



### Highlights

- Wirelessly gather/distribute sensor data
- Map I/O points anywhere within the network
- Point-to-multipoint, peer-to-peer connectivity
- Modbus Master/Slave functionality
- Serial/RTU interface (RS232/RS485)
- Integrate OleumTech I/O Expansion Modules without sacrificing its Serial port
- I/O Expansion Modules available (isolated)
- Compact form factor
- -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



OTC Transmitters

OTC Gateway

Local  
Controller

RTU/EFM/PLC/  
DCS/HMI/  
Long-Haul Radio



Network Infrastructure



Cloud (Analytics)

## Serial Gateway with Modular I/O Expansion Capabilities

### Primary Data Collection Point

The OleumTech® DH2-W Wireless Gateway plays an integral role in the OTC Wireless Sensor and I/O Network. It possesses the ability to aggregate data from OTC wireless transmitters and I/O modules onto its 1920-point register holding table. Third-party devices can access the data over the Modbus or LevelMaster ASCII protocol.

### Advanced Peer-to-Peer Networking

Deploy multiple gateways to the OTC platform, creating a custom, highly scalable network. The gateways have the ability to communicate with one another. Leverage the peer-to-peer technology and funnel data to the primary gateway, optimizing network efficiency and/or designing an extremely flexible I/O mapping system across the entire wireless network.

### Compact and Versatile

The DH2-W is a full-function gateway and is ideal for fitment where enclosure space is a premium. When it is deployed alone, it can be installed on a DIN rail having less than 1" width of space. The DH2-W can be configured as a Modbus Master or Slave device and provides Serial RS232/RS485 connectivity.

### Modular Wireless I/O Expansion Solution

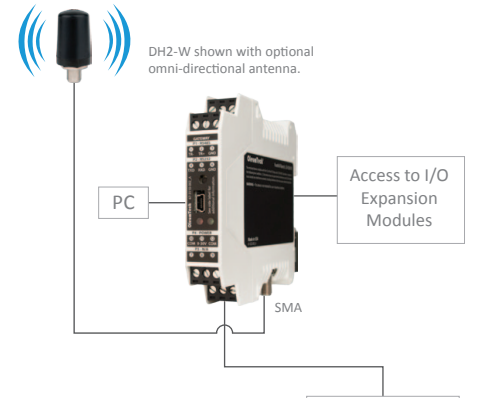
The DH2-W can be integrated with OleumTech's isolated Analog 0-10 Vdc, 4-20 mA, and Digital I/O Expansion Modules for solving various I/O challenges. The I/O Modules can be used in any mix or combination with the DH2-W. The BreeZ® Software makes it extremely easy to add and configure I/O points. A standard 35 mm DIN rail is required for I/O Expansion Module(s) integration.

