



 **MICROWATT**
Making Safety Work

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SALES • SERVICE • SUPPORT



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, IDT compliant and Wireless RadarMaster

SENTINEL

Intrinsically Safe Modules for Hazardous Areas

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 60°C (-40°F to 140°F)

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 Vdc and 12.5 Vdc. 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 Vdc, Digital input (state, counter, totals, frequency), RS-485/Modbus, Thermocouple and RTD temperature sensors.

Radio Power

40 mW

Receive Sensitivity

-109 dB

Security

128 AES Encryption

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

SENSOR TYPE	POWER SOURCE	ORDER CODE
HART	Internal Lithium Battery Pack	Sentinel-Hart-3BIS
HART	Solar/Battery System	Sentinel-Hart-Solar
Analog (1-5V or 4-20 mA)	Internal Lithium Battery Pack	Sentinel-Analog-3BIS
Analog (1-5V or 4-20mA)	Solar/Battery System	Sentinel-Analog-Solar
Modbus	Internal Lithium Battery PackModbus	Sentinel-485-3BIS
Modbus	Solar/Battery System	Sentinel-485-Solar
Digital Inputs (2)	Internal Lithium Battery PackModbus	Sentinel-DI-3XBIS
Digital Inputs (2)	Solar/Battery System	Sentinel-DI-Solar

C1D1 MULTI INPUT NODE

Multiple-input module is certified intrinsically safe for use in hazardous environments.

MULTIPLE INPUTS

DIGITAL DISPLAY

HAZARDOUS AREA SAFE

SIMPLE TO INSTALL AND MAINTAIN



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 ORDER CODE

ORDER CODE	DESCRIPTION
MC1D1-3BIS-D	Multi Input System, Class 1 Div 1, HART, 4-20, 1-5V, Battery Powered, with Display
MC1D1-3BIS-ND	Multi Input System, Class 1 Div 1, Hart, 4-20, 1-5, Battery Powered, No Display



C1D1 MULTI INPUT NODE

Multiple-input module is certified intrinsically safe for use in hazardous environments.

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 60°C

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

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

Networks

Up to 65,520 separate networks

Enclosure

Fiberglass Reinforced UV Stabilized Polycarbonate

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

GATEWAY

Integrated Gateway and High-Gain Antenna

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

Gateway-In-a-Stick



Gateway DIN Mount



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

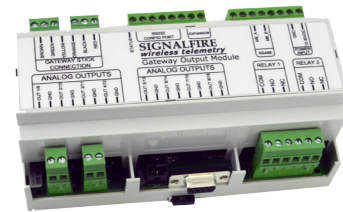
Encapsulated electronics, high-gain antenna, and multi-mount aluminum base all contained in a high-impact polycarbonate "Stick".

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.



GATEWAY

Integrated Gateway and High-Gain Antenna

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

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

Internal Diagnostics

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

STANDARD CONFIGURATION ORDER CODES

INTERFACE	IO OUPUTS	ORDER CODE
RS 485 (Gateway-in-a-Stick)	None	GWS-CBBL
Modbus-TCP (Gateway-in-a-Stick)	None	GWSSTATICIP
RS 485 (Gateway-in-a-Stick)	8 Analog (4-20 mA/1-5V) and 2 Relays	GWS-8AO2DO
RS 485 (DIN Mount Gateway)	None	GW-DIN
Modbus-TCP (DIN Mount Gateway)	None	GW-DIN-STATICIP

COUNTER STICK

Potted electronics, a high-gain antenna, and a multi-mount aluminum base all contained in a high-impact polycarbonate "Stick".

