

# T811-CM SERIES

Outdoor 802.11ac Wave2 4x4:4 Wi-Fi Access Point



## DATA SHEET



### BENEFITS

#### GREAT OUTDOOR WI-FI

Experience high performance outdoor Wave 2 Wi-Fi with Industrial-grade IP-67 hardened enclosure (-40°C to +65°C) with GPS and DOCSIS 3.1 cable modem.

#### GREAT WI-FI PERFORMANCE

Provide a great user experience no matter how challenging the environment with BeamFlex+™ adaptive antenna technology using multiple directional antenna patterns. Additionally, with DOCSIS 3.1, the T811-CM delivers 1+Gbps over coax cable on the backhaul.

#### 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 enhancing non-Wave 2 device performance.

#### MULTIPLE MANAGEMENT OPTIONS

Manage the T811-CM from on-premises or remote physical/virtual appliances.

#### 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.

In a fiercely competitive marketplace, multiple system cable operators (MSOs) are looking for new ways to differentiate their services and open new revenue streams. To do it, many are looking to expand branded broadband Wi-Fi throughout their coverage areas. But overlaying existing hybrid fiber coax (HFC) cable networks with new Wi-Fi services can be a complex and expensive proposition.

The Ruckus T811-CM outdoor access point is the industry's highest performing outdoor 802.11ac 4x4:4 Wave 2 Wi-Fi in a strand-mounted form factor designed to easily integrate with existing HFC networks. It features patented Ruckus BeamFlex+ adaptive antenna technology for RF optimization and interference mitigation to extend wireless range and reliability, combined with an integrated DOCSIS 3.1-, and EuroDOCSIS- backhaul. Available with an omnidirectional antenna, the T811-CM can provide consistent, reliable data access in a wide range of high-density client environments.

The T811-CM is a perfect choice for MSOs looking to deliver branded Wi-Fi connectivity for outdoor hotspot services in neighborhoods, resorts, train stations, and other public locations across their coverage areas. The form factor design affords easy installation and integration with HFC networks—using existing mounting, power, backhaul, customer service systems, and other existing cable assets. Network operators can easily create tiered wireless services at different quality levels, data offload solutions, and other new revenue-generating Wi-Fi services. And they can extend reliable managed wireless services outdoors to locations where Ethernet cabling is too expensive or impractical.

The T811-CM 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.

Additionally, using the T811-CM's integrated GPS, operators can automatically establish the exact location of each access point on a network map; greatly simplifying installation and maintenance.

Whether operators are deploying ten or ten thousand APs, the T811-CM is easy to manage through Ruckus SmartZone management services.

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### ACCESS POINT ANTENNA PATTERN

Ruckus' BeamFlex+ adaptive antennas allow the T811-CM Series 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

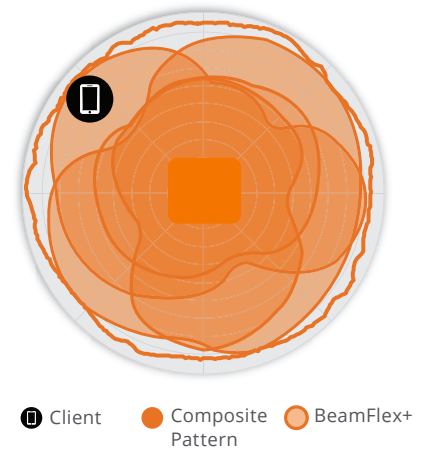


Figure 2. T811 2.4GHz Azimuth Antenna Patterns



Figure 3. T811 5GHz Azimuth Antenna Patterns

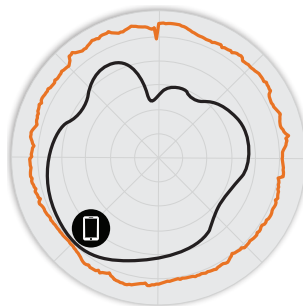


Figure 4. T811 2.4GHz Elevation Antenna Patterns

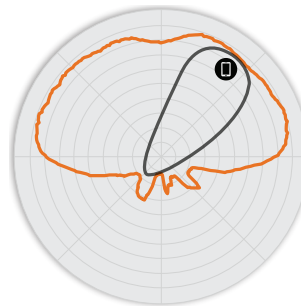
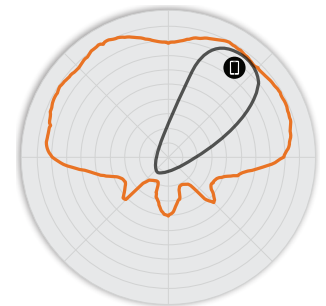


Figure 5. T811 5GHz Elevation Antenna Patterns



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 1733 Mbps</li> <li>802.11n: 6.5 to 600Mbps</li> <li>802.11a/g: 6 to 54 Mbps</li> <li>802.11b: 1 to 11 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>4x4</li> </ul>
Spatial Streams	<ul style="list-style-type: none"> <li>4 streams SU/MU</li> </ul>
Channelization	<ul style="list-style-type: none"> <li>20, 40, 80, 160MHz</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	
Antenna Type	<ul style="list-style-type: none"> <li>BeamFlex+ adaptive antennas</li> <li>Polarization: 2 Vertical &amp; 2 Horizontal</li> </ul>
Antenna Gain (max)	<ul style="list-style-type: none"> <li>3dBi for both 2.4GHz and 5GHz</li> </ul>
Peak Transmit Power (aggregate across MIMO chains)	<ul style="list-style-type: none"> <li>2.4GHz: 28dBm</li> <li>5GHz: 30dBm</li> </ul>
Minimum Receive Sensitivity <sup>1</sup>	<ul style="list-style-type: none"> <li>2.4GHz: -102dBm</li> <li>5GHz: -96dBm</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
-98	-79	-95	-77

