ENABLING ROBUST, LONG-DISTANCE WIRELESS COMMUNICATION AMONG MULTIPLE DEVICES IN CHALLENGING OUTDOOR ENVIRONMENTS

Oil | Gas | Agriculture | Water Management | General Telemetry
SENTINEL
Intrinsically Safe Modules for Hazardous Areas

CLASS 1 DIVISION 1 CERTIFIED
RUGGED OIL FIELD PROVEN
WIRELESS PACTWARE™ AND RADARMATER™ SUPPORT
TRUE WIRELESS - POWERS SENSOR AND RADIO
WIRELESS CONFIGURATION

FEATURES

• Powers sensor and radio for years with an internal battery
• Class 1 Division 1 Intrinsically safe system
• Optional Class 1 Division 1 solar module with integrated charger, battery panel, and mounting bracket
• Costs less than 60ft of installed conduit
• Rugged design for demanding outdoor environments
• Up to 1/2 mile range
• Sensor independent
• 1/2” NPT conduit interface
• Automatically configures as a star or mesh network
• Simple to install and Maintain

MODELS

Sentinel HART
Connects to a single HART sensor

Sentinel Analog
Connects to a single 4-20 mA/1-5v sensor

Sentinel Digital
2 digital inputs
2 KHz frequency response

Sentinel Modbus
RS-485 Modbus interface

Sentinel Turbine
Connects directly to the Magnetic Pickup of the Turbine Sensor

Sentinel Thermocouple
Connects directly to Thermocouple sensors (j,k other)

Sentinel RTD
Connects directly to P100 RTD sensors

HART Model supports wireless PACTware and Wireless RadarMaster
TECHNICAL SPECIFICATIONS

Operating Temp
-40°C to 60°C

Humidity
0% – 100% condensing

Power
3 X D Lithium battery pack. Field replaceable. Class 1 Division 1 certified when used with SignalFire system. In situ replacement does not require a work ticket. Optional Class1 Division 1 solar/battery module

Sensor Power
True wireless: powers both the radio system and the sensor/transmitter. User configurable for 18 and 12.5V. Barriers and external power not required.

Battery Life
1–10 years depending on the type of sensor and reporting frequency

Data Interface
Wireless – available as Modbus registers at Gateway

Data Update Rates
User-selectable. 5 seconds to 1 hour, typical.

Supported Sensor Interfaces
HART, 4-20 mA current loop, 1-5 Volt, Digital input (state, counter, totals, frequency), RS-485/Modbus, Thermocouple and RTD temperature sensors.

Radio Power
40 mW

Receive Sensitivity
-109 dB

Radio Frequency
902–928 MHz, FHSS, license-free ISM Band Compliant with FCC Part 15

Range
Up to 1/2 mile

Networks
Up to 65,520 separate networks

Intrinsically Safe
Class 1 Division 1, Temp Code T3, Groups C&D. Conforms to UL Std. 913, Certified to Can/CSA Std C22.2 No. 157

Internal Diagnostics
Battery voltage, signal strength, error conditions

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>SENSOR TYPE</th>
<th>POWER SOURCE</th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART</td>
<td>Internal Lithium Battery Pack</td>
<td>Sentinel-Hart-3BIS</td>
</tr>
<tr>
<td>HART</td>
<td>Solar/Battery System</td>
<td>Sentinel-Hart-Solar</td>
</tr>
<tr>
<td>Analog (1-5V or 4-20 mA)</td>
<td>Internal Lithium Battery Pack</td>
<td>Sentinel-Analog-3BIS</td>
</tr>
<tr>
<td>Analog (1-5V or 4-20mA)</td>
<td>Solar/Battery System</td>
<td>Sentinel-Analog-Solar</td>
</tr>
<tr>
<td>Modbus</td>
<td>Internal Lithium Battery Pack Modbus</td>
<td>Sentinel-485-3BIS</td>
</tr>
<tr>
<td>Modbus</td>
<td>Solar/Battery System</td>
<td>Sentinel-485-Solar</td>
</tr>
<tr>
<td>Digital Inputs (2)</td>
<td>Internal Lithium Battery Pack Modbus</td>
<td>Sentinel-DI-3XBIS</td>
</tr>
<tr>
<td>Digital Inputs (2)</td>
<td>Solar/Battery System</td>
<td>Sentinel-DI-Solar</td>
</tr>
</tbody>
</table>
The Multi-Input, Hazardous-Area system is rated for use in Class 1 Division 1 areas and can power a sensor from its internal battery pack. Available with or without an integrated LCD display for data review in the field. The intrinsically safe battery pack can be changed in place without a work ticket.

