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.
The T310 Series is delivered in four models with different antenna configurations, power options, and support of an integrated USB port. See Table 1 for the major differences between the four models.

Table 1 - T310 model feature differences

<table>
<thead>
<tr>
<th>MODEL</th>
<th>ANTENNA</th>
<th>LOW TEMP</th>
<th>USB</th>
<th>DC POWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>T310c</td>
<td>Omni</td>
<td>-20°C</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>T310d</td>
<td>Omni</td>
<td>-40°C</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>T310n</td>
<td>Narrow Sector (30º)</td>
<td>-40°C</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>T310s</td>
<td>Sector (120º)</td>
<td>-40°C</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

** when used with Ruckus ZoneDirector or SmartZone controllers.

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ACCESS POINT ANTENNA PATTERN

The T310 Series access points incorporate the Ruckus' BeamFlex™ adaptive antenna technology which manages RF coverage dynamically on a packet-by-packet basis to optimize signal strength, data-rates and connection reliability.

The Ruckus’ adaptive antenna is unique and the multiple, over-laid patterns (see Figure 1) depict its ability to optimize coverage and mitigate interference. Each AP antenna is specifically designed to match the target use case and have up to 64 different antenna patterns from which to select in meeting the goal of optimizing the wireless performance and ensuring the best connection reliability.

The BeamFlex adaptive antenna design is also more than a simple one-dimension omni-antenna. The antennae are dual polarized and can transmit and receive signals with both vertical and horizontal polarizations. Ruckus’ unique BeamFlex antennas outperform traditional omnidirectional antennas used in competitive access points.

The four figures above demonstrate the unique design of the BeamFlex technology in the two major Wi-Fi RF bands. The outer trace represents the composite RF footprint of all possible BeamFlex patterns. The inner trace represents an individual adaptive antenna pattern that may appear in various positions within the outer trace, providing greater SNR and increased performance on a packet-by-packet basis.

BeamFlex operates without any need for client feedback and irrespective of the 802.11 standard the client may be running and hence benefits even legacy clients.
# T310 Series
Outdoor 802.11ac 2x2:2 Wi-Fi Access Point

## DATA SHEET

### Wi-Fi

#### Wi-Fi Standards
- IEEE 802.11a/b/g/n/ac Wave 2

#### Supported rates
- IEEE 802.11a/b/g/n/ac Wave 2
- **802.11ac:** 6.5 to 876Mbps (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80, NSS = 1 to 2 for VHT80)
- **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
- WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v
- 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

#### Antenna gain (max)
- 2.4GHz: 2dBi
- 5GHz: 3dBi
- 2.4GHz: 6dBi
- 5GHz: 9dBi
- 2.4GHz: 10dBi
- 5GHz: 13dBi

#### Peak transmit power (aggregate across MIMO chains)
- 2.4GHz: 23dBm
- 5GHz: 24dBm
- 2.4GHz: 24dBm
- 5GHz: 27dBm
- 2.4GHz: 21dBm
- 5GHz: 18dBm
- 2.4GHz: 20dBm
- 5GHz: 17dBm

#### Minimum receive sensitivity
- -101dBm

#### 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 T310 RECEIVE SENSITIVITY

<table>
<thead>
<tr>
<th>Rate</th>
<th>HT20</th>
<th>HT40</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS0</td>
<td>-95dBm</td>
<td>-92dBm</td>
</tr>
<tr>
<td>MCS7</td>
<td>-78dBm</td>
<td>-75dBm</td>
</tr>
</tbody>
</table>

### 5GHZ T310 RECEIVE SENSITIVITY

<table>
<thead>
<tr>
<th>Rate</th>
<th>VHT20</th>
<th>VHT40</th>
<th>VHT80</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS0</td>
<td>-96dBm</td>
<td>-77dBm</td>
<td>-71dBm</td>
</tr>
<tr>
<td>MCS7</td>
<td>-93dBm</td>
<td>-74dBm</td>
<td>-66dBm</td>
</tr>
</tbody>
</table>

