



TATA INSTITUTE OF SOCIAL SCIENCES

RE-IMAGINING FUTURES

Mumbai 400088.

ENQUIRY					
To:					
PRESS		Enquiry No : TISS/PUR/47/20			
PRESS					
		Our Email ID : dilip_p@tiss.edu			
		Date : 07-10-2020			
		Due Date : 16-10-2020			
		Our Tel No :			
		Mob No :			
Dear Sir/Madam, You are requested to submit your sealed quotation in the following format superscribing "Quotation for TISS/PUR/47/20", in company's letter head to the Section Officer, Purchase & Stores Section, Tata Institute of Social Sciences, Sion Trombay Road, Deonar, Mumbai. The last date for submission of quotation is on or before 16-10-2020 on any working days between 10:30 a.m. & 5.30 p.m.					
Sl.No	Description of Items (Please Quote along with Specifications or full details of the equipments)	RATE (Rs.)	PER QTY.	TOTAL QTY REQUIRED.	AMOUNT (Rs.)
1	WIFI ROUTER 1 RUCKUS R310 INDOOR 802.11AC 2X2:2 WIFI ACCESS POINT			3 EACH	
2	WIFI ROUTER 2 RUCKUS R510 INDOOR 802.11AC 2X2:2 WIFI ACCESS POINT			2 EACH	
3	WIFI ROUTER 3 RUCKUS R710 INDOOR 802.11AC 24X4:4 WIFI ACCESS POINT			3 EACH	
4	ADAPTER CAPITAL DIGITAL POE ADAPTER DIGISOL 48V DC DESKTOP MOUNT GIGABIT ETHERNET POE INJECTOR DG-PE2248D			8 EACH	
5	SOFTWARE1 LICENCES FOR ZONE DIRECTOR			8 EACH	
a.Add: Sales Tax:					
b.Add: Resale Tax:					
c.Add: VAT@ %					
d.Add: Excise Duty :					
e.Add: Swacha Bharat Cess:					
f.Add: Krishi kalyan Cess:					
g.Add: Krishi kalyan Cess:					
h.Add: Service Tax:					
i.Add: GST:					
j.Add: Any Other:					
TOTAL (Rs.)					
Warranty:					
Payment Terms:					

Less : Discount if any (for Educational Institute)
**SEAL AND STAMP
 OF THE ORGANISATION**

19/10/20
 08/10/20
 Yours faithfully

Section Officer(Purchase & Stores)

**TATA INSTITUTE OF SOCIAL SCIENCES****RE-IMAGINING FUTURES****Mumbai 400088.****TERMS AND CONDITIONS**

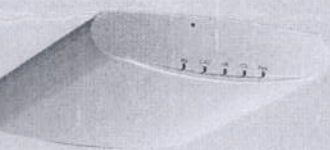
- 1 FREE DELIVERY AT THE INSTITUTE'S PREMISES IN MUMBAI CAMPUS
- 2 PRICES SHOULD BE INCLUSIVE OF GST IN PERCENTILE
- 3 PLEASE PROVIDE GST NUMBER AND NEFT CODE WITH BANK DETAILS
- 4 BREAK UP OF INDIVIDUALS COST OF ITEMS SHOULD BE PROVIDED
- 5 IF ANY HIDDEN CHARGES, KINDLY SPECIFY. THIS INCLUDES MENTIONING INSTALLATION CHARGE ALSO AND PRODUCT SHOULD BE INSTALLED
- 6 QUOTATION SHOULD BE VALID FOR SIX MONTHS
QUOTATION WILL BE OPENED ON THE NEXT WORKING DAY OF DUE DATE AT 11.00 HRS
- 7 PAYMENT WILL BE MADE WITHIN 30 DAYS FROM THE DATE OF INVOICE.
- 8 INSTALLATION FEE / CHARGES, IF ANY MAY KINDLY BE QUOTED SEPARATELY ON YOUR LETTER HEAD. ✓

lg/Nov
08/7/20

RUCKUS R310

802.11ac 2x2:2 Wi-Fi Access Point

COMMScope®
RUCKUS®



SCALABLE ENTERPRISE PERFORMANCE
The R310 provides great performance with extended range at an affordable price.

WORKS WITH EXISTING SWITCHES AND CABLES
The R310 can operate on existing PoE switches and CAT5e cabling to minimize costly upgrades.

EASY MANAGEMENT OPTIONS
Manage the R310 from the cloud, with on-premises virtual appliances, or without a controller.

EXTENDED COVERAGE WITH BEAMFLEX™
The R310 provides extended coverage with patented BeamFlex™ adaptive antenna technology while mitigating interference by using 64 directional antenna patterns.

MAXIMIZE 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.

MORE THAN WI-FI
The R310 provides services beyond Wi-Fi with Cloudpath onboarding software, SPoT Wi-Fi analytics engine, and SCL network analytics.

Smaller locations can face big-time demands on their wireless infrastructure. Whether working out of a small office or connecting to a public hotspot, users are often still accessing the same high-bandwidth applications and content they'd consume anywhere else. And they expect strong, reliable connectivity. How can you provide it without breaking the bank?

The RUCKUS R310 delivers consistent, reliable 802.11ac wireless networking at an affordable price. It features the patented Ruckus BeamFlex adaptive antenna technology for performance optimization and interference mitigation found in our premier access points, delivering superior user experiences at extended ranges. But it provides them in an ultra-compact form factor built for small venues—with a price tag to match.

The R310 is an ideal choice for low-density enterprise and hotspot environments including small- and medium-size businesses, retail locations, restaurants, and multi-tenant small offices and branch offices.

