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I2-IO Series

I2-IOS Industrial 2.4 GHz Radio

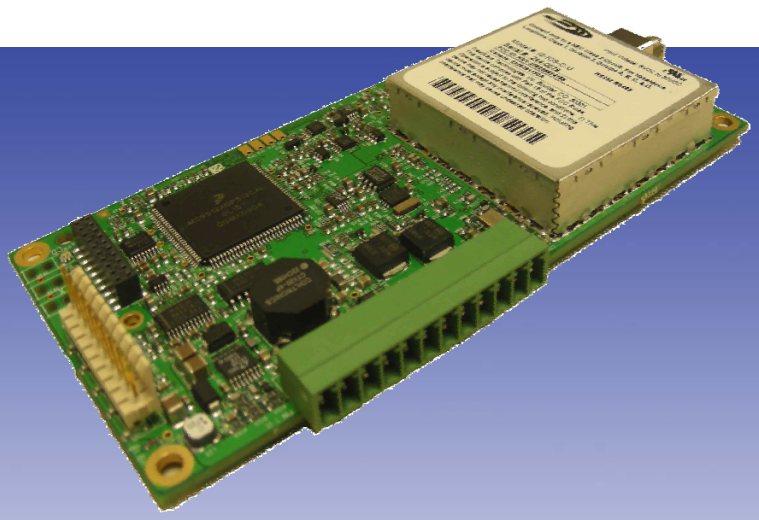
The I2-IOS radio with embedded I/O functions is available only at the board. The I2-IOS can operate in one of two modes: Modbus and Wire Replacement. In Modbus mode, the I2-IOS connects as an IO peripheral to a SCADA network. For wire replacement (wireless signal replication), the I2-IOS operates as a slave linked to an I2-IOM (master) radio. The enclosure version also includes switchable and protected resistors for convenience when using 4-20mA sensors. The I2-IOS is Class 1, Division 2 Approved.

Features - Modbus:

- User configurable IO counts - digital & analog.
- Up to 65,535 Slave Radios on a single Modbus network.
- Extends range and coverage to other I-Series radios by slave/repeater operation.
- Supply rated to 30V.
- Single register access to 16 bit a/d; 2 register access for full 20 bits.
- Enhance proportional control by 4-20mA AO's with programmable offsets and comm-loss set points.
- Hundreds of thousands of AI's, DI's, AO's and DO's on a single network
- All AI's reported as 16-bit integers or 32-bit floating points.
- Voltage and temperature monitoring reduces surprise outages.
- Pulse counting (32 bit) DI's allow detection of 500 usec. pulses and count to 1000 Hz.
- Active data port allows extension by adding external devices.
- DO's control up to 60 Watts each and have optional pulse-output to protect intermittent-rated loads.
- IO master can be any IO series of radios -

Features - Wire Replacement:

- Conveys the AI and DI states of 4 inputs to an I2IO radio for signal replication.
- Replicates the states of the DI's and sensor power inputs of the IO-M as DO's. The DO's are protected and have optional pulse-output to protect intermittent-rated loads.



I2-IO Series

I2-IOS Industrial 2.4 GHz Radio

Radio Specifications

Transmitter		Receiver	
Frequency Range	2.4-2.483 GHz (FHSS)	Sensitivity	-105 dBm for BER 10^{-6}, -107 dBm for BER 10^{-4}
Output Power	5 mW to 500 mW	Selectivity	TBD
Range - Line of Sight (LOS)	20 miles with clear LOS	System Gain	134 dB
Modulation	2 level GFSK, 115.2 Kbps	Data Transmission (1)	
Occupied Bandwidth	230 kHz	Error Detection	32 bit CRC, retransmit on error
Hopping Patterns	15 per Band, 105 total, user selectable	Link Throughput	115.2 Kbps
Hopping Channels	50 to 80 out of 240 user selectable	Data Interface	Serial
Hopping Bands	7, user selectable	Protocol	RS232/485/422, 1200 baud - 115.2 Kbaud
RF Connector	Type SMA, TNC (Female connectors)	Data Connector	10 pin header with locking ramp 0.1 inch spacing, power/data connector

Input	Modbus	Wire Replacement
2: Precision AI's (20 bits, 0-5.625 V, 0.1% FS Accuracy), also act as exact-threshold DI's	x	x
2: DI's with counters (32 bits, 1000 Hz), also act as aux. AI's (10 bits, 0-3.5 V, 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) DO's with current sensing and self-resetting protection	x	x(3)
1: AO - 15 bits, 4-22mA, 0.1% FS Accuracy, also acts as 50mA sensor power or DI	x	
1: AO - 16 bits, 4-22mA, 0.1% FS Accuracy	x	
Internal		
1: Battery/Supply Voltage - 10 bits, 0-30 V, 1% FS Accuracy	x	
1: Radio Temperature - 1°C units, -40° C to +70° C, 4° C accuracy	x	
Diagnostics Interface		
Connector: Separate 20-pin PCB header	x	x
Power Requirement		
Operating Voltage: 6 to 30 VDC	x	x

Average Current Update [mA]	Mode	6 VDC	12 VDC	30 VDC
	Transmit	375 mA	295 mA	140 mA
	Receive	120 mA	80 mA	51 mA
	Idle	9 mA	5 mA	3 mA
	Modbus Linked Lowpower = 4	10	7	5
	Wire Replacement Linked	30	15	8

Example Modbus Configurations				
	AIs	DIs	AOs	DOs
#1	2	2	2	2
#2	0	4	2	2
#3	4	0	2	2
#4	3	1	2	2
#5	1	3	2	2

General Information	
Operating Temperature Range	-40 °C to +75 °C. Every radio 100% factory tested over this range.
Dimensions	Board Level: 127 L x 62 W x 16 H (mm) Enclosure: 173 L x 96 W x 35 H (mm)
Weight	Board Level: 58 g Enclosure: 1.2 lbs
Humidity	0 to 95% non-condensing

Notes:
(1) Data port not operative in wire replacement mode.
(2) DI's operative, but there are no counters in wire replacement mode.
(3) No current sensing in wire replacement.

2.25.10

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