RADWIN JET
Beamforming solution for fiber-like connectivity

RADWIN JET is a disruptive Point-to-MultiPoint smart beamforming solution, excellent for operation in heavily congested unlicensed and licensed bands where spectrum resources are scarce. Offering up to 750 Mbps per sector, RADWIN JET ensures revenue growth for residential and enterprise service providers by delivering fiber-like connectivity with incomparable resiliency.
JET highlights

Market-leading Base Station
» Base Station with smart beamforming antenna
» Up to 750 Mbps per sector, 3 Gbps per cell
» Guaranteed SLA (CIR)
» Low latency and Jitter
» Long range – up to 40 km / 25 miles
» Radio synchronization for greater network capacity with built-in GPS
» Dynamic channel bandwidth selection - 80/40/20 MHz

Powerful subscriber units (SUs)
» High-capacity SUs – up to 200 Mbps
» Pay-as-you-grow capacity
» Multiple antenna configurations in a single unit
» Small form factor for low visual impact
» Innovative operational simplicity for mass deployment

Multi-band radio
» 3.3 - 3.8 / 3.65 GHz or 4.9 - 5.9 GHz in the same unit

Bi-Beam™ beamforming solution

RADWIN Bi-Beam highlights
» Active beamforming antenna in both uplink and downlink directions
» Antenna steering for best link performance over a 90° sector
» Effective narrow beam of 8° @ 5.x GHz, 15° @ 3.x GHz
» OFDM & MIMO 2x2 / diversity

RADWIN Bi-Beam benefits
» High interference immunity similar to Point-to-Point
» Industry’s highest throughput and range
» Optimized frequency reuse -2
» Robust operation in nLOS / NLOS
» Simplified network planning
Service providers

fixed IP traffic doubles in volume every 5 years, generating greater demand for more capacity on the subscriber side. RADWIN JET offers a future-proof solution that enables Service Providers to keep pace with the ever growing demand, and increase revenue through fiber-like wireless access in licensed and unlicensed sub-6GHz bands.

Wireless Internet Service Providers (ISPs)

» Last mile connectivity

Fixed / Incumbent Service Providers

» xDSL replacement
» Sub-urban and rural FTTH alternative
» FTTH backup
» WiMAX access network replacement
» DSLAMs backhaul

Cellular operators

» Small Cell Backhaul - RADWIN JET NLOS solution is available to support complex urban NLOS backhaul scenarios

Government & enterprise networks

RADWIN JET, powered by unique beamforming technology, offers wireless broadband infrastructure for government, public safety and enterprise networks required to work in semi-licensed or congested unlicensed spectrum in urban or suburban areas. RADWIN JET dramatically reduces the total cost of ownership and secures stable and reliable connectivity for the following applications:

» Connectivity of high definition video surveillance
» Long range building-to-building connectivity
» Mission critical broadband applications
» Real-time SCADA data transmission
» Industrial infrastructure monitoring & control (Oil and Gas, Utilities)
» Leased line replacement
Bi-Beam™ technology

RADWIN JET incorporates unique Bi-Beam™ technology: A disruptive beamforming MIMO antenna at the Base Station, together with an intelligent air interface that redefines the performance of Broadband Wireless Access. RADWIN JET beamforming antenna is formed from an array of antenna elements that are combined to generate a narrow and steerable beam. The beamforming antenna is utilized both for uplink and downlink directions to deliver the following unique advantages:

» Increase antenna and system gain in uplink & downlink directions
  Boost capacity, range and link robustness

» Improve interference immunity, similar to PtP
  A result of the narrow beam replacing the wide beam of common sector antennas.

» Greater frequency reuse
  The narrow beam created by the Bi-Beam antenna reduces the level of mutual interference between adjacent sectors and sites. Less spectrum is required and network planning is simplified.

» Excellent operation in nLOS / NLOS conditions
  Bi-Beam antenna can be steered to the optimal reflection point to obtain the best possible link.
RADWIN JET base stations with bi-beam technology

jET PRO delivers up to 750Mbps in 5.x GHz and up to 250Mbps in 3.x GHz. Designed for a variety of applications, the Base Station enables SLA connectivity based on CIR (Committed Information Rate) for enterprise customers, video cameras and other heavy bandwidth applications. JET PRO also supports Best Effort connectivity for residential and non-critical bandwidth applications.

