



I/O Series

FGR2-IOS Industrial 900 MHz Industrial Radio



FGR2-IOS-C-U



FGR2-IOS-CE-U

OVERVIEW

The FGR2-IOS radio with embedded I/O functions is available in either as board level device or in an enclosure. Both versions can operate in one of two modes: Modbus and Wire Replacement. In the Modbus mode, FGR2-IOS can be directly connected as an I/O peripheral to a SCADA network. For Wire Replacement (wireless signal replication), the FGR2-IOS can operate as a Slave linked to an FGRIO-M (Master) radio. The enclosure version also includes switchable and protected resistors for convenience when using 4-20 mA sensors. The FGR2-IO is Class 1, Division 2 approved by UL-US and C-UL.

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

APPLICATIONS



Oil & Gas



Smart Grid



Water & Wastewater



Precision Agriculture

KEY FEATURES

- User Configurable I/O: 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 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

MODEL

DIMENSIONS

PRODUCT OPTIONS

FGR2-IOS-CE-U

173 L x 96 W x 35 H (mm)

Enclosed

FGR2-IOS-C-U

127 L x 62 W x 16 H (mm)

Board Level

FGR2-IO5 900 MHz Industrial Radio Technical Specifications

| TRANSMITTER | | RECEIVER | | | | | | | |
|--|--|---|--|---------|---|-----|-----|-----|---|
| Frequency Range | 902 to 928 MHz (FHSS) | Sensitivity | -107 dBm for BER 10 ⁻⁶ -109 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 | | | | | | | |
| 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 mA | 380 mA | 170 mA | AIs | Dis | AOs | DOs | |
| | Receive | 90 mA | 55 mA | 40 mA | #1 | 2 | 2 | 2 | 2 |
| | Idle | 24 mA | 16 mA | 8 mA | #2 | 0 | 4 | 2 | 2 |
| | Modbus Linked Lowpoer = 4 | 10 mA | 7 mA | 5 mA | #3 | 4 | 0 | 2 | 2 |
| | Wire Replacement Linked | 30 mA | 15 mA | 8 mA | #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 | Board Level: 127 L x 62 W x 16 H (mm) Enclosure: 173 L x 96 W x 35 H (mm) | | | | | | | | |
| Weight | Board Level: 60 g Enclosure: 500 g | | | | | | | | |



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

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