LONG RANGE 3+ MILES

PROVIDES A WIRELESS INTERFACE TO DISCRETE DIGITAL SIGNALS

MESSAGE-FORWARDING CAPABILITY

LOW POWER CONSUMPTION

SIMPLE TO INSTALL AND MAINTAIN

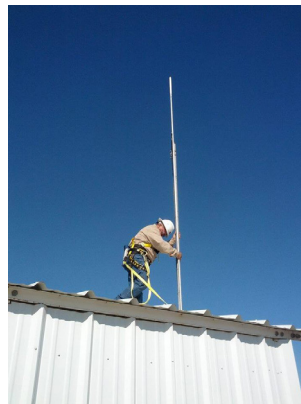


FEATURES

- 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



COUNTER STICK

Potted electronics, a high-gain antenna, and a multi-mount aluminum base all contained in a high-impact polycarbonate "Stick".

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 70°C

Humidity

0% – 100% condensing

Power

6-36 VDC

Data Interface

2 digital inputs

Data Update Rates

User configurable with configuration utility

Radio Power

500mW

Antenna Type

Omnidirectional

Antenna Gain

5 dB

Receive Sensitivity

-105 dB

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 65,520 separate networks

Enclosure

Weather-tight integrated
electronics and antenna

Internal Diagnostics

Line voltage, signal strength,
error conditions

Safety Rating

Non-insensitive, Class 1 Division 2
groups C and D, T5

STANDARD CONFIGURATION ORDER CODES

INTERFACE TYPE	ORDER CODE	DESCRIPTION
Frequency Input	CTRS-CBBL	Counter-in-a-Stick, 2DI, 25 Ft Cable, with DIN Mounted CBBL Interface Board

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

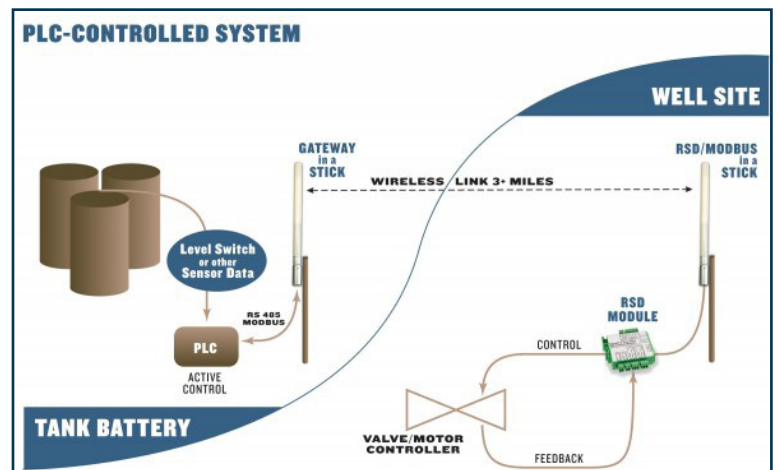
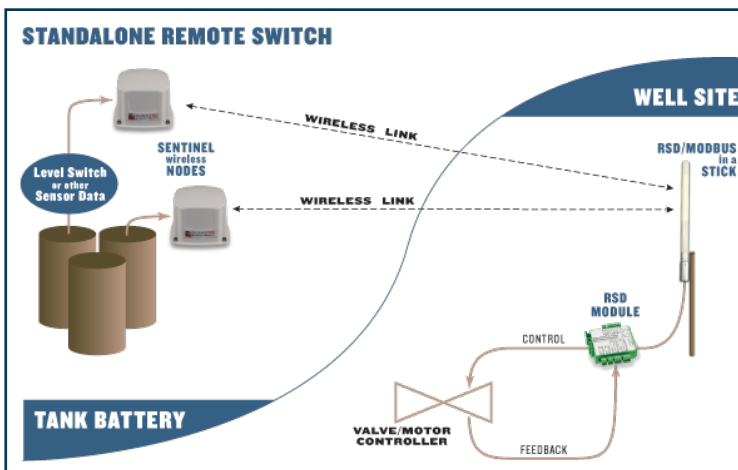
- A PLC monitors and controls remote assets through a Gateway, which relays data to the remote assets

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

ORDER CODE	DESCRIPTION
MBS-RSD	RSD-Stick with DIN mounted RSD Module. 2 relays, 2 digital inputs



