

# R510

Indoor 802.11ac Wave 2 2x2:2 Wi-Fi Access Point



## DATA SHEET



### BENEFITS

#### STUNNING WI-FI PERFORMANCE

Provide a great user experience no matter how challenging the environment with BeamFlex+™ adaptive antenna technology and a library of 64 directional antenna patterns.

#### SERVE MORE DEVICES

Connect more devices simultaneously with two MU-MIMO spatial streams and concurrent dual-band 2.4/5GHz radios while enhancing non-Wave 2 device performance.

#### AUTOMATE OPTIMAL THROUGHPUT

ChannelFly™ dynamic channel technology uses machine learning to automatically find the least congested channels. You always get the highest throughput the band can support.

#### MULTIPLE MANAGEMENT OPTIONS

Manage the R510 from the cloud, with on-premises physical/virtual appliances, or without a controller.

#### BETTER MESH NETWORKING

Reduce expensive cabling, and complex mesh configurations by checking a box with SmartMesh™ wireless meshing technology to dynamically create self-forming, self-healing mesh networks.

#### MORE THAN WI-FI

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

By definition, small and medium-size venues host a smaller number of users and devices. But high-performance Wi-Fi is just as important to each and every one of them. People are still accessing the same bandwidth-hungry applications and cloud services they would use anywhere else. Organizations are still connecting an ever-growing assortment of mobile and Internet of Things (IoT) devices. Users and guests still expect consistent, reliable connectivity wherever they roam.

The R510 802.11ac Wave 2 access point delivers the ideal combination of performance, reliability, and coverage for medium-density indoor locations. Using the same patented technologies found in our premier high-density APs, it supports data rates up to 1.2Gbps, along with industry-leading Wi-Fi intelligence to extend range and mitigate interference.

The R510 is the perfect choice for medium-density venues such as small and mid-size enterprise locations, common areas in hotels and office buildings, retail sites, and branch offices. In hotel common areas, for example, the R510 provides high-performance wireless access. In retail stores, it can provide reliable, inconspicuous connectivity for high-quality video applications, wireless IP phones, and handheld point-of-sale scanners.

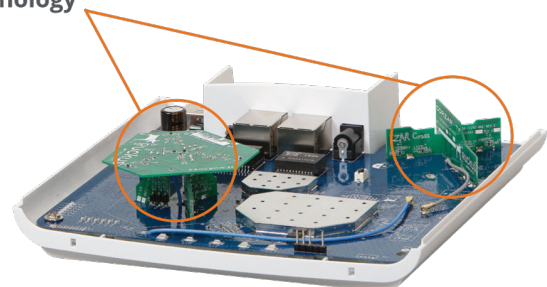
The R510 802.11ac Wave 2 Wi-Fi AP and switch incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

- Extended coverage with patented BeamFlex+ utilizing multi-directional antenna patterns.
- Improve throughput with ChannelFly, which dynamically finds less congested Wi-Fi channels to use.

Additionally, the R510 provides next-generation 802.11ac features like MultiUser MIMO (MU-MIMO) connectivity. It can simultaneously transmit to multiple client devices, drastically improving airtime efficiency, overall throughput for all users—even those with non-Wave 2 clients. The R510 also features a USB port for hosting IoT devices such as Bluetooth Low Energy (BLE).