**FEATURES**

- Class 1 Division 1 Intrinsically Safe System
- Battery Powers System and Sensor for up to 3 years
- Multiple Inputs
  - 1 Multi-Drop HART® Channel (supports up to 4 HART field devices)
  - 2 4-20 MA OR 1-5V Channels
  - 2 Digital Input Channels
- Integrated High-Gain Omnidirectional Antenna
- Rugged Watertight Enclosure
- Up to 1/2 Mile Range
- Sensor Independent
- Part of the SignalFire Remote Sensing System Mesh Network
- 1/2” NPT Wiring/Conduit Interface
- 915 MHz, FHSS Radio

**STANDARD CONFIGURATION**

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1D1-3BIS-D</td>
<td>Multi Input System, Class 1 Div 1, HART, 4-20, 1-5V, Battery Powered, with Display</td>
</tr>
<tr>
<td>MC1D1-3BIS-ND</td>
<td>Multi Input System, Class 1 Div 1, HART, 4-20, 1-5, Battery Powered, No Display</td>
</tr>
</tbody>
</table>
**Operating Temp**
-40ºC to 60ºC

**Humidity**
0% – 100% condensing

**Sensor Power**
18V for 4-20 mA Current Loop or HART Sensors. Sensor power is provided from the system, no need for external sensor power, no barriers required.

**Battery Life**
1–4 years depending on the number and type of sensors and reporting frequency

**Data Interface**
Wireless – Available as Modbus Registers at Gateway

**Supported Sensor Interfaces**
HART (up to 4 devices), 4-20 mA Current, Loop, 1-5 Volt, Digital Input (State, Counter, Totals, Frequency)

**Display**
Externally visible display shows communications status and sensor readings

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**Data Update Rates**
User-selectable, 5 seconds to 1 hour, typical

**Radio Power**
10mW

**Antenna Type**
External Weather Resistant, Omnidirectional

**Antenna Gain**
5 dB

**Receive Sensitivity**
-105 dB

**Frequency**
902–928 MHz, FHSS, License Free ISM Band Compliant with FCC Part 15

**Range**
1/2 Mile (Line of Sight, Real World) careful placement

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**Networks**
Up to 65,520 separate networks

**Enclosure**
Fiberglass Reinforced UV Stabilized Polycarbonate

**Intrinsically Safe**
Class 1 Division 1, Temp Code T3, GroupsC&D. Conforms to UL Std. 913, Certified to Can/CSA Std C22.2 No. 157

**Internal Diagnostics**
Battery Voltage, Signal Strength, Error Conditions
GATEWAY
Integrated Gateway and High-Gain Antenna

CLASS 1 DIVISION 2 CERTIFIED
RUGGED OIL FIELD PROVEN
LONG RANGE OF 3+ MILES
LOW POWER CONSUMPTION

FEATURES
- Modbus interface (RS485 RTU or Modbus TCP with optional Ethernet Gateway Interface Module)
- Long range: 3+ miles
- Stores all sensor data in Modbus format
- Manages outbound communications
- Low power consumption
- Integrated high-gain omnidirectional antenna and gateway electronics
- Supports wireless configuration of remote nodes and HART devices via PACTware or Radar Master
- Automatically configures as star or mesh network
- Designed for rugged outdoor environments
- Times out readings from off-line sensors

MODELS
- Gateway DIN Mount
  Compact DIN mount gateway module with external RP-SMA antenna connection.
- Gateway-In-a-Stick
  Encapsulated electronics, high-gain antenna, and multi-mount aluminum base all contained in a high-impact polycarbonate “Stick”.

INTERFERENCE MODULES
- Connector Breakout Board for use with Gateway-in-a-Stick. Provides DIN mounted connection point for wiring and configuration.
- Analog /Relay Output Module maps any type of sensor reading to an analog or relay output, ideal for retrofit applications.
- Ethernet Interface Module provides Modbus-TCP connection and diagnostic interface for remote configuration.
TECHNICAL SPECIFICATIONS

Operating Temp
-40°C to 85°C

Humidity
0% – 100% condensing

Power
6-36 VDC

Data Interface
RS-485 Modbus RTU, or Modbus-TCP, RS 232 for configuration. All readings are converted to Modbus registers and stored in the gateway.