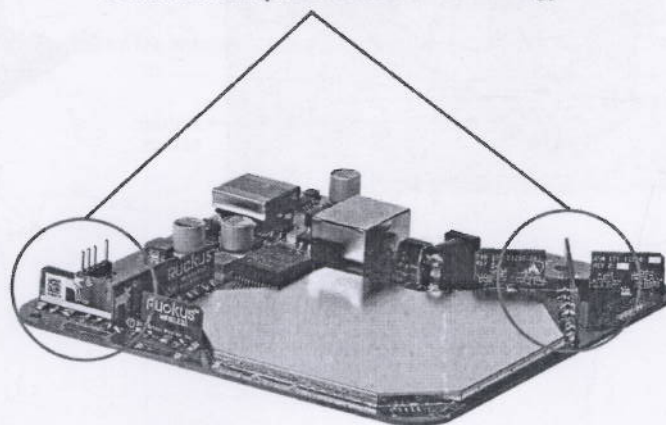
The R310 802.11ac Wi-Fi AP incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

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

The R310 provides an ideal combination of features and performance for smaller environments. Additionally, it supports up to 100 clients per AP.

Whether you're deploying ten or ten thousand APs, the R310 is also easy to manage through Ruckus' appliance, virtual, controller-less and cloud management options.

BeamFlex Adaptive Antenna Technology



RUCKUS R310

802.11ac 2x2:2 Wi-Fi Access Point

Access Point Antenna Pattern

Ruckus' BeamFlex adaptive antennas allow the R310 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

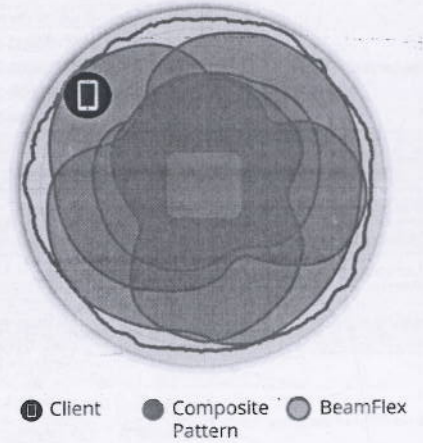


Figure 2. R310 2.4GHz Azimuth Antenna Patterns

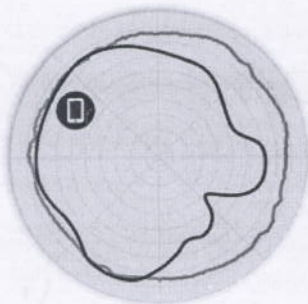


Figure 3. R310 5GHz Azimuth Antenna Patterns

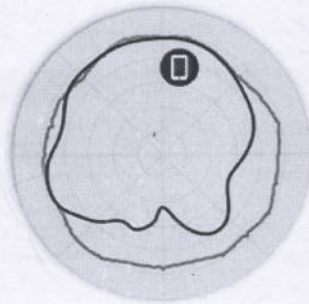


Figure 4. R310 2.4GHz Elevation Antenna Patterns

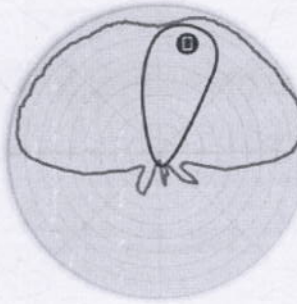
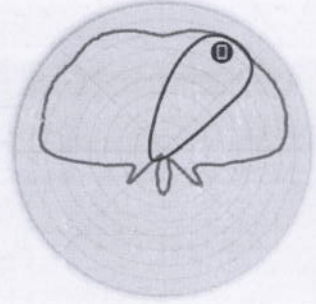


Figure 5. R310 5GHz Elevation Antenna Patterns



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.

RUCKUS R310

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

Wi-Fi	
Wi-Fi Standards	IEEE 802.11a/b/g/n/ac
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
Spatial Streams	2 SU-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 - Adaptive antenna that provides up to 64 unique antenna patterns per band
Antenna Gain (max)	Up to 3dBi
Peak Transmit Power (aggregate across MIMO chains)	2.5GHz: 25dBm 5GHz: 24dBm
Minimum Receive Sensitivity ¹	-99dBm
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
-89	-68	-85	-65

5GHZ RECEIVE SENSITIVITY					
VHT20		VHT40		VHT80	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-98	-69	-86	-66	-83	-62

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

2.4GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 HT20	23
MCS7 HT20	18
MCS0 HT40	22
MCS7 HT40	19

5GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 VHT20	21
MCS7 VHT20	18
MCS0 VHT40	21
MCS7 VHT40	18
MCS0 VHT80	20
MCS7 VHT80	17

PERFORMANCE AND CAPACITY	
Peak PHY Rates	2.4GHz: 300Mbps 5 GHz: 867Mbps
Client Capacity	Up to 100 clients per AP
SSID	Up to 16 per AP

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	BeamFlex
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	SpeedFlex

RUCKUS R310

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

NETWORKING	
Controller Platform Support	- SmartZone - ZoneDirector - Unleashed² - Cloud Wi-Fi - Standalone
Mesh	No Mesh support
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
Policy Management Tools	- Application Recognition and Control - Access Control Lists - Device Fingerprinting - Rate Limiting

PHYSICAL INTERFACES	
Ethernet	1 x 1GbE port, RJ-45

PHYSICAL CHARACTERISTICS	
Physical Size	13.8(L) x 13.5(W) x 3.3(H) cm 5.43(L) x 5.31(W) x 1.3(H) in
Weight	220g (7.8oz)
Mounting	- Wall, Drop ceiling, Desk - Secure bracket (sold separately)
Physical Security	- Hidden latching mechanism - Kensington lock - T-bar Torx
Operating Temperature	0 °C (32 °F) to 40 °C (104 °F)
Operating Humidity	Up to 95%, non-condensing

