BridgeWave
COMMUNICATIONS

FE60U   GE60   AR60/X

60 GHz Fast Ethernet, Gigabit Ethernet and AdaptRate™ Wireless Links

60 GHz WIRELESS LINKS FOR HIGH BANDWIDTH APPLICATIONS

BridgeWave is the leading supplier of high capacity and gigabit millimeter wave connectivity solutions for service provider, government, military, and enterprise applications. BridgeWave's wireless links extend network operator fiber to provide high capacity access and backhaul, as well as extending enterprise LANs between buildings and sites at a fraction of the cost and time to implement fiber between facilities.

FEATURES

- License-free operation in many countries
- Fast Ethernet full-duplex transmission (FE60U) upgradeable to Gigabit Ethernet & AR functionality with software upgrade key
- Gigabit Ethernet full-duplex transmission (GE60)
- AdaptRate™ & AdaptPath™ functionality (AR60/X) for rain fade mitigation
- Interference-free operation enabling high-density deployments
- Low latency – does not affect real time applications such as VoIP & video
- Forward Error Correction provides maximum link range

GE60

AR60X

WIRELESS VIRTUAL FIBER SOLUTIONS FOR:

MOBILE BACKHAUL
Future-proof full-rate gigabit backhaul for next generation 4G/LTE/WiMAX networks.

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

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

ENTERPRISE
Server centralization, remote data storage and backup, leased line replacement.

GOVERNMENT/MUNICIPALITIES
Video surveillance systems, traffic control and monitoring, Wi-Fi/4.9GHz backhaul.

HEALTHCARE
Secure, HIPAA-compliant connectivity, medical office, lab network access, real-time imaging & records, application connectivity.

SECURITY:

- Highly secure narrow beamwidth antennas
- Secure Management software option provides HTTPS management access
- RADIUS authentication

AES ENCRYPTION (option on AR):

- 256-bit key length AES - provides the strongest level available
- Full FE or GE line-rate data protection under all traffic loads
- Ultra-low latency – adds only 2 µSec
- FIPS-197 Certified (NIST Cert #638)
- Cipher Block Chaining (128 bit blocks) conceals patterns in plain text
- Meets "Top Secret" security standards
- Built-in – NO external encryptor required

RELIABILITY:

- Rigorous HASS testing
- Up to 99.999% carrier-grade availability
- 28-year MTBF

EASE-OF-USE:

- Connects directly to standard network equipment
- All-outdoor, compact design
- Low voltage power cabling
- Rapid & flexible deployment
- Embedded web and SNMP based network management

CONNECTIVITY RANGES:

- AR60X – up to 1.5 miles (2.5 km)
- AR60 – up to 1 mile (1.6 km)
- FE60U – up to 1 mile (1.6 km)
- GE60 – up to 0.75 miles (1.2 km)

Distances are dependent on rain region and desired availability. Contact BridgeWave or an Authorized Reseller for path analysis for your specific application.

