributed access architecture converged interconnect networks

The Ruckus ICX® 7850 family of switches provide robust, high performance Ethernet switching, with the flexibility to evolve from simple single-layer networks suitable for small/medium sized deployments as used in Distributed Access Architectures (DAA) such as Remote PHY (R-PHY) or Remote-OLT (R-OLT), to highly scalable leaf-spine architectures. Converged Interconnect Networks (CIN) design requires a non-blocking and scalable architecture with predictable and low latency. Modern data-center designs using spine and leaf architecture are well-suited to meet these requirements.

Benefits

40GbE AND 100GbE FOR MAXIMUM PERFORMANCE

- Up to 32x 40/100 GbE ports per switch
- Up to 8x 100 GbE stacking ports, 1.6 Tbps of stacking bandwidth per switch

SECURITY AND DATA PRIVACY

- MACsec 128-bit and 256-bit data encryption ensures compliance and data confidentiality

HIGHLY RESILIENT CORE SWITCHING

- Redundant, hot-swappable power supplies and fans
- In-Service Software Upgrades (ISSU)
- Multi-Chassis Trunking (MCT) for core failover with load-balancing
- Hitless stack insertion and removal

ADVANCED L3 ROUTING DELIVERS DESIGN FLEXIBILITY

- IPv4 and IPv6
- BGP, OSPF, VRRP, PIM, PBR, VRF

MARKET-LEADING STACKING SCALABILITY

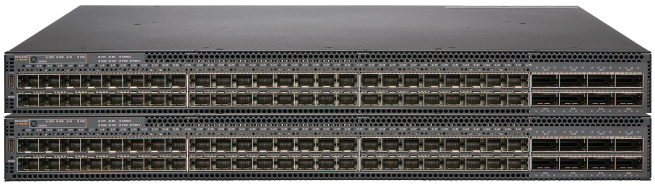
- Up to 12 switches per stack
- Up to 10 km using standard optics or cables
- Up to 8x 40/100GbE standard QSFP28 stacking ports

Benefits of a Leaf-Spine switching fabric includes:

- High scalability and flexibility
- Linear scale out architecture simplifies capacity upgrades. To add more Remote PHY Devices (RPD) in the network, simply add more leaf and spine switches.
- Single tier leaf switches can be reused as when migrating to a 2-Tier architecture when additional nodes are being added

The Ruckus ICX Ethernet switches are the CIN aggregator connecting the R-OLT, Remote MAC-PHY Devices (RMD) and R-PHY nodes into the core network. They provide robust, high performance optical Ethernet switching, with the flexibility to evolve from simple single-layer networks suitable for small/ medium sized deployments to highly scalable leaf-spine architectures.