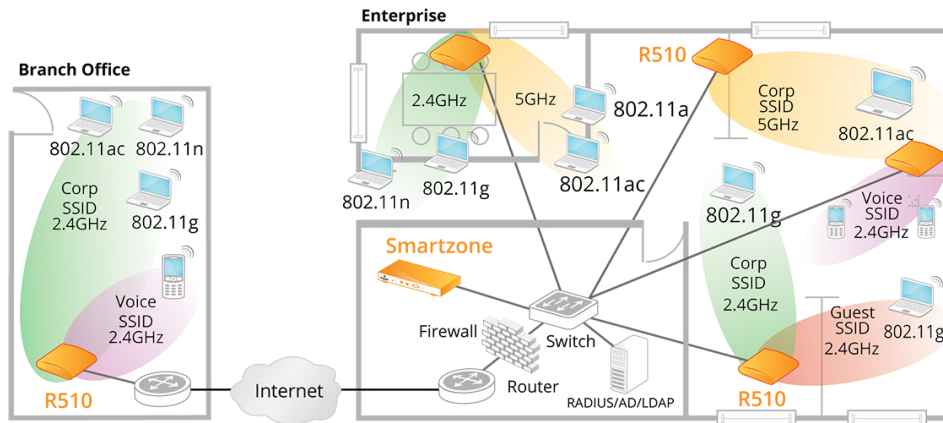
Whether you're deploying ten or ten thousand APs, the R510 is also easy to manage through Ruckus' appliance, virtual and cloud management options.

#### BeamFlex+ Adaptive Antenna Technology



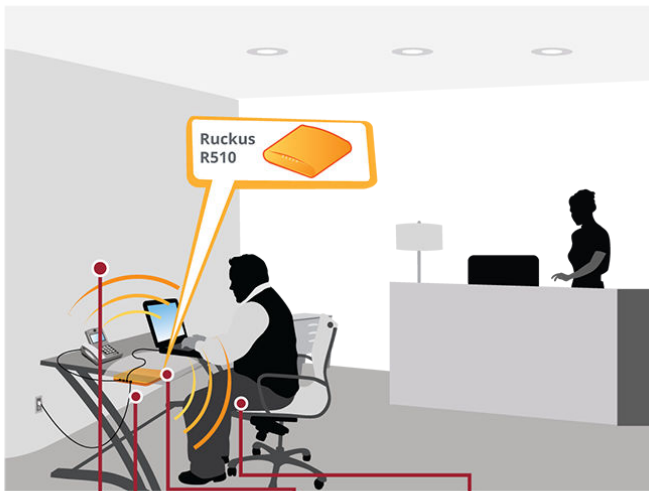
### THE R510 INTEGRATES WITH YOUR EXISTING NETWORK INFRASTRUCTURE

Delivering best-in-class 802.11ac performance and reliability at a competitive price—making it the ideal wireless solution for mid-range enterprise and branch office applications.



### HOTEL COMMON AREAS SUCH AS SHARED OFFICES

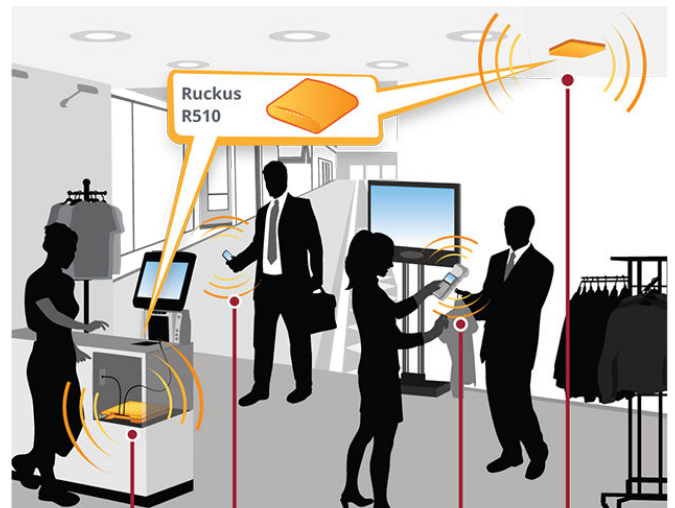
The R510 is ideal for deployment in hotel common areas to provide wireless connection to high quality data access, as well as wired connections to IP phone and guest devices.



- Dual-band (2.4/5GHz) support allows for concurrent Internet and IP-based video services
- Sleek, elegant design easily concealed
- Multiple SSIDs for high-speed Internet access and other services
- Wired ports for connecting IP devices such as laptops and VoIP phones

### DEPLOYMENT FOR RETAIL / BRANCH OFFICES

The R510 is ideal for deployment in retail stores to provide inconspicuous wireless connection to high quality video, wireless IP phones and data access for handheld PoS bar code scanners.



