

AR60 & AR60X

60GHz AdaptRate™ Wireless Links

60GHz WIRELESS LINKS FOR HIGH-BANDWIDTH APPLICATIONS

BridgeWave is the leading supplier of gigabit RF connectivity solutions for service provider, government, military and enterprise applications. BridgeWave Gigabit Ethernet links extend network operator fiber to provide high-capacity access and backhaul, as well as extending enterprise LANs between buildings and sites.

FEATURES

PERFORMANCE:

- Full rate, full duplex, Gigabit or Fast Ethernet
- License-free operation in the U.S. and Canada
- AdaptRate switching overcomes rain downpours
- AdaptPath provides secondary path switching for maximum service availability
- Interference-free operation enabling high-density deployments
- Low latency for fiber-equivalent performance
- Forward Error Correction provides maximum link range

SECURITY:

- Highly secure narrow beamwidth antennas
- Secure Management software option provides HTTPS management access and RADIUS authentication (see Advanced Security datasheet)
- AES Encryption hardware option provides the ultimate level of full line-rate data protection (see Advanced Security datasheet)

RELIABILITY:

- Rigorous HALT/HASS testing; 28-Year MTBF
- Up to 99.999%, carrier-grade availability

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 agent

CONNECTIVITY RANGES



AR60

Up to 1 Miles
(1.5 km)



AR60X

Up to 1.5 Miles
(2.5 km)

WIRELESS "VIRTUAL FIBER" SOLUTIONS FOR SERVICE PROVIDER, GOVERNMENT/MILITARY, AND ENTERPRISE APPLICATIONS

LAN EXTENSION
Extends LAN backbones between buildings

FIRST/LAST MILE
Supports high-speed access services

METRO AREA NETWORK (MAN)
Complements/extends metro fiber

SERVER CONSOLIDATION
Enables centralization of IT facilities

SPATIAL DIVERSITY
Creates redundant paths for mission-critical applications

FAST AND FLEXIBLE
Provides temporary and disaster-recovery connectivity

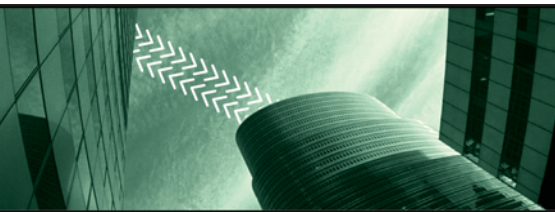
FIBER ALTERNATIVE
Offers fiber-equivalent performance, security and reliability

CONFIGURATIONS

- Point-to-point
- Hot standby
- Multi-hop/repeater
- Hub-and-spoke
- Ring
- Mesh

SPECIFICATIONS

	AR60 AdaptRate™ Gigabit Ethernet		AR60X AdaptRate™ Extended Range	
Operating Mode	Full-time 1000 Mbps / Full-time 100 Mbps / 1000/100 Mbps AdaptRate			
AdaptRate and AdaptPath Switching	Normal operation: 1000 Mbps / Path fade mode: 100 Mbps / Secondary link: Dependant of user supplied product capability			
	Switching time: < 50 milliseconds			
	AdaptRate switch point: -57dBm / -59dBm			
	AdaptPath switch point: Configurable			
	1000 Mbps	100 Mbps	1000 Mbps	100 Mbps
Data Rate	1000 Mbps full duplex	100 Mbps full duplex	1000 Mbps full duplex	100 Mbps full duplex
Latency	< 40 uSec	< 220 uSec	< 40 uSec	< 220 uSec
Link Budget	149.5dB @ 10 ⁻¹² BER	160.5dB @ 10 ⁻¹² BER	161.5dB @ 10 ⁻¹² BER	172.5dB @ 10 ⁻¹² BER
RF Interface	58.1GHz/62.9GHz (FDD), digitally modulated (BFSK) with forward error correction RS(204,188)			
	1.4GHz bandwidth	140MHz bandwidth	1.4GHz bandwidth	140MHz bandwidth
	Min. link distance 65 ft (20 m)		Min. link distance 330 ft (100 m)	
	256-Bit AES Encryption option (see Advanced Security datasheet for details)			
Antenna	External 12 in (31 cm) directional cassegrain		External 24 in (62 cm) directional cassegrain	
	Linear polarized (H/V), 40dBi gain, 1.4° beam		Linear polarized (H/V), 46dBi gain, 0.6° beam	
Ethernet Interfaces	1000base-SX with LC connectors - up to 270m 62.5/125µm MMF, or 500m 50/125µm MMF			
	10/100base-TX with RJ-45 connector - up to 100m Cat5 cable (two Ethernet surge suppressors required)			
	Maximum Ethernet frame length: 1632 bytes			
Management	Web-based (HTML) embedded management agent: setup, security, status, statistics, software update			
	Secure Management Access (see Advanced Security datasheet for details)			
	SNMP support: MIB-II and BridgeWave enterprise MIB			
	Voltmeter test points: Receive Signal Level and Link Quality			
	SysLog support			
Power	Supplied 100 – 240 VAC input, +24VDC output, indoor rated power supply (0°C to +40°C), 45watts max. consumption			
	Optional outdoor rated power supply for extreme temperatures (-40°C to +60°C) mounted in sealed enclosures			
	Max. cable length: 650 ft (200m) with 12AWG 400 ft (125m) with 14AWG, stranded wires highly recommended (24VDC surge suppressor required)			
Mount	Pole mount: 2-4.5 in (5-11 cm) OD		Fine-adjust pole mount: 3.5-4.5in (8.9-11.4cm) OD -- SCH40 or higher	
	Wall mount bracket			
Size	Radio/antenna unit: 12w * 12h * 6d (in) / 30w * 30h * 15d (cm)		Radio with antenna and mount: 24w * 24h * 20d (in) / 62w * 62h * 50d (cm)	
Weight	Radio with antenna and mount: 22 lbs (10 kg)		Radio with antenna and mount: 38.5 lbs (17.5 kg)	
Environmental	Operating temperature: -30 to +50 °C (-22 to 122 °F)			
	Operating altitude: 14,764 ft maximum (4,500 m)			
Wind Loading	50 lbs. force @ 100 MPH		120 lbs. force @ 100 MPH	
Regulatory	Safety: UL Listed, CE Mark, meets FCC 1.1310 general population RF MPE limits			
	RF Certifications: U.S. FCC Part 15.255 Industry Canada RSS-210			
Install Kit	Voltmeter test cable, power connectors, visual alignment tool		Voltmeter test cable, power connectors	



