



BridgeWave
COMMUNICATIONS

ETHERFLEX®

6 - 38 GHz All-Outdoor Microwave Point-to-Point Wireless Links

BridgeWave's EtherFlex® family of microwave radio systems has been designed specifically to meet the requirements of service providers, government and private networks operators who require highly-reliable Ethernet connectivity over medium-to-long range distances.

With a base capacity of 100 Mbps full-duplex, EtherFlex provides higher initial capacity than other all-outdoor microwave solutions and is easily upgradeable to full duplex 364 Mbps (ETSI) or 314 Mbps (ANSI) capacity with a single software license key. Compact and lightweight, the all-outdoor design affords rapid fitting on any REMEC style antenna mount. Considerations for radio power further simplify the installation process, with Power over Ethernet and a single CAT5 cable connection to the radio. PoE injectors are included with the radio and are fully weather-sealed for outdoor mounting with hardware for pole or wall mounting.

EtherFlex provides the highest link budget for an all-outdoor solution, yielding greater link availability and/or the longest link distances. Higher radio link budgets translate into smaller antenna sizes, which help to alleviate overall system operating costs.

BridgeWave is the market leader in providing highly reliable, high capacity wireless solutions for next generation 4G networks. The EtherFlex family of products leverages our expertise in designing and bringing to market carrier-class microwave and millimeter wave solutions that have been accepted and used in thousands of installations worldwide.



EtherFlex
with 12" (30cm) antenna

WIRELESS VIRTUAL FIBER SOLUTIONS FOR:

MOBILE BACKHAUL
Future-proof backhaul for next generation 4G/LTE networks.

SERVICE PROVIDER
High capacity business services, fiber extensions, cellular/Wi-Fi backhaul, redundant fiber overlays, mesh.

EDUCATION
High-performance campus connectivity, Wi-Fi and security camera backbone.

ENTERPRISE
Leased line replacement, LAN extensions, server centralization, remote data storage and backup.

GOVERNMENT/MUNICIPALITIES
Inter-building connections, video surveillance systems, traffic control and monitoring, Wi-Fi/4.9 GHz backhaul.

HEALTHCARE
Lab network access, real-time imaging & records transmission, application connectivity, Inter-campus connectivity

PERFORMANCE:

- Industry leading system gain for high availability and/or longest distance
- 4QAM – 256QAM with Hitless Adaptive Modulation
- Native Ethernet transmission
- Internal 2-port Ethernet switch with QoS and VLAN
- Low-latency for fiber-equivalent performance

EASE OF USE:

- Zero-footprint, all-outdoor design
- Web based HTTP GUI
- SNMP v2 and v3 management

PROVEN RELIABILITY:

- Based on proven design – hundreds of thousands of microwave terminals installed worldwide
- Up to 99.999% carrier-grade availability

SIMPLE IMPLEMENTATION:

- Less hardware to install than other microwave systems
- Power over Ethernet for single cable installations
- No tower climb for upgrades
- Lower dollar per megabit total cost of ownership