- Wired ports to connect devices such as cash registers, printers, etc.
- Multiple SSIDs for differentiated user services (e.g., guest Wi-Fi, point of sale, voice)
- 5GHz band and smart antenna system ideal for 11ac clients
- Reliable Wi-Fi connectivity for point of sale devices

### ACCESS POINT ANTENNA PATTERN

Ruckus' BeamFlex+ adaptive antennas allow the R510 AP to dynamically choose among a host of antenna patterns (up to 64 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

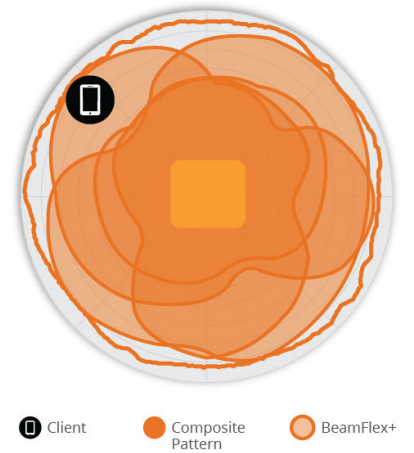


Figure 2. R510 2.4GHz Azimuth Antenna Patterns



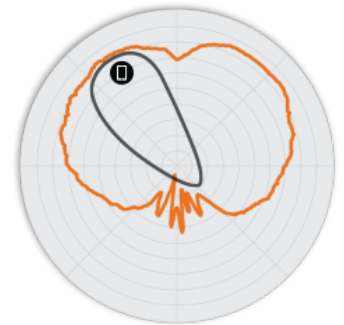
Figure 3. R510 5GHz Azimuth Antenna Patterns



Figure 4. R510 2.4GHz Elevation Antenna Patterns



Figure 5. R510 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.

WI-FI	
<b>Wi-Fi Standards</b>	<ul style="list-style-type: none"> <li>IEEE 802.11a/b/g/n/ac Wave 2</li> </ul>
<b>Supported Rates</b>	<ul style="list-style-type: none"> <li>802.11ac: 6.5 to 867Mbps (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80)</li> <li>802.11n: 6.5 Mbps to 300Mbps (MCS0 to MCS15)</li> <li>802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6Mbps</li> <li>802.11b: 11, 5.5, 2 and 1 Mbps</li> </ul>
<b>Supported Channels</b>	<ul style="list-style-type: none"> <li>2.4GHz: 1-13</li> <li>5GHz: 36-64, 100-144, 149-165</li> </ul>
<b>MIMO</b>	<ul style="list-style-type: none"> <li>2x2 SU-MIMO</li> <li>2x2 MU-MIMO</li> </ul>
<b>Spatial Streams</b>	<ul style="list-style-type: none"> <li>2 SU-MIMO</li> <li>2 MU-MIMO</li> </ul>
<b>Radio Chains and Streams</b>	<ul style="list-style-type: none"> <li>2x2:2</li> </ul>
<b>Channelization</b>	<ul style="list-style-type: none"> <li>20, 40, 80MHz</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK</li> <li>WIPS/WIDS</li> </ul>
<b>Other Wi-Fi Features</b>	<ul style="list-style-type: none"> <li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v</li> <li>Hotspot</li> <li>Hotspot 2.0</li> <li>Captive Portal</li> <li>WISPr</li> </ul>

RF	
<b>Antenna Type</b>	<ul style="list-style-type: none"> <li>BeamFlex+ adaptive antennas with polarization diversity</li> <li>Adaptive antenna that provides up to 64 unique antenna patterns per band</li> </ul>
<b>Antenna Gain (max)</b>	<ul style="list-style-type: none"> <li>Up to 3dBi</li> </ul>
<b>Peak Transmit Power (aggregate across MIMO chains)</b>	<ul style="list-style-type: none"> <li>2.4GHz: 26dBm</li> <li>5GHz: 25dBm</li> </ul>
<b>Minimum Receive Sensitivity<sup>1</sup></b>	<ul style="list-style-type: none"> <li>-101dBm (2.4GHz)</li> <li>-96dBm (5GHz)</li> </ul>
<b>Frequency Bands</b>	<ul style="list-style-type: none"> <li>ISM (2.4-2.484GHz)</li> <li>U-NII-1 (5.15-5.25GHz)</li> <li>U-NII-2A (5.25-5.35GHz)</li> <li>U-NII-2C (5.47-5.725GHz)</li> <li>U-NII-3 (5.725-5.85GHz)</li> </ul>