### Technical Specifications (DH2-W)

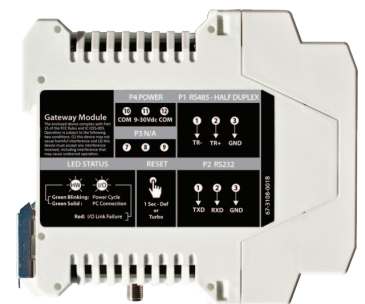
HARDWARE FEATURES	
Device Functionality	- Serial Wireless Gateway with I/O Expansion Capabilities
Embedded Controller	- 32-bit Low Power ARM7 Microcontroller with Internal FLASH (Field Upgradeable)
Serial Interfaces	- RTU Port (RS232/RS485) Terminal Block - Modbus Master/Slave, LevelMaster ASCII Slave, ROC-Link Master (Supports Opcodes 17 and 10)
Configuration	- Config / Debug Port - RS232 Slave Only (Mini-USB) / BreeZ® Software for PC
Device Diagnostics	- Health Tag: Supply Voltage
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: 25mW
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 <sup>1</sup> (Gateway-to-Gateway) - 900/915 MHz: Up to 7500 Feet / 1.4 Miles / 2.3 km with Clear Line of Sight <sup>1</sup> (Transmitter-to-Gateway) - 2.4 GHz: Up to 4.3 Miles / 7 km with Clear Line of Sight <sup>1</sup> - 868 MHz: Up to 5.2 Miles / 8.4 km with Clear Line of Sight <sup>1</sup>
SOFTWARE USER INTERFACE (PC APPLICATION)	
Version/PC Platform	- BreeZ® Software v6.0 or Later; PC with Windows® 7 or Later
CERTIFICATIONS & COMPLIANCE	
EMC/EMI	 <ul style="list-style-type: none"> <li>- FCC Part 15 (USA), IC ICES-003 (Canada), ACMA (Australia)</li> <li>- AS/NZS CISPR 32 (Australia), EN55032 &amp; EN55024 (EU)</li> <li>- Class I, Division 2, Groups A, B, C, D T4; Ex nA IIC T4 Gc</li> <li>- Class I Zone 2 AEx nA IIC T4 Gc</li> </ul>
Safety	 <ul style="list-style-type: none"> <li>- ATEX: Sira 15ATEX4134X; Ex nA IIC T4 Gc, II 3 G</li> <li>- IECEx: SIR 15.0055X; Ex nA IIC T4 Gc</li> </ul>
MECHANICAL SPECIFICATIONS	
Dimensions	- 0.7 x 3.9 x 4.5-in / 17.5 x 99 x 114 mm
Package Dimensions	- GM1: 4.8 x 5.1 x 2.8-in / 123 x 129 x 72 mm   GM1K: 5.5 x 10.1 x 2.8-in / 140 x 257 x 72 mm
Package Weight	- GM1: 0.5 lbs / 227 g   GM1K: ~1 lbs / 0.4 kg
DIN Rail Mounting	- 35 mm x 7.5 mm DIN Rail
I/O Module Support	- Up to 5 I/O Modules using 156 mm DataRail Bus
ELECTRICAL SPECIFICATIONS	
DC Power Input	- 9-30 Vdc
Average Power Input	- 2 Watt
Power Consumption @12 Vdc	- 900/915 MHz @ 1000 mW: Receive Avg 62 mA, Transmit Avg 291 mA - 2.4 GHz @ 63 mW: Receive Avg 62 mA, Transmit Avg 109 mA - 868 MHz @ 25 mW: Receive Avg 59 mA, Transmit Avg 75 mA
Power Consumption @24 Vdc	- 900/915 MHz @ 1000 mW: Receive Avg 37 mA, Transmit Avg 168 mA - 2.4 GHz @ 63 mW: Receive Avg 37 mA, Transmit Avg 62 mA - 868 MHz @ 25 mW: Receive Avg 35 mA, Transmit Avg 45 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	
Gateway Only (GM1)	- BM-0900-GM1, BM-0915-GM1, BM-2400-GM1, BM-0868-GM1
Gateway with I/O Kit (GM1K)	- BM-xxxx-GM1K (Includes DataRail and Mounting Hardware)
DIN Rail Mounting Kit	- SA1000-WK1 (1 DataRail + Mounting H/W: Cover, 2 End Terminal Brackets, 4 Terminal Plugs)
4-20 mA I/O Module	- BM-A420-122S (Single Pack) / BM-A420-122D (Dual Pack)
0-10 V I/O Module	- BM-A010-122S (Single Pack) / BM-A010-122D (Dual Pack)
Digital I/O Module	- BM-D100-144S (Single Pack) / BM-D100-144D (Dual Pack)
Wirelessly Connects To	- OTC Wireless Devices (Gateways, Transmitters, I/O Modules)
Configuration Cable	- SX1000-CC2, 20-ft All-in-One Configuration Cable

### Networking Diagram

#### OTC GATEWAY - DH2-W



#### OTC TRANSMITTERS



<sup>1</sup> 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.

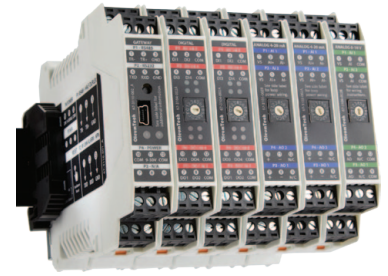
## Technical Specifications (I/O Modules)

### HARDWARE FEATURES

Maximum I/O Module Capacity	· Max Capacity Depends on I/O Combination Impacting Power
When Using More Than 5 Modules	· Use Power Budget Calculator <a href="http://goo.gl/Z7xC5M">http://goo.gl/Z7xC5M</a>
DIN Rail Mounting Compatibility	· 35 mm x 7.5 mm DIN Rail
DataRail® Included with GM1K	· 6.1" / 156 mm - Supports Up to 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
Package Dimensions (WxHxD)	· 4.8 x 5.1 x 2.8-in / 123 x 129 x 72 mm
Package Weight	· Single Pack: 0.5 lbs / 227 g; Dual Pack: 0.8 lbs / 363 g
Warranty	· 2-Year Limited

### 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
Safety	· Class I, Division 2, Groups A, B, C, D T4; Ex nA IIC T4 Gc
	· Class I Zone 2 AEx nA IIC T4 Gc
	· ATEX: Sira 15ATEX4134X; Ex nA IIC T4 Gc
	· IECEx: SIR 15.0055X; Ex nA IIC T4 Gc



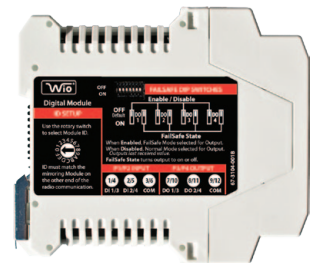
DH2-W Shown with I/O Modules



0-10 V I/O Module



4-20 mA I/O Module



Digital I/O Module

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

Number of Inputs and Outputs	· 2 Inputs (24-bit Resolution) / 2 Outputs (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
AI Input Impedance	· 40K ohm
AO Output Impedance	· 10 ohm
Power Consumption	· Typical: 40 mA / Max: 45 mA @12 Vdc

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

Number of Inputs and Outputs	· 2 Inputs (24-bit Resolution) / 2 Outputs (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
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

### DIGITAL I/O MODULE

Number of Inputs and Outputs	· 4 Inputs / 4 Outputs
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
Green LEDs	· Line-Driven Input Indicators
Red LEDs	· Output Indicators
Power Consumption	· Typical: 18 mA / Max: 26 mA @12 Vdc