**Scalable, Customizable Wireless I/O System for Signal Replication**

### Quick and Easy I/O Mirroring

The WIO® System by OleumTech® is one of the easiest ways to wirelessly monitor and control field or stranded assets. The system provides point-to-point communication for replicating 0-10 Vdc, 4-20 mA, and/or digital I/O signals in either direction. The WIO System is designed for rapid deployment. Having to obtain permits to trench to run conduit and hardwire is a thing of the past. The bi-directional connectivity gives you the flexibility to connect third-party equipment such as PLC or RTU to either or both ends of the radio spectrum.

### Just Add I/O Modules

Constructing a WIO System begins with a WIO Radio Kit. The Kit includes a factory-paired Radio set and all the mounting hardware necessary for installation onto 35 mm DIN rails. Then, simply add matching pairs of I/O Modules to get just the right mix of I/O. There are three available I/O Modules to choose from: Analog 4-20 mA, Analog 0-10 Vdc, and Digital.

Each paired Radio System provides secure I/O link using AES encryption. You can safely and reliably run multiple radio pairs in close proximity.

### No Programming Required

Not having to learn or program any software is what makes the WIO System so easy to use. And although this system does not require any programming, an Advanced User Interface (UI) for PCs is available to take full advantage of the entire feature set. Through the Advanced UI, you can view and optimize RF strength, view input and output status, set analog fail-safe output values, locally force outputs for diagnostic testing, and more.

### Fail-Safe Output Protection

You can set the predetermined value for each output in case of a RF or I/O failure. DIP switches are used for the Digital I/O Module to control the fail-safe output settings. The Analog I/O Modules default to 0 V or 4 mA. Advanced UI can be utilized for setting any other desired value. The system’s RF and I/O health can be remotely monitored by tying the NPN outputs on the Radio Modules to a third-party monitoring system.

US Patent #8,811,459 B1

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**Highlights**

- Wireless I/O mirroring system
- Replicate raw signals in either direction
- Fully customizable modular I/O solution
- Supports 0-10 V, 4-20 mA, and discrete
- No software programming required
- Mounts onto 35 mm DIN rails
- Class I, Division 2 (Zone 2)
- -40 °C to 80 °C
- 900 MHz or 2.4 GHz radio option
- Secure AES encryption
**HARDWARE & SYSTEM**

**Unique System Features**
- Bi-Directional, Paired, Wireless I/O Communication System
- No Software or Programming Required

**Maximum Network Capacity**
- Max Capacity Depends on I/O Combination Impacting Power

**When Using More Than 5 Modules**
- Use Power Budget Calculator http://goo.gl/167r3k

**DIN Rail Mounting Compatibility**
- 35 mm x 7.5 mm DIN Rail

**DataRail™**
- 6.1" / 156 mm - Supports Up to Five (5) I/O Modules
- (2x Included with Radio Kit)
- Other Lengths Also Available

**I/O Module Slave ID Selection**
- 16-Position Rotary Switch

**DataRail Mounting Hardware**
- 4-Claw Attachment to 35 mm DIN Rail with End Terminal Bracket

**Built-In Mounting Hardware**
- Spring-Loaded Clip-On System

**Wire Gauge**
- Solid / Stranded (AWG) 28-12 Gauge

**Wire Rating**
- UL: 300 V RMS, 80 °C and 300 V, 105 °C
- CSA: 300 V RMS, 105 °C

**Warranty**
- 2-Year Limited

**RADIO MODULE - 900 MHz or 2.4 GHz**

**Frequency**
- 902-928 MHz or 2.4 GHz License-Free ISM Band

**Antenna Connector Type**
- SMA (Female Connector)

**Default Transmit Speed / Update**
- 1 Second

**Turbo Tx Speed Based on**
- 1=100 ms, 2=200 ms, 4=250 ms, 5=333 ms,
- 7=500 ms, 12=1661 second

**Number of I/O Modules**
- 300 V, 105 °C

**Outdoor / Line of Sight Max Range**
- 900 MHz: 6.3 Miles (10.1 Km) / 2.4 GHz: 5.7 Mile (9.2 Km)

**Indoor / Urban Range**
- 900 MHz: 1000 ft (305 m) / 2.4 GHz: 300 ft (90 m)

**Maximum Transmit Power**
- 900 MHz: 24 dBm (250 mW)
- 2.4 GHz: 18 dBm (63 mW)

**Receiver Sensitivity**
- 900 MHz: -101 dbm / 2.4 GHz: -100 dbm

**Spread Spectrum**
- 900 MHz: FHSS / 2.4 GHz DSSS

**RF Security**
- 128-bit AES Encryption

**Controlled Local Shutdown (ESD)**
- Yes, via Provided Dry Contact Input

**RF Link Alarm Digital Output**
- Adjustable 2 to 10-Second RF Timeout Trigger (PNP)

**I/O Link Alarm Digital Output**
- I/O Mismatch, Bus or Module Failure (PNP)

**RF Link Diagnostics (Left LED)**
- Green = RF Traffic / Yellow = RF Link Fail

**RF Link Diagnostics (Right LED)**
- Green = I/O OK, Modules Detected / Red = I/O Link Fail

**Supply Voltage Range**
- 9 - 30 Vdc (+5%)

**Reverse Polarity Protection**
- Yes

**Advanced User Interface Features**
- Test RSSI, Tx Power Adjustment, Force Local Output(s), Set Fail-Safe Parameters, and Additional Diagnostics

