

I/O Series

FGR2-IO-IOE 900 MHz Industrial Radio



FGR2-IO-IOE

OVERVIEW

The FGR2-IO-IOE radio with embedded I/O functions is available in expansion plastics. It can operate in one of two modes: Expandable Modbus or Wire Replacement. In Modbus mode the FGR2-IO-IOE can provide wireless I/O to a SCADA network. In Wire Replacement mode (wireless signal replication), the FGR2-IO-IOE can operate as a Slave linked to an FGRIO-M (Master) radio. The FGR2-IO-IOE also features Class 1, Division 2 approval from UL-US and C-UL.

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

MODEL	DIMENSIONS	PRODUCT OPTIONS
FGR2-IO-IOE	181 L x 80 W x 38 H (mm)	Enclosed

APPLICATIONS



Oil & Gas



Smart Grid



Water & Wastewater



Precision Agriculture

KEY FEATURES

- **Expandable, Wireless I/O:** Stack Expansion Modules for 186 I/O points at one Modbus address
- **User Configurable:** Digital & Analog
- Modbus Master can be any FGR family of radios
- Extends range and coverage to other FGR-family radios by Slave/Repeater operation
- Supply rated from +6V to +30 V
- All AIs reported as 16-bit integers or 32 bit floating points
- Pulse counting (32 bit) DIs allow detection of 500 usec. Pulses and count to 1000 Hz
- Active data port allows extension by adding external devices
- Single register access to 16 bit a/d; 2 register access for full 20 bits
- Enhance proportional control by 4 to 20 mA AOs with programmable offsets and comm-loss set points
- DOs control up to 60 W each and have optional pulse-output to protect intermittent rated loads

FGR2-IO-IOE 900 MHz Industrial Radio Technical Specifications

TRANSMITTER		RECEIVER							
Frequency Range	902 to 928 MHz (FHSS)	Sensitivity	-106 dBm for BER 10 ⁻⁶ -108 dBm for BER 10 ⁻⁴						
Output Power	1 Watt	Selectivity	20 dB at fc +/- 115 kHz 60 dB at fc +/- 145 kHz						
Data Link Range	60 miles, Clear Line of Sight	System Gain	140 dB						
Modulation	2 level GFSK, 115.2 kbps or 153.6 kbps	DATA TRANSMISSION ⁽¹⁾							
RF Data Rate	153.6 kbps High Speed, 115.2 kbps Standard Speed	Error Detection	32 bit CRC, Retransmit on error						
Occupied Bandwidth	230 kHz	Data Throughput	115.2 kbps						
Hopping Patterns	15 per Band, 105 total, user selectable	Protocol	RS232/RS485/RS422, 1200 baud to 115.2 kbaud						
Hopping Channels	50 to 112, user selectable	Data Interface	Serial						
Hopping Bands	7, user selectable	Data Connector	10 pin header with locking ramp 0.1 inch spacing, power/data connector						
RF Connector	Type SMA, TNC (Female connectors)								
INPUT		Modbus	Wire Replacement						
2: Precision AIs (20 bit, 0 - 5.625 V, 0.1% FS Accuracy), also act as exact-threshold Dis		X	X						
2: Dis with counters (32 bits, 1000 Hz), also act as aux. AIs (10 bits, 0-3.5V, 0.25% FS Accuracy)		X	⁽²⁾						
1: DI with pull down resistor (5 Kohm)		X							
1: DI with pulsed 50 mA pull-up for long-lines or high noise		X							
OUTPUT									
2: High Current (2 A sink to GND) Dos with current sensing and self-resetting protection		X	X ⁽³⁾						
1: AO - 15 bits, 4 - 22 mA, 0.1% FS Accuracy, also acts as 50 mA sensor power or DI		X							
1: AO - 16 bits, 4 - 22 mA, 0.1% FS Accuracy		X							
INTERNAL									
1: Battery/Supply Voltage - 10 bits, 0 to 30 V, 1% FS Accuracy		X							
1: Radio Temperature - 1° C units, -40° C to +70° C, 4° C accuracy		X							
Expandable I/O Stack up to 15 Expansion Modules		X							
DIAGNOSTICS									
Connector: Separate 20-pin PCB header		X	X						
POWER REQUIREMENTS									
Operating Voltage: +6 to +30 VDC *Currents shown with no AO connections made		X	X						
Typical Current (mA)	Mode	+6 VDC	+12 VDC	+30 VDC	Example Modbus Configurations				
	Transmit	800	380	170		AIs	Dis	AOs	DOs
	Receive	90	55	40	#1	2	2	2	2
	Idle	24	16	8	#2	0	4	2	2
	Modbus Linked Lowpoer = 4	10	7	5	#3	4	0	2	2
	Wire Replacement Linked	30	15	8	#4	3	1	2	2
				#5	1	3	2	2	
GENERAL INFORMATION					Notes: (1) Data port not operative in wire replacement mode. (2) DIs operative, but there are no counters in wire replacement mode. (3) No current sensing in wire.				
Operating Temperature	-40° C to +75° C								
Humidity	0 to 95%, non-condensing								
Dimension	Enclosure: 181 L x 80 W x 38 H (mm)								
Weight	Enclosure: 163 g								



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

5395 Pearl Parkway, Suite 100, Boulder, CO 80301 TF 866.923.6168 T 303.381.9200 sales@freewave.com