Powerful, carrier-grade subscriber units

RADWIN’s powerful Subscriber Units (SUs) deliver fiber-like connectivity with the industry’s highest Packet-Per-Second (PPS) processing power to maintain highest capacity even in small packet applications. Designed for low visual impact, RADWIN’s ruggedized SUs assure long lasting operation even in the harshest conditions. Innovative operational simplicity concepts and cutting-edge technology streamline operations and maintenance procedures.

High-capacity subscriber units (4.9 - 5.9 GHz)

» Pay-as-you-grow 25 up to 200Mbps
» Multiple antenna configurations in a single unit
» High durability – IP 66 enclosure
» Compatible with all RADWIN base stations
» Available Models:
  › SU AIR: Designed for residential subscribers
  › SU PRO: Offers SLA for enterprise and bandwidth-demanding applications, based on CIR

High-capacity subscriber units (3.3 - 3.8 GHz / 3.65 GHz)

» Pay-as-you-grow 25 up to 100Mbps
» Available as connectorized unit or with integrated antenna
» High durability – IP 67 enclosure
» Available Models:
  › HSU-R: Designed for residential subscribers
  › HSU: Offers SLA for enterprise and bandwidth-demanding applications, based on CIR
Innovative operational simplicity

**Smartphone installation application**
RADWIN SU PRO series include a smartphone application tool which is designed to speed up and simplify the installation process.

**WINTouch APP**
Enables automated installation, alignment & commissioning
Simple, fast and precise installation

**Multiple antenna configurations**
RADWIN SU series includes an embedded antenna and is compatible with RADWIN’s new and innovative slide-on antenna to achieve greater range. An option for third-party external antennas is also available.

**TurboGain™ antenna**
Slide-on antenna
Doubles the service range
Key product benefits

more Capacity, Less Infrastructure
RADWIN JET uniquely delivers fixed and high transmission power across all modulations. When combined with increased gain and an interference-immune Bi-Beam antenna, RADWIN JET delivers greater downlink and uplink capacity and a longer range than conventional PtMP solutions or PtMP with beamforming in an uplink-only direction.

Greater Network Capacity Per Given Spectrum
Only two frequency channels are required to deploy a multiple JET cell network - with each cell comprising of 4 sectors. As a result, two channels of 80 MHz can yield tremendous cell capacity of up to 3 Gbps!

Unique Air Interface for Highly Robust Link Performance
RADWIN JET Bi-Beam technology ensures best link performance by managing the individual transmission scheme of each SU: Channel bandwidth (80, 40 or 20MHz) and antenna configuration (MIMO or diversity mode) are dynamically selected per SU to achieve the highest possible capacity. Fast ARQ (Automatic Repeat upon reQuest) is used to guarantee error-free transmission, even in adverse spectrum conditions.

Full Span of Asymmetric Traffic
RADWIN JET can be configured to deliver more than 90% of traffic in either uplink or downlink direction.

Secured Service Level Agreement (SLA) for Bandwidth Demanding Applications
RADWIN’s Dynamic Bandwidth Allocation (DBA) optimally maximizes throughput for active users demanding various service levels e.g. Committed Information Rate (CIR) or Best Effort.

TDD Synchronization, Enabling Dense Deployments with Maximum Performance
RADWIN JET features TDD synchronization between sectors and sites, using a built-in GPS. This synchronization prevents mutual interference and increases network capacity and range.
Product specifications (See individual Product Data Sheets for detailed spec.)

