

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.

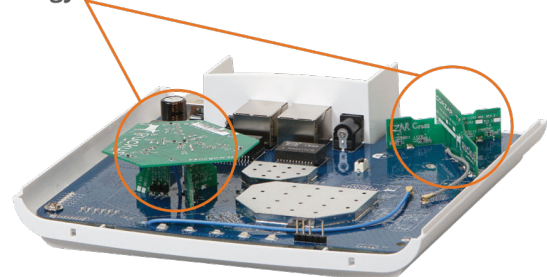
The R510 802.11ac Wave 2 Wi-Fi AP and switch incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

- 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).

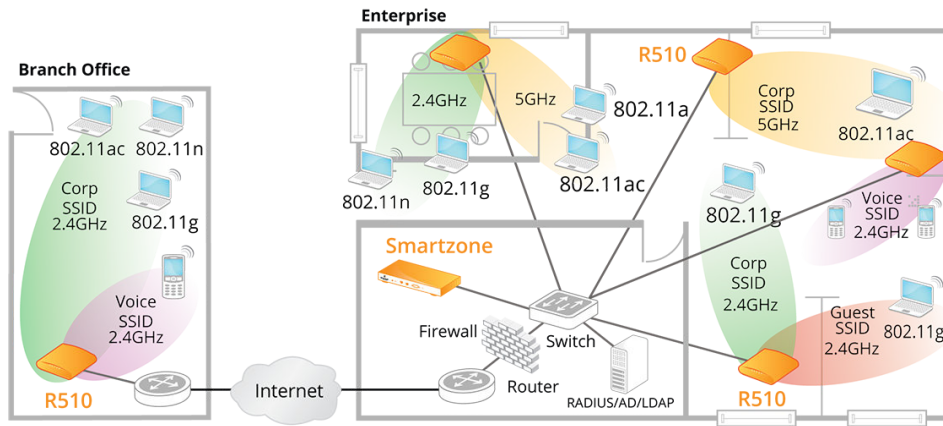
Whether you're deploying ten or ten thousand APs, the R510 is also easy to manage through Ruckus' appliance, virtual and cloud management options.

BeamFlex+ Adaptive Antenna Technology



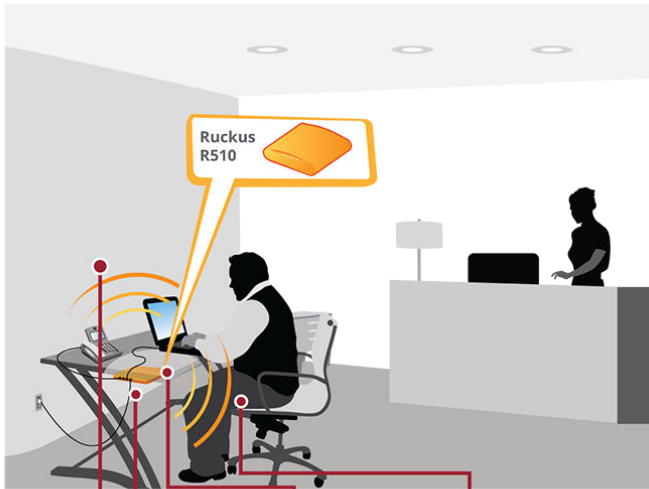
THE R510 INTEGRATES WITH YOUR EXISTING NETWORK INFRASTRUCTURE

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

Wired ports for connecting IP devices such as laptops and VoIP phones

Multiple SSIDs for high-speed Internet access and other services

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)

Reliable Wi-Fi connectivity for point of sale devices

5GHz band and smart antenna system ideal for 11ac clients

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

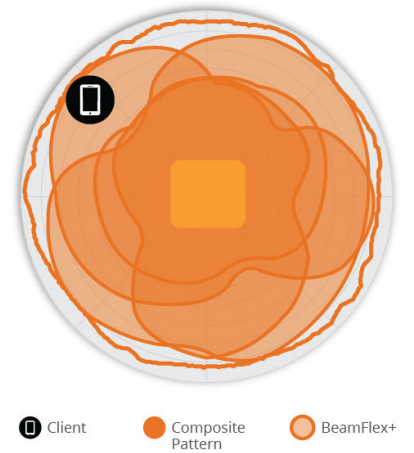


Figure 2. R510 2.4GHz Azimuth Antenna Patterns



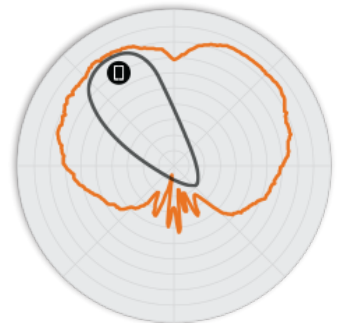
Figure 3. R510 5GHz Azimuth Antenna Patterns



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

RF	
Antenna Type	<ul style="list-style-type: none"> BeamFlex+ adaptive antennas with polarization diversity Adaptive antenna that provides up to 64 unique antenna patterns per band
Antenna Gain (max)	<ul style="list-style-type: none"> Up to 3dBi
Peak Transmit Power (aggregate across MIMO chains)	<ul style="list-style-type: none"> 2.4GHz: 26dBm 5GHz: 25dBm
Minimum Receive Sensitivity¹	<ul style="list-style-type: none"> -101dBm (2.4GHz) -96dBm (5GHz)
Frequency Bands	<ul style="list-style-type: none"> ISM (2.4-2.484GHz) U-NII-1 (5.15-5.25GHz) U-NII-2A (5.25-5.35GHz) U-NII-2C (5.47-5.725GHz) U-NII-3 (5.725-5.85GHz)

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

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

¹ Rx sensitivity varies by band, channel width and MCS rate.

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"> SmartZone ZoneDirector Unleashed² Cloud Wi-Fi Standalone
Mesh	<ul style="list-style-type: none"> SmartMesh™ wireless meshing technology. Self-healing Mesh
IP	<ul style="list-style-type: none"> IPv4, IPv6
VLAN	<ul style="list-style-type: none"> 802.1Q (1 per BSSID or dynamic per use based on RADIUS) VLAN Pooling Port-based
802.1x	<ul style="list-style-type: none"> Authenticator & Supplicant
Tunnel	<ul style="list-style-type: none"> L2TP, GRE, Soft-GRE
Policy Management Tools	<ul style="list-style-type: none"> Application Recognition and Control Access Control Lists Device Fingerprinting Rate Limiting
IoT Capable	<ul style="list-style-type: none"> Yes

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

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

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

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance⁴	<ul style="list-style-type: none"> Wi-Fi CERTIFIED™ a, b, g, n, ac Passpoint®, Vantage
Standards Compliance⁵	<ul style="list-style-type: none"> EN 60950-1 Safety EN 60601-1-2 Medical EN 61000-4-2/3/5 Immunity EN 50121-1 Railway EMC EN 50121-4 Railway Immunity IEC 61373 Railway Shock & Vibration UL 2043 Plenum EN 62311 Human Safety/RF Exposure WEEE & RoHS ISTA 2A Transportation

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

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

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

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.

² Refer to Unleashed datasheets for SKU ordering information.

³ Max power varies by country setting, band, and MCS rate.

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

⁵ For current certification status, please see price list.