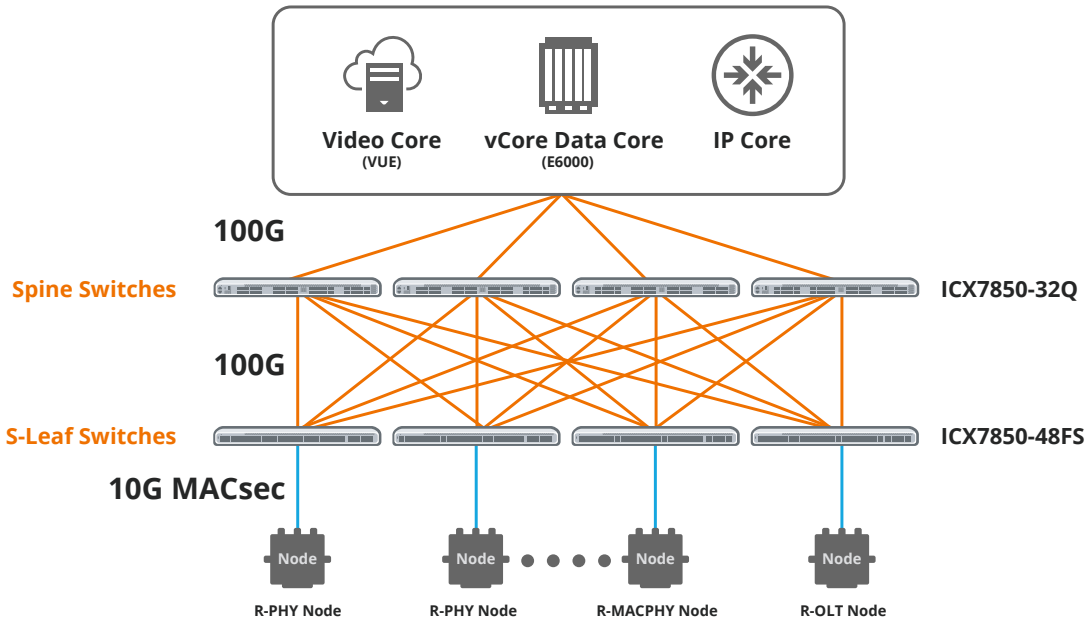
10 GbE AND 25 GbE LEAF/S-LEAF SWITCHES



The Ruckus® ICX® 7850 stackable aggregation switches come in 1/10 GbE and 1/10/25 GbE models. Both come standard with 8-ports of 40/100 GbE for stacking or uplinks. The 1/10 GbE model offers 48x 1/10 GbE ports with MACsec support, the 1/10/25 GbE model offers 48x 1/10/25 GbE ports and 8x 40/100GbE ports for uplinks or stacking. The switches are designed to be the leaf or S-leaf (Secure-leaf) in a CIN network.

40/100 GbE SPINE SWITCHES

The ICX 7850-32Q comes standard with 32 40/100 GbE ports and up to 12 of these ports can be used for stacking. The QSFP28 ports are capable of native 40 GbE or 100 GbE Ethernet, or may be broken out to 4x10 Gbps or 4x25 Gbps links to give up to 128 10/25GbE ports. The ICX 7850-32Q is ideal to be used as a spine switching in a CIN network.



Ruckus ICX 7850

All Ruckus ICX 7850 models offer, dual power supply slots, 5 or 6 fan tray slots in the back, one RJ-45 Ethernet port for out-of-band network management, one USB Type-C port for console management, one RJ-45 port for serial console management, and one USB Type A port for external file storage.

Ruckus ICX 7850-32Q

- 32x 40/100 GbE QSFP28 ports supporting native 40 GbE or 100 GbE, or breakout to 4x10 GbE or 4x25 GbE
- Up to 8 of the rightmost QSFP28 ports as stacking ports
- 2x hot-swappable load sharing power supplies and 6x hot-swappable fan assemblies with reversible airflow options (Power supplies and FAN airflows must be the same)

Ruckus ICX 7850-48FS

- 48x 1/10 GbE SFP+ ports with 128/256 bit MACsec support
- 8x 40/100 Gbps QSFP28 ports supporting native 40 GbE or 100 GbE, or breakout to 4x 10 GbE or 4x25 GbE
- Up to 8 of the QSFP28 ports as stacking ports
- 2x hot-swappable load sharing power supplies and 5x hot-swappable fan assemblies with reversible airflow options (Power supplies and FAN airflows must be the same)

Ruckus ICX 7850-48F

- 48x 1/10/25 GbE SFP28 ports
- 8x 40/100 GbE QSFP28 ports supporting native 40 GbE or 100 GbE, or breakout to 4x10 GbE or 4x25 GbE
- Up to 8 of the QSFP28 ports as stacking ports
- 2x hot-swappable load sharing power supplies and 5x hot-swappable fan assemblies with reversible airflow options (Power supplies and FAN airflows must be the same)

Ruckus ICX 7850-32Q Rear View

- 2 power supply slots for 650W AC or DC power supplies (see ordering information for details)
- 6 fan tray slots for fan assembly with front to back or back to front airflow (see ordering information for details)

Ruckus ICX 7850-48F and -48FS Rear View

- 2 power supply slots for 650W AC or DC power supplies (see ordering information for details)
- 5 fan tray slots for fan assembly with front to back or back to front airflow (see ordering information for details)

RUCKUS ICX 7850 SWITCH FEATURE/MODEL COMPARISON

	40/100 GbE Switch	1/10 GbE Switch	1/10/25 GbE Switch
	Ruckus ICX 7850-32Q	Ruckus ICX 7850-48FS	Ruckus ICX 7850-48F
FEATURE	**SPECIFICATIONS**		
Switching capacity (data rate, full duplex, stacking enabled)	6.4 Tbps	2.56 Tbps	4.0 Tbps
Forwarding capacity (data rate, full duplex, stacking enabled)	2.0 Bpps	1.9 Bpps	2.0 Bpps
1/10 Gbps SFP+ downlinks		48	
1/10/25 Gbps SFP28 downlinks			48
40/100 Gbps QSFP28 ports	32	8	8
Max ports usable for stacking	8	8	8
Base IPv4/v6 Layer 3 routing (static routing, RIP)	Standard		
Advanced IPv4/v6 Layer 3 routing (OSPF, BGP, VRRP, PIM, PBR, VRF)	With license		
MACsec 128/256bit	N/A	With license	N/A
Aggregated stacking bandwidth	9.6 Tbps		
Stacking density (maximum switches in a stack)	12		
Maximum stacking distance (distance between stacked switches)	10 km		