Backhaul Evolved®

60 GHz SPECIFICATIONS

	FE60U	GE60	AR60	AR60X
DATA RATES				
Base Rate	100 Mbps	1000 Mbps	1000 Mbps	1000 Mbps
Upgrade Rates	1000 Mbps AR mode	-	-	-
AdaptRate™ Operation	AR mode w/software key	-	100 Mbps	100 Mbps
LATENCY				
GE Mode	-	-	< 40 µSec	< 40 µSec
FE Mode	< 220 µSec	< 40 µSec	< 220 µSec	< 220 µSec
LINK BUDGET				
GE Mode	-	150.5 dB @ 10^{-12} B.E.R.	150.5 dB @ 10^{-12} B.E.R.	163.5 dB @ 10^{-12} B.E.R.
	-	152.5 dB @ 10^{-6} B.E.R.	152.5 dB @ 10^{-6} B.E.R.	165.5 dB @ 10^{-6} B.E.R.
FE Mode	161.5 dB @ 10^{-12} B.E.R.	-	161.5 dB @ 10^{-12} B.E.R.	174.5 dB @ 10^{-12} B.E.R.
	163.5 dB @ 10^{-6} B.E.R.	-	163.5 dB @ 10^{-6} B.E.R.	176.5 dB @ 10^{-6} B.E.R.
RF INTERFACE	58.1 / 62.9 GHz (FDD) BFSK modulated with forward error correction RS (204,188)			
Bandwidth	285 MHz	1.4 GHz	1.4 GHz (GE mode)	1.4 GHz (GE mode)
			285 MHz (FE mode)	285 MHz (FE mode)
MINIMUM DISTANCE	65 ft (20m)	65 ft (20m)	65 ft (20m)	330 ft (100m)
ETHERNET INTERFACE	1000base-SX with LC connectors – up to 270m 62.5/125 µm MMF, or 500m 50/125µm MMF 10/100base-TX with RJ-45 connector (with integral surge suppressor) – up to 100m CAT5 cable Maximum Ethernet frame length: 1632 bytes			
MANAGEMENT	Web-based (HTML) embedded management agent: setup, security, statistics, software update, HTTPS Secure Management Access SNMP Support: MIB-II And BridgeWave enterprise MIB SysLog (RFC 3164, RFC 3195) event support RADIUS Authentication Voltmeter test points: Receive Signal Level and Link Quality			
POWER	Supplied 100 – 240 VAC input / +24 VDC output - Indoor rated power supply (0°C to +40°C); 45 watts max consumption Max cable length: 650 ft (200m) with 12AWG; 400 ft (125m) with 14AWG, stranded wires highly recommended (surge suppressor required)			
ANTENNA	Integrated 10" (25cm) cassegrain (H/V), 40 dBi gain, 1.4° beam	Integrated 10" (25cm) cassegrain (H/V), 40 dBi gain, 1.4° beam	Integrated 10" (25cm) cassegrain (H/V), 40 dBi gain, 1.4° beam	External 24" (60cm) cassegrain (H/V), 46 dBi gain, 0.6° beam
MOUNT	2" - 4.5" (5 -11.4 cm) O.D. pole SCH40 or higher Wall mount bracket included	2" - 4.5" (5 -11.4 cm) O.D. pole SCH40 or higher Wall mount bracket included	2" - 4.5" (5 -11.4 cm) O.D. pole SCH40 or higher Wall mount bracket included	3.5" – 4.5" (5 -8.9 cm) O.D. pole SCH40 or higher
SIZE (h, w, d)				
Radio Unit	12 x 12 x 6 (in) / 30 x 30 x 15 (cm)	12 x 12 x 6 (in) / 30 x 30 x 15 (cm)	12 x 12 x 6 (in) / 30 x 30 x 15 (cm)	12 x 12 x 6 (in) / 30 x 30 x 15 (cm)
Antenna	Included in above	Included in above	Included in above	24 x24 x20 (in) / 62 x 62 x 50 (cm)
WEIGHT				
Radio Unit	11.9 lbs (5.4 kg)	11.9 lbs (5.4 kg)	11.9 lbs (5.4 kg)	11.9 lbs (5.4 kg)
Antenna Mount	6.6 lbs (3.3 kg)	6.6 lbs (3.3 kg)	6.6 lbs (3.3 kg)	26.6 lbs (12.1 kg)
WIND LOADING	50 lbs force @ 100 MPH	50 lbs force @ 100 MPH	50 lbs force @ 100 MPH	202 lbs force @ 125 MPH
ENVIRONMENTAL	Operating Temperature: -33°C to +55°C (-27°F to +131°F); Humidity: 100% all-weather operation; Maximum Altitude: 14764 ft (4,500 m)			
REGULATORY	RF Certifications: U.S. FCC Part 15.255; Industry Canada RSS-210; ETSI EN 302 217-3 V1.3.1 Safety: UL Listed; CE Mark; EN60950-1:2006 + A11:2009; EN 301 489-4 V1.4.1; Meets FCC 1.1310 General Population and EN 62311:2008 RF MPE limits			

BSI
ISO 9001:2008
FM 59394

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