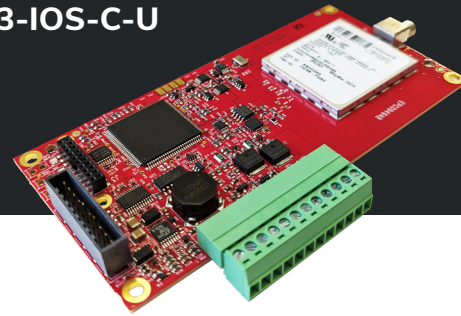


FGR3-IO-IOE



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 ⁻⁴ -104 dBm @ 153.6 for BER 10 ⁻⁴ |
| 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 | FGR3-IO-IOE: 181 L x 80 W x 35 H (mm) 7.1 L x 3.2 W x 1.4 H (in) |
| | FGR3-IOS-C-U: 127 L x 61 W x 12 H (mm) 5.0 L x 2.4 W x 0.47 H (in) |
| Weight | FGR3-IO-IOE: 163 g (0.36 lbs) |
| | FGR3-IOS-C-U: 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 |