

# RUCKUS® R850

Indoor Wi-Fi 6 8x8:8 Access Point  
with 5.9 Gbps Data Rate



## Benefits

### Connect More Devices Simultaneously

Improve device performance, by enabling more simultaneous device connections with built-in 12 spatial streams (8x8:8 in 5GHz, 4x4:4 in 2.4GHz), MU-MIMO and OFDMA technology.

### Ultra-High-Density Performance

Provides exceptional end-user experience within stadiums, large public venues, convention centers and school auditoriums with the RUCKUS® Ultra-High-Density Technology Suite.

### Enhanced Security

Supports the latest Wi-Fi security standard, WPA3, for enhanced protection from man-in-the-middle attacks in the most secure way.

### Multi-Gigabit Access Speeds

Optimized multi-gigabit Wi-Fi performance delivered using built-in 5GbE/2.5GbE Ethernet ports to connect to multi-gigabit switches.

### Device Management Options

Manage the R850 with cloud, on-premise physical/virtual appliances and control auto-provisioning for faster deployment and seamless firmware upgrades.

### Better Mesh Networking

Minimize complexity by reducing expensive cabling with SmartMesh that dynamically creates self-forming, self-healing mesh networks.

### Converged Access Point

Eliminate siloed wireless networks with a unified platform that augments Wi-Fi with onboard BLE & Zigbee radios with the option to integrate other wireless technologies via the USB port.

### More Than Wi-Fi

Support services beyond Wi-Fi with [RUCKUS IoT Suite](#), [Cloudpath®](#) security and onboarding software, [SPoT Wi-Fi](#) locationing engine, and [RUCKUS analytics](#).

**The RUCKUS® R850 is based on the latest Wi-Fi standard, Wi-Fi 6, which bridges the performance gap from 'gigabit' Wi-Fi to 'multi-gigabit' Wi-Fi in support of the insatiable demand for better and faster Wi-Fi.**

The RUCKUS R850 is our highest capacity dual-band, dual-concurrent Wi-Fi 6 access point (AP) that supports 12 spatial streams (8x8:8 in 5GHz, 4x4:4 in 2.4GHz). The R850, with OFDMA, TWT and MU-MIMO capabilities, efficiently manages up to 1,024 client connections with increased capacity, improved coverage and performance in ultra-high dense environments. Furthermore, a 5 Gbps multi-gigabit Ethernet port mitigates backhaul capacity bottlenecks.

Additionally, the R850 is IoT- and LTE-ready, and supports wireless standards beyond Wi-Fi in combination with the RUCKUS IoT Suite and our CBRS/OpenG modules.

The R850 addresses the increasing client demands in transit hubs, auditoriums, stadiums, conference centers, and other highly trafficked indoor spaces. It is the perfect choice for data-intensive streaming multimedia applications like 4K video transmissions, while supporting latency sensitive voice and data applications with stringent quality-of-service requirements.

The R850 when paired with the RUCKUS Ultra-High-Density Technology Suite found only in the RUCKUS Wi-Fi portfolio, dramatically improves network performance through a combination of patented wireless innovations and learning algorithms that includes:

- **Airtime Decongestion:** Increases average network throughput in heavily congested environments
- **Transient Client Management:** Reduces interference traffic from unconnected Wi-Fi devices
- **BeamFlex® Antennas:** Extended coverage and optimized throughput with patented multi-directional antennas and radio patterns

Whether you're deploying ten or ten thousand APs, the R850 is also easy to manage through our collection of on-premises or cloud-based management options.

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## Access Point Antenna Pattern

RUCKUS' BeamFlex+ adaptive antennas allow the R850 AP to dynamically choose among a host of antenna patterns (over 4,000 possible combinations) in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the RUCKUS BeamFlex+ adaptive antenna directs the radio signals per-device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern

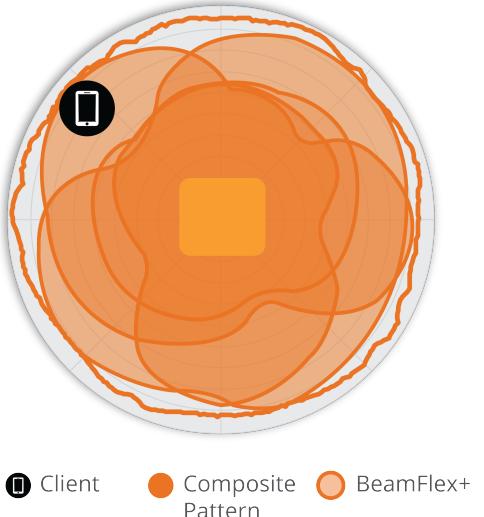


Figure 2. R850 2.4GHz Azimuth Antenna Patterns

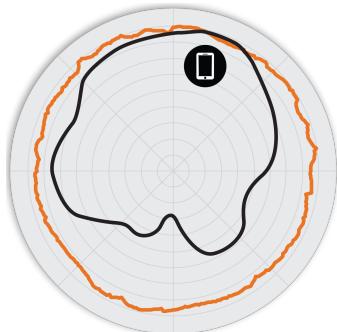


Figure 3. R850 5GHz Azimuth Antenna Patterns



Figure 4. R850 2.4GHz Elevation Antenna Patterns

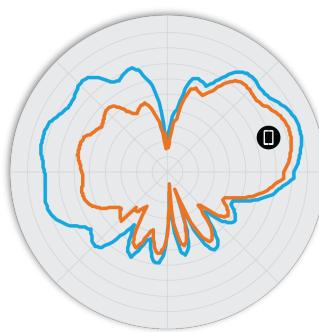
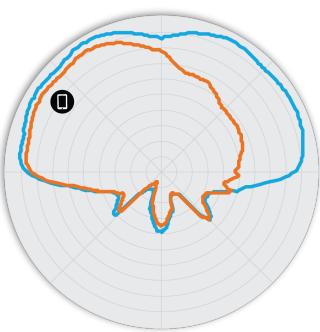


Figure 5. R850 5GHz Elevation Antenna Patterns



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

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Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"> <li>IEEE 802.11a/b/g/n/ac/ax</li> </ul>
Supported Rates	<ul style="list-style-type: none"> <li>802.11ax: 4 to 4800 Mbps</li> <li>802.11ac: 6.5 to 3467 Mbps</li> <li>802.11n: 6.5 to 600 Mbps</li> <li>802.11a/g: 6 to 54 Mbps</li> <li>802.11b: 1 to 11 Mbps</li> </ul>
Supported Channels	<ul style="list-style-type: none"> <li>2.4GHz: 1-13</li> <li>5GHz: 36-64, 100-144, 149-165</li> </ul>
MIMO	<ul style="list-style-type: none"> <li>8x8 MU-MIMO</li> <li>8x8 SU-MIMO</li> </ul>
Spatial Streams	<ul style="list-style-type: none"> <li>8 MU-MIMO</li> <li>8 SU-MIMO</li> </ul>
Radio Chains and Streams	8x8:8
Channelization	<ul style="list-style-type: none"> <li>20, 40, 80, 160 MHz</li> </ul>
Modulation	<ul style="list-style-type: none"> <li>OFDMA (up to 1024-QAM)</li> </ul>
Security	<ul style="list-style-type: none"> <li>WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK</li> <li>WIPS/WIDS</li> </ul>
Other Wi-Fi Features	<ul style="list-style-type: none"> <li>WMM, Power Save, TxBF, LDPC, STBC, 802.11r/k/vHotspot</li> <li>Hotspot 2.0</li> <li>Captive Portal</li> <li>WISPr</li> </ul>

RF	
Antenna Type	<ul style="list-style-type: none"> <li>BeamFlex+ Adaptive Antennas with 4000+ unique antenna patterns</li> <li>Horizontal and Vertical polarization (PD-MRC)</li> </ul>
Antenna Gain (max)	<ul style="list-style-type: none"> <li>Up to 2 dBi</li> </ul>
Frequency Bands	<ul style="list-style-type: none"> <li>2.4 - 2.484 GHz</li> <li>5.17 - 5.33 GHz</li> <li>5.49 - 5.71 GHz</li> <li>5.735 - 5.835 GHz</li> </ul>

2.4GHZ RECEIVE SENSITIVITY							
HT20		HT40		VHT20		VHT40	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-91	-73	-88	-70	-91	-73	-88	-70
HE20							
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-91	-73	-68	-62	-88	-70	-65	-59

5GHZ RECEIVE SENSITIVITY											
VHT20				VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-91	-72	-69	—	-88	-69	—	-65	-85	-66	—	-62
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-91	-72	-68	-62	-88	-69	-65	-59	-85	-66	-62	-56