Radio Power
500 mW

Antenna Type
Omnidirectional

Antenna Gain
5dB

Receive Sensitivity
-105 dB

Internal Diagnostics
Line voltage, signal strength, error conditions, internal event logging

Frequency
902-928 MHz license-free ISM band compliant with FCC Part 15

Range
3 miles (typical) much farther with careful placement

Networks
Up to 64 separate networks

Enclosure
Weather-tight, integrated electronics and antenna, NEMA 3R (GW Stick)

Safety Rating
Nonincendive, Class 1 Division 2 Groups C and D, T5

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>INTERFACE</th>
<th>IO OUTPUTS</th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS 485 (Gateway-in-a-Stick)</td>
<td>None</td>
<td>GWS-CBBL</td>
</tr>
<tr>
<td>Modbus-TCP (Gateway-in-a-Stick)</td>
<td>None</td>
<td>GWSSTATISTICIP</td>
</tr>
<tr>
<td>RS 485 (Gateway-in-a-Stick)</td>
<td>8 Analog (4-20 mA/1-5V) and 2 Relays</td>
<td>GWS-8AO2DO</td>
</tr>
<tr>
<td>RS 485 (DIN Mount Gateway)</td>
<td>None</td>
<td>GW-DIN</td>
</tr>
<tr>
<td>Modbus-TCP (DIN Mount Gateway)</td>
<td>None</td>
<td>GW-DIN-STATICIP</td>
</tr>
</tbody>
</table>
COUNTER STICK
Potted electronics, a high-gain antenna, and a multi-mout aluminum base all contained in a high-impact polycarbonate “Stick”.

LONG RANGE 3+ MILES
PROVIDES A WIRELESS INTERFACE TO DESCRETE DIGITAL SIGNALS
MESSAGE-FORWARDING CAPABILITY
LOW POWER CONSUMPTION
SIMPLE TO INSTALL AND MAINTAIN

FEATURES
- Provides a wireless interface to remote counting sensors such as flow meters
- Two digital interfaces, dry contact, open collector and other interfaces
- Calculates:
  - Total Counts
  - Instantaneous Frequency
  - Frequency Since Last Read
  - State
- Measures to 2 kHz
- Rugged design for demanding outdoor environments

MODELS
Counter/Totalizer
2 counter input channels

www.signal-fire.com | 43 Broad St., Unit C-300, Hudson, MA 01749 USA | 978.212.2868
# COUNTER STICK
Potted electronics, a high-gain antenna, and a multi-mout aluminum base all contained in a high-impact polycarbonate “Stick”.

## TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Operating Temp</strong></th>
<th><strong>Antenna Type</strong></th>
<th><strong>Networks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C to 70°C</td>
<td>Omnidirectional</td>
<td>Up to 65,520 separate networks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Humidity</strong></th>
<th><strong>Antenna Gain</strong></th>
<th><strong>Enclosure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0% – 100% condensing</td>
<td>5 dB</td>
<td>Weather tight integrated electronics and antenna</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power</strong></th>
<th><strong>Receive Sensitivity</strong></th>
<th><strong>Internal Diagnostics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>6-36 VDC</td>
<td>-105 dB</td>
<td>Line voltage, signal strength, error conditions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Data Interface</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Safety Rating</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 digital inputs</td>
<td>902-928 MHz license-free ISM band compliant with FCC Part 15</td>
<td>Non-insendive, Class 1 Division 2 groups C and D, T5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Update Rates</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>User configurable with configuration utility</td>
<td>3 miles (typical) much farther with careful placement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Radio Power</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>500mW</td>
</tr>
</tbody>
</table>

## STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>INTERFACE TYPE</th>
<th>ORDER CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Input</td>
<td>CTRS-CBBL</td>
<td>Counter-in-a-Stick, 2DI, 25 Ft Cable, with DIN Mounted CBBL Interface Board</td>
</tr>
</tbody>
</table>
REMOTE SHUT DOWN (RSD)
Gateway-controlled asset monitoring and shutdown.
PLC-controlled asset monitoring and shutdown

NO PLC PROGRAMMING REQUIRED
SIMPLE TABLE-BASED CONFIGURATION LOGIC
CONFIGURABLE FAILSAFE FEATURES
LONG RANGE: 3+ MILES

TOPOLOGIES

Gateway-Controlled
• May be configured to monitor and control as a standalone system
• A PLC may be used to offload sensor data

PLC-Controlled
• A PLC monitors and controls remote assets through a Gateway, which relays data to the remote assets

Standalone Remote Switch Mode
• No Gateway required, remote sensor data is sent directly to a RSD-Stick
• The RSD-Stick uses its internal configuration logic to trigger shutdowns based on remote sensor data

STANDARD CONFIGURATION
ORDER CODE

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBS-RSD</td>
<td>RSD-Stick with DIN mounted RSD Module. 2 relays, 2 digital inputs</td>
</tr>
</tbody>
</table>

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TECHNICAL SPECIFICATIONS

Operating Temp
-40ºC to 70ºC

Power
6-36 VDC

Relay Outputs
2A, 30V, SPDT

Digital Inputs
Dry contact or 30 volts max (push-pull)

Radio Power
500 mW

Antenna Gain
5 dB

Receive Sensitivity
-105 dB

Frequency
902-928 MHz license-free ISM band, FHSS, FCC part 15 compliant

Range
3+ miles (line of sight)

Internal Diagnostics
Supply voltage, signal strength, error conditions

Failsafe Operation
Multiple configurable failsafe timers. Relay fault monitoring.

