FREEWAVE

I2-IOS-C-U

I2-IO Series

2.4 GHz Industrial Radio

I2-IO Series radios with embedded I/O functions are available only at the board level.

The I2-IOS can operate in one of two modes: Modbus and wire replacement.
In Modbus mode, the I2-IOS connects as an I/O peripheral to a SCADA network.
For wire replacement (wireless signal replication), the I2-IOS operates as an Endpoint linked to an I2-IOM (Gateway) radio. The enclosure version also includes switchable and protected resistors for convenience when using 4 - 20 mA sensors. The I2-IOS is Class I, Division 2 approved by UL-US and C-UL.

- User-Configurable I/O: Digital and analog

- Up to 65,535 Endpoint radios on a single Modbus network

- Extends range and coverage to other FGR family radios by Endpoint/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

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

Key Features

Versatility: Gateway, Endpoint, Repeater or simultaneous Endpoint and Repeater function in a single radio

Long Range: 32 km (20 miles) with clear line of sight

Noise Immunity: Superior performance in noise congested environments

Secure: Using Frequency Hopping Spread Spectrum (FHSS) technology; available with 128-, 192-, and 256-bit AES encryption

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

Transmitter

Frequency Range	2.4 to 2.483 GHz
Output Power	Up to 500 mW
Range	32 km (20 miles) with clear line of sight
Channel Spacing	230 kHz
RF Data Rate	115.2 kbps or 153.6 kbps, user-selectable

Receiver

Sensitivity	-105 dBm for BER 1×10^{-4} -103 dBm for BER 1×10^{-6}
Selectivity	20 dB at fc +/- 230 kHz 60 dB at fc +/- 290 kHz
System Gain	132 dB

Data Transmission[1]

Type	Frequency Hopping Spread Spectrum Options: TDMA, Super Epoch TDMA
Modulation	2 level GFSK
Data Throughput	115.2 kbps
Error Detection	32-bit CRC, retransmit on error
Data Encryption	Options: 128- / 192- / 256-bit AES encryption
Hopping Zones	16 zones, 5 channels per zone, user-selectable
Hopping Bands	7, user-selectable
Hopping Channels	50 to 80 (out of 240), user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	RS232 / RS422 / RS485 1200 Baud to 115.2 kBaud

Power Requirements

Operating Voltage	+6 to +30 VDC			
Current Consumption	**Voltage**	**Transmit**	**Receive**	**Idle**
	+6 VDC	375 mA	120 mA	9 mA
	+12 VDC	295 mA	80 mA	16 mA
	+30 VDC	140 mA	51 mA	8 mA

Interfaces

Data Interface	10-pin locking header 2.5 mm (0.1 in) spacing power / data connector
Diagnostics Interface	20-pin PCB header
RF Connector	Female SMA, TNC

General Information

Operating Temperature	-40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95%, non-condensing
Dimensions	127 L x 62 W x 16 H (mm) 5.0 L x 2.44 W x 0.63 H (in)
Weight	58 g (0.13 lbs)

Certifications

UL	Class I, Division 2

Input / Output

	I2-IOM	I2-IOS
Wire Replacement Master	X	
Wire Replacement Slave		X
Modbus Slave		X
Analog Inputs		2
Analog Outputs	4	2
Discrete Inputs w/ counter	4	
Discrete Outputs	4	2
Analog/Discrete Inputs		2

Information to Order

Model Number	Description
I2-IOS-C-U	Board Level
I2-IOM	Gateway Radio

1. Data port not operative in wire replacement mode