I/O Series
I2-IOS 2.4 GHz Industrial Radio

FREEWAVE

KEY FEATURES

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

OVERVIEW

The I2-IOS radio with embedded I/O functions is 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 1, Division 2 approved by UL-US and C-UL.

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

Specifications

MODEL	FORM FACTOR	OPTIONS
I2-IOS-C-U	127 L x 62 W x 16 H (mm)	Board Level

TECHNICAL SPECIFICATIONS

TRANSMITTER

Frequency Range	2.4 to 2.483 GHz (FHSS)
Output Power	5 mW to 500 mW
Data Link Range	20 miles, clear line of sight
Modulation	2 level GFSK, 115.2 kbps
Occupied Bandwidth	230 kHz
Hopping Patterns	15 per band, 105 total, user-selectable
Hopping Channels	50 to 80 out of 240, user-selectable
Hopping Bands	7, user-selectable
RF Connector	Type SMA, TNC (female connectors)

DATA TRANSMISSION

Error Detection	32 bit CRC, retransmit on error
Data Throughput	115.2 kbps
Data Interface	Serial
Protocol	RS232/RS422/RS485, 1200 Baud to 115.2 kBaud
Data Connector	10-pin header with locking ramp 0.1 in. spacing, power/data connector

POWER REQUIREMENTS

Operating Voltage	+6 VDC to +30 VDC

+6 VDC Typical Current

Transmit: 375 mA	Receive: 120 mA	Idle: 9 mA

+12 VDC Typical Current

Transmit: 295 mA	Receive: 80 mA	Idle: 16 mA

+30 VDC Typical Current

Transmit: 140 mA	Receive: 51 mA	Idle: 8 mA

RECEIVER

Sensitivity	-105 dBm for BER 10^{-6}
	-107 dBm for BER 10^{-4}
Selectivity	TBD
System Gain	134 dB

GENERAL INFORMATION

Operating Temperature	-40° C to +75° C
Humidity	0 to 95%, non-condensing
Dimensions	Board Level: 127 L x 62 W x 16 H (mm)
	Enclosed: 173 L x 96 W x 35 H (mm)
Weight	Board Level: 58 g
	Enclosed: 1.2 lbs.

	Modbus	Wire Replacement
INPUT		
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

APPLICATIONS

OIL & GAS   AGRICULTURE   UTILITIES   DEFENSE   SCADA   MINING   FLEET MANAGEMENT   MUNICIPAL   ENTERPRISE

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