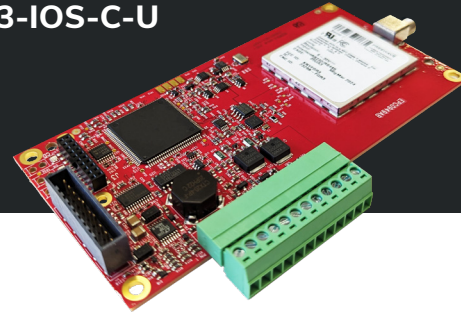


FGR3-IO-IOE



FGR3-IOS-C-U



# FGR3 IO Series

## 900 MHz Remote I/O Solutions

The FGR3-IO radios are available as standalone board-level or enclosed devices, as well as in an expandable format to meet any wireless I/O need.

All models can operate in Modbus mode:

- In the Modbus mode, all models can be directly connected as an I/O peripheral to a SCADA network.
- All AIs are reported as integers and floating points.
- Pulse counting DIs allow detection and accumulation of pulses up to 1 kHz.
- Data port allows simultaneous operation as a Modbus I/O device and radio slave or repeater.
- Single register access to 16-bit AI value, two-register access for full 20-bit accuracy.
- Protect systems in event of communication loss with programmable failsafe output states.
- DOs control up to 60 W each and have optional pulse-output protection intermittent rated loads.

FGR3-IO-IOE is expandable with the IOEX-4422, IOEX-4404, AND IOEX-4440 I/O Series

The FGR3-IOS-C-U and FGR3-IO-IOE are UL Class 1, Division 2 approved.

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

### Key Features

**User Configurable:** I/O Digital or Analog

**Long Range:** 97 km (60 miles) with clear line of sight with the ability to extend through Endpoint/Repeater; Modbus Gateway can be any FGR Series radio

**Noise Immunity:** Superior Performance in noise congested environments

**Error Free Communications:** 32-bit CRC with automatic retransmissions

**Low Power Consumption:** ideal for solar-powered applications

**Industrial Grade:** Operating temperature from -40°C to +75°C

### Information to Order

Model Number	Description
FGR3-IOS-C-U	Board Level
FGR3-IO-IOE	Expandable I/O
FGRIO-M	Wire replacement master
IOEX-4422	IO Expansion module: 4 universal points, 4 input points, 2 discrete relay input points, 2 discrete relay output points
IOEX-4404	IO Expansion module: 4 universal points, 4 input points, 4 discrete relay output points
IOEX-4440	IO Expansion module: 4 universal points, 4 input points, 4 discrete relay input points

## Transmitter

Frequency Range	902 to 928 MHz
Output Power	Up to 1 W
Range	Up to 97 km (60 miles) with clear line of sight
Channel Spacing	230.4 kHz
RF Data Rate	115.2 kbps standard speed 153.6 kbps, high speed User selectable

## Receiver

Sensitivity	-107 dBm @ 115.2 for BER 10 <sup>-4</sup> -104 dBm @ 153.6 for BER 10 <sup>-4</sup>
IF Selectivity	40 dB at fc +/- 460 kHz
RF Selectivity	>60 dB
Maximum Input Power	+10 dBm

## Data Transmission

Type	Frequency Hopping Spread Spectrum
Modulation	2 level GFSK
Data Throughput	80 kbps, standard speed 115.2 kbps, high speed
Error Detection	32-bit CRC, retransmit on error
Data Encryption	Options: AES 128- / 256-bit encryption and Proprietary Spread Spectrum Technology
Hopping Zones	16 zones, user-selectable
Hopping Channels	50 to 112, user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	RS232 / RS422 / RS485

## Power Requirements

Operating Voltage	+6 VDC to +30 VDC			
Current Consumption	Voltage	Transmit	Receive	Idle
	+6 VDC	410 mA	84 mA	76 mA
	+12 VDC	198 mA	46 mA	42 mA
	+30 VDC	86 mA	24 mA	24 mA

## Interfaces

Data Interface	10-pin shrouded header for power and data, 2mm pin spacing Separate 20-pin PCB header
Diagnostics Interface	Serial, RS232 or TTL
RF Connector	SMA Female

## General Information

Operating Temperature	-40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95% non-condensing
Dimensions	<b>FGR3-IO-IOE:</b> 181 L x 80 W x 35 H (mm) 7.1 L x 3.2 W x 1.4 H (in)
	<b>FGR3-IOS-C-U:</b> 127 L x 61 W x 12 H (mm) 5.0 L x 2.4 W x 0.47 H (in)
Weight	<b>FGR3-IO-IOE:</b> 163 g (0.36 lbs)
	<b>FGR3-IOS-C-U:</b> 60 g (0.13 lbs)

	Wire Replacement Master	Wire Replacement Slave	Modbus I/O Slave	Universal Channels	Input-Only Channels	Analog Input	Analog Output	Discrete Only Input	Discrete/Pulse Input	Relay Output	Relay Input	Notes
FGRIO-M	X						4	4		4		Only for use in wire replacement applications
FGR3-IOS-C-U			X		2	2	2			2		
FGR3-IO-IOE			X		2	2	2			2		Supports up to 15 IOEX modules
IOEX-4422			X	4	4	8	4	2	8 @ 1 kHz 4 @ 10 kHz	2	2	Requires FGR3-IO-IOE or wired IOE module
IOEX-4404			X	4	4	8	4		8 @ 1 kHz 4 @ 10 kHz	4	4	Requires FGR3-IO-IOE or wired IOE module
IOEX-4440			X	4	4	8	4	4	8 @ 1 kHz 4 @ 10 kHz			Requires FGR3-IO-IOE or wired IOE module