

# T310 SERIES - WAVE 2

## Outdoor 802.11ac 2x2:2 Wi-Fi Access Point



### DATA SHEET



## BENEFITS

### SIMPLICITY

Ruckus' Outdoor APs make Wi-Fi deployments extremely simple to deploy with one-touch technologies like SmartMesh™

### STUNNING WI-FI PERFORMANCE

Extends coverage with patented BeamFlex+™ adaptive antenna technology while mitigating interference by utilizing up to 64 directional antenna patterns.

### GREAT OUTDOOR WI-FI

Experience high performance outdoor 802.11ac Wave 2 Wi-Fi with IP-67 weather proofing.

### MULTIPLE MANAGEMENT OPTIONS

Manage the T310 Series with physical or virtual controller appliances.

### 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.

### 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.

### 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.

Modern Wi-Fi device users expect reliable connectivity—anywhere, anytime. But in crowded outdoor venues with thousands of users and constant RF noise, they are often frustrated by poor coverage, dropped connections, and reduced data rates. These aggravating Wi-Fi experiences can easily translate to negative perceptions of the venue and the service provider, resulting in loss of business. The quality of the network experience becomes the “litmus test” for acceptance or rejection.

As the market leader in outdoor Wi-Fi deployments, Ruckus knows that one AP solution cannot meet every possible challenge of varied and complex outdoor requirements. This is why the Ruckus T310 802.11ac Wave 2 series is designed with more variety than any other outdoor AP in the market today. Available with either internal omni-directional antennas or internal high-gain directional antenna models, the T310 Series uses patented Ruckus antenna optimization and interference mitigation technologies to improve throughput, connection reliability, and deliver industry-leading 802.11ac Wave 2 performance to every connected client. At the same time, the T310 Series is designed for fast, simple installation with an ultra-lightweight, low profile, IP-67 rated enclosure that can stand up to the most challenging outdoor environments.

At Ruckus, we know that outdoor AP deployments are especially challenging for installation and maintenance, which is why Ruckus outdoor APs use a variety of technologies, like SmartMesh that help simplify outdoor AP deployment.

The Ruckus T310 Series is perfect for high-density outdoor public venues such as airports, convention centers, plazas, malls, smart cities, and other dense urban environments. By providing a superior Wi-Fi experience to every user in high-density outdoor locations, venue operators can improve guest satisfaction and loyalty, deliver new kinds of wireless application services, and increase revenues.

The Ruckus T310 Series 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.

Whether you're deploying ten or ten thousand APs, the T310 Series is easy to manage through Ruckus' appliance and virtual management options.

## ACCESS POINT ANTENNA PATTERN

Ruckus' BeamFlex+ adaptive antennas allow the T310 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

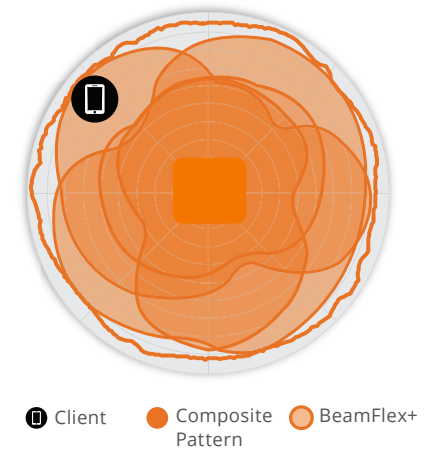


Figure 2. T310d 2.4GHz Azimuth Antenna Patterns



Figure 3. T310d 5GHz Azimuth Antenna Patterns



Figure 4. T310d 2.4GHz Elevation Antenna Patterns

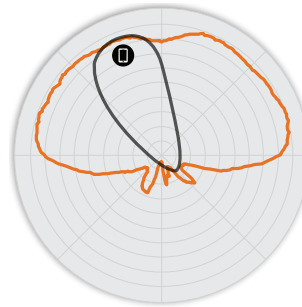
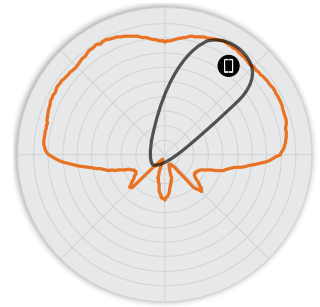


