FGR2 Series

FGR2-C/FGR2-T Industrial 900 MHz Series

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Overview:

FreeWave Technologies, Inc's 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, Colorado.

Features:

- Improved Low Signal Performance: RISC-based signal demodulation with matched filter.
- Long Range: 60 mile range with clear line of sight; ability to extend through Repeaters.
- Versatile: A single radio can operate as a Master, Slave, Repeater or Slave/Repeater.
- Backward compatible with the FGR & DGR Series of FreeWave radios.
- Unparalleled Signal Performance: GaAs FET RF front end with multistage SAW filtering has unmatched combination of overload immunity and sensitivity.
- High Noise Immunity: Provides superior performance in noise congested environments.
- Selectable Speeds: 115.2 Kbps & 153.6 Kbps.
- Secure: Proprietary spread spectrum technology prevents detection and unauthorized access; 128 bit AES encryption available.
- Reliability: Every radio 100% tested for RF performance from –40° C to +75° C.
- Low Power Consumption: Industry leading.
- UL Class 1, Division 2.

FGR2 Series

FGR2-C/FGR2-T Industrial 900 MHz Technical Specifications

Transmitter	
Frequency Range	902-928 MHz (FHSS)
Output Power	5 mW to 1 Watt
Range - Line of Sight	60 miles
Modulation	2 level GFSK, 115.2 Kbps or 153.6 Kbps
Occupied Bandwidth	230 kHz
Hopping Patterns	15 per Band, 105 total, user selectable
Hopping Channels	50 to 112, user selectable
Hopping Bands	7, user selectable
Frequency Zones	16 Zones, 7 Channels per zone
RF Connector	Type SMA, TNC-Enclosed version only (Female connectors)

Receiver	
Sensitivity	-107 dBm for BER $1x10^{-6}$, -109 dBm for BER $1x10^{-4}$
IF Selectivity	40 dB at fc +/- 230 kHz
RF Selectivity	50 dB at 896 MHz, 935 MHz
Dynamic Range	+10 dBm 3rd Order Intercept Point at Input Connector

Data Transmission	
Error Detection	32 bit CRC, Retransmit on error
Data Encryption	AES 128 bit encryption* and Proprietary Spread Spectrum Technology
Link Throughput	115.2 Kbps Standard Speed; 80 Kbps Low Speed
Data Interface	Serial
Protocol	RS232 / 485 / 422, 1200 Baud to 230.4 KBaud
Data Connector	Board Level: 10-pin header with locking ramp, 0.1 inch spacing, power/data connector

Diagnostics	
Connector	Board Level: Separate 20-pin PCB header | Enclosed (ruggedized): 3-pin PCB header

Power Requirements				
Operating Voltage	+6 to +30 VDC			
Current (mA)	**Mode**	**+6 VDC**	**+12 VDC**	**+30 VDC**
	Transmit	800	380	170
	Receive	90	55	40
	Idle	24	16	8
	Sleep	8	6	3

General Information	
Operating Temperature Range	-40° C to +75° C (-40° F to +167° F)
Dimensions	Board Level: 136mm L x 62mm W x 14mm H
Weight	Board Level: 58 g
Humidity	0 to 95% non-condensing

**Contact your FreeWave reseller or sales rep for implementation details.*

FreeWave Radios Require Professional Installation. Specifications may change at any time without notice.

2.15.12

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FGR2 Series

FGR2-CE Industrial 900 MHz Series

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Features:

- Improved Low Signal Performance: RISC-based signal demodulation with matched filter.
- Long Range: 60 mile range with clear line of sight; ability to extend through Repeaters.
- Versatile: A single radio can operate as a Master, Slave, Repeater or Slave/Repeater.
- Backward compatible with the FGR & DGR Series of FreeWave radios.
- Unparalleled Signal Performance: GaAs FET RF front end with multistage SAW filtering has unmatched combination of overload immunity and sensitivity.
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- Secure: Proprietary spread spectrum technology prevents detection and unauthorized access; 128 bit AES encryption available.
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- Low Power Consumption: Industry leading.
- UL Class 1, Division 2.

* Enclosed version available with optional mounting shoe and/or DIN rail mount.

FGR2 Series

FGR2-CE Industrial 900 MHz Technical Specifications

Transmitter	
Frequency Range	902-928 MHz (FHSS)
Output Power	5 mW to 1 Watt
Range - Line of Sight	60 miles
Modulation	2 level GFSK, 115.2 Kbps or 153.6 Kbps
Occupied Bandwidth	230 kHz
Hopping Patterns	15 per Band, 105 total, user selectable
Hopping Channels	50 to 112, user selectable
Hopping Bands	7, user selectable
Frequency Zones	16 Zones, 7 Channels per zone
RF Connector	TNC-Enclosed version only (Female connectors)
Receiver	
Sensitivity	-108 dBm for BER $1x10^{-6}$, -110 dBm for BER $1x10^{-4}$
IF Selectivity	40 dB at fc +/- 230 kHz
RF Selectivity	50 dB at 896 MHz, 935 MHz
Dynamic Range	+10 dBm 3rd Order Intercept Point at Input Connector
Data Transmission	
Error Detection	32 bit CRC, Retransmit on error
Data Encryption	AES 128 bit encryption* and Proprietary Spread Spectrum Technology
Link Throughput	115.2 Kbps Standard Speed; 80 Kbps Low Speed
Data Interface	Serial
Protocol	RS232 / 485 / 422, 1200 Baud to 230.4 KBaud
Data Connector	Enclosed (ruggedized): DB9
Diagnostics	
Connector	Enclosed (ruggedized): 3-pin PCB header
Power Requirements	
Operating Voltage	+6 to +30 VDC

Current (mA)	**Mode**	**+6 VDC**	**+12 VDC**	**+30 VDC**
	Transmit	800	380	170
	Receive	90	55	40
	Idle	24	16	8
	Sleep	8	6	3

General Information	
Operating Temperature Range	-40° C to +75° C (-40° F to +167° F)
Dimensions	Enclosed: 173mm L x 107mm W x 35mm H
Weight	Enclosed: 504 g
Humidity	0 to 95% non-condensing

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