POWER ³	
Power Supply	Maximum Power Consumption
802.3af	11W
DC input 12 VDC 10A	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-R310-XX02	Concurrent dual band 802.11ac AP, no power adapter

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	
902-0162-XXYY	PoE injector (24W) (Sold in quantities of 1, 10 or 100)
902-0195-0000	Spare, T-bar ceiling mount kit for mounting to flush frame ceiling
902-1169-XX00	Power Supply (12V, 2.0A, 24W)
902-0120-0000	Spare, Accessory Mounting Bracket
902-0173-XXYY	Power Adapter (12V, 1.0A, 12W) (Sold in quantities of 1 or 10)

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.

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 the Wi-Fi Alliance website.

⁵ For current certification status, please see the price list.

RUCKUS R310

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

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com

COMMScope®

commscope.com

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

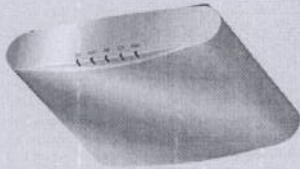
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Further information regarding CommScope's commitment can be found at www.commscope.com/About-Us/Corporate-Responsibility-and-Sustainability.

RUCKUS R510

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



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 RUCKUS 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.

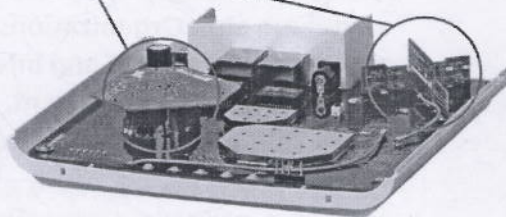
Additionally, the R510 provides next-generation 802.11ac features like MultiUser MIMO (MU-MIMO) connectivity. It can simultaneously transmit to multiple client devices, drastically improving airtime efficiency, overall throughput for all users—even those with non-Wave 2 clients. The R510 also features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

RUCKUS R510

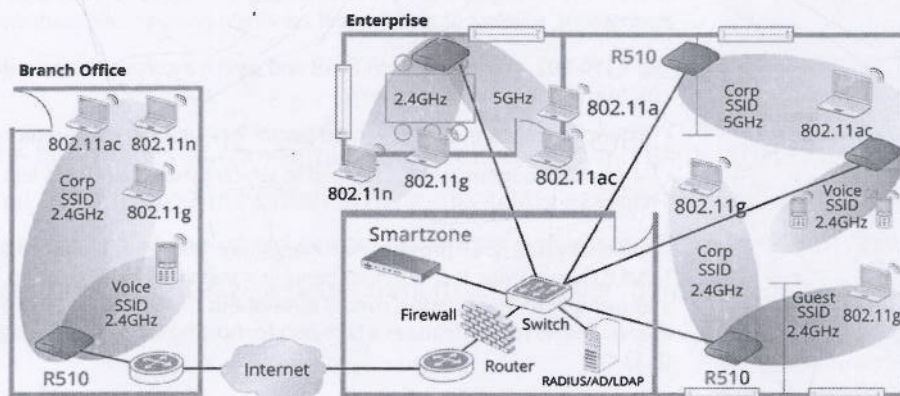
Indoor 802.11ac Wave 2 2x2:2 Wi-Fi Access Point

**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

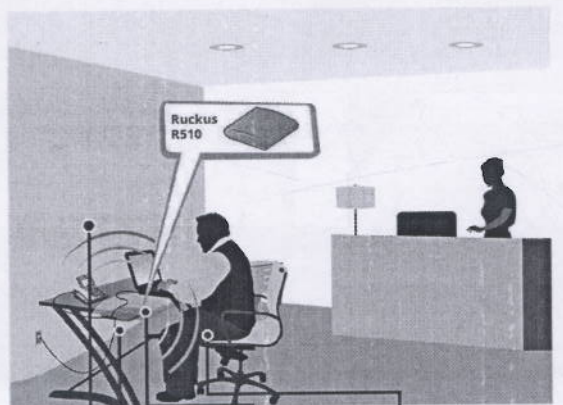
The R510 is ideal for deployment in hotel common areas to provide wireless connection to high quality data access, as well as wired connections to IP phone and guest devices.

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.

RUCKUS R510

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

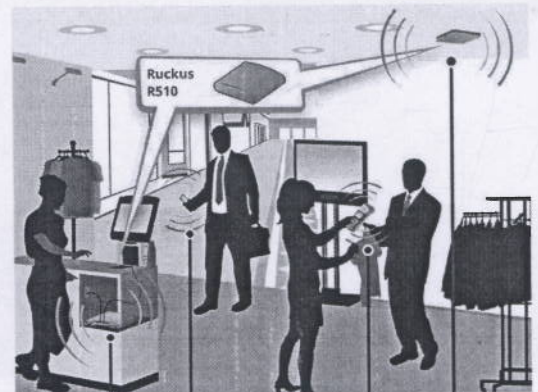


Dual-band (2.4/5GHz)* support allows for concurrent Internet and IP-based video services

