



# HARMONY ENHANCED

## HIGH POWER HIGH CAPACITY PACKET MICROWAVE

### SERVICE PROVIDERS CAN NOW DO MORE WITH THE ZERO-FOOTPRINT HARMONY ENHANCED

This high-capacity packet microwave system delivers big performance in small package. Since the radio and modem are integrated into a single highly compact outdoor unit, Harmony Enhanced is a zero-footprint solution - eliminating rack congestion and minimizing collocation space. Equipped with DragonWave's Bandwidth Accelerator+ technology, the Harmony Enhanced achieves the highest degree of spectral efficiency (through 2048 QAM and wide channels) delivering more capacity per channel with a longer reach than most other out-door microwave systems. Harmony Enhanced delivers industry-leading capacities up to 500 Mbps with in a single link and 1Gbps in a single antenna with XPIC.

With unmatched capacity and system gain, single installation and operation in addition to sophisticated remote management capability, the Harmony Enhanced delivers significant lifecycle cost savings for service providers and enterprises.

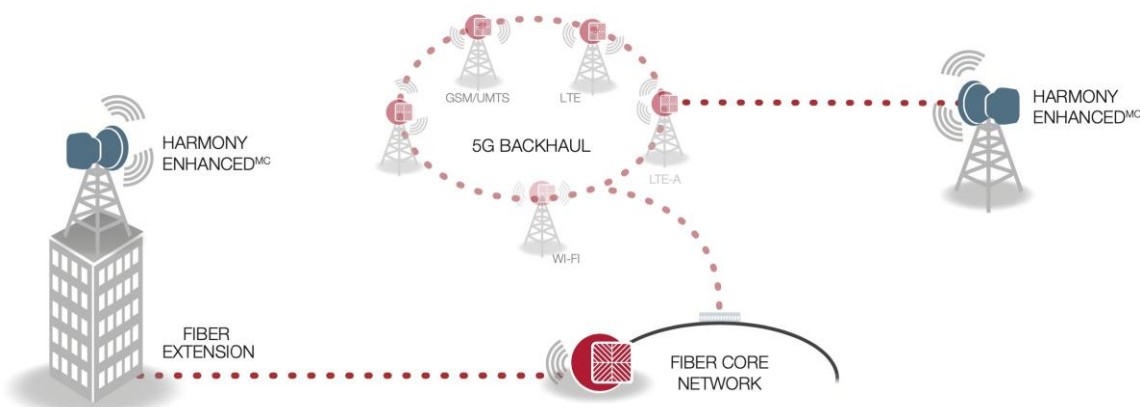
The innovative, carrier-grade packet microwave solution operates in licensed or unlicensed spectrum from 6 to 38 gigahertz (GHz).

### SOLUTION HIGHLIGHTS

- Zero footprint, fully integrated all-outdoor unit
- Ultra High Power radio option with up to 34 dBm of transmit power
- Single Radio XPIC configuration
- Wide channel support up to 56 MHz
- Up to 2048QAM modulation support
- Service aware Hitless Automatic Adaptive Modulation (HAAM)
- Support for SyncE
- Pay-as-you-grow with automatic remote scalability
- Multi-port capability including an integrated 10Gb Ethernet port
- Advanced QoS support with 8 levels of prioritization
- Comprehensive management and provisioning with NetViewer NMS
- Intuitive EMS with LinkView
- Lowest total cost of ownership solution

### KEY APPLICATIONS

- Mobile Backhaul
- Leased Line Replacement
- Last Mile Fiber Extension
- Private and Enterprise Networks



**FREQUENCIES**

|         |                           |
|---------|---------------------------|
| 6 GHz   | FCC/IC/ETSI/ITU           |
| 7/8 GHz | ETSI/ITU/                 |
| 11 GHz  | FCC/ETSI/ITU/IC           |
| 13 GHz  | ETSI/AUS/NZ/ITU           |
| 15 GHz  | IC/ETSI/AUS/NZ/MX/ITU     |
| 18 GHz  | FCC/IC /ETSI/AUS/NZ/ITU   |
| 23 GHz  | FCC/IC/ETSI/AUS/NZ/ITU/MX |
| 26 GHz  | ETSI                      |
| 28 GHz  | FCC/ETSI                  |
| 38 GHz  | FCC/ETSI/AUS/NZ/MX        |

**FEATURES**

|                        |  |
|------------------------|--|
| Base Capacity          | Variable from 10 Mbps to 1 Gbps full duplex with DPRM on a single antenna* |
| Capacity w/Accelerator | Bandwidth Accelerator+ delivering up to 2x increase in base throughput     |
| Latency GigE           | <100µs @ 2048QAM, 56 MHz   |
| Modulations            | QPSK to 2048QAM  |
| Channel Bandwidth      | 3.5 MHz to 56MHz   |
| Maximum Tx Power       | Up to 29dBm and up to 34dBm in the High Power Variant                      |
| Modulation Shifting    | Yes, Hitless   |
| Loopback               | Yes, Radio loopback and Ethernet   |
| Synchronization        | Synchronous Ethernet (with ESMC)   |

**MECHANICAL**

|                               |   |
|-------------------------------|---|
| Interface                     | 2 x 10/100/1000bT + 2 x Optical SFP                           |
| Input                         | 40.5 VDC to -57.5 VDC or<br>+40.5 VDC to +57.5 VDC            |
| Radio/Modem (without antenna) | 21.6 cm x 25.4 cm x 12.8cm; 4.1kg<br>8.5" x 10" x 5.05"; 9lbs |
| Antenna Wind Loading          | 112 kph (70 mph) operational<br>200 kph (125 mph) survival    |
| Antenna Mount Adjustment      | +/- 45° Azimuth; +/- 22° Elevation                            |

\* Assumes 56MHz bandwidth

\*\* Assumes minimum moving air speed of 10 km/h

**ELEMENT MANAGEMENT**

|  |  |
|--|--|
| Alarm Management                           | SNMP Traps, Enterprise MIBs                              |
| NMS Support                                | DragonWave's NetViewer or any SNMP based network manager |
| EMS Support                                | LinkView   |
| SNMP Support                               | V1, V2c, V3  |
| Management Access                          | Web based management, SMNP Telenet                       |
| Ethernet OAM Fault Management              | 802.1ag  |
| Authentication, Authorization & Accounting | RADIUS   |
| Management Interface                       | In band and out of band                                  |
| Addressing                                 | IPv4 / IPv6  |

**ENVIRONMENTAL**

|                       |                                    |
|-----------------------|------------------------------------|
| Operating Temp        | -40°C to+ 55°C (-40°F to+131° F)** |
| Humidity              | 100 % Condensing                   |
| Altitude              | 5000 m (16,404 ft)                 |
| Water Tightness       | IP66 (directed hose test)          |
| Operational Shock     | ETSI 300-019-1-4; 5g 11ms          |
| Operational Vibration | ETSI 300-019-1-4 Class 4m5         |
| Earthquake            | NEBS GR-63                         |

**ETHERNET**

|                |   |
|----------------|---|
| Packet Size    | Up to 9600B   |
| Flow Control   | Color Aware congestion avoidance (WRED)                             |
| Prioritization | 8 levels served by 8 hardware queues, based on 802.1p/q, MPLS, DSCP |



[www.DragonWaveX.com](http://www.DragonWaveX.com)