RUCKUS ICX 7850 SWITCH FEATURE/MODEL COMPARISON

	40/100 GbE Switch	1/10 GbE Switch	1/10/25 GbE Switch
	Ruckus ICX 7850-32Q	Ruckus ICX 7850-48FS	Ruckus ICX 7850-48F
FEATURE	**POWER**		
Power inlet	C14		
Input voltage/frequency	AC: 100 to 240 VAC @ 50 to 60 Hz, -48V to -60V DC		
Power supply rated maximum	2 x 650W		
Airflow	Front-to-back, or back-to-front (depending on power supplies and fans installed)		
Switch power utilization[1] (25°C)			
Typical	336.5 W	336.5 W	282.4 W
Maximum	479.6 W	443.1 W	396.2 W
Switch heat dissipation[1] (25°C)			
Typical	1149 BTU/hour	1149 BTU/hour	963.7 BTU/hour
Maximum	1637 BTU/hour	1512 BTU/hour	1352 BTU/hour
FEATURE	**ENVIRONMENT**		
Weight[1]	9.1kg (20lb)	9.1kg (20lb)	8.8kg (19.4lb)
Dimensions	43.7mm (1.72in) H 440mm (17.32in) W 444.5mm (17.5 in) D	43.7mm (1.72in) H 440mm (17.32in) W 444.5mm (17.5 in) D	43.7mm (1.72in) H 440mm (17.32in) W 444.5mm (17.5 in) D
Acoustics[1] (25°C, ISO 7779)	50.6 dBA	50.3 dBA	50.3 dBA
MTBF[1] (25°C)	467,508	298,215	457,244

[1] Switch includes two AC power supplies, 5 fans for 48F and 48FS, 6 fans for 32Q.

Ruckus ICX 7850 Specifications

FEATURES	CAPABILITIES
Connector options	• 1/10 Gbps SFP+ ports • 1/10/25 Gbps SFP28 ports • 40/100 Gbps QSFP28 ports • Out-of-band Ethernet management: 10/100/1000 Mbps RJ-45 • Console management: USB type C (Type C plug) and RJ45 • File Transfer: USB port, standard-A plug • For the latest information about supported optics, please visit www.ruckuswireless.com/optics. • For the latest list of supported 10G SFP+ DWDM optics, please visit https://www.commscope.com/globalassets/digizuite/62393-ttd454080.pdf
DRAM	• 4 GB
NVRAM (flash)	• 32 GB
Packet Buffer Size	• 32 MB
Maximum VLANs	• 4095
Maximum PVLANs	• 256
Maximum VEs	• 512

FEATURES	Profile 1 (Default)	Profile 2
Maximum MAC Addresses	• 32K	• 96K
Maximum routes (in hardware)	• 128K (IPv4) • 7K (IPv6) • 20K (Next Hop Addresses)	• 16K (IPv4) • 1K (IPv6) • 20K (Next Hop Addresses)
Trunking	• Maximum ports per trunk: 16 • Maximum trunk groups: 256	
Maximum jumbo frame size	• 9,216 bytes	
Average latency	• 0.8 µs	
QoS priority queues	• 10 for Unicast and Multicast traffic	
Multicast Groups	• 8,192 (Layer 2) • 8,192 (Layer 3)	
VRF	• 64 instances	

Ruckus ICX 7850 Specifications (continued)