GE60

60GHz Gigabit Ethernet Wireless Links

60GHz WIRELESS LINKS FOR HIGH-BANDWIDTH DATA APPLICATIONS

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FEATURES

PERFORMANCE:

- License-free operation in the U.S. and Canada
- Full rate, full duplex, Gigabit Ethernet
- Interference-free operation, enabling high-density deployments
- Low latency for fiber-equivalent performance
- Forward Error Correction provides maximum link range

SECURITY:

- Highly secure narrow beamwidth antennas
- Secure Management software option provides HTTPS management access and RADIUS authentication (see Advanced Security datasheet)
- AES Encryption hardware option provides the ultimate level of full line-rate data protection (see Advanced Security datasheet)

RELIABILITY:

- Rigorous HALT/HASS testing; 28-Year MTBF
- Up to 99.999%, carrier-grade availability

EASE-OF-USE:

- Connects directly to standard network equipment
- All-outdoor, compact design
- Low voltage power cabling
- Rapid & flexible deployment
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CONNECTIVITY RANGE



GE60 Up to .75 Mile
(1 km)

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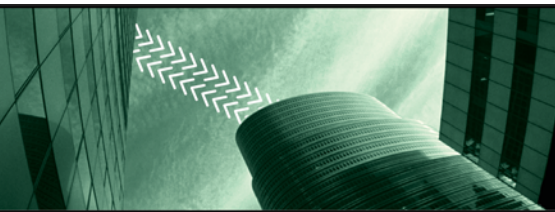
FIBER ALTERNATIVE
Offers fiber-equivalent performance, security and reliability

CONFIGURATIONS

- Point-to-point
- Hot standby
- Multi-hop/repeater
- Hub-and-spoke
- Ring
- Mesh

SPECIFICATIONS

GE60 Gigabit Ethernet	
Data Rate	1000 Mbps full-duplex
Latency	< 40uSec
Link Budget	149.5dB @ 10 ⁻¹² BER
RF Interface	58.1GHz/62.9GHz (FDD), digitally modulated (BFSK) with forward error correction RS(204,188) 1.4GHz bandwidth Min. link distance 65ft (20m) 256-Bit AES Encryption option (see Advanced Security datasheet for details)
Antenna	Integrated 10 in (25cm) directional cassegrain Linear polarized (H/V), 40dBi gain, 1.4° beam
Ethernet Interfaces	1000base-SX with LC connectors - up to 270m 62.5/125µm MMF, or 500m 50/125µm MMF 10/100base-TX with RJ-45 connector - up to 100m Cat5 cable (two Ethernet surge suppressors required) Maximum Ethernet frame length: 1632 bytes
Management	Web-based (HTML) embedded management agent: setup, security, status, statistics, software update Secure Management Access (see Advanced Security datasheet for details) SNMP support: MIB-II and BridgeWave enterprise MIB Voltmeter test points: Receive Signal Level and Link Quality SysLog support
Power	Supplied 100 – 240 VAC input, +24VDC output, indoor rated power supply (0°C to +40°C), 45watts max. consumption Optional outdoor rated power supply for extreme temperatures (-40°C to +60°C) mounted in sealed enclosures Max. cable length: 650 ft (200m) with 12AWG 400 ft (125m) with 14AWG, stranded wires highly recommended (24VDC surge suppressor required)
Mount	Pole mount: 2-4.5 in (5-11 cm) OD Wall mount bracket
Size	Radio/antenna unit: 12w * 12h * 6d (in) / 30w * 30h * 15d (cm) (Not including pole mount hardware)
Weight	Radio: 11.9 lbs (5.4 kg) Mount: 6.6 lbs (3.0 kg)
Environmental	Operating temperature: -30 to +50 °C (-22 to 122 °F) Operating altitude: 14,764 ft maximum (4,500 m)
Wind Loading	50 lbs. force @ 100 MPH
Regulatory	Safety: UL Listed, CE Mark, meets FCC 1.1310 general population RF MPE limits RF Certifications: U.S. FCC Part 15.255 Industry Canada RSS-210
Install Kit	Voltmeter test cable, power connectors, visual alignment tool