**Power Consumption**
- 35 mA @ 12V AVG (10% Duty Cycle)

**Packaging Dimensions (WxHxD)**
- 5.5 x 10.1 x 2.8-in / 140 x 257 x 72 mm

**Net Dimensions**
- 0.7 x 3.9 x 4.5-in / 17.5 x 99 x 114 mm

**Packaging Weight**
- 1.3 lbs / 590 g

**Net Weight (Single Radio)**
- 0.3 lbs / 136 g

**SAFETY & COMPLIANCE**

**Operational Temperature**
- -40 °C to 80 °C / -40 °F to 176 °F

**Ambient Temperature**
- -20 °C to 80 °C / -4 °F to 176 °F

**Humidity**
- 0 to 99 %, Non-condensing

**Degree of Protection**
- IP20 / Plastic

**Hazardous Locations Classifications**
- Class I; Division 2 (Zone 2): CSA, ATEX, IECEx

**RF Emissions**
- FCC Part 15/IC

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**ANALOG 0-10 V I/O MODULE**

- Number of Inputs: 2 (24-bit Resolution)
- Number of Outputs: 2 (16-bit Resolution)
- Signal Range: 0 Vdc to 10 Vdc (10.5 V Max)
- Isolation Voltage: 2500 V r.m.s.
- Accuracy: < 0.1 % of Full Scale
- Fail-Safe Output Modes: Last Known Value (Def.) or Any Value on Scale
- AI Input Impedance: 40 KOhm
- AO Output Impedance: 10 Ohm

**Power Consumption**
- Typical: 40 mA / Max: 45 mA @ 12 Vdc

**Packaging Dimensions**
- (WxHxD): 4.8 x 5.1 x 2.8-in / 123 x 129 x 72 mm

**Net Dimensions**
- 0.7 x 3.9 x 4.5-in / 17.5 x 99 x 114 mm

**Packaging Weight**
- Single: 0.5 lbs / 227 g; Double: 0.8 lbs / 363 g

**Net Weight (Single)**
- 0.3 lbs / 136 g

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**ANALOG 4-20 mA I/O MODULE**

- Number of Inputs: 2 (24-bit Resolution)
- Number of Outputs: 2 (16-bit Resolution)
- Signal Range: 4 mA to 20 mA
- Isolation Voltage: 2500 V r.m.s.
- Accuracy: < 0.2 % of Full Scale
- Internal Loop Power: +13.5 VDC
- Maximum Current: 84 mA @ 12 Vdc

**Packaging Dimensions**
- (WxHxD): 4.8 x 5.1 x 2.8-in / 123 x 129 x 72 mm

**Net Dimensions**
- 0.7 x 3.9 x 4.5-in / 17.5 x 99 x 114 mm

**Packaging Weight**
- Single: 0.5 lbs / 227 g; Double: 0.8 lbs / 363 g

**Net Weight (Single)**
- 0.3 lbs / 136 g

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**DIGITAL I/O MODULE**

- Number of Inputs: 4
- Number of Outputs: 4
- Input Voltage Range: 3-30 Vdc
- Isolation Voltage: 2500 V r.m.s.

**Input Voltage Threshold**
- Signal ("H"): > 2.3 Vdc
- 0 Signal ("L"): < 1.1 Vdc

**Output Rating**
- 1 A Sink Current for Open-Drain Outputs / PNP

**Fail-Safe Output Modes**
- Off, On, or Last Known Value (Default)

**Green LEDs**
- Line-Driven Input Indicators

**Red LEDs**
- Output Indicators

**Power Consumption**
- Typical: 18 mA / Max: 26 mA @ 12 Vdc

**Packaging Dimensions**
- (WxHxD): 4.8 x 5.1 x 2.8-in / 123 x 129 x 72 mm

**Net Dimensions**
- 0.7 x 3.9 x 4.5-in / 17.5 x 99 x 114 mm

**Packaging Weight**
- Single: 0.5 lbs / 227 g; Double: 0.8 lbs / 363 g

**Net Weight (Single)**
- 0.3 lbs / 136 g

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**ORDERING INFORMATION**

**WIO System Radio Kit**
- 900 MHz: BM-0900-RM1K
- 2.4 GHz: BM-2400-RM1K

**0-10 V I/O**
- 2-Pack: BM-A010-122D

**4-20 mA I/O**
- 2-Pack: BM-A420-122D

**Digital I/O**
- 2-Pack: BM-D100-144D