SIMPLE TABLE-BASED CONFIGURATION LAYOUT

[Table image]
A2 LONG RANGE
Long-range, multiple-input modules for sophisticated data transmission over distances of up to three miles between nodes.

POWERS SENSOR AND RADIO FOR YEARS WITH A BATTERY
RUGGED DESIGN FOR DEMANDING OUTDOOR ENVIRONMENTS
UP TO A 3-MILE RANGE
AUTOMATICALLY CONFIGURES AS A STAR OR MESH NETWORK
SIMPLE TO INSTALL AND MAINTAIN

FEATURES

• Powers sensor and radio for years with an internal battery
• Optional solar power package
• Costs less than 60ft of installed conduit
• Rugged design for demanding outdoor environments
• Up to 3-mile range
• Sensor independent
• 1/2" NPT conduit interface
• Automatically configures as a star or mesh network
• Simple to install and Maintain

MODELS

A2
Monitor two analog sensors and one digital input:

• 4-20 mA current loop sensor
• 1-5 V sensor
• Digital input/counter

HART
Monitor one HART® loop and one digital input:

• HART (1-4 sensors)
• Digital input/counter

Modbus
Monitor one or more Modbus sensors

Thermocouple/Digital Input
Monitor one thermocouple and one digital input
A2 LONG RANGE
Long-range, multiple-input modules for sophisticated data transmission over distances of up to three miles between nodes.

TECHNICAL SPECIFICATIONS

Operating Temp
-40°C to 85°C

Humidity
0% – 100% condensing

Power
3 X D Lithium battery pack. Field replaceable.

Sensor Power
12.5 or 18V jumper selectable for 4-20mA current loop, 1-5V, or HART sensors. Sensor power is provided from the system, no need for external sensor power

Battery Life
1–10 years depending on the type of sensor and reporting frequency

Data Interface
Wireless – available as Modbus registers at Gateway

Data Update Rates
User Selectable Rotary Switch from 5 sec to 2 hours

Supported Sensor Interfaces
Analog (4-20mA/1-5V)
Digital input
HART
RS485 Modbus RTU
K-Type Thermocouple

Radio Power
300 mW

Antenna Type
External Weather Resistant, Omnidirectional

Receive Sensitivity
-105 dB

Frequency
902-928 MHz License Free ISM Band Compliant with FCC Part 15

Range
Up to 3 Miles (Line of Sight)

Networks
Up to 65,520 separate networks

Enclosure
Aluminum, NEMA 4X Rated

Internal Diagnostics
Battery voltage, signal strength, error conditions

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>SENSOR TYPE</th>
<th>POWER SOURCE</th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Analog (1-5V or 4-20 mA)</td>
<td>Battery</td>
<td>A2-A2D1-3B</td>
</tr>
<tr>
<td>HART</td>
<td>Battery</td>
<td>A2-HART-3B</td>
</tr>
<tr>
<td>RS-485/Modbus</td>
<td>Battery</td>
<td>A2-485-3B</td>
</tr>
<tr>
<td>K Type Thermocouple</td>
<td>Battery</td>
<td>A2-KTHERM-3B</td>
</tr>
</tbody>
</table>
WIRELESS I/O MODULE
Din Mounted Node for Wireless Network.

- RUGGED OIL FIELD PROVEN
- INTEGRATED RADIO WITH ANTENNA KIT
- ANALOG AND DIGITAL SIGNAL REPLICATION

DESCRIPTION

The SignalFire Wireless I/O System can interface to analog (4-20mA/1-5V) inputs and outputs, digital inputs and has relay outputs. There are two modes of operation, the first utilizes two modules and acts as a wire replacement that replicates analog and digital signals over a wireless link between the pair of Wireless I/O Modules. The second mode of operation is as a standard node that sends the data (via the SignalFire wireless mesh network) to a SignalFire Gateway where the data is available via a Modbus RTU or Modbus-TCP interface. The modules are DIN rail mounted and designed to be easy to use.

Point to Point I/O Mirroring Configuration: the analog/digital inputs on one module are replicated on the other module (and vice versa)-ideal for stand alone valve control or simple retrofit applications.

