



Flex4G-10000
shown with 12" (30cm) Antenna

80GHz Wireless Backhaul System Delivering 9.7Gbps Capacity

As mobile data consumption increases exponentially, operators are looking for a backhaul solution that provides flexibility and easy scalability to meet tomorrow's bandwidth demands. The BridgeWave Flex4G-10000, which supports backhaul capacity of up to 9.7 Gbps per radio, meets this demand. The radio operates in bandwidths up to 2000MHz and modulation of 128QAM to achieve its highest capacity while maintaining the highest system gain. The radio also operates at 256QAM in lower bandwidths to maximize capacity when spectrum is scarce. The Flex4G-10000 has been designed to alleviate the strain of backhaul connections by combining advanced radio and modem capabilities with carrier-grade 10G Ethernet, CPRI, and SONET/SDH features at the lowest total cost of ownership.

Carrier Ethernet services are provided through the use of an integrated low-latency switch supporting jumbo frames and advanced Ethernet functionality including Quality of Service (QoS), VLAN support, Provider Bridge (Q-in-Q), and Ethernet OAM management. The Flex4G-10000 provides the comprehensive timing support required for 5G/4G/LTE deployments including Synchronous Ethernet and IEEE1588v2 with hardware-based time stamping for one-step or two-step clocks.

With low power consumption and PoE along with direct DC power, the Flex4G-10000 provides all of its capabilities in an environmentally friendly, compact and lightweight, zero-footprint all-outdoor solution.

The Flex4G-10000 leverages BridgeWave's expertise in providing high reliability gigabit millimeter wave wireless solutions. BridgeWave has delivered tens of thousands of gigabit millimeter wave radios worldwide.

FLEX4G-10000

Performance

- 9.7 Gbps data rate per 1+0 radio
- 1+0, 1+1 HSB, 2+0 configuration support
- Adaptive Code Modulation from QPSK through 256QAM
- 500, 1000, and 2000MHz bandwidth support
- Highest bit/Hz spectral efficiency at the longest link distances
- Outstanding RF performance benefiting from highly integrated architecture
- LDPC FEC providing threshold improvement over other FEC technologies
- RF channel tuning in 250 MHz steps
- Automatic Transmit Power Control
- Zero-footprint ODU with low power consumption and Power-over-Ethernet

Carrier-Grade:

- Carrier Ethernet services enabled via built-in low-latency switch
- Quality of Service (802.1p) traffic prioritization, VLAN (802.1q), Provider Bridge (Q-in-Q 802.1ad)
- Synchronous Ethernet per G.8261 and G.8262 and G.8264
- PTP per 1588v2 – Transparent and Boundary Clock support
- Ethernet OAM support per 802.3ah, 802.1ag and Y.1731
- SONET/SDH & CPRI interfaces

Security:

- Highly secure narrow beamwidth antennas
- FIPS-197 compliant AES Encryption provides the ultimate in data protection at full line rate gigabit speeds with minimal latency



Proven Reliability:

- Based on proven design – tens of thousands of systems deployed worldwide
- Rigorous HALT/HASS testing
- Carrier-grade 99.999% availability