FEATURES	CAPABILITIES	
Layer 2 switching	• 802.1s Multiple Spanning Tree • 802.1x Authentication • Auto MDI/MDIX • BPDU Guard, Root Guard • Dual-Mode VLANs • Dynamic Voice VLAN Assignment • Dynamic VLAN Assignment • Fast Port Span • GVRP: GARP VLAN Registration Protocol • IGMP Snooping (v1/v2/v3) • IGMP Proxy for Static Groups • IGMP v2/v3 Fast Leave • Inter-Packet Gap (IPG) adjustment • Link Fault Signaling (LFS) • MAC Address Filtering • MAC Learning Disable MLD Snooping (v1/v2) • Multi-device Authentication	• Per-VLAN Spanning Tree (PVST/PVST+/PVRST) • Mirroring - Port-based, ACL-based, MAC Filter-based, and VLAN-based • PIM-SM v2 Snooping • Port Loop Detection • Private VLAN • Remote Fault Notification (RFN) • Single-instance Spanning Tree • Trunk Groups (static, LACP) • Uni-Directional Link Detection (UDLD) • Metro-Ring Protocol (MRP) (v1, v2) • Virtual Switch Redundancy Protocol (VSRP) • Topology Groups • Q-in-Q and selective Q-in-Q • VLAN Mapping • MCT (Ruckus Multi-Chassis Trunking)
Base Layer 3 IP routing	• IPv4 and IPv6 static routes • RIP v1/v2, RIPng • ECMP • Port-based Access Control Lists • Layer 3/Layer 4 ACLs	• Host routes • Virtual Interfaces • Routed Interfaces • Route-only Support • Routing Between Directly Connected Subnets
Premium Layer 3 IP routing (with software license)	• IPv4 and IPv6 dynamic routes • OSPF v2, OSPF v3 (IPv6) • PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4/IPv6 multicast routing functionality) • PBR	• Virtual Route Redundancy Protocol VRRP v3 (IPv6) • VRRP-E (IPv4, IPv6), BGP4, BGP4+ (IPv6) • GRE • IPv6 over IPv4 tunnels • VRF-lite (IPv4 and IPv6) • MSDP
Quality of Service (QoS)	• ACL Mapping and Marking of ToS/DSCP (CoS) • ACL Mapping and Marking of 802.1p • ACL Mapping to Priority Queue • Classifying and Limiting Flows Based on TCP Flags	• DiffServ Support • Honoring DSCP and 802.1p (CoS)MAC Address Mapping to Priority Queue • Priority Queue Management using Weighted Round Robin (WRR), Strict Priority (SP), and a combination of WRR and SP • Priority Flow Control
Traffic management	• ACL-based inbound rate limiting and traffic policies • Broadcast, multicast, and unknown unicast rate limiting	• Inbound rate limiting per port • Outbound rate limiting per port and per queue
Security	• MACsec (with license) • 802.1X authentication • MAC authentication • Flexible authentication • Web authentication • DHCP snooping • Dynamic ARP inspection • Neighbor Discovery (ND) Inspection • Tri-level Access Mode (EXEC, Privileged EXEC and Global Configuration) • EAP pass-through support	• IEEE 802.1X username export in sFlow • Protection against Denial of Service (DoS) attacks Authentication, Authorization, and Accounting (AAA) • MAC Address Locking MAC Port Security • Advanced Encryption Standard (AES) with SSHv2 • RADIUS/TACACS/TACACS+ • Secure Copy (SCP) • Secure Shell (SSHv2) • Local Username/Password • Change of Authorization (CoA) RFC 5176 • Trusted Platform Module • Protected ports

Ruckus ICX 7850 Specifications (continued)