Figure 5. T310d 5GHz Elevation Antenna Patterns



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"> <li>IEEE 802.11a/b/g/n/ac Wave 2</li> </ul>
Supported Rates	<ul style="list-style-type: none"> <li>802.11ac: 6.5 to 876Mbps (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80, NSS = 1 to 2 for VHT80)</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>
Support Channels	<ul style="list-style-type: none"> <li>2.4GHz: 1-13</li> <li>5GHz: 36-64, 100-144, 149-165</li> </ul>
MIMO	<ul style="list-style-type: none"> <li>2x2 SU-MIMO</li> <li>2x2 MU-MIMO</li> </ul>
Spatial Streams	<ul style="list-style-type: none"> <li>2 SU-MIMO</li> <li>2 MU-MIMO</li> </ul>
Channelization	<ul style="list-style-type: none"> <li>20, 40, 80MHz</li> </ul>
Security	<ul style="list-style-type: none"> <li>WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, Dynamic PSK</li> <li>WIPS/WIDS</li> </ul>
Other Wi-Fi Features	<ul style="list-style-type: none"> <li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v</li> <li>Hotspot, Hotspot 2.0</li> <li>Captive Portal</li> <li>WISPr</li> </ul>

RF				
	T310c	T310d	T310s	T310n
Antenna Type	<ul style="list-style-type: none"> <li>BeamFlex+ adaptive antennas with polarization diversity</li> </ul>			
Antenna Gain (max)	<ul style="list-style-type: none"> <li>2.4GHz: 2dBi</li> <li>5GHz: 3dBi</li> </ul>	<ul style="list-style-type: none"> <li>2.4GHz: 6dBi</li> <li>5GHz: 9dBi</li> </ul>	<ul style="list-style-type: none"> <li>2.4GHz: 9dBi</li> <li>5GHz: 13dBi</li> </ul>	
Peak Transmit Power (aggregate across MIMO chains)	<ul style="list-style-type: none"> <li>2.4GHz: 23dBm</li> <li>5GHz: 24dBm</li> </ul>	<ul style="list-style-type: none"> <li>2.4GHz: 24dBm</li> <li>5GHz: 21dBm</li> </ul>	<ul style="list-style-type: none"> <li>2.4GHz: 21dBm</li> <li>5GHz: 17dBm</li> </ul>	
BeamFlex+ SINR Transmit Power Gain*	<ul style="list-style-type: none"> <li>Up to 6 dB</li> </ul>			
BeamFlex+ SINR Receive Power Gain*	<ul style="list-style-type: none"> <li>Up to 4 dB</li> </ul>			
Minimum Receive Sensitivity <sup>1</sup>	<ul style="list-style-type: none"> <li>-101dBm</li> </ul>			
Frequency Bands	<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
-95dBm	-78dBm	-92dBm	-75dBm

5GHZ RECEIVE SENSITIVITY							
VHT20		VHT40			VHT80		
MCS0	MCS7	MCS0	MCS7	MCS9	MCS0	MCS7	MCS9
-96dBm	-77dBm	-93dBm	-74dBm	-69dBm	-90dBm	-71dBm	-66dBm

\* BeamFlex gains are statistical system level effects translated to enhanced SINR based on observations over time in real-world conditions with multiple APs and many clients.  
<sup>1</sup> 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	18

5GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 VHT20	24
MCS7 VHT20	20
MCS9 VHT20	18
MCS0 VHT40, VHT80	23
MCS7 VHT40, VHT80	20
MCS9 VHT40, VHT80	18

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

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

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"> <li>SmartZone</li> <li>ZoneDirector</li> <li>Standalone</li> </ul>
Mesh	<ul style="list-style-type: none"> <li>SmartMesh™ wireless meshing technology. Self-healing Mesh</li> </ul>
IP	<ul style="list-style-type: none"> <li>IPv4, IPv6</li> </ul>
VLAN	<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>
802.1x	<ul style="list-style-type: none"> <li>Authenticator &amp; Supplicant</li> </ul>
Tunnel	<ul style="list-style-type: none"> <li>L2TP, GRE, soft-GRE</li> </ul>
Policy Management Tools	<ul style="list-style-type: none"> <li>Application Visibility and Control</li> <li>Access Control Lists</li> <li>Device Fingerprinting</li> <li>Rate Limiting</li> </ul>

