



I/O Series

FGRIO-M Industrial 900 MHz Industrial Radio



FGRIO-M

OVERVIEW

The FGRIO-M System provides outstanding performance and versatility in wireless transmission of process-control signals. FGRIO-M offers “transparent” acquisition, transport and reconstruction of analog, digital and power signals, eliminating the need for associated buried wiring. The RTU requires no altered programming. The FGRIO-M is Class 1 Division 2 Approved and is lower-cost and provides better signal integrity than vulnerable wiring.

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

MODEL

DIMENSIONS

PRODUCT OPTIONS

FGRIO-M

140 L x 70 W x 34 H (mm)

Board Level

APPLICATIONS



Oil & Gas



Smart Grid



Water & Wastewater



Precision Agriculture

KEY FEATURES

- **Wire Replacement:** FGRIO System accuracy is not diminished by distance as it may be in wired systems
- **Master Radio:** Mirrors signals for up to 4 Slaves and provides Link and Command Alarm signals
- **Slave Radio:** Accepts 2 Digital Inputs, 2 Analog Inputs and switches 2 Digital Outputs.
- **Frequency Hopping:** Communication and diagnostics between the IO Master and the IO Slaves
- **Low Latency:** Less than one second signal delay
- **High Accuracy:** FGRIO System analog signal fidelity is factory calibrated and drift with time and temperature is much less than that of transducers
- **Low Power:** Suitable for solar powered installations
- **Error Free Communications:** 32 bit CRC with automatic retransmission
- **Master Input Voltage Range:** +6 to 30 VDC at full RF output power
- **Noise Immunity:** Superior performance in noise congested environments
- **Secure:** Proprietary spread spectrum technology prevents unauthorized access

FGRIO-M 900 MHz Industrial Radio Technical Specifications

TRANSMITTER			
Frequency Range	902 to 928 MHz (FHSS)	Hopping Patterns	15 per Band, 105 total, user selectable
Output Power	5 mW to 1 Watt (+30 dBm)	Hopping Channels	50 to 112, user selectable
Data Link Range	Up to 60 miles Line of Sight	Hopping Bands	7, user selectable
Modulation	2 level GFSK	RF Connector	Type SMA
Occupied Bandwidth	230 kHz		

MASTER RECEIVER		MASTER ANALOG OUTPUTS	
Sensitivity	-108 dBm for BER 10 ⁻⁶ -110 dBm for BER 10 ⁻⁴	Number of Outputs	4, can be mapped to up to 4 slaves
Selectivity	20 dB at fc +/- 115 kHz 60 dB at fc +/- 145 kHz	Accuracy, Resolution	+/- .1%, 16 bit
System Gain	140 dB	Output Range	.2 to 5.62 V, >10 kohm Load Resistance

MASTER DIGITAL OUTPUTS		MASTER DIGITAL INPUTS	
Number of Outputs	4 per Master, 1 Link, 1 Command Alarm	Number of Outputs	4
Output Connector	Mini Phoenix (3.55mm)	Slave Input to Master Output Delay	1 sec. Max
Slave Input to Master Output Delay	1 sec. Max	Voltage Range	0 to 30 V
Signal Output Voltage Range	0 to 4.6 V		

DATA TRANSMISSION	
Error Detection	32 bit CRC, Retransmit on error
Data Encryption	Dynamic Key Substitution
Data Throughput	115.2 kbps
Protocol	RS232/RS485/RS422, 1200 baud to 115.2 kbaud
Data Interface	Serial
Data Connector	10 pin header with locking ramp 0.1 inch spacing, power/data connector

DIAGNOSTICS
Connector: Separate 20-pin PCB header

POWER REQUIREMENTS
Operating Voltage: +6 to +30 VDC

Typical Current (mA)	Mode	+6 VDC	+12 VDC	+30 VDC
	Transmit	1 A	500 mA	200 mA
	Receive	140 mA	86 mA	43 mA
	Idle	120 mA	70 mA	28 mA

GENERAL INFORMATION	
Operating Temperature	-40° C to +75° C
Humidity	0 to 95%, non-condensing
Dimension	140 L x 70 W x 34 H (mm)
Weight	137 g



FreeWave Radios Require Professional Installation. Specifications may change at any time without notice. ©2013 FreeWave Technologies, Inc.

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