HORIZON E-SERIES

GIGABIT ETHERNET WIRELESS SOLUTION

DELIVER MORE CAPACITY AT A LOWER COST USING LICENSED E-BAND SPECTRUM WITH THE HORIZON E-SERIES FROM DRAGONWAVE.

Operating in the uncongested 71-76 GHz licensed E-Band frequencies, the Horizon E-Series is a next generation all-outdoor, millimeter-wave Ethernet backhaul system that can deliver up to 1 Gbps capacity. The Horizon E-Series offers advanced networking capabilities for carrier-grade operation and enhanced Adaptive Bandwidth, Coding & Modulation to ensure maximum spectral efficiency.

With its unique all-silicon design, the E-Series has fewer components, resulting in greater reliability and pricing that is up to 80% lower than comparable radio systems. This light-weight zero-footprint solution offers flexible deployment options and is simple to install and manage.

Designed with strenuous carrier wireless backhaul demands in mind, the Horizon E-Series is equally capable in mobile backhaul, enterprise or Ethernet service provider network applications.

SOLUTION HIGHLIGHTS

- Up to 1 Gbps throughput
- 71-76 GHz licensed E-band spectrum
- Advanced hitless/errorless Adaptive Bandwidth, Coding and Modulation (ABCM)
- Bandwidth-aware QoS, service management and OAM
- Advanced timing over packet handling (SyncE, 1588v2)
- Carrier class availability and resiliency with advanced ring, mesh and link aggregation (1+1, 2+0)
- 256-bit AES encryption
- Green design with ultra low power consumption and zero-footprint
- Use a single cable for both power and data with PoE
- All-outdoor solution is simple to install and maintain

KEY APPLICATIONS

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

CAPACITY

		250 MHz Channel Mode			500 MHz Channel Mode		
Mode	Modulation	Bandwidth (MHz)	L1 Rate (Mbps) (1,2)		Bandwidth (MHz)	L1 Rate (Mbps) (1,2)	
			Minimum	Maximum		Maximum	Minimum
0	QAM 64	250	514	477	500	1028	955
1	QAM 16	250	349	321	500	699	642
2	QPSK	250	182	160	500	365	320
3	QPSK	125	42	39	250	85	79
4	QPSK	62.5	10	9	125	20	19

Notes:
(1) Aggregated capacity. Capacity may be divided at an downstream-upstream ratio of: 50%-50%, 75%-25% or 90%-10%.
(2) Capacity increases when divided asymmetrically (75%-25%, 90%-10%).
(3) Capacity varies according to packet size.

RADIO SPECIFICATIONS

Standards	ETSI, FCC
Operating Frequency Range	71-76 GHz
Air Interface	TDD, OFDM
Channel Size	500 MHz, 250 MHz
RF Channel Arrangement	500 MHz: 71375 + n x 500 MHz, n=0…8 250 MHz: 71250 + n x 250 MHz, n=0...18
RF Channel Selection	Via EMS/NMS/CLI
Transmit Power (typical)	+5 dBm
Adaptive Bandwidth, Coding and Modulation Dynamic Range	21 dB
Typical link distance (1)	Up to 2,500 m. (8,200 ft.)

ETHERNET INTERFACES

Supported Ethernet Interfaces	2 x 100/1000Base-T (RJ45) 2 x 1000Base-X (SFP)
Supported SFP Types	1000Base-LX (1310 nm), SX (850 nm)

CARRIER ETHERNET FUNCTIONALITY

Latency over the radio link (typical) (2)	350 µsec @ highest mode of operation
Jumbo frames support	Up to 9,200 Bytes
Carrier Ethernet Switch	4096 active VLANs MAC address learning with 4K MAC addresses IEEE 802.1ad Provider Bridge (QinQ) IEEE 802.1d Transparent Bridging IEEE 802.1ag Ethernet Service OAM (CFM) ITU-T Y.1731 OAM functions and mechanisms for Ethernet based networks IEEE 802.3ah Ethernet Link OAM (EFM) ITU-T G. 8032 Ethernet Ring Protection ITU-T G. 8031 Ethernet Linear Protection IEEE 802.3ad Link Aggregation Link state propagation
Quality of Service	Advanced CoS classification and prioritization Per interface CoS based packet queuing / buffering (8 CoS served by 8 queues) Flexible scheduling schemes (SP/WFQ/ Hybrid) Traffic shaping Traffic policing
Synchronization	G.8262, G.8264 Synchronous Ethernet IEEE 1588v.2 Timing-over-packet optimized transport
Performance Monitoring	Per Ethernet port statistics Per VLAN statistics Per queue statistics Enhanced radio Ethernet statistics
Encryption	AES 128, AES 256

NETWORK MANAGEMENT, DIAGNOSTICS, STATUS AND ALARMS

Network Management System	DragonVision NMS
NMS Interface Protocol	SNMP v1/v2/v3
Element Management	Web-based EMS, CLI
Management Channels & Protocols	SSH, HTTPS
Authentication, Authorization & Accounting	User access control SYSLOG
Management Interface	Via the Ethernet interfaces
RSSI Indication	Accurate power reading available at ODU and EMS

MECHANICAL

Dimensions		
ODU (H x W x D):	24.5cm x 22.5cm x 5cm	
Antennas:	(9.7” x 8.9” x 2”)	
26 cm, 10.3” (Dia. x Depth):	26 cm x 10 cm; (10.3” x 3.9”)	
31 cm, 12.2” (Dia. x Depth):	31 cm x 11 cm; (12.2” x 4.3”)	
65 cm, 25.6” (Dia. x Depth):	65 cm x 37 cm; (25.6” x 14.6”)	
Weights:		
ODU+ antenna (26 cm, 10.3”):	3 kg	(6.6 lbs)
ODU+ antenna (31 cm, 12.2”):	3.5 kg	(7.7 lbs)
ODU:	2 kg	(4.4 lbs)
Antenna (26 cm, 10.3”):	1 kg	(2.2 lbs)
Antenna (31 cm, 12.2”):	1.5 kg	(3.3 lbs)
Antenna (65 cm, 25.6”):	8 kg	(18 lbs)
Mounting kit	EH-MK-1ft (26 / 31 cm antenna)	

ENVIRONMENTAL

Operating Temperature	-45° to +55°C (-49° to +131°F)
Relative Humidity	0 to 100%
Ingress Protection Rating	IP67
Altitude	4,500 m. (14,765 ft.)

POWER INPUT AND CONSUMPTION

Standard Input	±48 VDC, ±24 VDC
DC Input Range	±21 to ±57 VDC
Power over Ethernet Input	IEEE 802.3at-2009
Power Consumption (typical)	25W

STANDARD COMPLIANCE

CE	CE Marked
RF	EN 302 217-3 1.3.1, FCC 47 CFR part 101:2009
EMC	EN 301 489-4, FCC 47 CFR part 15
Safety	UL 60950
Operation	EN 300 019-1-4 Class 4.1E
Storage	EN 300 019-1-1 Class 1.2
Transportation	EN 300 019-1-2 Class 2.2

Notes:
(1) Max. 4,500 m. (max. 14,765 ft.)
(2) Latency varies according to packet size and load

DragonWave
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