

RUCKUS M 510

MOBILE INDOOR 802.11AC WAVE 2 WI-FI AP WITH LTE BACKHAUL

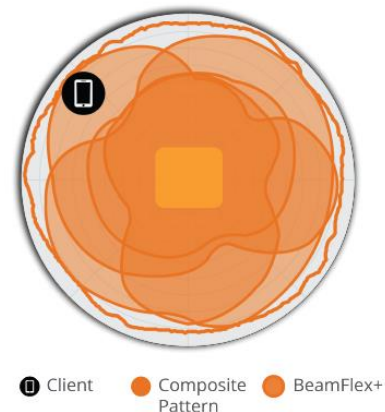
The Ruckus M510 mobile-wireless access point (AP) is an 802.11ac 2x2:2 Wave 2 Wi-Fi AP designed to leverage LTE networks as a backhaul and connect wirelessly back to any network without the need for an Ethernet cable connection.



ACCESS POINT ANTENNA PATTERN

Ruckus' BeamFlex+ adaptive antennas allow the M510 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



FEATURES

- **Mobile Wi-Fi**
Superior performance, managed Wi-Fi without cable pulls using an LTE connection to support mobile hotspot requirements
- **Carrier-Grade Management**
M510 with SmartZone brings in carrier-grade management features. MSPs can leverage physical or virtual SmartZone controller to manage all Aps
- **Onboard GPS**
GPS support location aware services for tracking the mobile unit.
- **Enterprise Wi-Fi Coverage**
Provide an excellent user experience in any environment with patented BeamFlex+™ adaptive antenna technology and multiple directional antenna patterns.
- **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.
- **Serve More Devices**
Connect more devices simultaneously with two MU-MIMO spatial streams and concurrent dual-band 2.4/5GHz radios while also enhancing non-Wave 2 device performance.
- **More Than Wi-Fi**
Support services beyond Wi-Fi with the Ruckus IoT Suite, Cloudpath security and onboarding software, SPoT Wi-Fi locationing engine, and SCI network analytics.

SPECIFICATIONS

WI-FI	
Wi-Fi Standards	• IEEE 802.11a/b/g/n/ac Wave 2
Supported Rates	• 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80) • 802.11n: 6.5 Mbps to 300 Mbps (MCS0 to MCS15) • 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps • 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
WI-FI RADIO SPECIFICATIONS	
Antenna Type	• BeamFlex+ adaptive antennas with polarization diversity • Adaptive antenna that provides up to 64 antenna patterns per band
Antenna Gain (max)	• Up to 3dBi
Peak Transmit Power ¹ (aggregate across MIMO chains)	• 2.4GHz: 24 dBm • 5GHz: 23 dBm
Minimum Receive Sensitivity	• -101dBm (2.4GHz) • -95dBm (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	
MCS0	MCS7
-95	-77
HT40	
MCS0	MCS7
-92	-74
5GHZ RECEIVE SENSITIVITY	
VHT20	
MCS0	MCS7
-95	-77
VHT40	
MCS0	MCS7
-92	-74
VHT80	
MCS0	MCS7
-89	-71
2.4GHZ TX POWER TARGET (DUAL CHAIN)	
Rate	Pout (dBm)
MCS0 HT20	24
MCS7 HT20	21
MCS0 HT40	23
MCS7 HT40	21
MCS8 VHT20	20
MCS9 VHT40	19
5GHZ TX POWER TARGET (DUAL CHAIN)	
Rate	Pout (dBm)
MCS0 VHT20	23
MCS0 VHT80	22
MCS7 VHT40, VHT80	22
MSC9 VHT40, VHT80	20
WI-FI PERFORMANCE AND CAPACITY	
Physical Layer Rates	• 2.4GHz: 300Mbps • 5GHz: 867Mbps
Client Capacity	• Up to 512 clients per AP
SSID	• Up to 31 per AP
GPS SPECIFICATIONS	
GPS Radio	• GNSS: GPS, GLONASS, BeiDou, Galileo
Antenna Connector	• SMA female
Antenna (included with M510)	• Magnetic mount, 2dBi active GPS antenna, 3m/10ft cable