### T310 2.4GHz TX POWER TARGET

<table>
<thead>
<tr>
<th>Rate</th>
<th>Pout (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4GHz Tx</td>
<td>23</td>
</tr>
<tr>
<td>MCS0 HT20</td>
<td>18</td>
</tr>
<tr>
<td>MCS7 HT20</td>
<td>18</td>
</tr>
<tr>
<td>MCS0 HT40</td>
<td>22</td>
</tr>
<tr>
<td>MCS7 HT40</td>
<td>18</td>
</tr>
</tbody>
</table>

### 5GHz Tx POWER TARGET

<table>
<thead>
<tr>
<th>Rate</th>
<th>Pout (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5GHz VHT20</td>
<td>24</td>
</tr>
<tr>
<td>5GHz MCS7 VHT20</td>
<td>20</td>
</tr>
<tr>
<td>5GHz MCS9 VHT20</td>
<td>18</td>
</tr>
<tr>
<td>5GHz MCS0 VHT40/VHT80</td>
<td>23</td>
</tr>
<tr>
<td>5GHz MCS7 VHT40/VHT80</td>
<td>20</td>
</tr>
<tr>
<td>5GHz MCS9 VHT40/VHT80</td>
<td>18</td>
</tr>
</tbody>
</table>

### PERFORMANCE & 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

#### Smart Cast 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
- 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 Visibility and Control
- Access Control Lists
- Device Fingerprinting
- Rate Limiting

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### PHYSICAL INTERFACES

<table>
<thead>
<tr>
<th></th>
<th>T310c</th>
<th>T310d</th>
<th>T310s</th>
<th>T310n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>• 1 x 1GbE port, RJ-45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB</td>
<td>--</td>
<td>• 1 USB 2.0 port, Type A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Power</td>
<td>--</td>
<td>12V DC Terminal Block (8V - 20V)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>T310c</th>
<th>T310d</th>
<th>T310s</th>
<th>T310n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Size</td>
<td>• 18.1(L) x 15.1(W) x 7.9 (H) cm</td>
<td>• 26(L) x 20.9(W) x 10.3(H) cm</td>
<td>• 10.2(L) x 8.2(W) x 4.1(H) in.</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>• 1kg (2.1lbs)</td>
<td>• 1.65kg (3.6lbs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>• IP-67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>• Wall, Drop ceiling, Desk</td>
<td>• Pole Mount Diameter 1&quot; to 2.5&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>• -20ºC to 65ºC (149ºF)</td>
<td>• -40ºC to 65ºC (149ºF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>• Up to 95%, non-condensing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CERTIFICATIONS AND COMPLIANCE

- Wi-Fi Alliance: Wi-Fi CERTIFIED™ a, b, g, n, ac, Passpoint®, Vantage
- Standards Compliance³: 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 Penum, EN 62311 Human Safety/RF Exposure, WEEE & RoHS, ISTA 2A Transportation

### POWER³

<table>
<thead>
<tr>
<th></th>
<th>T310c</th>
<th>T310d</th>
<th>T310s</th>
<th>T310n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>Max Power Consumption (includes USB power)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>802.3af/at (PoE)</td>
<td>7.92W</td>
<td>11.86W</td>
<td>11.86W</td>
<td>11.86W</td>
</tr>
<tr>
<td>DC</td>
<td>--</td>
<td>11.7W</td>
<td>12.11W</td>
<td>11.7W</td>
</tr>
</tbody>
</table>

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

### 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

### SUPPORTED SERVICES

- Location Based Services: SPoT
- Network Analytics: SmartCell Insight (SCI)
- Security & Policy: Cloudpath

### ORDERING INFORMATION

**T310 OUTDOOR APS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>901-T310-XX40</td>
<td>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. -40ºC to 65ºC Operating Temperature. Includes mounting bracket and one year warranty. Does not include PoE injector.</td>
</tr>
<tr>
<td>901-T310-XXS1</td>
<td>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. -40ºC to 65ºC Operating Temperature. Includes adjustable mounting bracket and one year warranty. Does not include PoE injector.</td>
</tr>
<tr>
<td>901-T310-XX61</td>
<td>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. -40ºC to 65ºC Operating Temperature. Includes adjustable mounting bracket and one year warranty. Does not include PoE injector.</td>
</tr>
</tbody>
</table>

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.

Warranty: Sold with a limited one year warranty.

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Ruckus Wireless, Inc. | 350 West Java Drive | Sunnyvale, CA 94089 USA | T: (650) 265-4200 | F: (408) 738-2065