2.4GHZ RECEIVE SENSITIVITY			
HT20		HT40	
MCS0	MCS7	MCS0	MCS7
-95	-77	-92	-74

5GHZ RECEIVE SENSITIVITY					
VHT20		VHT40		VHT80	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-96	-77	-93	-75	-90	-72

2.4GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 HT20	22
MCS7 HT20	19

5GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 VHT20	22
MCS7 VHT20	19
MCS0 VHT40, VHT80	22
MCS7 VHT40, VHT80	19

PERFORMANCE AND CAPACITY	
<b>Peak PHY Rates</b>	<ul style="list-style-type: none"> <li>2.4GHz: 300Mbps</li> <li>5GHz: 867Mbps</li> </ul>
<b>Client Capacity</b>	<ul style="list-style-type: none"> <li>Up to 512 clients per AP</li> </ul>
<b>SSID</b>	<ul style="list-style-type: none"> <li>Up to 31 per AP</li> </ul>

RUCKUS RADIO MANAGEMENT	
<b>Antenna Optimization</b>	<ul style="list-style-type: none"> <li>BeamFlex+</li> <li>Polarization Diversity with Maximal Ratio Combining (PD-MRC)</li> </ul>
<b>Wi-Fi Channel Management</b>	<ul style="list-style-type: none"> <li>ChannelFly</li> <li>Background Scan Based</li> </ul>
<b>Client Density Management</b>	<ul style="list-style-type: none"> <li>Adaptive Band Balancing</li> <li>Client Load Balancing</li> <li>Airtime Fairness</li> <li>Airtime-based WLAN Prioritization</li> </ul>
<b>SmartCast Quality of Service</b>	<ul style="list-style-type: none"> <li>QoS-based scheduling</li> <li>Directed Multicast</li> <li>L2/L3/L4 ACLs</li> </ul>
<b>Mobility</b>	<ul style="list-style-type: none"> <li>SmartRoam</li> </ul>
<b>Diagnostic Tools</b>	<ul style="list-style-type: none"> <li>Spectrum Analysis</li> <li>SpeedFlex</li> </ul>

<sup>1</sup> Rx sensitivity varies by band, channel width and MCS rate.

NETWORKING	
<b>Controller Platform Support</b>	<ul style="list-style-type: none"> <li>SmartZone</li> <li>ZoneDirector</li> <li>Unleashed<sup>2</sup></li> <li>Cloud Wi-Fi</li> <li>Standalone</li> </ul>
<b>Mesh</b>	<ul style="list-style-type: none"> <li>SmartMesh™ wireless meshing technology. Self-healing Mesh</li> </ul>
<b>IP</b>	<ul style="list-style-type: none"> <li>IPv4, IPv6</li> </ul>
<b>VLAN</b>	<ul style="list-style-type: none"> <li>802.1Q (1 per BSSID or dynamic per use based on RADIUS)</li> <li>VLAN Pooling</li> <li>Port-based</li> </ul>
<b>802.1x</b>	<ul style="list-style-type: none"> <li>Authenticator &amp; Supplicant</li> </ul>
<b>Tunnel</b>	<ul style="list-style-type: none"> <li>L2TP, GRE, Soft-GRE</li> </ul>
<b>Policy Management Tools</b>	<ul style="list-style-type: none"> <li>Application Recognition and Control</li> <li>Access Control Lists</li> <li>Device Fingerprinting</li> <li>Rate Limiting</li> </ul>
<b>IoT Capable</b>	<ul style="list-style-type: none"> <li>Yes</li> </ul>

