

## FGR2 Series

### FGR2 900 MHz Industrial Radio

FGR2-CE-U



FGR2-C-U



The FGR2 radio is the next generation of the FGR Series that has the same proven performance, reliability and quality that our customers have come to know and expect in all of our products. The FGR2 is a cost effective solution that allows customers to incorporate wireless communications into a wide variety of applications.

Offered as a board level product and in an enclosure, the FGR2 provides tremendous flexibility for use in applications around the world ranging from oil and gas to golf carts, water systems and more. The FGR2 is backward compatible with the FGR and DGR Series of FreeWave radios, enabling existing customers to leverage and extend their existing investment.

All radios are designed, manufactured, and tested in Boulder, CO.

#### Key Features

**Versatility:** Gateway, Endpoint, Repeater or simultaneous Endpoint and Repeater function in a single radio

**Long Range:** Up to 97 km (60 miles) with clear line of sight with the ability to extend through Repeaters

**Noise Immunity:** Superior performance in noise congested environments

**Secure:** Using Frequency Hopping Spread Spectrum (FHSS) technology; available with 128- and 256-bit AES encryption

**Error Free Communications:** 32-bit CRC with automatic retransmissions

**Low Power Consumption:** Ideal for solar, battery, and DC applications

**Industrial Grade:** Operating temperature from -40°C to +75°C

**UL Approved:** Class I, Division 2

Transmitter	
Frequency Range	902 to 928 MHz
Output Power	Up to 1 W
Range	97 km (60 miles) with clear line of sight
Channel Spacing	230 kHz
RF Data Rate	115.2 kbps, standard speed 153.6 kbps, high speed user-selectable

Receiver	
Sensitivity	-108 dBm @ 115.2 for BER 10 <sup>-4</sup> -104 dBm @ 153.2 kbps BER 10 <sup>-4</sup>
IF Selectivity	40 dB at fc +/- 460 kHz
RF Selectivity	65 dB at 896 MHz, 935 MHz
Maximum Input Power	+10 dBm

Data Transmission	
Type	Frequency Hopping Spread Spectrum
Modulation	2 level GFSK
Data Throughput	80 kbps, standard speed 115.2 kbps, high speed
Error Detection	32-bit CRC, retransmit on error
Data Encryption	Options: AES 128- / 256-bit encryption and PSST
Hopping Zones	16 zones, user-selectable
Hopping Channels	50 to 112, user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	<b>FGR2-C-U:</b> RS232 / RS422 / RS485 <b>FGR2-CE-U:</b> RS232 / RS422 / RS485 <b>FGR2-T-U:</b> TTL <b>FGR2-WC:</b> RS232 / RS422 / RS485

Power Requirements				
Operating Voltage	+6 to +30 VDC (+/- 5%) (>7.5 VDC recommended)			
Current Consumption	<b>Voltage</b>	<b>Transmit</b>	<b>Receive</b>	<b>Idle</b>
	+6 VDC	644mA	93 mA	48 mA
	+12 VDC	330 mA	60 mA	32 mA
	+30 VDC	125 mA	33 mA	23 mA
<b>Note:</b> All measurements at 25°C with LEDs disabled				

Interfaces	
Data Interface	Serial, 1200 bps to 230.4 kbps, DCE <b>FGR2-C-U:</b> 10-pin shrouded header for power and data, 2mm pin spacing <b>FGR2-CE-U:</b> DB9
Diagnostics Interface	Serial, RS232 or TTL <b>FGR2-C-U:</b> 20-pin header <b>FGR2-CE-U:</b> 3-pin plug <b>FGR2-T-U:</b> 20-pin header <b>FGR2-WC:</b> Fischer 11-pin
RF Connector	<b>FGR2-C-U:</b> SMA Female <b>FGR2-CE-U:</b> TNC Female <b>FGR2-T-U:</b> SMA Female <b>FGR2-WC:</b> N-Type Female

General Information	
Operating Temperature	-40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95%, non-condensing
Dimensions	<b>FGR2-C-U:</b> 127 L x 61 W x 12 H (mm) 5.0 L x 2.4 W x 0.47 H (in)
	<b>FGR2-CE-U:</b> 173 L x 107 W x 35 H (mm) 6.8 L x 4.2 W x 1.4 H (in)
	<b>FGR2-T-U:</b> 127 L x 61 W x 12 H (mm) 5.0 L x 2.4 W x 0.47 H (in)
	<b>FGR2-WC:</b> 165 L x 78 W x 60 H (mm) 6.50 L x 3.07 W x 2.36 H (in)
Weight	<b>FGR2-C-U:</b> 58 g (0.13 lbs) <b>FGR2-CE-U:</b> 504 g (1.1 lbs) <b>FGR2-T-U:</b> 58 g (0.13 lbs) <b>FGR2-WC:</b> 496 g (1.09 lbs)

Certifications	
Safety	Class I, Division 2 Groups A-D
FCC	Part 15

Information to Order	
Model Number	Description
FGR2-C-U	Board Level
FGR2-CE-U	Rugged Enclosure
FGR2-T-U	Board Level, TTL Interface
FGR2-WC	Waterproof Enclosure