Standard SignalFire Configuration: Operates as a remote node with a standard SignalFire Gateway. All IO data is available at the Gateway as Modbus registers. Supports Modbus writes to control the analog and relay outputs. SignalFire node in a SignalFire network, providing longer-range as well as more sophisticated monitoring and control.

FEATURES

- 4 Analog Inputs (0-20mA or 0-5V)
- 4 Analog Outputs (0-20mA or 0-5V)
- 2 Digital Inputs
- 2 Relay Outputs (1 DPDT, 1 SPST)
- Acts as a repeater for other SignalFire wireless devices
- Wide Range DC Power Input (10-30VDC)
- Low Power Consumption
- DIN Rail Mount with pluggable screw terminal blocks
- Status LEDs
TECHNICAL SPECIFICATIONS

**Operating Temp**
-40ºC to 65ºC

**Power**
10-30 VDC (25mA average @12V no relays energized, additional 15mA max for each energized relay, plus any analog output current)

**Analog Outputs**
0-20 mA, 0-5 Volts

**Digital Inputs**
Dry contact or 30 volts max (push-pull)

**Radio Frequency**
902-928 MHz ISM band, FHSS radio, RP-SMA connector

**Relay Outputs**
2A, 60W

**Networks**
Up to 65,520 separate networks

**Safety Rating**
Class 1 Division 2 Certified, Groups C&D, Temperature Code T5. Certified to CSA C22.2 No. 213, Conforms to ISA 12.12.01

**Radio Power**
300 mW

**Range**
Up to 3 miles line of sight (depending on antenna)

**Internal Diagnostics**
Supply voltage, signal strength, error conditions

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>I/O MODULE TYPE</th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless IO System with 300 mW Radio and RP-SMA whip antenna. For use with plastic or fiberglass enclosures.</td>
<td>Wireless IO-IA</td>
</tr>
<tr>
<td>Wireless IO System with 300 mW Radio with external enclosure mount antenna kit.</td>
<td>Wireless IO-EXA</td>
</tr>
</tbody>
</table>

POINT-TO-POINT MIRRORING MODE

[Diagram of point-to-point mirroring mode]
CHEMICAL INJECTION PACKAGE
Control & Diagnostic System Monitoring

OPERATIONAL VISIBILITY INTO CRITICAL PROCESSES
VERIFICATION OF INJECTION PERFORMANCE
WIRELESS INTERFACE ADD-ON
DIRECT ACCESS OF CONTROLLER DATA BY SCADA SYSTEM

FEATURES

5 Operating Modes
• Timed - Inject on a timed schedule
• Auto Volume - Specify a daily injection quantity (quarts/day)
• Auto Production - Specify well production rate and desired chemical dosing PPM, requires flow rate data from a flow computer. Injection rates will automatically change with production.
• Manual - Manual on and off
• Temperature - Set temp limits to start or stop all injection based on ambient temp.

SCADA Integration
• Modbus interface – RS 485 or Ethernet
• Wired or wireless using the SignalFire Telemetry System
• Remotely monitor performance
  - Injection rates
  - Pump performance
  - Tank levels
  - Fault conditions
  - Battery voltage
• Remotely change configuration
  - Injection rates
  - Temp limits
  - Calibration
  - Enable/Disable

BENEFITS

Optimize Chemical Usage –
*Inject the right amount when it is needed*
• Avoid the costs of over injection.
• Avoid downtime/reworks due to under injection.
• Rapidly identify leaks or clogs.

Flow Assurance
• Immediate feedback from the gear meter lets you know you are pumping chemical, resulting in no blocked lines or empty tanks.

Manage Tank Levels
• Optimize chemical delivery by carefully managing tank levels.

Monitor System Performance
• Prevent system downtime by continually monitoring system performance.

Easy Installation
• Reduce installation time with wireless integration.

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CHEMICAL INJECTION PACKAGE
Control & Diagnostic System Monitoring

TECHNICAL SPECS

Operating Temperature
-40°C to +85°C

Power
9-15 VDC

Data Interfaces
- SignalFire Wireless Radio
- RS485 Modbus RTU

Supported Pumps
12 VDC Electric pump (up to 12A), other pumps on request

Internal Diagnostics
Supply voltage, signal strength, error conditions

Radio Frequency
902-928 MHz ISM band, 300 mW FHSS radio. Antenna included with wireless option.