IEEE standards compliance	• 802.1AB LLDP • 802.1D MAC Bridging • 802.1p Mapping to Priority Queue • 802.1s Multiple Spanning Tree (MST) • 802.1w Rapid Reconfiguration of Spanning Tree • 802.1x Port-based Network Access Control (PNAC) • 802.3 Carrier Sense Multiple Access/Collision Detection (CSMA/CD) • 802.3x Full duplex and Flow Control • 802.3z 1000Base-SX/LX	• 802.3 MAU MIB (RFC 2239) • 802.3ba 40 and 100 Gbps Ethernet • 802.1AE-MACsec (with license) • 802.1Q VLAN Tagging • 802.1BR Bridge Port Extension • 802.3ab 1000BASE-T • 802.1 AX-2008 Link Aggregation • 802.3ae 10 Gigabit Ethernet
IETF RFC standards compliance	• For a complete list of RFCs supported by the Ruckus FastIron® software platform, please consult the "FastIron Features and Standards Support Matrix" document available from support.ruckuswireless.com.	
High availability	• Redundant hot-swappable power supplies • Hot-swappable fan trays • Layer 3 VRRP/VRRP-E protocol redundancy • Real-time state synchronization across the stack	• Hitless failover and switchover from master to standby stack controller • Hot insertion and removal of stacked units • Layer 2 VSRP switch redundancy • In Service Software Update (ISSU) • Multi Chassis Trunking (MCT)
Management	• DHCP Auto Configuration • Configuration Logging • Digital Optical Monitoring • Display Log Messages on Multiple Terminals • Embedded Web Management (HTTP/HTTPS) • Embedded DHCP Server • Industry-standard Command Line Interface (CLI) • SmartZone Network Controller (sold separately) • Easy activation of optional software features • USB file management and storage • Boot from USB storage • Macro for batch execution • Out-of-band Ethernet Management • ERSPAN support for remote traffic monitoring • RSPAN • TFTP • TELNET Client and Server • Bootp	• SNMPv1/v2c • DHCP Server and DHCP Relay • SNMPv3 Intro to Framework • Architecture for Describing SNMP Framework • SNMP Message Processing and Dispatching • SNMPv3 Applications • SNMPv3 User-based Security Model • SNMP View-based Access Control Model SNMP • sFlow • Network Time Protocol (NTP) • Multiple Syslog Servers • SCP • EOAM (EFM-OAM) • Virtual Cable Tester (VCT) • For Management MIB, please consult the "FastIron MIB Reference" document available from support.ruckuswireless.com.

Ruckus ICX 7850 Specifications (continued)

FEATURES	ENVIRONMENT
Temperature	• Operating temperature: 0°C to 45°C/32°F to 113°F at sea level • Storage temperature: –40°C to 70°C/–40°F to 158°F
Humidity	• Operating relative humidity: 10% to 90% at 50°C, non-condensing • Non-operating relative humidity: 10% to 90% at 70°C, non-condensing
Altitude	• Operating altitude: 10,000 ft. (3,000 m) maximum • Storage altitude: 39,000 ft. (12,000 m) maximum

FEATURES	COMPLIANCE/CERTIFICATION
Electromagnetic emissions	• FCC Class A (Part 15); EN 55022/CISPR-22 Class A; VCCI Class A; ICES-003 Electromagnetic Emission; AS/NZS 55022; EN 61000-3-2 Power Line Harmonics; EN 61000-3-3 Voltage Fluctuation and Flicker EN 61000-6-3 Emission Standard
Safety	• CAN/CSA-C22.2 NO. 60950-1-07; UL 60950-1; IEC60950-1; EN 60950-1:2006 Safety of Information Technology Equipment; EN 60825-1 Safety of Laser Products
Immunity	• EN 61000-6-1 Generic Immunity and Susceptibility; EN 55024 Immunity Characteristics; EN 61000-4-3 Radiated, Radio Frequency, Electromagnetic Field; EN 61000-4-4 Electrical Fast Transient; EN 61000-4-5 Surge; EN 61000- 4-6 Conducted Disturbances Induced by Radio-Frequency Fields; EN 61000-4-8 Power Frequency Magnetic Field; EN 61000-4-11 Voltage Dips and Sags
Environmental regulatory compliance	• RoHS-compliant (6 of 6); WEEE-compliant
Vibration	• IEC 68-2-36, IEC 68-2-6
Shock and drop	• IEC 68-2-27, IEC 68-2-32

Ruckus ICX 7850 Ordering Information

PART NUMBER	SWITCH BUNDLES
1513073	• Ruckus ICX 7850 with 32× 40/100GbE QSFP28 ports (ICX 7850-32Q), 2 AC power supplies and 6 fans included, front to back airflow. • Requires ICX7850-PREM-LIC to use advanced L3 features. Optical transceivers sold separately.
1513076	• Ruckus ICX 7850 with 48x 1/10/25GbE SFP28 and 8x 40/100 QSFP28 ports (ICX 7850-48F), 2 AC power supplies and 5 fans included, front to back airflow. • Requires ICX7850-PREM-LIC to use advanced L3 features. Optical transceivers sold separately.
1513079	• Ruckus ICX 7850 with 48x 1/10GbE SFP+ and 8x 40/100 QSFP28 ports and MACsec (ICX 7850-48FS), 2 AC power supplies and 5 fans included, front to back airflow. • Requires ICX7850-PREM-LIC to use advanced Layer 3 features and MACsec license to use MACsec. Optical transceivers sold separately.

