

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.

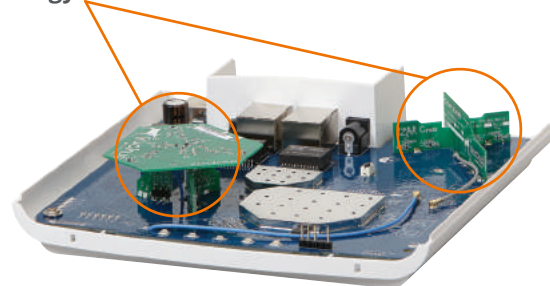
The R510 802.11ac Wave 2 Wi-Fi AP and switch incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

- 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).

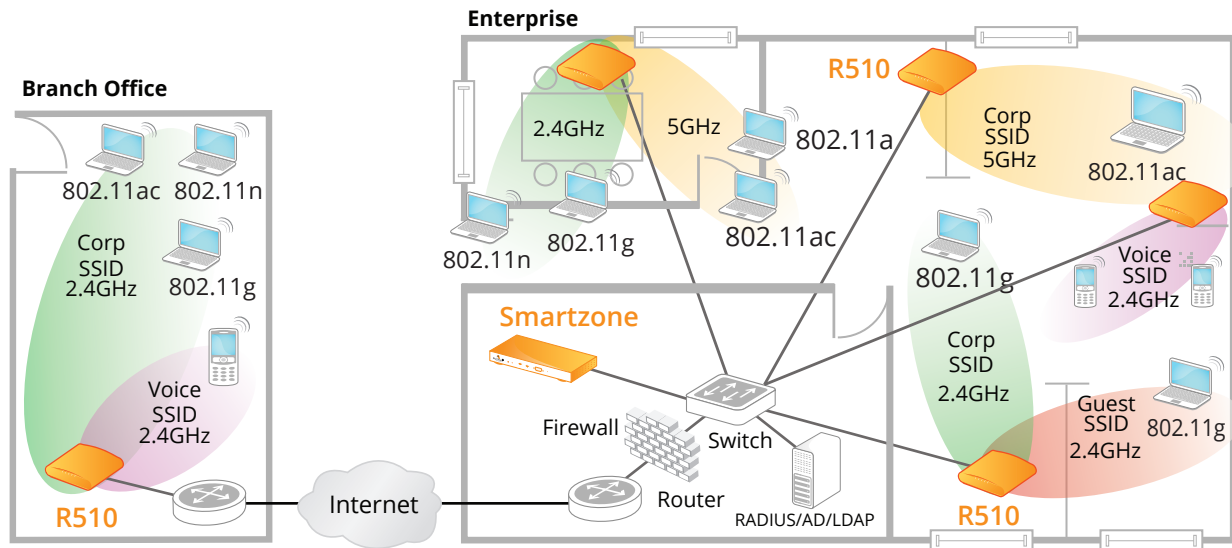
Whether you're deploying ten or ten thousand APs, the R510 is also easy to manage through Ruckus' appliance, virtual and cloud management options.