PHYSICAL INTERFACES	
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>2 x 1GbE ports, RJ-45, PoE in on one port</li> </ul>
<b>USB</b>	<ul style="list-style-type: none"> <li>USB 2.0 port, Type A Connector</li> </ul>

PHYSICAL CHARACTERISTICS	
<b>Physical Size</b>	<ul style="list-style-type: none"> <li>16.8(L) x 16.5(W) x 4.1(H) cm</li> <li>6.6(L) x 6.49(W) x 1.6(H) in</li> </ul>
<b>Weight</b>	<ul style="list-style-type: none"> <li>350g (0.77oz)</li> </ul>
<b>Mounting</b>	<ul style="list-style-type: none"> <li>Wall, Drop ceiling, Desk</li> <li>Secure bracket (sold separately)</li> </ul>
<b>Physical Security</b>	<ul style="list-style-type: none"> <li>Hidden latching mechanism</li> <li>Kensington lock</li> <li>T-bar Torx</li> <li>Bracket (902-0108-0000) Torx screw &amp; padlock (sold separately)</li> </ul>
<b>Operating Temperature</b>	<ul style="list-style-type: none"> <li>0°C (32°F) to 50°C (122°F)</li> </ul>
<b>Operating Humidity</b>	<ul style="list-style-type: none"> <li>Up to 95%, non-condensing</li> </ul>

POWER <sup>3</sup>	
Power Supply	Maximum Power Consumption
<b>802.3af</b>	<ul style="list-style-type: none"> <li>12.6W</li> </ul>
<b>DC Input 12VDC 10A</b>	<ul style="list-style-type: none"> <li>11.9W</li> </ul>

CERTIFICATIONS AND COMPLIANCE	
<b>Wi-Fi Alliance<sup>4</sup></b>	<ul style="list-style-type: none"> <li>Wi-Fi CERTIFIED™ a, b, g, n, ac</li> <li>Passpoint®, Vantage</li> </ul>
<b>Standards Compliance<sup>5</sup></b>	<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>UL 2043 Plenum</li> <li>EN 62311 Human Safety/RF Exposure</li> <li>WEEE &amp; RoHS</li> <li>ISTA 2A Transportation</li> </ul>

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

ORDERING INFORMATION	
<b>901-R510-XX00</b>	<ul style="list-style-type: none"> <li>Concurrent dual band 802.11ac AP, no power adapter</li> </ul>

See Ruckus price list for country-specific ordering information. Warranty: Sold with a limited lifetime warranty. For details see: <http://support.ruckuswireless.com/warranty>.

OPTIONAL ACCESSORIES	
<b>902-0162-XXYY</b>	<ul style="list-style-type: none"> <li>PoE injector (24W) (Sold in quantities of 1, 10 or 100)</li> </ul>
<b>902-0195-0000</b>	<ul style="list-style-type: none"> <li>Spare, T-bar ceiling mount kit for mounting to flush frame ceiling</li> </ul>
<b>902-1169-XX00</b>	<ul style="list-style-type: none"> <li>Power Supply (12V, 2.0A, 24W)</li> </ul>
<b>902-0108-0000</b>	<ul style="list-style-type: none"> <li>Spare, accessory mounting bracket with padlock support</li> </ul>
<b>902-0120-0000</b>	<ul style="list-style-type: none"> <li>Spare, Accessory Mounting Bracket</li> </ul>
<b>902-0173-XXYY</b>	<ul style="list-style-type: none"> <li>Power Adapter (12V, 1.0A, 12W) (Sold in quantities of 1 or 10)</li> </ul>

XX: US/KS/JP/Z2/WW

For expansion of XX and YY: Please consult current Ruckus Price List. Region availability subject to Certification Date per region.

<sup>2</sup> Refer to Unleashed datasheets for SKU ordering information.

<sup>3</sup> Max power varies by country setting, band, and MCS rate.

<sup>4</sup> For complete list of WFA certifications, please see Wi-Fi Alliance website.

<sup>5</sup> For current certification status, please see price list.