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



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

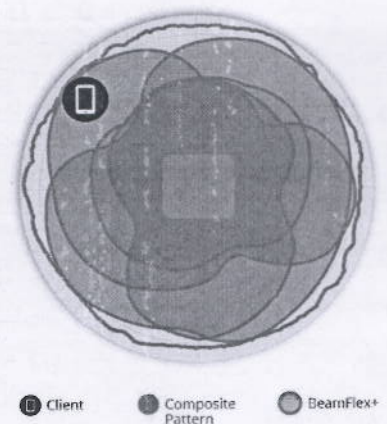
Access Point Antenna Pattern

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

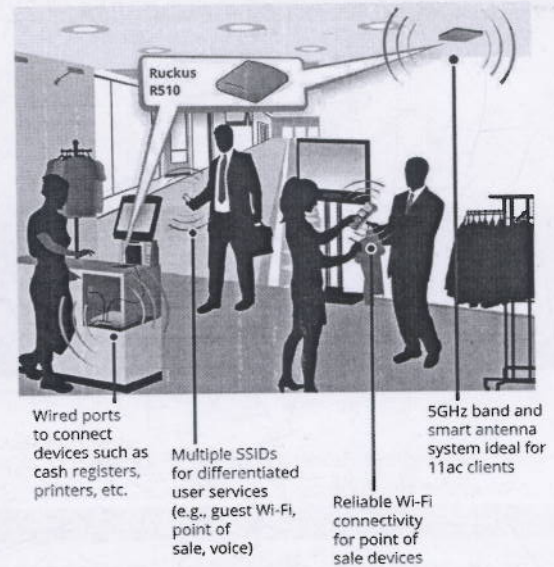
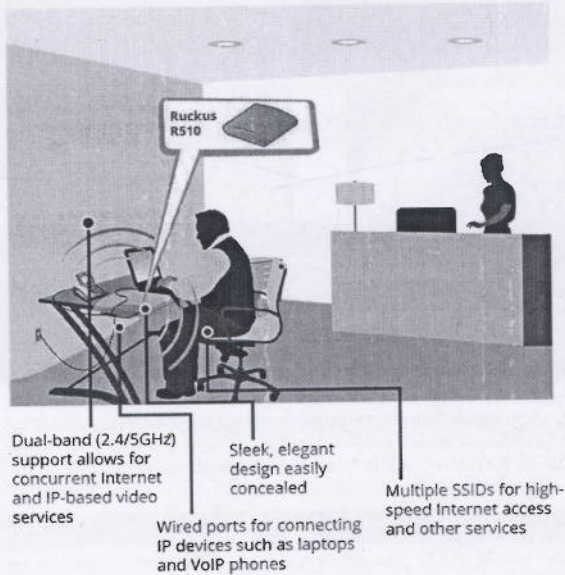
Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the Ruckus BeamFlex+ adaptive antenna directs the radio signals per-device on a packet-by-packet basis to optimize Wi-Fi coverage and 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



RUCKUS R510

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



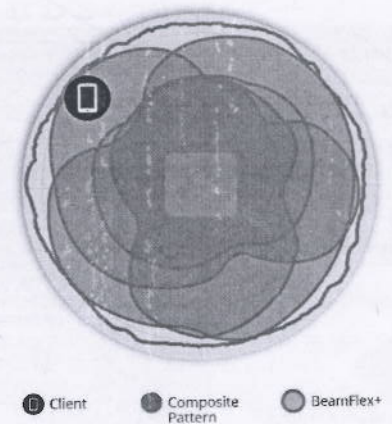
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Figure 1. Example of BeamFlex+ pattern



RUCKUS R510

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

Figure 2. R510 2.4GHz Azimuth Antenna Patterns

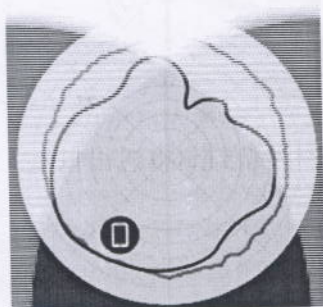


Figure 3. R510 5GHz Azimuth Antenna Patterns

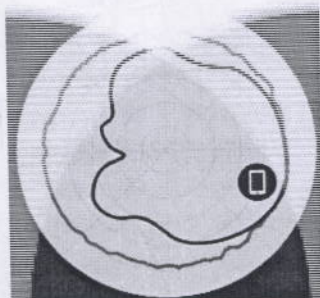


Figure 4. R510 2.4GHz Elevation Antenna Patterns

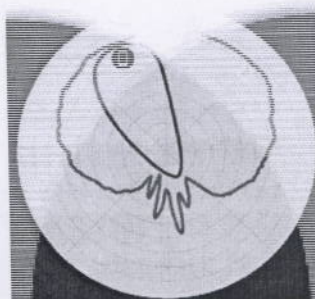
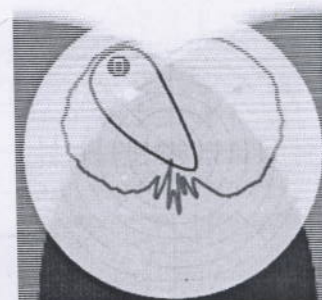


Figure 5. R510 5GHz Elevation Antenna Patterns



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
Radio Chains and Streams	2x2:2
Channelization	20, 40, 80MHz
Security	- WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 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)	Up to 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