DATA INTERFACES
• SignalFire Wireless Radio
• RS485 Modbus RTU

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Injection Monitoring and Control Base Package</td>
<td>CIS - GM - x - y - z</td>
</tr>
<tr>
<td>Level Sensor Option:</td>
<td>x = 0 (no level sensor)</td>
</tr>
<tr>
<td></td>
<td>x = 1 (level sensor)</td>
</tr>
<tr>
<td>Wireless Option:</td>
<td>y = 0 (Modbus RS485 interface)</td>
</tr>
<tr>
<td></td>
<td>y = 1 (Wireless interface)</td>
</tr>
<tr>
<td></td>
<td>y = 2 (Wireless interface and a DIN Gateway)</td>
</tr>
<tr>
<td>Temperature Sensor Option:</td>
<td>z = 0 (no temperature sensor)</td>
</tr>
<tr>
<td></td>
<td>z = 1 (ambient temperature sensor)</td>
</tr>
</tbody>
</table>

www.signal-fire.com | 43 Broad St., Unit C-300, Hudson, MA 01749 USA | 978.212.2868
PRESSURE SCOUT
Intrinsically Safe Wireless Pressure Sensor

PRESSURE ALARM REPORTING
CLASS 1 DIVISION 1 CERTIFIED
EASY TO INSTALL
LOW COST ALTERNATIVE
HIGH PERFORMANCE & LONG BATTERY LIFE
WIRELESS CONFIGURATION

FEATURES

- Powers integrated pressure sensor and radio for years with an internal battery
- Class 1 Division 1 Intrinsically safe system
- Rugged design for outdoor environments
- Up to ½ mile range
- ½” NPT Process connection standard
- Rapid pressure sampling with configurable alarms and report by exception
- Extremely low power and long battery life
- Compact and simple to install and maintain
- Available in standard pressure ranges
- Pushbutton or remote zeroing

PRESSURE SENSOR

PERFORMANCE AT 77°F/25°C

Accuracy: <±0.25% BFSL
Stability (1 year): ±0.25% FS, typical
Over Range Protection: 2X Rated Pressure, Minimum
Burst Pressure: 5X or 40,000 PSI (whichever is less)
Pressure Cycles: >100 Million
Process Connection: 1/2” NPTM 316L Stainless Steel Standard
  F250C Autoclave for pressure >10,000 psi
  Other process connections/material available

Standard Pressure Ranges: 0-50 psi, 0-100 psi, 0-300 psi, 0-500 psi, 0-1000 psi, 0-3000 psi, 0-5000 psi, 0-7500 psi, 0-10,000 psi, 0-15,000 psi, 20,000 psi
Low Pressure Ranges: 0-1 psi, 0-2 psi, 0-5 psi, 0-7.5 psi 0-10 psi, 0-15 psi, 0-20 psi

THERMAL LIMITS

Operating Range: -40 to +176°F (-40 to +80°C)
Compensated Range: 32 to +131°F (0 to 55°C)

TC Zero: <±1.5% of FS
TC Span: <±1.5% of FS
TECHNICAL SPECIFICATIONS

**Operating Temp:** -40 to +176°F (-40°C to 80°C)

**Humidity:** 0% – 100% condensing

**Power:** “D” Cell Lithium battery pack. Field replaceable. Class 1 Division 1 certified when used with SignalFire system. Optional Class1 Division 1 solar/battery module.

**Battery Life:** 1–10+ years depending on reporting frequency. **Battery Life Example:** 5-second pressure sample interval with a 1-minute reporting interval = 6.5 years.

**Data Interface:** Wireless – available as Modbus registers at Gateway

**Report by Exception:** Configurable alarm pressure thresholds, pressure sample rate 5 seconds minimum.

**Data Update Rates:** User-selectable. 5 seconds to 1 hour, typical.

**Radio Power:** 40 mW

**Receive Sensitivity:** -109 dB

**Radio Frequency:** 902–928 MHz, FHSS, license-free ISM Band Compliant with FCC Part 15

**Range:** Up to 1/2 mile

**Networks:** Up to 65,520 separate networks

**Intrinsically Safe:** Class 1 Division 1, Temp Code T3, Groups C&D. Conforms to UL Std. 913, Certified to Can/CSA Std C22.2 No. 157

**Internal Diagnostics:** Battery voltage, signal strength, error conditions
TANK LEVEL FLOAT STICK SYSTEM
Intrinsically Safe Wireless Tank Level Monitoring

RUGGED OIL FIELD PROVEN
COMPLETE WIRELESS TANK LEVEL MONITORING SOLUTION
WIRELESS CONFIGURATION

DESCRIPTION

The SignalFire Tank Level Float Stick System consists of a magnetostrictive level probe mated with a Sentinel wireless node which creates a wireless link between the sensor and the Gateway. The Sentinel will take level and temperature readings, and send the data (via the SignalFire wireless mesh network) to the Gateway where the data is available via a Modbus RTU or TCP interface. The system is powered by internal lithium batteries or optional C1D1 rated solar package. Sensor data along with node-diagnostic information is available at the Gateway.