PART NUMBER	BARE SWITCHES
1513072	• Ruckus ICX 7850 with 32× 40/100GbE QSFP28 ports (ICX 7850-32Q), power supplies and fans sold separately (up to 2 power supplies and 6 fans per switch). Requires ICX7850-PREM-LIC to use advanced Layer 3 features. Optical transceivers sold separately.
1513075	• Ruckus ICX 7850 with 48x 1/10/25GbE SFP28 and 8x 40/100 QSFP28 ports (ICX 7850-48F), power supplies and fans sold separately (up to 2 power supplies and 5 fans per switch). Requires ICX7850-PREM-LIC to use advanced L3 features. Optical transceivers sold separately.
1513078	• Ruckus ICX 7850 with 48x 1/10GbE SFP+ and 8x 40/100 QSFP28 ports and MACsec (ICX 7850-48FS), power supplies and fans sold separately (up to 2 power supplies and 5 fans per switch). Requires ICX7850-PREM-LIC to use advanced Layer 3 features and ICX MACsec license to use MACsec. Optical transceivers sold separately.

PART NUMBER	POWER SUPPLIES AND FANS
1513081	• 650W AC power supply, front to back airflow, for the Ruckus ICX 7850 (up to 2 per switch)
1513082	• 650W AC power supply, back to front airflow, for the Ruckus ICX 7850 (up to 2 per switch)
1513083	• 650W DC power supply, front to back airflow, for the Ruckus ICX 7850 (up to 2 per switch)
1513084	• 650W DC power supply, back to front airflow, for the Ruckus ICX 7850 (up to 2 per switch)
1512122	• Fan assembly, front to back airflow, for the Ruckus ICX 7850 (up to 5 or 6 per switch depending on switch model)
1512123	• Fan assembly, back to front airflow, for the Ruckus ICX 7850 (up to 5 or 6 per switch depending on switch model)

PART NUMBER	FEATURE LICENSE AND ACCESSORIES
ICX7850-PREM-LIC	• ICX 7850 advanced L3 License adds support for OSPF, BGP VRRP, PIM, PBR, VRF
1512064	• ICX MACsec license adds support for 128/256 bit MACsec encryption to ICX 7850

OPTICS	
See Optics Datasheet at www.ruckuswireless.com/optics	CommScope offers a unique set of high-performance, reliable, and cost-effective optical transceivers to help enterprises and service providers meet the challenges of diverse network topologies. To ensure maximum quality, CommScope selects and tests the most reliable, highest-performing optical transceivers on the market, and then warrants their availability, capacity, and performance in Ruckus® product. "For a the specific list of optics supported by each ICX product see the Optics Datasheet at www.ruckuswireless.com/optics.
10G SFP+ DWDM optics	For a list of supported 10G SFP+ DWDM optics, please see https://www.commscope.com/globalassets/digizuite/62393-ttd454080.pdf

MANAGEMENT SOFTWARE	
See SmartZone Datasheet: www.ruckuswireless.com/smartzone	Ruckus SmartZone centralizes management of the entire family of Ruckus switches and wireless Access Points with a single easy to deploy management platform. It simplifies network set-up and management, enhances security, streamlines troubleshooting and eases upgrades. SmartZone Network Controllers are available in both appliance and virtual appliance form. For more information, go to www.ruckuswireless.com/smartzone.

ORDERING NOTES

Customers have two options when ordering a Ruckus ICX 7850 Switch. They can select one of the pre-built units from the "Switch Bundles" section, or they can build their own custom unit by selecting a "Bare Switch" and adding their choice of power supplies, fans, and port modules.

Pre-built units ordered from the "Switch Bundles" section include a USA power cord, two-post rack mounting brackets, and a USB serial console cable. Units ordered from the "Bare Switches" section include two-post rack mounting brackets and a USB serial console cable.

AC power supplies ordered separately do not include a power cord, power cord must be ordered separately. Stacking and data cables must be ordered separately.

WARRANTY

Ruckus ICX 7850 Switches are covered by the Ruckus Assurance Limited Lifetime Warranty. For details, visit www.ruckuswireless.com/warranty.

BEST-IN-CLASS SUPPORT

Ruckus ICX 7850 switches come with 90 days of free technical support from the Ruckus Technical Assistance Center (TAC). For continued access to the TAC past the initial 90 days, customers must purchase a Ruckus Technical Support contract. For details, visit support.ruckuswireless.com/programs.

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