5GHZ RECEIVE SENSITIVITY					
VHT20		VHT40		VHT80	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-97	-78	-95	-77	-92	-74

2.4GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 HT20	22
MCS7 HT20	18
MCS0 HT40	17
MCS7 HT40	16
MCS8 VHT20	17
MCS9 VHT40	16

5GHZ TX POWER TARGET	
Rate	Pout (dBm)
MCS0 VHT20	25
MCS0 VHT80	23
MCS7 VHT40, VHT80	22
MCS9 VHT40, VHT80	19

PERFORMANCE AND CAPACITY	
Peak PHY rates	<ul style="list-style-type: none"> <li>2.4GHz: 600 Mbps</li> </ul>
Client capacity	<ul style="list-style-type: none"> <li>Up to 512 clients per AP</li> </ul>
SSID per radio	<ul style="list-style-type: none"> <li>Up to 32 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>Band Balancing</li> <li>Client Load Balancing</li> <li>Airtime Fairness</li> <li>Airtime-based WLAN Prioritization</li> </ul>
Queuing and Scheduling	<ul style="list-style-type: none"> <li>SmartCast</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> </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</li> <li>BSSID-based (16 BSSIDs / radio)</li> <li>Port-based</li> <li>Dynamic, per user based on RADIUS</li> </ul>
802.1x	<ul style="list-style-type: none"> <li>Wired &amp; wireless authenticator &amp; Supplicant</li> </ul>
Tunnel	<ul style="list-style-type: none"> <li>RuckusGRE, softGRE</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> </ul>

PHYSICAL INTERFACES	
Ethernet	<ul style="list-style-type: none"> <li>1 x 1GbE port PoE-out (802.3at), RJ-45</li> </ul>
USB	<ul style="list-style-type: none"> <li>1 USB 2.0 port, Type A</li> </ul>
Fiber	<ul style="list-style-type: none"> <li>SFP, 1Gbps, EPON, 1000BASE-lx</li> </ul>
Cable Modem	<ul style="list-style-type: none"> <li>Type F, DOCSIS 3.1</li> </ul>

<sup>1</sup> Rx sensitivity varies by band, channel width and MCS rate.

PHYSICAL CHARACTERISTICS	
Physical Size	<ul style="list-style-type: none"> <li>44.2 (L) x 24.98 (W) x 15.43 (H) cm</li> <li>17.4 (L) x 9.84 (W) x 6.07 (H) in</li> </ul>
Weight	<ul style="list-style-type: none"> <li>7.15kg (15.73lbs)</li> </ul>
Ingress Protection	<ul style="list-style-type: none"> <li>IP-67. ASTM B117 (Salt Spray)</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>Strand</li> </ul>
Operating Temperature	<ul style="list-style-type: none"> <li>-40°C (-40°F) to 65°C (149°F)</li> </ul>
Operating Humidity	<ul style="list-style-type: none"> <li>Up to 95%, non-condensing</li> </ul>

POWER <sup>2</sup>		
AC Input (over Coax)	<ul style="list-style-type: none"> <li>40V to 90V RMS 50/60Hz Quasi-Square Wave</li> </ul>	
Operating Modes	Maximum Current Draw	Power Consumption
PoE Out Enabled	<ul style="list-style-type: none"> <li>Max Current</li> <li>Draw: 1.75A @50V</li> </ul>	<ul style="list-style-type: none"> <li>Min: 56.7W</li> <li>Typical: 67.8W</li> <li>Max: 93.7W</li> </ul>
PoE Out Disabled	<ul style="list-style-type: none"> <li>Max Current</li> <li>Draw: 1.02A @50V</li> </ul>	<ul style="list-style-type: none"> <li>Min: 23.0W</li> <li>Typical: 31.6W</li> <li>Max: 51.7W</li> </ul>

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 60950-22 Safety</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>EN 62311 Human Safety/RF Exposure</li> <li>WEEE &amp; RoHS</li> <li>ISTA 2A Transportation</li> </ul>

OTHER RADIO TECHNOLOGIES	
GPS	<ul style="list-style-type: none"> <li>GPS, GLONASS</li> </ul>

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

ORDERING INFORMATION	
T811 OUTDOOR APS	
901-T811-US01	T811-CM 802.11ac Wave 2 Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, one 1GbE PoE+ port, IP-67 Outdoor enclosure. DOCSIS 3.1, supports Low+Mid Frequency Splits on both US and DS. Wi-Fi is band-locked for North America use. -40°C to 65°C Operating Temperature. For box contents, see Shipping Container Contents.
901-T811-WW01	T811-CM 802.11ac Wave 2 Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, one 1GbE PoE+ port, IP-67 Outdoor enclosure. DOCSIS 3.1, supports Low+Mid Frequency Splits on both US and DS. Wi-Fi is NOT band-locked for World-Wide use. -40°C to 65°C Operating Temperature. For box contents, see Shipping Container Contents.
901-T811-WW11	T811-CM 802.11ac Wave 2 Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, one 1GbE PoE+ port, IP-67 Outdoor enclosure. EuroDOCSIS 3.1, supports Mid+High Frequency Splits on both US and DS. Wi-Fi is NOT band-locked for World-Wide use. -40°C to 65°C Operating Temperature. For box contents, see Shipping Container Contents.

Warranty: Sold with a limited one year warranty.  
 For details see: <http://support.ruckuswireless.com/warranty>.

<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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