PHYSICAL INTERFACES				
	T310c	T310d	T310s	T310n
Ethernet	• 1 x 1GbE port, RJ-45			
USB	—	• 1 USB 2.0 port, Type A		
DC Power	—	• 12V DC Terminal Block (8V - 20V)		

PHYSICAL CHARACTERISTICS				
	T310c	T310d	T310s	T310n
Physical Size	• 18.1(L) x 15.1(W) x 7.9 (H) cm • 7.1(L) x 5.9(W) x 3.1(H) in.		• 26(L) x 20.9(W) x 10.3(H) cm • 10.2(L) x 8.2(W) x 4.1(H) in.	
Weight	• 1kg (2.1lbs)		• 1.65kg (3.6lbs)	
Ingress Protection	• IP-67			
Mounting	• Wall, Drop ceiling, Desk • Pole Mount Diameter 1" to 2.5"			
Operating Temperature	• -20°C (-4°F) to 65°C (149°F)		• -40°C (-40°F) to 65°C (149°F)	
Operating Humidity	• Up to 95%, non-condensing			

POWER <sup>2</sup>				
	T310c	T310d	T310s	T310n
Power Supply	Max Power Consumption (includes USB power)			
802.3af/at (PoE)	7.92W	11.86W	11.86W	11.86W
DC	—	11.7W	12.11W	11.7W

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance <sup>3</sup>	<ul style="list-style-type: none"> <li>• Wi-Fi CERTIFIED™ a, b, g, n, ac</li> <li>• Passpoint®, Vantage</li> </ul>
Standards Compliance <sup>4</sup>	<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	
Location Based Services	• SPoT
Network Analytics	• SmartCell Insight (SCI)
Security and Policy	• Cloudpath

MODEL FEATURE DIFFERENCES				
Model	Antenna	Low Temp	USB	DC Power
T310c	Omni	-20°C	N	N
T310d	Omni	-40°C	Y	Y
T310n	Narrow Sector (30°)	-40°C	Y	Y
T310s	Sector (120°)	-40°C	Y	Y

ORDERING INFORMATION	
T310 OUTDOOR APs	
901-T310-XX20	T310c, omni, outdoor access point, 802.11ac Wave 2 2x2:2 internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input. -20°C to 65°C Operating Temperature. Includes mounting bracket and one year warranty. Does not include PoE injector.
901-T310-XX40	T310d, omni, outdoor access point, 802.11ac Wave 2 2x2:2 internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input, DC input and USB port. -40°C to 65°C Operating Temperature. Includes mounting bracket and one year warranty. Does not include PoE injector.
901-T310-XX51	T310s, 120x30 deg, Outdoor 802.11ac Wave 2 2x2:2, 120 degree sector, dual band concurrent access point. One Ethernet port, PoE input, DC input and USB port. -40°C to 65°C Operating Temperature. Includes adjustable mounting bracket and one year warranty. Does not include PoE injector.
901-T310-XX61	T310n, 30x30 deg, Outdoor 802.11ac 2x2:2 Wave 2, narrow beam, dual band concurrent access point. One Ethernet port, PoE input, DC input and USB port. -40°C to 65°C Operating Temperature. Includes adjustable mounting bracket and one year warranty. Does not include PoE injector.

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-XX00	Spares of Power over Ethernet (PoE) Adapter
902-1121-0000	Weatherizing Cable gland with option of one hole or 2 hole connection
902-0127-0000	Extended cap to accommodate up to 6 cm long USB dongle

PLEASE NOTE: When ordering outdoor 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.

<sup>2</sup> Max power varies by country setting, band, and MCS rate.

<sup>3</sup> For complete list of WFA certifications, please see Wi-Fi Alliance website.

<sup>4</sup> For current certification status, please see price list.

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