REMOTE SHUT DOWN (RSD)

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 70°C

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

Remote Shutdown Settings

Remote Shutdown settings with the same Destination Relay will ALL need to meet the Run System (Energize) condition in order to run the system

	Source Node				Relay Control Logic				Destination Counter/RSD Stick				
	Slave ID	Node Type	Register Address	Register Type	Current Register Value	Run System (Energize Relay) when...	Value	Shutdown System (De-energize Relay) when...	Value	Number of Readings	Slave ID	Relay Channel	Current Relay State (readonly)
1	100	Sentinel H...	4005-HAR...	32bit FLOAT	99.2606	Less than	100	Greater than	110	1	1	1	Unknown
2	101	Sentinel H...	4011-HAR...	32bit FLOAT	0.0301919	Greater than	5	Less than	4	1	1	1	Unknown
3	102	Sentinel H...	4009-HAR...	32bit FLOAT	19.7995	Less than	15	Greater than	16	1	1	2	Unknown
4	0	None	0	16bit UINT	Unknown	Greater than	0	Less than	0	1	0	1	Unknown

Read Remote Shutdown Settings from Gateway Failsafe Enabled - Missing Slave or Register results in Relay being De-energized

Write Remote Shutdown Settings to Gateway Latch De-energize - Requires RTU to Re-energize Relay via Modbus Coil Write

Save to File Load from File Clear Remote Shutdown Table

Success

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

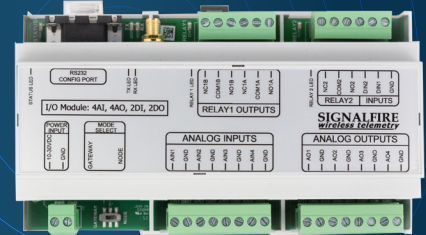
STANDARD CONFIGURATION ORDER CODES

SENSOR TYPE	POWER SOURCE	ORDER CODE
2 Analog (1-5V or 4-20 mA)	Battery	A2-A2D1-3B
HART	Battery	A2-HART-3B
RS-485/Modbus	Battery	A2-485-3B
K Type Thermocouple	Battery	A2-KTHERM-3B

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

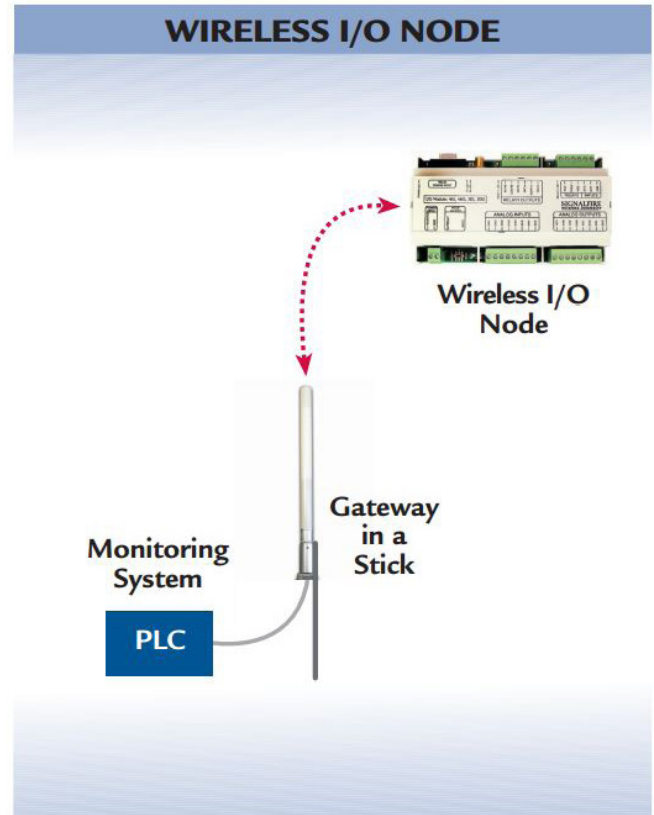
The SignalFire Wireless I/O System can interface to analog (4-20mA/1-5V) inputs and outputs, digital inputs and has relay outputs. There are two modes of operation, the first utilizes two modules and acts as a wire replacement that replicates analog and digital signals over a wireless link between the 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



WIRELESS I/O MODULE

Din Mounted Node for Wireless Network.