FLEX4G-10000 SPECIFICATIONS

Frequency	Range: 71 – 76 GHz / 81 – 86 GHz T/R Spacing: 10 GHz, FDD operation Channelization: Software selectable channels in 250 MHz increments per ITU-R F.2006 Recommendation Stability: ±10 ppm					
Configurations	1+0 Non-Protected; 2+0 1+1 Hot Standby - dual antenna or single antenna with symmetrical coupler or asymmetrical coupler					
Data Rate	Up to 9.7 Gbps in 1+0 configuration					
F.E.C	Low Density Parity Check (LDPC)					
Modulation	QPSK	16QAM	32QAM	64QAM	128QAM	256QAM
RF Channel Bandwidth	500/1000/2000 MHz	500/1000/2000 MHz	500/1000/2000 MHz	500/1000/2000 MHz	500/1000/2000 MHz	500 MHz
User Data Rate (Mbps)	752/1504/2765	1504/3008/5531	1880/3761/6914	2257/4513/8297	2633/5265/9680	3009
Tx Power Output (dBm)	Up to 17dBm					
Link Budget (10E ⁻⁶ BER)	Up to 176dB (1ft/30cm antenna) and 190dB (2ft/60cm antenna)					
Interfaces	Ethernet: 1 x 10G/2.5G/1G SFP+, 2 x 2.5G/1G SFP+, and 2 x RJ-45 for 1G SDH/SONET/CPRI: 1 x SFP SDH/SONET: 1 x STM-4/OC-12 (622.08 Mbps) or 1 x STM-16/OC-48 (2488.32 Mbps) CPRI: 1 x Option 1 to 7 (614.4 Mbps to 9830.4 Mbps) Protection Port: 1 x 1G RJ-45					
Networking	Quality of Service per IEEE 802.1p, DSCP and port based Scheduling: 8 queues allowing user configurable Strict Priority or Shaped Deficit Weighted Round Robin (SDWRR) MEF compliant traffic policing (two rate, three color scheme) VLAN per IEEE 802.1q, up to 4096 VLANs Provider Bridge Q-in-Q per IEEE 802.1ad Synchronous Ethernet (SyncE) per ITU-T G.8261, G.8262 and DNU section of G.8264 Precision Time Protocol (PTP) per IEEE 1588v2 – Transparent and Boundary Clock support Congestion Management: Tail Dropping Ethernet Protection: Ring per G.8032, MPLS-TP protection (G.8131 & G.8132) Maximum Ethernet frame length: Jumbo packets up to 10,000 bytes MAC Layer: Supports MAC Learning, MAC Switching, MAC Ageing Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree Protocol (RSTP) Link State Propagation: Rapid Link Shutdown (RSP) supports remote port LSP					
Latency	Dependent on configuration, as low as 12 µSec					
Security	Inherently secure ultra-narrow beamwidth antennas for low probability of detection and interception Option: FIPS-197 compliant 256-bit AES Encryption (export controlled)					
Management	Web-based (HTTP/HTTPS) embedded management agent; Console Interface (CLI/SSH), IPv6 protocol stack SNMP Support: MIB-II and BridgeWave enterprise MIB, SNMP V1, V2, V3 SysLog (RFC 3164, RFC 3195) event support, RADIUS RFC2865 client support Ethernet OAM per 802.3ah (Link OAM), 802.1ag (Configuration Fault Management), Y.1731 (Performance Monitoring) Loopbacks: Ethernet (per port, per direction), Local Modem Test					
Power	48 VDC nominal input, ± (42.5 to 57) VDC input to POE or +/- (37.5 to 60) VDC direct DC input; 73W typical power consumption Max POE Cat5E/6 cable length is 328 ft (100 m) Max DC cable length with 12 AWG cable is 650 ft (198 m) and with 14 AWG cable is 400 ft (122 m)					
Size & Weight	13.1" w x 11.6" h x 4" d (33.4 cm x 29.5 cm x 10.2 cm); 9.6 lbs (4.4 kg)					
Environmental	Operating Temperature: -33°C to +55°C (-27°F to +131°F) per EN 300 019-1-4 Class 4.1 Humidity: 100% all-weather operation Operating Altitude: Up to 4,500m (14,764 ft) Water Ingress: NEMA 4X (IP66) RoHS & WEEE Compliant					
Regulatory	RF Certifications: U.S. FCC Part 101, EN 302 217-3; RF Exposure : meets FCC 1.310 General Population & EN 62311 RF MPE limits Safety: CE Mark; 60950-1; Corrosion : EN 60950-22 EMC/EMI: EN 301 489-1 and -4; FCC Part 15 Class B Surge & Immunity: IEC61000-4-5, GR-1089, K.21, K.44					
Antennas	12" (30cm) Parabolic, 44dBi gain, 0.8° beamwidth or 24" (60cm) Parabolic, 51dBi gain, 0.4° beamwidth					

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