Backhaul Evolved®



ETHERFLEX[®] SPECIFICATIONS

FREQUENCY BAND	6L	6U	7	8	11	13	15	18	23	26	32	38
Frequency Range (GHz)	5.9 - 6.4	6.4 - 7.1	7.1 - 7.9	7.9 - 8.5	10.7 - 11.7	12.7 - 13.3	14.4 - 15.4	17.7 - 19.7	21.2 - 23.6	24.2 - 26.5	31.8 - 33.4	37.0 - 40.0
T/R Spacing (MHz)	252.04	160, 170, 340	154, 161, 168, 196, 245	119, 126, 151.614, 208, 266, 311.32	490, 500, 530	266	315, 420, 475, 490, 640, 644, 728	1008, 1010, 1560	1008, 1200, 1232	800, 1008	812	700, 1260
ANSI RF Channel Bandwidth (MHz)	10, 30	10, 30	N/A	N/A	10, 30, 40	N/A	N/A	10, 20, 30, 40, 50	10, 20, 30, 40, 50	10, 20, 30, 40	N/A	10, 20, 30, 40, 50
ETSI RF Channel Bandwidth (MHz)	30, 40	30, 40	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56
Frequency Stability	±7 ppm all bands, exc 6 GHz (±10ppm)											
TX POWER OUTPUT (dBm)												
4QAM	+30	+30	+30	+30	+28	+26	+26	+26	+25	+25	+23	+23
16QAM	+28	+28	+28	+28	+26	+24	+24	+23	+23	+22	+21	+20
32QAM	+28	+28	+28	+28	+26	+24	+24	+23	+23	+22	+21	+20
64QAM	+25	+25	+25	+25	+22	+20	+20	+19	+19	+19	+17	+17
128QAM	+25	+25	+25	+25	+22	+20	+20	+19	+19	+19	+17	+17
256QAM	+23.5	+23.5	+23.5	+23.5	+20.5	+18.5	+18.5	+17.5	+17.5	+17.5	+15.5	+15.5
Modulation	QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM with hitless Adaptive Modulation											
Power Control	Automatic and Manual Transmit Power Control											
DATA THROUGHPUT												
Capacity	Base data rate of 100 Mbps full-duplex with software upgradable capacity to maximum of 314 Mbps (ANSI radios) or 364 Mbps (ETSI radios) via license key											
Channel Bandwidth	7 MHz	10 MHz	14 MHz	20 MHz	28 MHz	30 MHz	40 MHz	50 MHz	56 MHz			
4QAM	10.1 Mbps	N/A	21.1 Mbps	N/A	42.7 Mbps	44.5 Mbps	N/A	N/A	N/A			
16 QAM	20.5 Mbps	N/A	42.3 Mbps	N/A	85.5 Mbps	89. Mbps	118.8 Mbps	148.5 Mbps	172.5 Mbps			
32 QAM	25.4 Mbps	35.8 Mbps	52.8 Mbps	74.1 Mbps	106.9 Mbps	111.3 Mbps	148.4 Mbps	185.6 Mbps	214.7 Mbps			
64 QAM	32.0 Mbps	44.9 Mbps	65.9 Mbps	92.4 Mbps	133.2 Mbps	138.7 Mbps	185.0 Mbps	231.3 Mbps	268.1 Mbps			
128 QAM	37.7 Mbps	52.9 Mbps	77.8 Mbps	108.9 Mbps	157.1 Mbps	163.5 Mbps	218.1 Mbps	272.6 Mbps	315.9 Mbps			
256 QAM	N/A	N/A	N/A	125.5 Mbps	180.9 Mbps	188.3 Mbps	251.2 Mbps	314.0 Mbps	363.9 Mbps			
NETWORKING												
Ethernet Interfaces	Two RJ-45 (CAT5e) 10/100/1000 Base-T. Fast Ethernet & Gigabit Ethernet per IEEE 802.3											
Latency	Dependent on configuration, as low as 150 μSec											
Ethernet Frame Length	Jumbo packets up to 9,720 bytes											
Quality of Service	Priority queuing per 802.1p (VLAN or DiffServ priority bytes)											
VLAN	VLAN tagging per 802.1q											
Flow Control	802.3x											
Management	Web-based HTTP embedded management agent, SNMP v2/v3 support: MIB-II And BridgeWave enterprise MIB, Console Port											
Management Protocols	HTTP, SNMPv2, SNMPv3, SSH, Telnet, and TFTP											



ETHERFLEX[®] SPECIFICATIONS

 RX SENSITIVITY @ 10⁻⁴ B.E.R. (DBM)

FREQUENCY BAND		6L	6U	7	8	11	13	15	18	23	26	32	38
7 MHz	4QAM	-	-	-92.5	-92.5	-93.0	-93.0	-93.0	-93.0	-92.5	-92.5	-91.5	-90.5
	16QAM	-	-	-85.0	-85.0	-85.5	-85.5	-85.5	-85.5	-85.0	-85.0	-84.0	-83.0
	32QAM	-	-	-81.0	-81.0	-81.5	-81.5	-81.5	-81.5	-81.0	-81.0	-80.0	-79.0
	64QAM	-	-	-77.5	-77.5	-78.0	-78.0	-78.0	-78.0	-77.5	-77.5	-76.5	-75.5
	128QAM	-	-	-74.5	-74.5	-75.0	-75.0	-75.0	-75.0	-74.5	-74.5	-73.5	-72.5
	256QAM	-	-	-	-	-	-	-	-	-	-	-	-
10 MHz	4QAM	-	-	-	-	-	-	-	-	-	-	-	-
	16QAM	-	-	-	-	-	-	-	-	-	-	-	-
	32QAM	-79.5	-79.5	-	-	-80.0	-	-	-80.0	-79.5	-79.5	-	-76.5
	64QAM	-76.5	-76.5	-	-	-77.0	-	-	-77.0	-76.5	-76.5	-	-73.5
	128QAM	-73.0	-73.0	-	-	-73.5	-	-	-73.5	-73.0	-73.0	-	-70.0
	256QAM	-	-	-	-	-	-	-	-	-	-	-	-
14 MHz	4QAM	-	-	-89.5	-89.5	-90.0	-90.0	-90.0	-90.0	-89.5	-89.5	-88.5	-87.5
	16QAM	-	-	-82.0	-82.0	-82.5	-82.5	-82.5	-82.5	-82.0	-82.0	-81.0	-80.0
	32QAM	-	-	-78.0	-78.0	-78.5	-78.5	-78.5	-78.5	-78.0	-78.0	-77.0	-76.0
	64QAM	-	-	-75.0	-75.0	-75.5	-75.5	-75.5	-75.5	-75.0	-75.0	-74.0	-73.0
	128QAM	-	-	-72.0	-72.0	-72.5	-72.5	-72.5	-72.5	-72.0	-72.0	-71.0	-70.0
	256QAM	-	-	-	-	-	-	-	-	-	-	-	-
20 MHz	4QAM	-	-	-	-	-	-	-	-	-	-	-	-
	16QAM	-	-	-	-	-	-	-	-	-	-	-	-
	32QAM	-	-	-	-	-	-	-	-	-78.0	-78.0	-	-75.0
	64QAM	-	-	-	-	-	-	-	-75.5	-75.0	-75.0	-	-72.0
	128QAM	-	-	-	-	-	-	-	-72.5	-72.0	-72.0	-	-69.0
	256QAM	-	-	-	-	-	-	-	-69.5	-69.0	-69.0	-	-66.0
28 MHz	4QAM	-	-	-87.0	-87.0	-87.5	-87.5	-87.5	-87.5	-87.0	-87.0	-86.0	-85.0
	16QAM	-	-	-80.0	-80.0	-80.5	-80.5	-80.5	-80.5	-80.0	-80.0	-79.0	-78.0
	32QAM	-	-	-76.5	-76.5	-77.0	-77.0	-77.0	-77.0	-76.5	-76.5	-75.5	-74.5
	64QAM	-	-	-73.5	-73.5	-74.0	-74.0	-74.0	-74.0	-73.0	-73.5	-72.5	-71.5
	128QAM	-	-	-70.5	-70.5	-71.0	-71.0	-71.0	-71.0	-70.5	-70.5	-69.5	-68.5
	256QAM	-	-	-67.5	-67.5	-68.0	-68.0	-68.0	-68.0	-67.5	-67.5	-66.5	-65.5
30 MHz	4QAM	-87.0	-87.0	-	-	-87.5	-	-	-87.5	-87.0	-87.0	-	-84.0
	16QAM	-80.0	-80.0	-	-	-80.5	-	-	-80.5	-80.0	-80.0	-	-77.0
	32QAM	-76.5	-76.5	-	-	-76.5	-	-	-76.5	-76.0	-76.0	-	-73.0
	64QAM	-73.5	-73.5	-	-	-74.0	-	-	-74.0	-73.5	-73.5	-	-70.5
	128QAM	-70.5	-70.5	-	-	-70.5	-	-	-70.5	-70.0	-70.0	-	-67.0
	256QAM	-67.5	-67.5	-	-	-67.5	-	-	-67.5	-67.0	-67.0	-	-64.0



