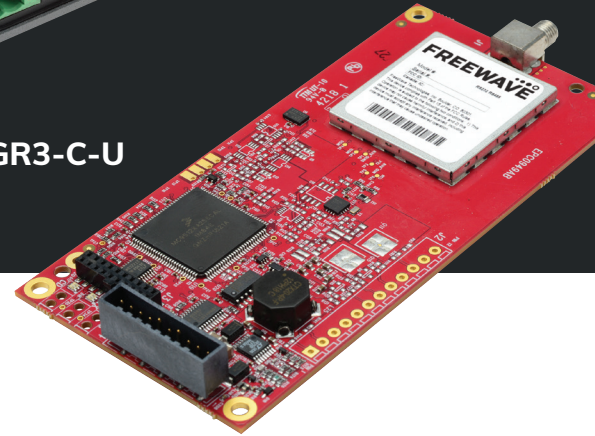# FREEWAVE

FGR3-CE-U

FGR3 Series

FGR3 900 MHz Industrial Radio

FGR3-C-U

The FGR3 Series is the next generation of FreeWave's FGR2 Series of serial radios and has the same proven performance, reliability, and quality that our customers have come to know and expect in all of our products. The FGR3 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 a ruggedized enclosure, the FGR3 provides tremendous flexibility for use in applications around the world ranging from oil and gas to golf carts, water systems, and more. The FGR3 Series is backward compatible with the FGR2, 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: 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

Designed, Manufactured, and Tested in Boulder, CO

Made in USA

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	-107 dBm @ 115.2 kbps for BER 10^{-4} -104 dBm @ 153.6 kbps for BER 10^{-4}
IF Selectivity	40 dB at fc +/- 460 kHz
RF Selectivity	>60 dB
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 Proprietary Spread Spectrum Technology
Hopping Zones	16 zones, user-selectable
Hopping Channels	50 to 112, user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	RS232 / RS422 / RS485

Power Requirements

Operating Voltage	+6 to 30 VDC				
Current Consumption, Typical	**Voltage**	**Transmit**	**Receive**	**Idle, Linked (Slave)**	**Idle, Linked (Master)**
	+6 VDC	192 mA	74 mA	73 mA	118 mA
	+12 VDC	101 mA	42 mA	42 mA	63 mA
	+30 VDC	47 mA	22 mA	22 mA	32 mA

Interfaces

Data Interface	Serial, 1200 bps to 230.4 kbps, DCE **FGR3-C-U:** 10-pin shrouded header for power and data, 2mm pin spacing **FGR3-CE-U:** DB-9
Diagnostics Interface	Serial, RS232 or TTL **FGR3-C-U:** 20-pin header **FGR3-CE-U:** 3-pin plug **FGR3-WC:** Fischer 11-pin
RF Connector	**FGR3-C-U:** SMA Female **FGR3-CE-U:** TNC Female **FGR3-WC:** N-Type Female

General Information

Operating Temperature	-40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95%, non-condensing
Dimensions	**FGR3-C-U:** 127 L x 61 W x 12 H (mm) 5.0 L x 2.4 W x 0.47 H (in) **FGR3-CE-U:** 173 L x 107 W x 35 H (mm) 6.8 L x 4.2 W x 1.4 H (in) **FGR3-WC:** 165 L x 78 W x 60 H (mm) 6.50 L x 3.07 W x 2.36 H (in)
Weight	**FGR3-C-U:** 58 g (0.13 lbs) **FGR3-CE-U:** 504 g (1.1 lbs) **FGR3-WC:** 496 g (1.09 lbs)
Safety	Class I, Division 2, Groups A-D
Reliability	220,000 hours MTBF

Information to Order

Model Number	Description
FGR3-C-U	Board Level
FGR3-CE-U	Rugged Enclosure
FGR3-T-U	Board Level, TTL Interface
FGR3-WC	Waterproof enclosure

FREEWAVE

5395 Pearl Parkway
Boulder, CO 80301

TF: 1.866.923.6168
Tel: 303.381.9200

www.freewave.com

Specifications are subject to change without notice.

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