2.4GHZ TX POWER TARGET (PER CHAIN)		
Rate	Pout (dBm) - Full Power	Pout (dBm) - 802.3at
MCS0 HT20	20	20
MCS7 HT20	16	16
MCS8 VHT20	15	15
MCS9 VHT40	14	14
MCS11 HE40	12	12

5GHZ TX POWER TARGET (PER CHAIN)		
Rate	Pout (dBm) - Full Power	Pout (dBm) - 802.3at
MCS0 VHT20	22	22
MCS7 VHT40, VHT80	16.5	16.5
MCS9 VHT40, VHT80	15	15
MCS11 HE20, HE40, HE80	12.5	12.5

PERFORMANCE AND CAPACITY	
Peak PHY Rates	<ul style="list-style-type: none"> <li>2.4GHz: 1.148 Gbps (11ax)</li> <li>5GHz: 4.8 Gbps (11ax)</li> </ul>
Client Capacity	<ul style="list-style-type: none"> <li>Up to 1024 clients per AP</li> </ul>
Simultaneous VoIP Clients	<ul style="list-style-type: none"> <li>Up to 60 per AP</li> </ul>
SSID	<ul style="list-style-type: none"> <li>Up to 16 per radio</li> </ul>

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	<ul style="list-style-type: none"> <li>BeamFlex+</li> <li>PD-MRC</li> </ul>
Wi-Fi Channel Management	<ul style="list-style-type: none"> <li>ChannelFly</li> </ul>
Client Density Management	<ul style="list-style-type: none"> <li>Band Balancing</li> <li>Client Load Balancing</li> <li>Airtime Fairness</li> <li>Airtime-based WLAN Prioritization</li> </ul>
Queuing & Scheduling	<ul style="list-style-type: none"> <li>SmartCast</li> </ul>
Mobility	<ul style="list-style-type: none"> <li>SmartRoam</li> </ul>
Diagnostic Tools	<ul style="list-style-type: none"> <li>Spectrum Analysis</li> <li>SpeedFlex</li> </ul>
High Density Deployments (RF Innovations)	<ul style="list-style-type: none"> <li>Perpacket Adaptive Power</li> <li>Adaptive Wi-Fi Cell Size</li> <li>Transient Client Management</li> <li>Airtime Decongestion</li> </ul>

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NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"> <li>SmartZone</li> <li>ZoneDirector</li> <li>Standalone</li> <li>Cloud</li> <li>Unleashed</li> </ul>
Mesh	<ul style="list-style-type: none"> <li>SmartMesh™ wireless meshing technology</li> </ul>
IP	<ul style="list-style-type: none"> <li>IPv4, IPv6</li> </ul>
VLAN	<ul style="list-style-type: none"> <li>802.1Q</li> <li>BSSID-based (16 BSSIDs / radio)</li> <li>Port-based</li> <li>Dynamic, per user based on RADIUS</li> </ul>
802.1x	<ul style="list-style-type: none"> <li>Wired &amp; wireless</li> <li>Authenticator &amp; Suplicant</li> </ul>
Tunnel	<ul style="list-style-type: none"> <li>RuckusGRE, SoftGRE</li> </ul>
Policy Management Tools	<ul style="list-style-type: none"> <li>Application Recognition and Control</li> <li>Access Control Lists</li> <li>Device Fingerprinting</li> </ul>
IoT Capable	<ul style="list-style-type: none"> <li>Yes</li> </ul>

OTHER RADIO TECHNOLOGIES	
IoT	<ul style="list-style-type: none"> <li>BLE, Zigbee</li> </ul>

PHYSICAL INTERFACES	
Ethernet	<ul style="list-style-type: none"> <li>1x 1/2.5/5 Gbps port, RJ-45</li> <li>1x 10/100/1000 Mbps port, RJ-45</li> </ul>
USB	<ul style="list-style-type: none"> <li>1 USB 2.0 port, Type A</li> </ul>

PHYSICAL CHARACTERISTICS	
Physical Size	<ul style="list-style-type: none"> <li>22.19 x 24.96 x 6 cm</li> <li>8.74 x 9.83 x 2.36 in.</li> </ul>
Weight	<ul style="list-style-type: none"> <li>1.53 kg</li> <li>3.37 lbs</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>Wall, Acoustic ceiling, Desk</li> <li>Secure Bracket (sold separately)</li> </ul>
Physical Security	<ul style="list-style-type: none"> <li>Hidden Latching Mechanism</li> </ul>
Operating Temperature	<ul style="list-style-type: none"> <li>-0C (32F) to 50°C (122°F)</li> </ul>
Operating Humidity	<ul style="list-style-type: none"> <li>Up to 95%, non-condensing</li> </ul>