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 65°C

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

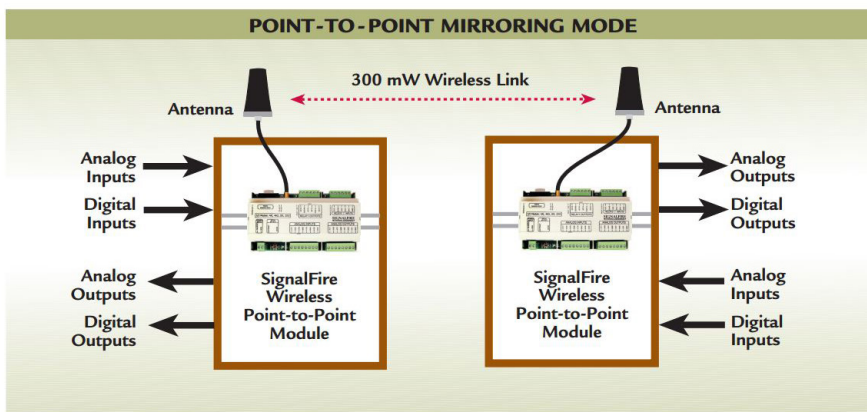
Up to 3 miles line of sight (depending on antenna)

Internal Diagnostics

Supply voltage, signal strength, error conditions

STANDARD CONFIGURATION ORDER CODES

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



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



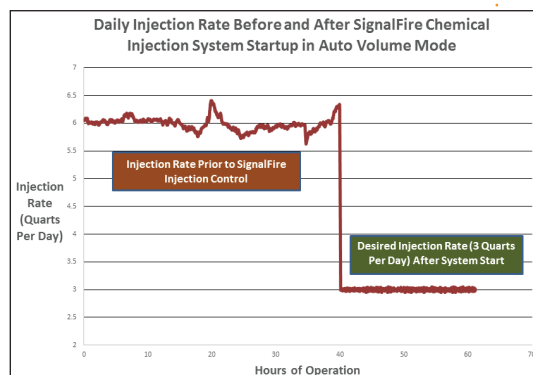
FEATURES

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.