FEATURES

- Available with flexible or rigid magnetostrictive level probe with single or dual floats for level and interface measurements
- Integrated temperature sensor to measure fluid temperature
- Class 1 Division 1 intrinsically safe (certification pending)
- Rugged design for demanding outdoor environments
- Up to 1/2 mile range
- 1” NPT mounting interface
- Automatically configures as a star or mesh network

RIGID TANK LEVEL FLOAT STICK SYSTEM
Intrinsically safe wireless tank level monitoring

FLEXIBLE TANK LEVEL FLOAT STICK SYSTEM
Intrinsically safe wireless tank level monitoring
TECHNICAL SPECIFICATIONS

**Operating Temp**
-40ºC to 60ºC

**Power**
3 X D Lithium battery pack. Field replaceable. Class 1 Division 1 certified.

**Battery Life**
1 min. check-in: 5+ years, 5 min. check-in: 10+ years

**Data Interface**
Wireless - Modbus data available at GW

**Reported Values**
Product level, interface level, temperature, status.

**Data Update Rate**
User selectable - 5 seconds to 1 hour

**Radio Power**
40 mW

**Antenna Type**
Internal weather resistant, omnidirectional.

**Receive Sensitivity**
-109 dB

**Frequency**
902-928 MHz, FHSS license-free ISM band, FCC part 15 compliant.

**Range**
Up to 1/2 mile

**Networks**
Up to 65520 separate network

**Diagnostics**
Battery voltage, signal strength, error conditions, Faults

---

LEVEL PROBE

**Measurement resolution**
0.0001”

**Repeatability**
Equal to Resolution

**Linearity**
± 0.01% of span or ± 0.039”, whichever is greater.

**Material**
Flexible: PVDF, Rigid: 316 Stainless

**Dead Band**
Flexible: 6”-17” depending on sensor length.
Rigid: 2”

**Length**
Flexible: 65” to 600”. Rigid: 20” to 288”.
Available in 1” increments
FIELD MONITOR
Provides in-field access to any gateway data without the need for a laptop computer or other I/O visual device.

IN-FIELD READOUT OF ANY GATEWAY DATA
BATTERY POWERED DISPLAY
PERFECT FOR LOCAL DISPLAY OF TANK LEVELS OR OTHER FIELD DATA

FEATURES

- Local display of data from network sensors
- Math functions for tank volume calculations
- Feet and inch conversion
- Multiple pages
- Rugged design for demanding outdoor environments
- Up to 3+ mile range
- Simple to install, maintain and can also act as the Gateway for display only applications.

STANDARD CONFIGURATION ORDER CODES

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Monitor</td>
<td>Field Monitor, Battery Powered, Sleeping Client Node</td>
</tr>
<tr>
<td>Field Monitor-GW-Solar</td>
<td>Field Monitor, IQ4XLD Solar Powered, Gateway</td>
</tr>
<tr>
<td>Field Monitor-GW-IQ</td>
<td>Field Monitor, With IQ Smart Battery, Gateway. For external 10-30V power</td>
</tr>
</tbody>
</table>

TECHNICAL SPECIFICATIONS

**Operating Temp**
-40°C to 70°C

**Humidity**
0% – 100% condensing

**Power**
3 X D Lithium battery pack. Field replaceable.

**Battery Life**
2-5 years depending on update rate

**Data Interface**
SignalFire toolkit configuration utility

**Radio Power**
300 mW

**Antenna Type**
External weather resistant, omnidirectional

**Antenna Gain**
5 dB

**Receive Sensitivity**
-105 dB

**Frequency**
902-928 MHZ, license-free ISM band compliant with FCC Part 15

**Range**
Up to 3+ miles (line of sight)

**Networks**
Up to 65,520 separate networks

**Enclosure**
NEMA 4X rated

**Internal Diagnostics**
Battery voltage, signal strength, error conditions

**Display**
High contrast 13x26 character Monochrome LCD
ETHERNET INTERFACE MODULE

DIN mounted module Ethernet enables the Gateway-In-a-Stick or DIN-Gateway.