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

RUCKUS R510

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

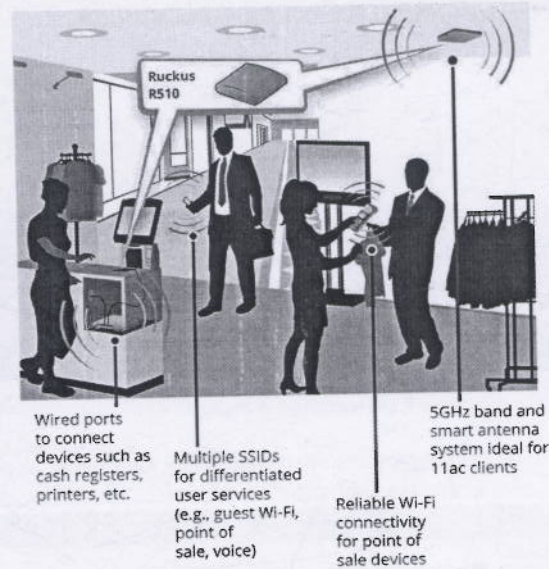
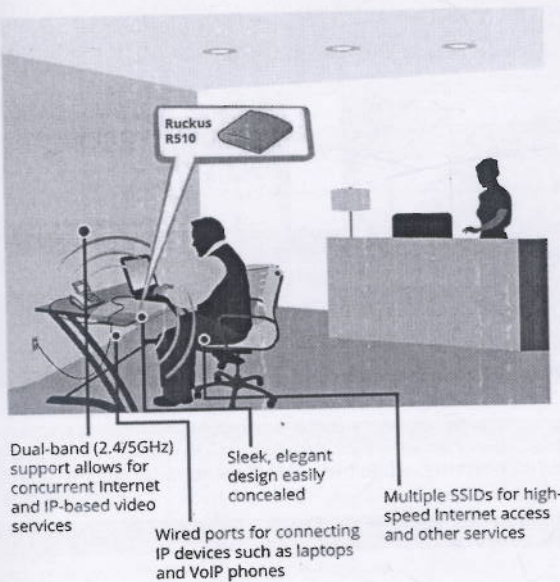


Figure 1. Example of BeamFlex+ pattern

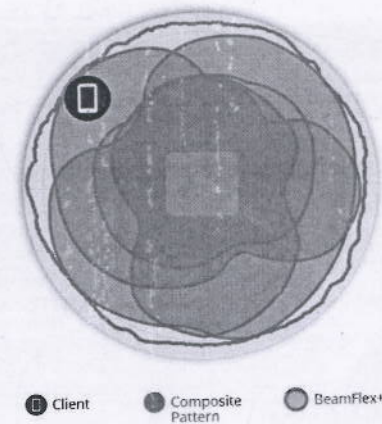
Access Point Antenna Pattern

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 omnidirectional 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 maximize 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.



RUCKUS R510

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

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: 300Mbps 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 - 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
Policy Management Tools	- Application Recognition and Control - Access Control Lists - Device Fingerprinting - Rate Limiting
IoT Capable	Yes

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 12VDC 10A	11.9W

² Refer to Unleashed datasheets for SKU ordering information.

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

RUCKUS R510

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

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
---------------	--

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

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

⁵ For current certification status, please see price list.

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	• PoE injector (24W) (Sold in quantities of 1, 10 or 100)
902-0195-0000	• Spare, T-bar ceiling mount kit for mounting to flush frame ceiling
902-1169-XX00	• Power Supply (12V, 2.0A, 24W)
902-0108-0000	• Spare, accessory mounting bracket with padlock support
902-0120-0000	• Spare, Accessory Mounting Bracket
902-0173-XXYY	• 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.

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com

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

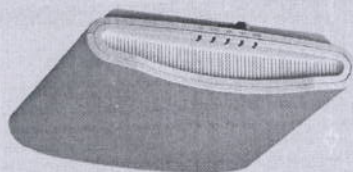
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RUCKUS R710

Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point



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 4K+ directional antenna patterns.

Serve More Devices

Connect more devices simultaneously with four 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 R710 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.

Expanded Backhaul

Pair two onboard 1GbE ports with link aggregation (LACP) to maximize throughput between the AP and wired switch.

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.

Bandwidth-hungry voice and video applications. Internet of Things (IoT) connections. An explosion of new devices and content. With these kinds of demands, organizations in every industry need more from their Wi-Fi. But with hundreds of devices and nonstop wireless noise and interference, busy indoor spaces can make challenging wireless environments.

The RUCKUS R710 is a premier indoor access point, delivering industry-leading performance and reliability in the most demanding high-density locations. With data rates up to 800Mbps (2.4GHz) and 1.733Gbps (5GHz), the R710 delivers the highest available throughput for Wi-Fi clients.

The R710 delivers reliable, high-performance connectivity in schools, universities, public venues, hotels, conference centers, and other busy indoor spaces. The perfect choice for data-intensive streaming multimedia applications, it delivers picture-perfect HD-quality IP video, while supporting voice and data applications with stringent quality-of-service requirements.

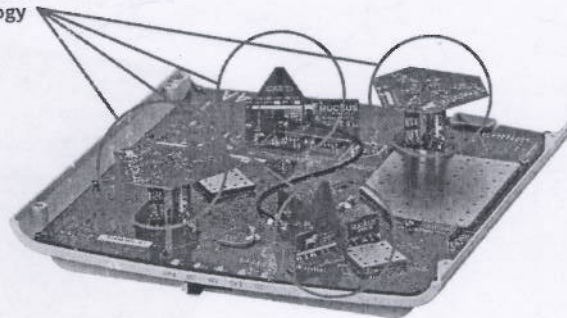
The R710 802.11ac Wave 2 Wi-Fi AP incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

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

With MultiUser MIMO (MU-MIMO) connectivity, the R710 can simultaneously transmit to multiple client devices, drastically improving RF efficiency, overall throughput, and availability—even for non-Wave 2 clients. The R710 also features a USB port for hosting IoT devices such as Bluetooth Low Energy (BLE) beacons, and dual Gigabit Ethernet ports that support Link Aggregation for higher-capacity backhaul to the switch. The R710 supports up to 512 clients per AP and features capacity-based admission control to prevent APs from getting congested with too many attached devices.