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

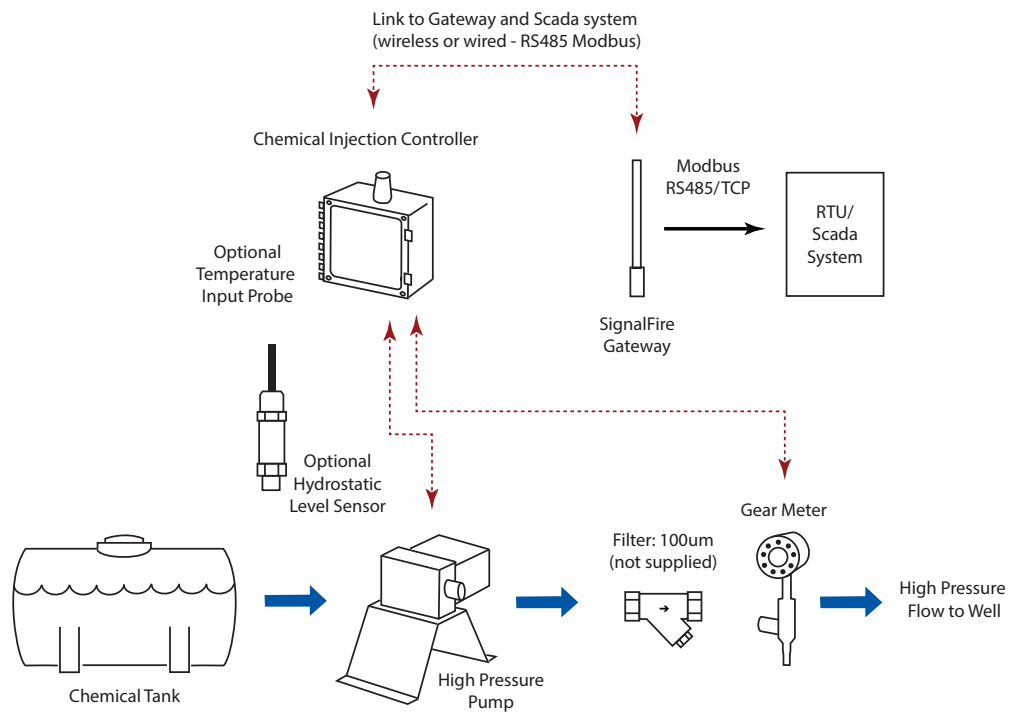
Internal Diagnostics

Supply voltage, signal strength, error conditions

Radio Frequency

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

CHEMICAL INJECTION PACKAGE DIAGRAM



STANDARD CONFIGURATION ORDER CODES

DESCRIPTION	ORDER CODE
Chemical Injection Monitoring and Control Base Package	C I S - G M - x - y - z
Level Sensor Option:	x = 0 (no level sensor)
	x = 1 (level sensor)
Wireless Option:	y = 0 (Modbus RS485 interface)
	y = 1 (Wireless interface)
	y = 2 (Wireless interface and a DIN Gateway)
Temperature Sensor Option:	z = 0 (no temperature sensor)
	z = 1 (ambient temperature sensor)

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: $\pm 0.25\%$ BFSL

Stability (1 year): $\pm 0.25\%$ 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: $\pm 1.5\%$ of FS

TC Span: $\pm 1.5\%$ of FS

PRESSURE SCOUT

Intrinsically Safe Wireless Pressure Sensor

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

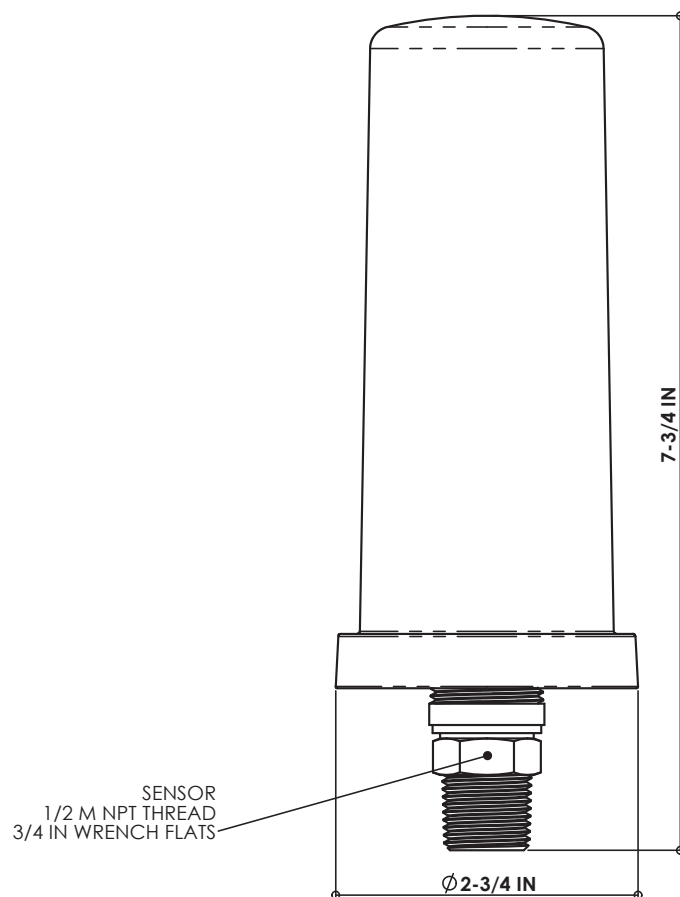
Radio Frequency: 902–928 MHz, FHSS, license-free ISM Band Compliant with FCC Part 15