FEATURES

- Direct connection to the SignalFire Gateway-in-a-Stick or the DIN mounted gateway
- Modbus TCP access to all data, supports up to 16 simultaneous server connections
- Allows remote configuration/diagnostics using the SignalFire ToolKit
- Supports remote configuration of HART devices using PACTware or Radar Master
- Power Over Ethernet (PoE) support with auto switchover to DC power supply
- Wide input voltage range of 6-36VDC
- Industrial Temperature range of -40 to +85C
- Easy web page configuration
- DB9 port for local connection to gateway
- Small form factor DIN mount enclosure
- Ethernet 10/100 base TX with Auto Negotiation, and HP Auto MDIX. RJ45 Connector

MODELS

Ethernet Interface Module
The Ethernet Interface Module permits direct connection of the SignalFire Wireless Mesh Network to an Ethernet Network. The Ethernet Interface Module has 2 TCP addressable ports and is designed to connect to a standard SignalFire Gateway-in-a-Stick or DIN mounted Gateway with little or no configuration necessary.

STANDARD CONFIGURATION ORDER CODE

<table>
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<tbody>
<tr>
<td>ENET-DIN</td>
<td>Ethernet Interface Module for use with a Gateway-In-a-Stick or a DIN Mounted Gateway</td>
</tr>
<tr>
<td>GWS-STATICIP</td>
<td>Gateway-in-a-Stick with 25’ cable with DIN Mounted Ethernet Interface Module</td>
</tr>
<tr>
<td>GW-DIN-STATICIP</td>
<td>DIN Mounted Gateway with SMA Antenna Connection with DIN Mounted Ethernet Interface Module</td>
</tr>
</tbody>
</table>
MULTI-I/O STICK SYSTEM

Designed to connect to a Modbus Stick and provide sophisticated wireless I/O control and monitoring at remote locations.

ULTRA-LOW POWER OPERATION
EASY TO USE
HAZARDOUS AREA SAFE

FEATURES

- 8 Analog inputs. 4-20mA / 1-5V switch selectable (16 bit) with units of measure scaling and threshold monitoring
- 6 Digital Inputs with report on state change and totalizing
- 2 Single Pole and 2 Double Pole relays with direct and programmable pulse control
- Up to 8 units may be daisy chained to one Modbus-In-A-Stick
- 6-36VDC input voltage rage
- Ultra-low power operation
- Class 1 Division 2, Temp Code T4, Groups C&D. Certified to CSA C22.2 No. 213, UL 61010-1, and CSA C22.2#61010-1, Conforms to ANSI/ISA 12.12.01
- Easy to use table driven configuration interface

STANDARD CONFIGURATION ORDER CODES

<table>
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<tr>
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<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBS-MIOM-CBBL</td>
<td>Modbus-in-A-Stick with Multi Input/Output Module. 8 Analog, 6 Digital inputs,</td>
</tr>
<tr>
<td></td>
<td>4 Relay Outputs, 25 Ft Cable, CBBL Interface Board.</td>
</tr>
<tr>
<td>MIOM</td>
<td>Multi Input/Output Module. 8 Analog, 6 Digital inputs, 4 Relay Outputs.</td>
</tr>
</tbody>
</table>
ACCESSORIES

BATTERIES

3XD Replacement Battery Pack
For use with the A2 and HART® battery powered systems.

Intrinsically Safe Replacement Battery Pack
For use with the C1D1 Hazardous Area Multiple Input Module.

Solar Battery Power IQ Smart - Battery Pack
For use with the A2 and HART modules

ADAPTER CABLES

Configuration Cable
For use with the A2, HART®, Multi Input, and D2. Connectors from board-mounted 4-pin header to USB for code loads and configurations.

USB-to-Serial Adapter
Our recommendation for best plug-and-play performance with SignalFire products.
ACCESSORIES

### NODE CHECKER
A setup and network-health tool — recommended for all installers
- Queries the status of any network node
- Provides signal information
- Available for wireless PACTware support to HART® sensors.

### SIGNALFIRE CONFIGURATION AND DIAGNOSTIC TOOLKIT
The SignalFire ToolKit is a free, easy to use PC application for configuration and diagnostics for all SignalFire products.
- Configures all settings in nodes and Gateway
- NodeChecker utility interfaces with NodeChecker hardware module to get detailed information about network performance and node data
- Diagnostics and troubleshooting information built into node-configuration window
- Automatically updates itself on startup and downloads latest node firmware versions
- Loads firmware into all nodes and prompts user to push updates when local disk has a newer version than the currently connected node
- Downloads and displays current configuration data from node

### SOLAR POWERED REPEATER
- Automatically configures as part of the SignalFire mesh network
- Forwards messages from all SignalFire nodes
- 300mW radio with high gain antenna
- Range up to 3 miles
- Internal rechargeable battery pack with integrated high efficiency solar charger
- Solar panel and all mounting hardware/brackets included
- Rugged design for demanding outdoor industrial environments
- Simple to install and maintain

www.signal-fire.com | 43 Broad St., Unit C-300, Hudson, MA 01749 USA | 978.212.2868