BeamFlex+ Adaptive Antenna Technology



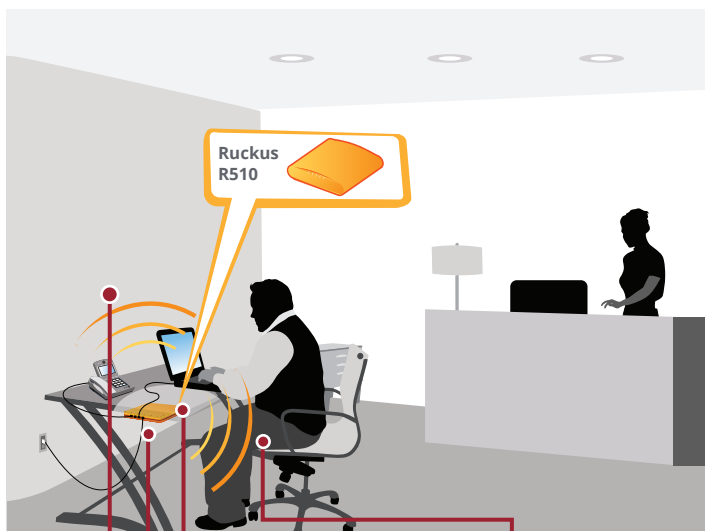
THE R510 INTEGRATES WITH YOUR EXISTING NETWORK INFRASTRUCTURE

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

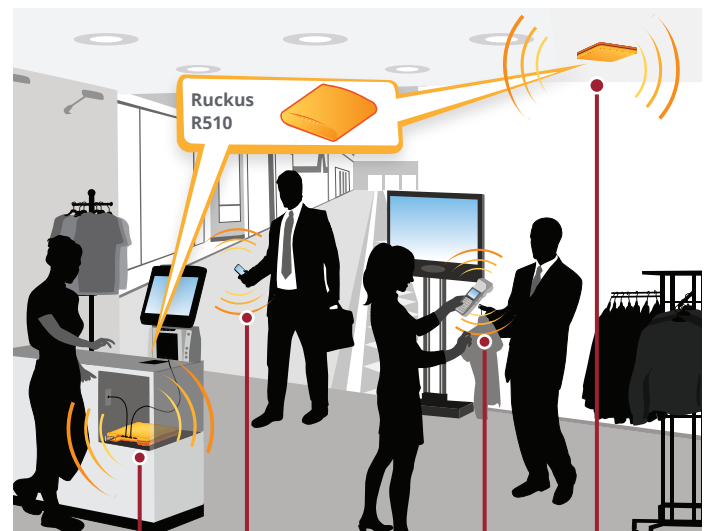
Sleek, elegant design easily concealed

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

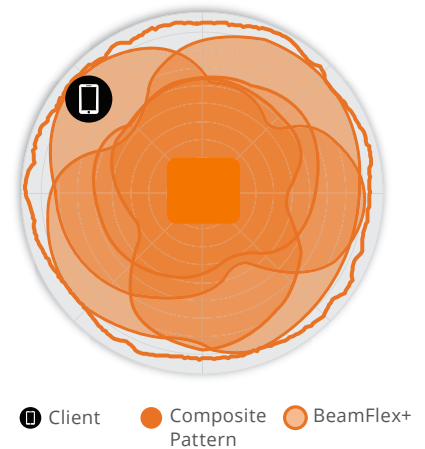


Figure 2. R510 2.4GHz Azimuth Antenna Patterns



Figure 3. R510 5GHz Azimuth Antenna Patterns



Figure 4. R510 2.4GHz Elevation Antenna Patterns

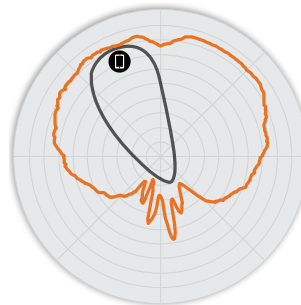
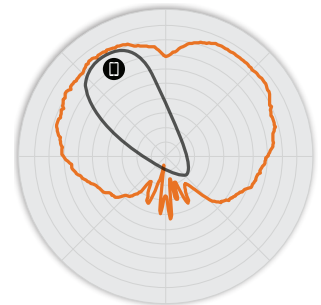


Figure 5. R510 5GHz Elevation Antenna Patterns



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	IEEE 802.11a/b/g/n/ac Wave 2
Supported Rates	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	2.4GHz: 1-13 5GHz: 36-64, 100-144, 149-165
MIMO	2x2 SU-MIMO 2x2 MU-MIMO
Spatial Streams	2 SU-MIMO 2 MU-MIMO
Channelization	20, 40, 80MHz
Security	- WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK - WIPS/WIDS
Other Wi-Fi Features	- WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v - Hotspot - Hotspot 2.0 - Captive Portal - WISPr

RF	
Antenna Type	- BeamFlex+ adaptive antennas with polarization diversity - Adaptive antenna that provides up to 64 unique antenna patterns per band
Antenna Gain (max)	2.4GHz: 1dBi 5GHz: 3dBi
Peak Transmit Power (aggregate across MIMO chains)	2.4GHz: 26dBm 5GHz: 25dBm
Minimum Receive Sensitivity ¹	-101dBm (2.4GHz) -96dBm (5GHz)
Frequency Bands	- 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	2.4GHz: 400Mbps 5GHz: 867Mbps
Client Capacity	Up to 512 clients per AP
SSID	Up to 31 per AP

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	- BeamFlex+ - Polarization Diversity with Maximal Ratio Combining (PD-MRC)
Wi-Fi Channel Management	- ChannelFly - Background Scan Based
Client Density Management	- Adaptive Band Balancing - Client Load Balancing - Airtime Fairness - Airtime-based WLAN Prioritization
SmartCast Quality of Service	- QoS-based scheduling - Directed Multicast - L2/L3/L4 ACLs
Mobility	SmartRoam
Diagnostic Tools	- Spectrum Analysis - SpeedFlex

NETWORKING	
Controller Platform Support	- SmartZone - ZoneDirector - Unleashed² - Cloud Wi-Fi - Standalone
Mesh	SmartMesh™ wireless meshing technology. Self-healing Mesh
IP	IPv4, IPv6
VLAN	802.1Q (1 per BSSID or dynamic per use based on RADIUS) - VLAN Pooling - Port-based
802.1x	Authenticator & Supplicant
Tunnel	L2TP, GRE, Soft-GRE

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

² Refer to Unleashed datasheets for SKU ordering information.

NETWORKING	
Policy Management Tools	- Application Recognition and Control - Access Control Lists - Device Fingerprinting - Rate Limiting
PHYSICAL INTERFACES	
Ethernet	2 x 1GbE ports, RJ-45, PoE in on one port
USB	USB 2.0 port, Type A connector
PHYSICAL CHARACTERISTICS	
Physical Size	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	350g (0.77oz)
Mounting	- Wall, Drop ceiling, Desk - Secure bracket (sold separately)
Physical Security	- Hidden latching mechanism - Kensington lock - T-bar Torx - Bracket (902-0108-0000) Torx screw & padlock (sold separately)
Operating Temperature	0°C (32°F) to 50°C (122°F)
Operating Humidity	Up to 95%, non-condensing
POWER ³	
Power Supply	Maximum Power Consumption
802.3af	12.6W
DC Input 12 VDC 10A	11.9W
CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance ⁴	- Wi-Fi CERTIFIED™ a, b, g, n, ac - Passpoint®, Vantage
Standards Compliance ⁵	- 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	SPoT
Network Analytics	SmartCell Insight (SCI)
Security and Policy	Cloudpath
ORDERING INFORMATION	
901-R510-XX00	Concurrent dual band 802.11ac AP, no power adapter
OPTIONAL ACCESSORIES	
902-0108-0000	Spare, Accessory Mounting Bracket with padlock support
902-0120-0000	Spare, Accessory Mounting Bracket
902-0195-0000	Spare, T-bar ceiling mount kit for R510 and other APs for mounting to flush frame ceiling
902-0173-XXYY	Power Adapter, AC/DC wall plug, 100-240Vac 50/60Hz
902-0162-XXYY	PoE injector (sold in quantities of 10 or 100)

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

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.

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.

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