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

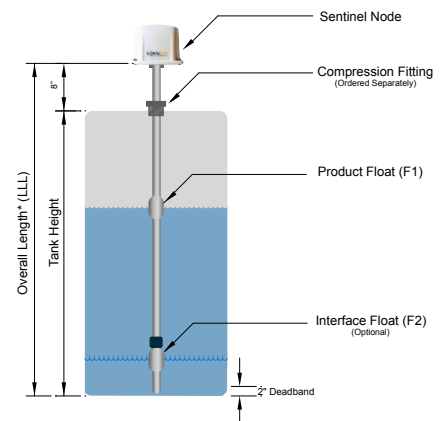
The SignalFire Tank Level Float Stick System consists of a magnetostrictive level probe mated with a Sentinel wireless node which creates a wireless link between the sensor and the Gateway. The Sentinel will take level and temperature readings, and send the data (via the SignalFire wireless mesh network) 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

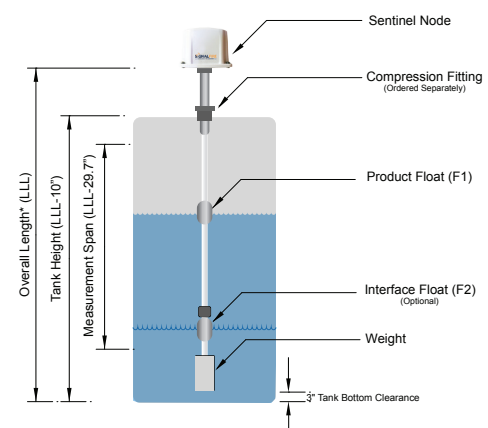
RIGID TANK LEVEL FLOAT STICK SYSTEM

Intrinsically safe wireless tank level monitoring



FLEXIBLE TANK LEVEL FLOAT STICK SYSTEM

Intrinsically safe wireless tank level monitoring



TANK LEVEL FLOAT STICK SYSTEM

Intrinsically Safe Wireless Tank Level Monitoring

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 60°C

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

ORDER CODE	DESCRIPTION
Field Monitor	Field Monitor, Battery Powered, Sleeping Client Node
Field Monitor-GW -Solar	Field Monitor, IQ4XLD Solar Powered, Gateway
Field Monitor-GW-IQ	Field Monitor, With IQ Smart Battery, Gateway. For external 10-30V power

TECHNICAL SPECIFICATIONS

Operating Temp

-40°C to 70°C

Radio Power

300 mW

Range

Up to 3+ miles (line of sight)