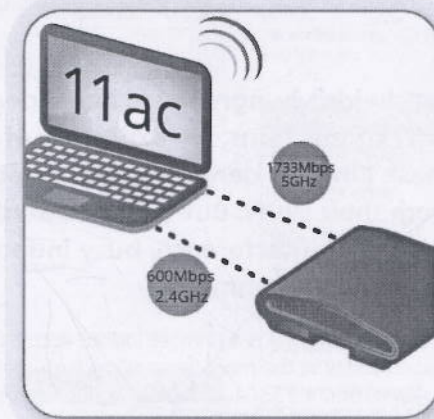
Whether you're deploying ten or ten thousand APs, the R710 is also easy to manage through Ruckus' appliance, virtual and cloud management options.

BeamFlex+ Adaptive Antenna Technology

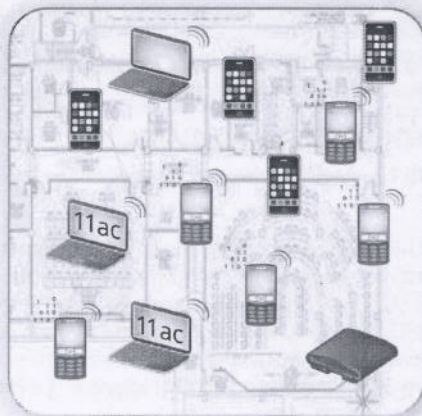


RUCKUS R710

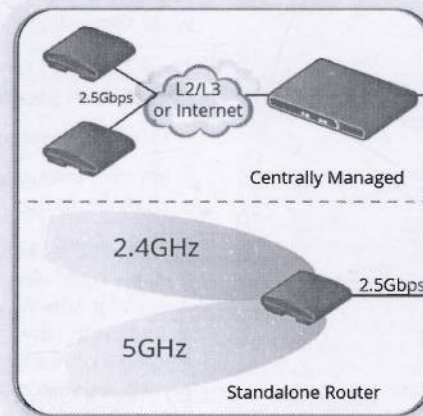
Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point



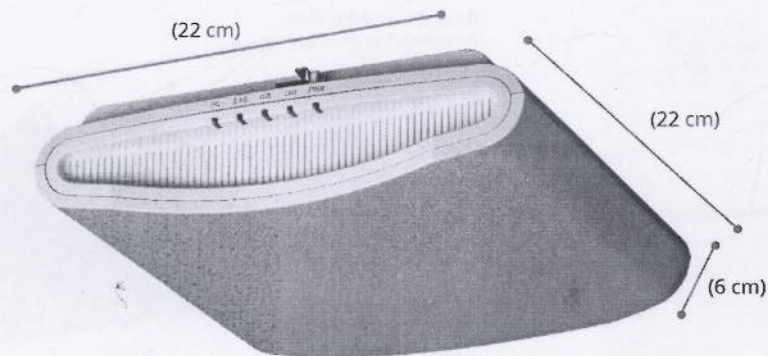
Blinding fast Wave 2 4x4:4
802.11ac with MU-MIMO



Deployment Scenarios



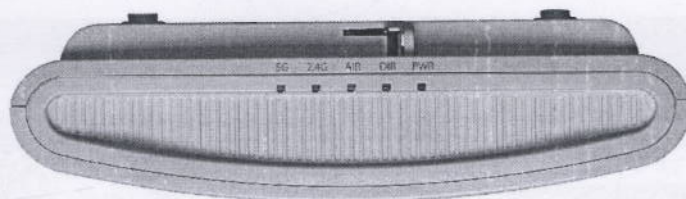
Architectural Flexibility



Weight is 1.1 kg. (2.3 lbs.)

RUCKUS R710

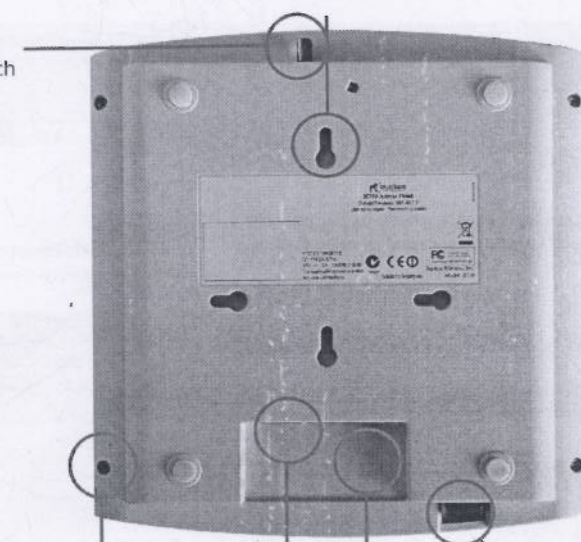
Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point



Front View

Integrated key holes for wall or ceiling mount
(adjustable acoustic drop ceiling bracket included)

Pad-lock
security latch

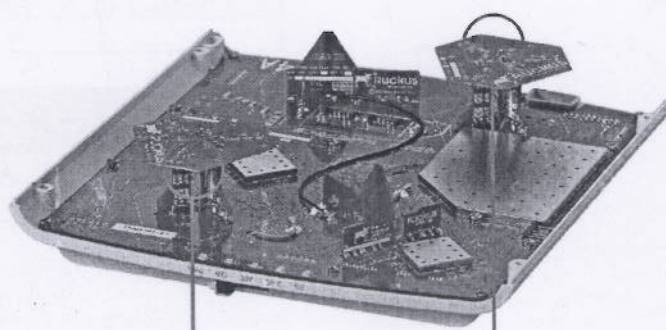


Kensington Lock Eye

Hidden Cables

USB Port for BLE

Two 10/100/1000 Ethernet ports,
one with 802.3af/at/bt (PoE, PoE+,
PoH, UPoE)