POWER CONSUMPTION			
Mode	Power Consumption	System Configuration	Wi-Fi Radios
DC Power, PoH, uPoE (Idle)	16.1W	<ul style="list-style-type: none"> <li>5Gbps Ethernet Enabled</li> <li>1Gbps Ethernet Enabled</li> <li>USB Enabled (3W)</li> <li>Zigbee/BLE Enabled (0.5W)</li> </ul>	2.4GHz (4x4) Enabled 5GHz (8x8) Enabled (No Clients Associated)
DC Power, PoH, uPoE (Max)	31.0W	<ul style="list-style-type: none"> <li>5Gbps Ethernet Enabled</li> <li>1Gbps Ethernet Enabled</li> <li>USB Enabled (3W)</li> <li>Zigbee/BLE Enabled (0.5W)</li> </ul>	2.4GHz (4x4) Tx 20 dBm 5GHz (8x8) Tx 22 dBm
802.3at (Mode 0)*	23.8W	<ul style="list-style-type: none"> <li>5Gbps Ethernet Enabled</li> <li>1Gbps Ethernet Enabled</li> <li>USB Enabled (3W)</li> <li>Zigbee/BLE <b>Disabled</b></li> </ul>	2.4GHz (4x4) Tx 20 dBm 5GHz (4x4) Tx 22 dBm
802.3at (Mode 1)*	25.31W	<ul style="list-style-type: none"> <li>5Gbps Ethernet Enabled</li> <li>1Gbps Ethernet <b>Disabled</b></li> <li>USB <b>Disabled</b> (3W)</li> <li>Zigbee/BLE <b>Disabled</b></li> </ul>	2.4GHz (4x4) Tx 20 dBm 5GHz (8x8) Tx 20 dBm
802.3af (Not recommended)	12.4W	<ul style="list-style-type: none"> <li>5Gbps &amp; 1Gbps Ethernet enabled</li> <li>USB <b>Disabled</b></li> <li>Zigbee/BLE <b>Disabled</b></li> </ul>	2.4GHz disabled 5GHz disabled

\*For 802.3at Mode 0/Mode 1 details - please refer to R850 AP Release Notes.

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance	<ul style="list-style-type: none"> <li>Wi-Fi CERTIFIED™ a, b, g, n, ac, ax</li> <li>Passpoint®</li> <li>Vantage</li> </ul>
Standards Compliance	<ul style="list-style-type: none"> <li>EN 60950-1 Safety</li> <li>EN 60601-1-2 Medical</li> <li>EN 61000-4-2/3/5 Immunity</li> <li>EN 50121-1 Railway EMC</li> <li>EN 50121-4 Railway Immunity</li> <li>IEC 61373 Railway Shock &amp; Vibration</li> <li>EN 62311 Human Safety/RF Exposure</li> <li>UL 2043 Plenum</li> <li>WEEE &amp; RoHS</li> <li>ISTA 2A Transportation</li> </ul>

SOFTWARE AND SERVICES	
Location Based Services	<ul style="list-style-type: none"> <li>SPoT</li> </ul>
Network Analytics	<ul style="list-style-type: none"> <li>SmartCell Insight (SCI), Ruckus Analytics</li> </ul>
Security and Policy	<ul style="list-style-type: none"> <li>Cloudpath</li> </ul>
IoT	<ul style="list-style-type: none"> <li>Ruckus IoT Suite</li> </ul>

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## ORDERING INFORMATION

901-R850-XX00	R850 dual-band (5GHz and 2.4GHz concurrent) 802.11ax wireless access point, Ultra-High Density performance, 12 spatial streams, adaptive antennas, PoE support. Includes adjustable acoustic drop ceiling bracket. Two Ethernet ports with 1GbE and 5GbE. Does not include power adaptor
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PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

## OPTIONAL ACCESSORIES

902-0180-XX00	• PoE Injector (60W)
902-1170-XX00	• Power Supply (48V, 0.75A, 36W)
902-1180-XX00	• Multigigabit PoE injector (2.5/5/10)-BaseT PoE port, 60W
902-0120-0000	• Spare, Accessory Mounting Bracket

PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, or -W instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX.

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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