



# HARMONY ENHANCED<sup>MC</sup>

## HIGH POWER MULTI CARRIER PACKET MICROWAVE

### DELIVERING THE LOWEST COST PER BIT OVER MICROWAVE

This high-capacity packet microwave radio builds upon the Harmony Enhanced family by delivering a multi-carrier system, doubling the capacity available in a single Outdoor Unit (qa). Since the radio and modem are integrated into a single, highly-compact ODU, Harmony Enhanced<sup>MC</sup> is a zero-footprint solution - eliminating rack congestion and minimizing collocation space. The Ultra High Transmit Power increases the overall system gain and allows for deployment of smaller dishes, higher order modulations, or increased link availability.

Using DragonWave's unique Bandwidth Accelerator+ technology, wide channel support and 2048 Quadrature Amplitude Modulation (QAM), the Harmony Enhanced<sup>MC</sup> provides exceptional spectral efficiency. Spectral efficiency runs up to 2.1 gigabits (Gbps) in a single radio and up to 4.2 Gbps on a single antenna using two ODUs with L1 aggregation.

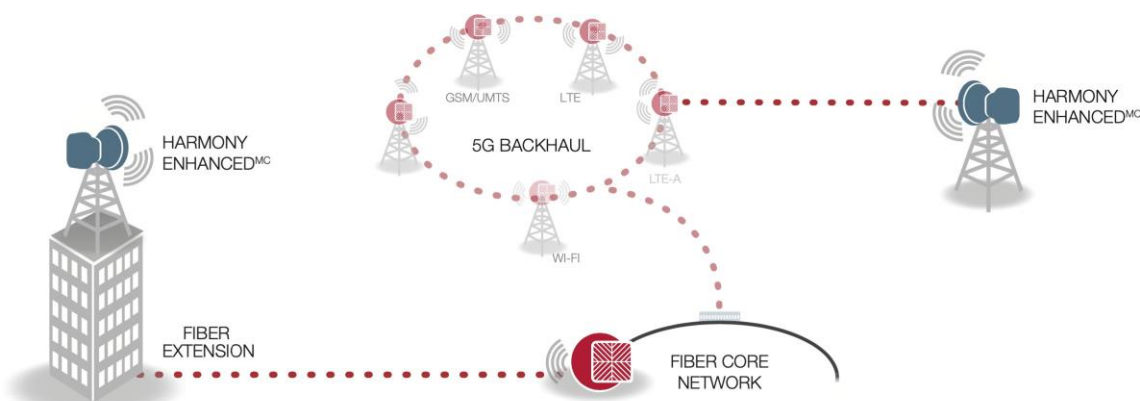
The Harmony Enhanced<sup>MC</sup> delivers significant cost-effective lifecycle services for consumers. These services include unmatched capacity and system gain, simple installation and operation, and sophisticated remote management capacity.

### 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 80 MHz
- Up to 2048QAM modulation support
- Service aware Hitless Automatic Adaptive Modulation (HAAM)
- 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
- 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
11 GHz	FCC/ETSI/AUS/NZ/ITU
15 GHz	IC/ETSI/AUS/NZ/MX/ITU/ANSI
18 GHz	FCC/IC /ETSI/AUS/NZ/ITU
23 GHz	FCC/IC/ETSI/AUS/NZ/ITU/MX

**FEATURES**

Base Capacity	Variable from 10 Mbps to 2.1 Gbps full duplex CIR 2x capacity up to 4.2 Gbps with single antenna*
Capacity w/Accelerator	Bandwidth Accelerator+ delivering up to 2x increase in base throughput
Latency GigE	<120µs @ 2048QAM, 50 MHz
Modulations	QPSK to 2048QAM
Channel Bandwidth	25/28/30/40/50/56/80 MHz
Loopback	Yes, Radio loopback and Ethernet
Synchronization	Synchronous Ethernet (with ESMC)

**MECHANICAL**

Interface	2 x 10/100/1000bT + 2 x Optical SFP (1xGE + combo 1GE/10GE)
Direct DC Port	-48 V Nominal (-27 VDC to -57.5 VDC), isolated
Radio/Modem (without antenna)	26 cm x 26 cm x 16 cm; 7.5kg 10.5" x 10" x 6.2"; 16.5 lbs
Antenna Wind Loading	112 kph (70 mph) operational 200 kph (125 mph) survival
Antenna Mount	+/- 45° Azimuth; +/- 22° Elevation

\* Assumes 80MHz 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)