<table>
<thead>
<tr>
<th>Maximum Net Aggregate Capacity</th>
<th>Base station</th>
<th>High-Capacity Subscriber Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>JET PRO</td>
<td>JET</td>
</tr>
<tr>
<td>4.9 - 5.9 GHz</td>
<td>750 Mbps</td>
<td>SU AIR – Up 100Mbps, SU PRO – Up to 200Mbps</td>
</tr>
<tr>
<td>3.3 - 3.8 GHz, 3.65 GHz</td>
<td>-</td>
<td>10, 25, 50 Mbps, upgradable to 100Mbps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antenna Configurations</th>
<th>Beamforming antenna:</th>
<th>Connectorized unit with 16dBi embedded antenna, 22dB when using TurboGain™</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.9 - 5.9 GHz</td>
<td>20 dBi (5.1 - 5.9 GHz), 17 dBi (4.9 GHz)</td>
<td></td>
</tr>
<tr>
<td>3.3 - 3.8 GHz, 3.65 GHz</td>
<td>17dBi</td>
<td>13dBi, 20dBi, Connectorized</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Radio</th>
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<tbody>
<tr>
<td>Number of SUs / HBS</td>
<td>Up to 64 SUs simultaneously</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>Up to 40 km / 25 miles</td>
<td></td>
</tr>
<tr>
<td>Frequency Bands</td>
<td>Multiband radio supporting 4.9 - 5.9 GHz or 3.3-3.8 / 3.65 GHz</td>
<td></td>
</tr>
<tr>
<td>Channel Bandwidth</td>
<td>5 x GHz: Configurable: 10, 20, 40, 80 MHz, Dynamic Channel BW selection: 20/40/80 MHz, 3 x GHz: 5, 7, 10, 14, 20, 40MHz</td>
<td></td>
</tr>
<tr>
<td>Radio Access scheme</td>
<td>OFDM, Auto MIMO 2x2 or Diversity per SU</td>
<td></td>
</tr>
<tr>
<td>Adaptive Modulation &amp; Coding</td>
<td>BPSK/QPSK/QAM16/QAM64/QAM256</td>
<td></td>
</tr>
<tr>
<td>SLA management</td>
<td>CIR, MIR, Best-Effort</td>
<td></td>
</tr>
<tr>
<td>End to End Latency</td>
<td>Typical: 3.5msec</td>
<td></td>
</tr>
<tr>
<td>Duplex Technology</td>
<td>TDD, Configurable Uplink / Downlink ratio</td>
<td></td>
</tr>
<tr>
<td>Max Tx Power</td>
<td>HBS: 25dBm @ 5.x GHz, 23dBm@ 3.x GHz (in all modulation schemes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HSU: 25dBm, SU: 24 dBm</td>
<td></td>
</tr>
<tr>
<td>DFS (FCC &amp; ETSI)</td>
<td>Supported</td>
<td></td>
</tr>
<tr>
<td>Spectrum Viewer</td>
<td>Supported at HBS &amp; SU/ HSU</td>
<td></td>
</tr>
<tr>
<td>TDD Synchronization</td>
<td>Inter &amp; Intra site synchronization, Embedded GPS receiver and antenna</td>
<td></td>
</tr>
<tr>
<td>Encryption</td>
<td>AES 128</td>
<td></td>
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</tbody>
</table>

| Interfaces                     | HBS: Two ports for Data & management, 10/100/1000BaseT, SU: 10/100BaseT | |

<table>
<thead>
<tr>
<th>Networking</th>
<th>Layer 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>QoS</td>
<td>Packet classification to 4 queues according to 802.1p and DiffServ, Strict Priority, TTL</td>
<td></td>
</tr>
<tr>
<td>VLAN</td>
<td>802.1Q, QinQ, 4094 VLANs</td>
<td></td>
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</tbody>
</table>

| Protocol                      | SNMPv1, SNMPv3, Telnet, HTTP, IPv4 & IPv6, RADIUS for AAA Server | |
| NMS Application               | RADWIN NMS (RNMS) or integration with 3rd party NMS system via standard MIBs | |

| Power                          | Provided over PoE interface | |
| Power Consumption              | HBS < 25W, SU & HSU < 12 W | |

| Environmental                  | -35°C to 60°C / -31°F to 140°F | |
|--------------------------------|---------------------------------| |
| Humidity                       | 100% condensing, HBS & HSU: IP67, SU: IP66 | |
| Radio Regulations              | FCC, IC, ETSI, WPC | |
| Safety                         | FCC/IC (cTUVus), ETSI | |
| EMC                            | FCC, ETSI, CAN/CSA, AS/NZS | |

1 QAM 256 only in 5.x band

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