Wireless Multi-I/O Solution with Modbus Master Functionality

**Scalable I/O Solution**

The OleumTech® OTC Wireless Multi-I/O Module provides a quick and scalable solution for adding analog inputs and digital I/O points to any OTC Sensor and I/O Network. It is equipped with four high resolution analog inputs (24-bit ADC). Each input can be independently selected for either 0-10 Vdc or 4-20 mA mode of operation. It also packs four independently configurable digital channels. Each channel can be setup as an input, counter, output, or pulsed output.

**Modbus Master Function**

The Wireless Multi-I/O Module also features Modbus Master functionality, which gives users read and write controls over assets connected over its RS485 Serial port.

**Robust Range, Advanced Networking**

With the provided robust RF range, the Wireless Multi-I/O Module can rescue stranded I/O points that was once economically not feasible. The Wireless Multi-I/O Module can be added to the network as needed and its I/O points can to be mapped to anywhere within the OTC Network creating an efficient, highly advanced system that is easy to create and manage. The Wireless Multi-I/O Module communicates with an assigned wireless gateway in the OTC Network. This wireless device is certified for use in Class I, Division 2 (Zone 2) hazardous locations.

**Highlights**

- 4 analog inputs (24-bit ADC)
- Independent selectability for 0-10 Vdc or 4-20 mA mode
- 4 programmable digital I/O channels
- Modbus master functionality (RS485)
- -40 °C to 80 °C (-40 °F to 176 °F)
- 900 MHz / 915 MHz / 2.4 GHz / 868 MHz
- Secure AES encryption
- Class I, Division 2 (Zone 2) certified

- US Patent #6,967,589
## Technical Specifications

### HARDWARE FEATURES
- **Device Functionality**
  - Wireless Multiple Input / Output Module
- **Embedded Controller**
  - Ultra-Low Power RISC Microcontroller with Internal FLASH (Field Upgradeable)
- **Configuration**
  - Config / Debug Port - RS232 Slave Only (RJ-45) / BreeZ® Software for PC
- **Serial**
  - RS485 Port - Modbus Master Only (RJ-45)
- **I/O Interfaces**
  - 4 Analog Inputs (24-bit ADC): 0-10 V or 4-20 mA Selectable Modes
  - 4 Programmable Digital (Discrete) Channels
  - Supports Mix of Inputs and Outputs
  - 30 Vdc (Max) Input for All Channels
  - 1A Sink Current for Open-Drain Outputs
  - Configurable Debounce Filter
- **Device Diagnostics**
  - Health Tags: Supply Voltage, Received Signal Strength Indication (RSSI), RF Refresh, RF Timeout

### WIRELESS COMMUNICATIONS
- **Radio Band**
  - ISM Band (License-Free)
  - 900 MHz / 915 MHz: FHSS, FSK, AES Encryption 256-bit (900 MHz), 128-bit (915 MHz)
  - 2.4 GHz: DSSS, AES Encryption 128-bit
  - 868 MHz: LBT-AFA, AES Encryption 128-bit
- **Bit Rate**
  - 900/915 MHz: 9600 bps / 115.2 kbps; 2.4 GHz: 250 kbps; 868 MHz: 80 kbps
- **Output Power (Max)**
  - 900/915 MHz: 1000 mW; 2.4 GHz: 63 mW; 868 MHz: 25 mW
- **Receiving Sensitivity**
  - 900/915 MHz: -110 dBm @ 9600 bps, -100 dBm @ 115.2 kbps
  - 2.4 GHz: -101 dBm @ 250 kbps; 868 MHz: -106 dBm @ 80 kbps
- **RF Range**
  - 900/915 MHz: Up to 40 Miles / 64 km with Clear Line of Sight
  - 2.4 GHz: Up to 4.3 Miles / 7 km with Clear Line of Sight
  - 868 MHz: Up to 5.2 Miles / 8.4 km with Clear Line of Sight

### CERTIFICATIONS & COMPLIANCE
- **EMC/EMI**
  - FCC Part 15 (USA), IC ICES-003 (Canada), ACMA (Australia)
  - AS/NZS CISPR 32 (Australia), EN55032 & EN55024 (EU)
- **Safety**
  - Class I, Division 2, Groups A, B, C, D T4; Ex nA IIC T4
  - Class I, Zone 2 Ex e IIC T4
  - ATEX: Sira 14ATEX4143X; Ex nA IIC T4 Gc
  - IECEx: SIR 13.0055X; Ex nA IIC T4 Gc

### MECHANICAL SPECIFICATIONS
- **Dimensions**
  - 4.9" (W) x 3" (H) x 1.4" (D) / 124.5 mm (W) x 76.2 mm (H) x 35.6 mm (D)
- **Package Dimensions**
  - 8" (W) x 6" (H) x 2.5" (D) / 203 mm (W) x 152 mm (H) x 63 mm (D)
- **Weight**
  - Net: 0.75 lbs / 0.3 kg; Packaging: 1 lbs / 0.4 kg
- **Mounting**
  - DIN Rail Mountable with Height Adjustability

### ELECTRICAL SPECIFICATIONS
- **DC Power Input**
  - 9-30 Vdc
- **Average Power Input**
  - 2 Watt
- **900/915 MHz Pwr Cons. @ 12 V**
  - @100 mW: Idle = 33 mA; Transmit = 138 mA; Idle = 33 mA; Transmit = 272 mA
- **900/915 MHz Pwr Cons. @ 24 V**
  - @100 mW: Idle = 26 mA; Transmit = 92 mA; Idle = 26 mA; Transmit = 180 mA
- **2.4 GHz Pwr Cons. @ 12 V**
  - @25 mW: Idle = 28 mA; Transmit = 60 mA; Idle = 28 mA; Transmit = 74 mA
  - @25 mW: Idle = 22 mA; Transmit = 44 mA; Idle = 22 mA; Transmit = 58 mA
- **868 MHz Pwr Cons. @ 12 V**
  - @10 mW: Idle = 20 mA; Transmit = 40 mA; @ 25 mW: Idle = 22 mA; Transmit = 49 mA
  - @10 mW: Idle = 20 mA; Transmit = 28 mA; @ 25 mW: Idle = 20 mA; Transmit = 33 mA

### GENERAL SPECIFICATIONS
- **Operating Conditions**
  - Temperature: Class I, Division 2 (Zone 2): -40 °C to 80 °C (-40 °F to 176 °F)
  - Humidity: 0 to 99 %, Non-Condensing
- **Warranty**
  - 2-Year Parts and Labor
- **Country of Origin**
  - USA

### ORDERING INFORMATION
- **Model Numbers**
  - WM-0900-002, WM-0915-002, 2.4 GHz, WM-2400-002, WM-0868-002
- **Wirelessly Connects To**
  - OTC Wireless Gateway

### Networking Diagram

---

1 The 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.