Humidity

0% - 100% condensing

Antenna Type

External weather resistant, omnidirectional

Networks

Up to 65,520 separate networks

Power

3 X D Lithium battery pack. Field replaceable.

Antenna Gain

5 dB

Enclosure

NEMA 4X rated

Battery Life

2-5 years depending on update rate

Receive Sensitivity

-105 dB

Internal Diagnostics

Battery voltage, signal strength, error conditions

Data Interface

SignalFire toolkit configuration utility

Frequency

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

Display

High contrast 13x26 character Monochrome LCD

ETHERNET INTERFACE MODULE

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

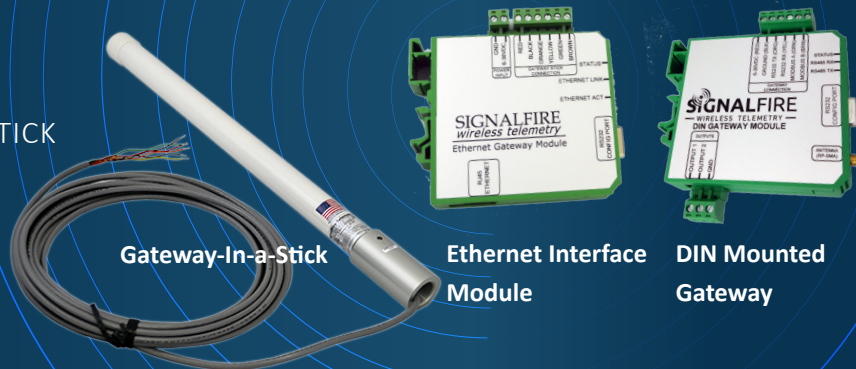
PROVIDES A MODBUS-TCP INTERFACE AND
REMOTE CONFIGURATION CAPABILITIES

EASY INTEGRATION WITH GATEWAY-IN-A-STICK
OR DIN MOUNTED GATEWAY

CONFORMAL COATED ELECTRONICS

RUGGED OIL FIELD PROVEN

LOW POWER CONSUMPTION



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

ORDER CODE	DESCRIPTION
ENET-DIN	Ethernet Interface Module for use with a Gateway-In-a-Stick or a DIN Mounted Gateway
GWS-STATICIP	Gateway-in-a-Stick with 25' cable with DIN Mounted Ethernet Interface Module
GW-DIN-STATICIP	DIN Mounted Gateway with SMA Antenna Connection with DIN Mounted Ethernet Interface Module

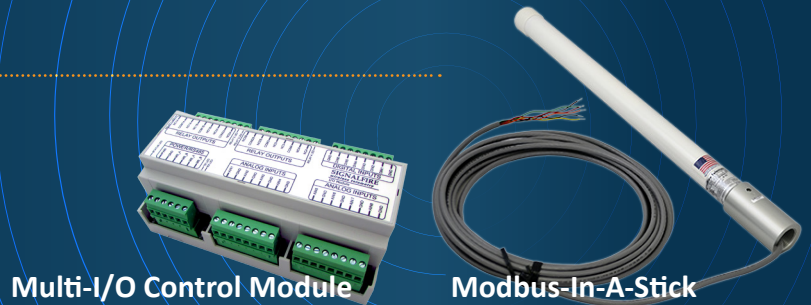
MULTI-I/O STICK SYSTEM

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

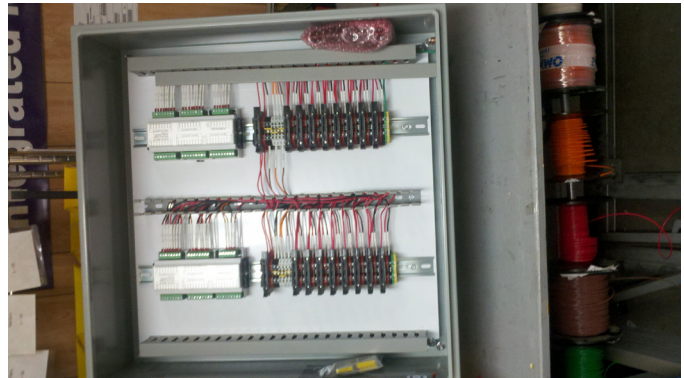


FEATURES

- 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 range
- 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

ORDER CODE	DESCRIPTION
MBS-MIOM-CBBL	Modbus-in-A-Stick with Multi Input/Output Module. 8 Analog, 6 Digital inputs, 4 Relay Outputs, 25 Ft Cable, CBBL Interface Board.
MIOM	Multi Input/Output Module. 8 Analog, 6 Digital inputs, 4 Relay Outputs.



ACCESSORIES

BATTERIES



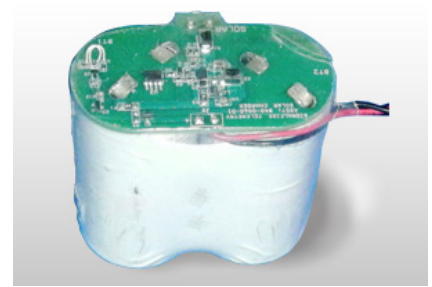
3XD Replacement Battery Pack

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



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