BeamFlex+ Adaptive Antenna Technology

RUCKUS R710

Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point

Access Point Antenna Pattern

Ruckus' BeamFlex+ adaptive antennas allow the R710 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

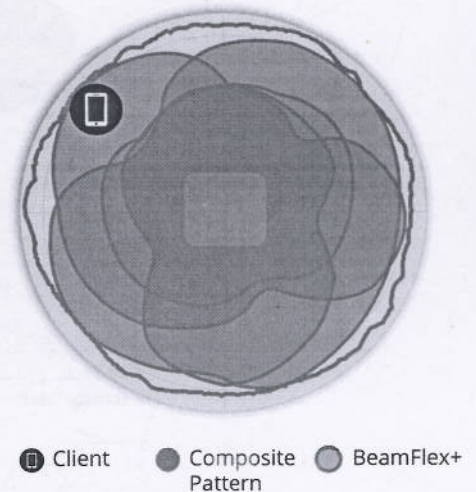


Figure 2. R710 2.4GHz Azimuth Antenna Patterns

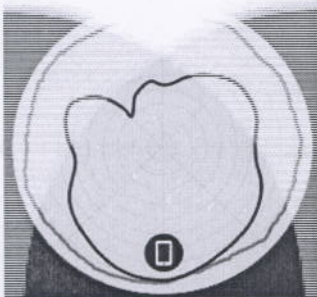


Figure 3. R710 5GHz Azimuth Antenna Patterns

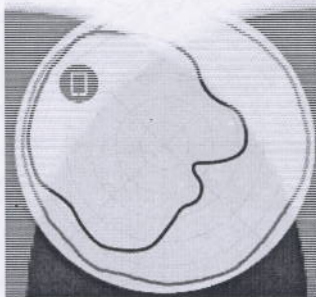


Figure 4. R710 2.4GHz Elevation Antenna Patterns

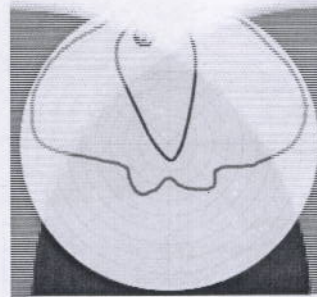
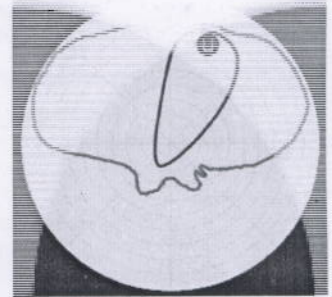


Figure 5. R710 5GHz Elevation Antenna Patterns



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.

RUCKUS R710

Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point

Wi-Fi	
Wi-Fi Standards	IEEE 802.11a/b/g/n/ac Wave 2
Supported Rates	802.11ac: 6.5 to 1,733Mbps (MCS0 to MCS9, NSS = 1 to 4 for VHT20/40/80) 802.11n: 6.5 Mbps to 600Mbps (MCS0 to MCS31) 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	4x4 SU-MIMO 4x4 MU-MIMO
Spatial Streams	4 streams for SU-MIMO 3 streams for MU-MIMO
Channelization	20, 40, 80MHz
Security	- WPA-PSK, WPA-TKIP, WPA2-Personal, WPA2-Enterprise, WPA3-Personal, WPA3-Enterprise, WPA3, 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 4,000+ unique antenna patterns
Antenna Gain (max)	Up to 3dBi
Peak Transmit Power (aggregate across MIMO chains)	2.4GHz: 28dBm 5GHz: 28dBm
Minimum Receive Sensitivity ¹	-104dBm
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
-97	-79	-94	-77

5GHz RECEIVE SENSITIVITY					
VHT20		VHT40		VHT80	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-98	-80	-94	-77	-91	-74

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

5GHz TX POWER TARGET	
Rate	Pout (dBm)
VHT20	22
MCS0, VHT40	22
MCS7, VHT40, VHT80	19
MCS9, VHT40, VHT80	16

PERFORMANCE AND CAPACITY	
Peak PHY Rates	2.4GHz: 600Mbps 5GHz: 1733Mbps
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
Client Density Management	- 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

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

RUCKUS R710

Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point

NETWORKING	
Controller Platform Support	- SmartZone - ZoneDirector - Unleashed² - Standalone - Cloud
Mesh	SmartMesh™ wireless meshing technology. Self-healing Mesh
IP	IPv4, IPv6, dual-stack
VLAN	802.1Q (1 per BSSID or dynamic per user based on RADIUS) - Port-based
802.1x	Authenticator & Supplicant
Tunnel	L2TP
Policy Management Tools	- Application Recognition and Control - Access Control Lists - Device Fingerprinting

PHYSICAL INTERFACES	
Ethernet	- Two 1Gbps Ethernet ports - Power over Ethernet (802.3af/at/bt) with Category 5/5e/6 cable - Link Aggregation (LACP)
USB	1 USB 2.0 port, Type A

PHYSICAL CHARACTERISTICS	
Physical Size	22 cm (L), 22 cm (W), 6 cm (H) 8.7in (L) x 8.7in (W) x 2.4in (H)
Weight	1.12 kg (2.5 lb)
Mounting	- Pole Mount, Flat Surface - Bracket included in the box
Operating Temperature	-4°C (25°F) to 60°C (140°F)
Operating Humidity	Up to 95%, non-condensing