FE60U

60GHz Fast Ethernet Upgradeable Wireless Links

60GHz WIRELESS LINKS FOR HIGH-BANDWIDTH DATA APPLICATIONS

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FEATURES

PERFORMANCE:

- License-free operation in the U.S. and Canada
- Full rate, full duplex, Fast Ethernet upgradeable to Gigabit Ethernet
- *Field upgradable to full Gigabit Ethernet AR60 product using software key* (please refer to AR60 datasheet for upgrade product specifications)
- Interference-free operation, enabling high-density deployments
- Low latency for fiber-equivalent performance
- Forward Error Correction provides maximum link range

SECURITY:

- Highly secure narrow beamwidth antennas
- Secure Management software option provides HTTPS management access and RADIUS authentication (see Advanced Security datasheet)

RELIABILITY:

- Rigorous HALT/HASS testing; 28-Year MTBF
- Up to 99.999%, carrier-grade availability

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 agent

CONNECTIVITY RANGE



FE60U

Up to 1 Mile
(1.5 km)

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FIBER ALTERNATIVE
Offers fiber-equivalent performance, security and reliability

CONFIGURATIONS

- Point-to-point
- Hot standby
- Multi-hop/repeater
- Hub-and-spoke
- Ring
- Mesh

SPECIFICATIONS

FE60U	
Fast Ethernet Gigabit Upgradeable	
Data Rate	100 Mbps full-duplex
Latency	< 200uSec
Link Budget	160.5dB @ 10 ⁻¹² BER
RF Interface	58.1GHz/62.9GHz (FDD), digitally modulated (BFSK) with forward error correction RS(204,188) 140MHz bandwidth * Min. link distance 65ft (20m)
Antenna	Integrated 10 in (25cm) directional cassegrain Linear polarized (H/V), 40dBi gain, 1.4° beam
Ethernet Interfaces	1000base-SX with LC connectors - up to 270m 62.5/125µm MMF, or 500m 50/125µm MMF 10/100base-TX with RJ-45 connector - up to 100m Cat5 cable (two Ethernet surge suppressors required) Maximum Ethernet frame length: 1632 bytes
Management	Web-based (HTML) embedded management agent: setup, security, status, statistics, software update Secure Management Access (see Advanced Security datasheet for details) SNMP support: MIB-II and BridgeWave enterprise MIB Voltmeter test points: Receive Signal Level and Link Quality SysLog support
Power	Supplied 100 – 240 VAC input, +24VDC output, indoor rated power supply (0°C to +40°C). 45watts max. consumption Optional outdoor rated power supply for extreme temperatures (-40°C to +60°C) mounted in sealed enclosures Max. cable length: 650 ft (200m) with 12AWG 400 ft (125m) with 14AWG, stranded wires highly recommended (24VDC surge suppressor required)
Mount	Pole mount: 2-4.5 in (5-11 cm) OD Wall mount bracket
Size	Radio/antenna unit: 12w * 12h * 6d (in) / 30w * 30h * 15d (cm) (Not including pole mount hardware)
Weight	Radio: 11.9 lbs (5.4 kg) Mount: 6.6 lbs (3.0 kg)
Environmental	Operating temperature: -30 to +50 °C (-22 to 122 °F) Operating altitude: 14,764 ft maximum (4,500 m)
Wind Loading	50 lbs. force @ 100 MPH
Regulatory	Safety: UL Listed, CE Mark, meets FCC 1.1310 general population RF MPE limits RF Certifications: U.S. FCC Part 15.255 Industry Canada RSS-210
Install Kit	Voltmeter test cable, power connectors, visual alignment tool

* = Refer to AR60 datasheet for upgrade features