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FGR Series

FGR-09MB Industrial 900 MHz Series

Overview:

Designed for use with the Schweitzer Engineering Laboratories Mirrored Bits™ communications, the FreeWave Technologies FGR-09MB 900 MHz transceiver provides robust, reliable, error-free communications for electric power protective relay applications.

The unique fast frequency hopping technology utilized by the FGR-09MB provides frequency hopping 500 times per second to assure reliable transmission of protective relay data even in the presence of noise, interference and high charged electrical fields found in substations. All radio are designed, manufactured and 100% tested at FreeWave's world class manufacturing facility in Boulder, Colorado.

Features:

- Separate Diagnostics Port: Real time remote diagnostics and set up, transparent to network communications.
- Improved Diagnostics: Include RSSI levels in dBm, antenna VSWR and transmit current.
- Wide Input Voltage Range: 6.5 to 30 VDC.
- The lowest current draw of any radio at 12 volts.
 - 21 mA in idle mode
 - 86 mA in full time receive
 - 500 mA transmit current
- Synthesized Waveform Transmit Data: Reduces out of band modulation products.
- High Noise Immunity: Superior Performance in noise congested environments.
- Secure: Proprietary spread spectrum technology prevents detection and unauthorized access.
- High Speed: 115.2 Kbps continuous throughput.
- Long Range: 60 mile line of sight range.
- Error Free Communications: 32 bit CRC with automatic retransmission
- Industrial Grade Specifications: 100% tested for RF performance from -40° C to +75° C.



FGR Series

FGR-09MB Industrial 900 MHz Radio Specifications

Transmitter				
Frequency Range	902-928 MHz (FHSS)			
Output Power	5 mW to 1 Watt			
Range, Line of Sight	Point-to-point: 60 miles, Point-to-multipoint: 60miles			
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			
Receiver				
Sensitivity	-108 dBm for BER 1x10 ⁻⁶ , -110 dBm for BER 1x10 ⁻⁴			
Selectivity	20 dB at fc +/- 230 kHz			
System Gain	140 dB			
Data Transmission				
Error Detection	32 bit CRC, Retransmit on error			
Data Encryption	Proprietary Spread Spectrum Technology			
Link Throughput**	115.2 Kbps standard speed, 38.4 Kbps low speed **Uncompressed, measured assuming 75% frequency availability			
Data Interface	Serial			
Protocol	RS 232 / 485 / 422*, 1200 baud to 115.2 Kbaud * See manual for limitations			
Data Connector	10 –pin PCB header with locking ramp, 0.1 inch spacing, power/data connector			
Data Interface				
Connector	Separate 20-pin PCB header			
Power Requirements				
Operating Voltage	6.5 to 30VDC			
Current [mA]	Mode	6.5 VDC	12 VDC	30 VDC
	Transmit	1.1 A	500 mA	200 mA
	Receive	152 mA	86 mA	43 mA
	Idle	40 mA	21 mA	12 mA
General Information				
Operating Temperature Range	-40 °C to +75 °C (-40°F to +175°F)			
Dimensions	127 L x 61 W x 18 H (mm)			
Weight	74 g			
Humidity	0 to 95% non-condensing			