POWER ³		
Power Supply	Operating Characteristics	Max Power Consumption
802.3af	2.4GHz: 2x4, 19dBm per chain 5GHz: 4x4, 20dBm per chain - Functional Limitation: 2nd Ethernet disabled USB disabled	Peak: 25W, including USB loading and 100m cable
802.3at, PoE+/injector, VDC	2.4GHz: 4x4, 22dBm per chain 5GHz: 4x4, 20dBm per chain - Functional Limitation: None	

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance ⁴	- Wi-Fi CERTIFIED™ a, b, g, n, ac - Wi-Fi Enhanced Open™ - WPA2™ - Personal - WPA2™ - Enterprise - WPA3™ - Personal - WPA3™ - Enterprise - Wi-Fi Agile Multiband™ - Wi-Fi Optimized Connectivity™ - Wi-Fi Vantage™ - WMM* - Passpoint*
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-R710-XX00	R710 dual-band (5 GHz and 2.4 GHz concurrent) Wave 2 802.11ac wireless access point, 4x4:4 streams, adaptive antennas, dual ports, PoE support. Includes adjustable flat surface or pole mount bracket. Does not include power adapter.

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	
902-0162-XXYY	PoE injector (24W) (Sold in quantities of 1, 10 or 100)
902-1169-XX00	Power Supply (12V, 2.0A, 24W)
902-0120-0000	Spare, Accessory Mounting Bracket
902-0123-0000	Flush-frame acoustic ceiling bracket for R710. Flush-frame only – not applicable for standard (recessed-frame) acoustic ceiling
902-0195-0000	Spare, T-bar ceiling mount kit for mounting to flush frame ceiling

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.

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.

RUCKUS R710

Indoor 802.11ac Wave 2 4x4:4 Wi-Fi Access Point

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com

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DIGISOL™

SWITCHING SOLUTIONS

DIGISOL 48V DC Desktop Mount Gigabit Ethernet PoE Injector

DG-PE2248D (H/W Ver. B1)

Key Features:-

- Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab and IEEE802.3af/ IEEE802.3at Standards
- Transmits electrical power and data on the single Ethernet Cable
- Compatible with IEEE802.3af/ IEEE802.3at compliant devices
- Supplies power up to 30 watts
- Integrated power module
- Plug-and-Play installation
- Compact Design



Introduction:-

DIGISOL DG-PE2248D Power over Ethernet Injector allows to connect IEEE 802.3af/ IEEE 802.3at compliant network devices to a non-PoE LAN switch port. The injector can be used to connect a wireless access point, IP phone, network camera or any IEEE 802.3af/ IEEE 802.3at compliant powered device (PD) to a switch. DG-PE2248D effectively provides Ethernet data and DC power to a PoE compliant device (IEEE 802.3af/ IEEE 802.3at compliant) using a single Ethernet cable. DG-PE2248D provides an efficient and convenient solution for remote network devices (PoE Compliant) where available space is limited and/or no power source is readily available.



DIGISOL™

SWITCHING SOLUTIONS

Technical Specifications:-

Hardware Specifications

- One Power Connector
- One 10/100/1000 Mbps Ethernet Data In Port
- One 10/100/1000 Mbps Ethernet Power & (PoE Out)

Standards Compliance

- IEEE802.3 10Base-T Ethernet
- IEEE802.3u 100Base-TX Fast Ethernet
- IEEE802.3af/ IEEE802.3at Power over Ethernet (PoE)
- IEEE802.3ab 1000BASE-T Gigabit Ethernet

Ethernet Pin Usage

- Data: Pin No. 1, 2, 3, 6
- Power: Pin No.1 & 2 (-ve), 3 & 6 (+Ve)

LED Indicator

- Power, PoE

Data Transfer rates

- 1000 Mbps
- 100 Mbps

Network Cables

- 100Base-Tx: UTP Cat5/ 5e/ 6 (100m)

Power

- Input: AC 100~240V, 50~60Hz
- PoE Out: 48V~52V DC

Environmental Specifications

- Operating Temperature: 0° C to 40° C

Storage Temperature:

- -10° C to 60° C
- Operating Humidity: 10% to 90% RH, non-condensing
- Storage Humidity: 5% to 90% RH, non-condensing

Dimension

- Net: 143 (L) x 60 (W) x 40 (H)mm
- Gross: 175 (L) x 115 (W) x 60 (H)mm

Weight

- Net: 0.17kg

PnP

Ordering Information:-

DG-PE2248D (H/W Ver. B1): DIGISOL 48V DC Desktop Mount Gigabit Ethernet PoE Injector

*Standard Warranty shall be subject to terms and conditions specified in the DIGISOL PRODUCT WARRANTY displayed on the website of the company.

• Product image and technical specification are subject to change without prior notice.

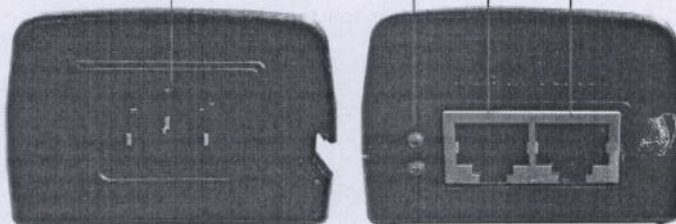
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POWER SOCKET

LED INDICATOR

DATA IN

PoE OUT



DIGISOL is a Subsidiary of Smartlink Holdings Limited

DIGISOL SYSTEMS LIMITED
215 Atrium Bldg., 2nd Floor,
B-Wing, Opp. Big Cinema,
Courtney Marriott Compound,
Andheri-Kurla Road,
Andheri (E), Mumbai - 400093.

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