3G/4G RADIO SPECIFICATIONS	
Physical Layer Rates	LTE: • LTE FDD: Max 150Mbps (DL)/Max 50Mbps (UL) • LTE TDD: Max 130Mbps (DL)/Max 35Mbps (UL) UMTS: • DC-HSDPA: Max 42Mbps (DL) • HSUPA: Max 5.76Mbps (UL) • WCDMA: Max 384Kbps (DL)/Max 384Kbps (UL)
Bands	USA (AT&T) SKU: • LTE FDD: B2/B4/B12 • WCDMA: B2/B4/B5 Domain 1 SKU: • LTE FDD: B1/B3/B5/B7/B8/B20 • LTE TDD: B38/B40/B41 • WCDMA: B1/B5/B8 Domain 2 SKU: • LTE FDD: B1/B2/B3/B4/B5/B7/B8/B28 • LTE TDD: B40 • WCDMA: B1/B2/B5/B8 Japan SKU: • LTE FDD: B1/B3/B8/B18/B19/B26 • LTE TDD: B41 • WCDMA: B1/B6/B8/B19
Peak Transmit Power	• 23dBm for LTE • 24dBm for WCDMA
Minimum Receive Sensitivity	• < -99.5dBm for LTE • < -110dBm for WCDMA
Antenna connectors	• 2x SMA female
Antennas (included with M510)	• 2x whip antennas, hinged, 700-2700MHz, peak gain 2dBi
SIM Card	• 2x SIM Card slots (primary & redundant), Micro-SIM size (3FF)
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 • Standalone
Mesh	• SmartMesh™ wireless meshing technology. Selfhealing Mesh (in future release)
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
Gateway & Routing	• NAT/DHCP
Policy Management Tools	• Application Recognition and Control • Access Control Lists • Device Fingerprinting • Rate Limiting
PHYSICAL INTERFACES	
Ethernet	• 2 x 1GbE ports, RJ-45
USB	• 1 USB 2.0 port, Type A connector

PHYSICAL CHARACTERISTICS		
Physical Size	• 17.2(L) x 16.7(W) x 4.2(H) cm • 6.8 (L) x 6.6(W) x 1.6(H) in.	
Weight	• 450g (15.9oz)	
Mounting	• Wall, Drop ceiling, Desk (mounting hardware included) • Vehicle (flange mounting bracket sold separately)	
Physical Security	• Hidden latching mechanism • Kensington lock	
Operating Temperature	• -40°C (-40°F) to 65°C (149°F)	
Operating Humidity	• Up to 95%, non-condensing	
POWER ²		
Power Supply	Operating Characteristics	Max Power Consumption
PoE (802.3af)	• USB disabled • 2nd Ethernet port disabled • GPS off • 2.4GHz: 19dBm per chain • 5GHz: 19dBm per chain	• 15.724W
PoE+ (802.3at)	• Full functionality	• 18.738W
12VDC (9V DC-16V DC) Input – Barrel connector 12VDC (9V DC-16V DC) Input – Terminal block	• Full functionality	• 16.999W
CERTIFICATIONS AND COMPLIANCE		
Wi-Fi Alliance ³	• Wi-Fi CERTIFIED™ a, b, g, n, ac • Passpoint®, Vantage, AMB, OCE	
Standards Compliance ⁴	• EN 60950-1 Safety • EN 61000-4-2/3/5 Immunity • EN 50155 Railway • EN 50121-3-2 Railway EMC • IEC 61373 Railway Shock & Vibration • UL 2043 Plenum • EN 62311 Human Safety/RF Exposure • EN 62311 • WEEE & RoHS • ISTA 2A Transportation • E-Mark Automotive	
Mobile Radio Approvals	• GCF, PTCRB, AT&T	
RELATED SOFTWARE AND SERVICES		
Location Based Services	• SPoT™	
Network Analytics	• SmartCell™ Insight (SCI)	
Security and Policy	• Cloudpath	