

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 I/O
- No software programming required
- Mounts onto 35 mm DIN rails
- Class I, Division 2 (Zone 2)
- -40 °C to 80 °C (-40 °F to 176 °F)
- 868 MHz / 900 MHz / 915 MHz / 2.4 GHz
- Secure AES encryption



US Patent #8,811,459 B1

Modular, Point-to-Point Wireless Signal Replication Solution

Custom-Tailor I/O Mix, Bi-Directional

The OleumTech® WIO® Modular Wireless I/O System provides instant I/O connectivity and is one of the easiest and most cost-effective solutions for solving a vast number of point-to-point I/O and stranded asset monitoring and control challenges. Each Radio Kit can be fully customized using available 0-10 Vdc, 4-20 mA, and Digital I/O Modules. The bi-directional connectivity gives you the flexibility to connect third-party equipment such as a PLC or RTU to either side of the radio link.

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.

Just Add I/O Modules

Constructing a Modular Wireless I/O 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 a secure I/O link using AES encryption. You can safely and reliably run multiple radio pairs in close proximity.

Fail-Safe Output Protection

You can set the predetermined value for each output in case of an 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.

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/t67r3k |
| DIN Rail Mounting Compatibility | 35 mm x 7.5 mm DIN Rail |
| DataRail® (2x Included with Radio Kit) | 6.1" / 156 mm - Supports Up to Five (5) I/O Modules 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 - 868 MHz, 900 MHz, 915 MHz, or 2.4 GHz ISM Bands

| | |
|---|--|
| Frequency | 868-870 MHz 902-928 MHz 915-928 MHz 2.4 GHz |
| Antenna Connector Type | SMA (Female Connector) |
| Default Transmit Speed / Update | 1 Second |
| Turbo Tx Speed Based on | 1=100 ms, 2-3=200 ms, 4= 250 ms, 5-6=333 ms, |
| Number of I/O Modules | 7-11=500 ms, 12-16=1 second |
| Outdoor / Line of Sight Max Range | 868 MHz: 5.2 Miles (8.4 Km) / 900 MHz: 6.3 Miles (10.1 Km) / 2.4 GHz: 4.3 Miles (7 Km) |
| Indoor / Urban Range | 868 MHz 370 ft (113 m) / 900 MHz: 1000 ft (305 m) / 2.4 GHz: 300 ft (90 m) |
| Maximum Transmit Power (Adjustable with Advanced UI) | 868 MHz: 25 mW (14 dBm) / 900 MHz: 250 mW (24 dBm) 2.4 GHz: 63 mW (18 dBm) |
| Receiver Sensitivity | 868 MHz: -101 dBm / 900 MHz: -101 dBm / 2.4 GHz: -100 dBm |
| Spread Spectrum | 868 MHz: LBT, AFA / 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 (NPN) |
| I/O Link Alarm Digital Output | I/O Mismatch, Bus or Module Failure (NPN) |
| RF Link Diagnostics (Left LED) | Green = RF Traffic / Yellow = RF Link Fail |
| I/O 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 @ 12 V 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 (USA), IC ICES-003 (Canada), ACMA (Australia) AS/NZS CISPR 32 (Australia), EN55032 & EN55024 (EU) |



¹Response time based on number of I/O Modules.

²The maximum RF range data was collected under optimal test conditions, including a clear line of sight between antennas. Actual wireless RF range may vary depending on location, RF interference, weather, antenna type, cable type, and line of sight.

³Requires WIO System Advanced User Interface to set a specific value on Analog I/O Modules.

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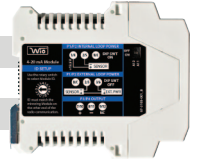
ANALOG 0-10 V I/O MODULE

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|------------------------|--|
| 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 ³ |
| AI Input Impedance | 40 K ohm |
| 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 |



ANALOG 4-20 mA I/O MODULE

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|---------------------------|--|
| 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 |
| Fail-Safe Output Modes | Last Known Value (Def.) or Any Value on Scale ³ |
| AI Input Impedance (loop) | 128 ohm |
| AO Terminal Voltage Range | 10 Vdc Min. / 31.5 Vdc Max. |
| Power Consumption | Typical: 50 mA / Max: 75 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 |



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 / NPN |
| Fail-Safe Output Modes | On, Off, 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 |



ORDERING INFORMATION

| | |
|-----------------------|---|
| WIO Modular Radio Kit | 868 MHz: BM-0868-RM1K (Europe) 900 MHz: BM-0900-RM1K (N. America) 915 MHz: BM-0915-RM1K (Australia/NZ) 2.4 GHz: BM-2400-RM1K (N. America/ME) |
| 0-10 V I/O Modules | 2-Pack: BM-A010-122D |
| 4-20 mA I/O Modules | 2-Pack: BM-A420-122D |
| Digital I/O Modules | 2-Pack: BM-D100-144D |