ETHERFLEX[®] SPECIFICATIONS

FREQUENCY BAND		6L	6U	7	8	11	13	15	18	23	26	32	38
40 MHz	4QAM	-	-	-	-	-	-	-	-	-	-	-	-
	16QAM	-78.5	-78.5	-	-	-79.0	-	-	-79.0	-78.5	-78.5	-	-75.5
	32QAM	-75.0	-75.0	-	-	-75.5	-	-	-75.5	-75.0	-75.0	-	-72.0
	64QAM	-72.0	-72.0	-	-	-72.5	-	-	-72.5	-72.0	-72.0	-	-69.0
	128QAM	-69.0	-69.0	-	-	-69.5	-	-	-69.5	-69.0	-69.0	-	-66.0
	256QAM	-66.0	-66.0	-	-	-66.5	-	-	-66.5	-66.0	-66.0	-	-63.0
50 MHz	4QAM	-	-	-	-	-	-	-	-	-	-	-	-
	16QAM	-	-	-	-	-	-	-	-78.0	-77.5	-	-	-74.5
	32QAM	-	-	-	-	-	-	-	-74.5	-74.0	-	-	-71.0
	64QAM	-	-	-	-	-	-	-	-71.5	-71.0	-	-	-68.0
	128QAM	-	-	-	-	-	-	-	-68.5	-68.0	-	-	-65.0
	256QAM	-	-	-	-	-	-	-	-65.5	-65.0	-	-	-62.0
56 MHz	4QAM	-	-	-	-	-	-	-	-	-	-	-	-
	16QAM	-	-	-77.0	-77.0	-77.5	-77.5	-77.5	-77.5	-77.0	-77.0	-76.0	-75.0
	32QAM	-	-	-73.5	-73.5	-74.0	-74.0	-74.0	-74.0	-73.5	-73.5	-72.5	-71.5
	64QAM	-	-	-70.5	-70.5	-71.0	-71.0	-71.0	-71.0	-70.5	-70.5	-69.5	-68.5
	128QAM	-	-	-67.5	-67.5	-68.0	-68.0	-68.0	-68.0	-67.5	-67.5	-66.5	-65.5
	256QAM	-	-	-64.5	-64.5	-65.0	-65.0	-65.0	-65.0	-64.5	-64.5	-63.5	-62.5

POWER, MECHANICAL AND ENVIRONMENTAL

Power	-48 VDC input, 50 to 58 watts max power consumption depending on frequency, Power over Ethernet
Size & Weight	10.9" dia x 6.5" deep (27.7 cm x 16.5 cm); 12.3 lbs (5.6 kg)
Environmental	Operating Temperature: -33° C to +55° C (-27° F to +131° F) per ETS 300 019-2-4 Class 4M5 Operating Altitude: 60 m (197 ft) below and 5,000 m (16,405 ft) above sea level Water Ingress: IP67
Surge Protection	IEC 61000-4-5
Storage	ETS 300-019-2-1
Transport	ETS 300-019-2-2