

## Application Note

# Getting Started with a SignalFire Wireless Telemetry System?

## OVERVIEW

At the heart of every SignalFire Wireless Telemetry System are sensors that collect data in the monitoring and control of different assets such as pumps, valves, tank levels, pipeline flow, etc. Unlike other wireless sensor control systems, SignalFire gives you the ability to choose your sensor type and brand, eliminating the expense of restocking or reconfiguring new devices when converting from a wired to a wireless automated solution. Featuring an open architecture mesh network, a SignalFire Wireless Telemetry System supports an easy configuration of different devices so you can remotely track and manage different assets.

For example, in tank level monitoring, you may prefer a radar, float ultrasonic or even a guided wave radar sensor, depending on monitored materials and environment. These and others are easily integrated into a SignalFire mesh network to ensure you have the best sensor for the application.

## QUICK START GUIDE

### *Here's How It Works*

In the architecture of our wireless sensor control system, your chosen sensor converts a physical measurement into an electronic signal that is collected by a SignalFire node and placed into a Modbus register. The node encodes this signal along with other internal Modbus registers into a SignalFire protocol, encrypts it, and transmits it over airwaves to the SignalFire Gateway. The Gateway collects all the Modbus registers from all the nodes on the network and stores them to be read by a PLC, RTU, or SCADA system.

Using a 900MHz radio network system for communications with devices, SignalFire can wirelessly send information, such as tank fluid levels or temperatures, to a PLC half a mile away without the need for expensive cable across long distances.

## Configuring a SignalFire Network

Once choosing a SignalFire Wireless Telemetry Solution to support your remote monitoring and control application, you can easily configure devices to connect to the network using our free Toolkit. The configuration is the first step before connecting sensors to the network.



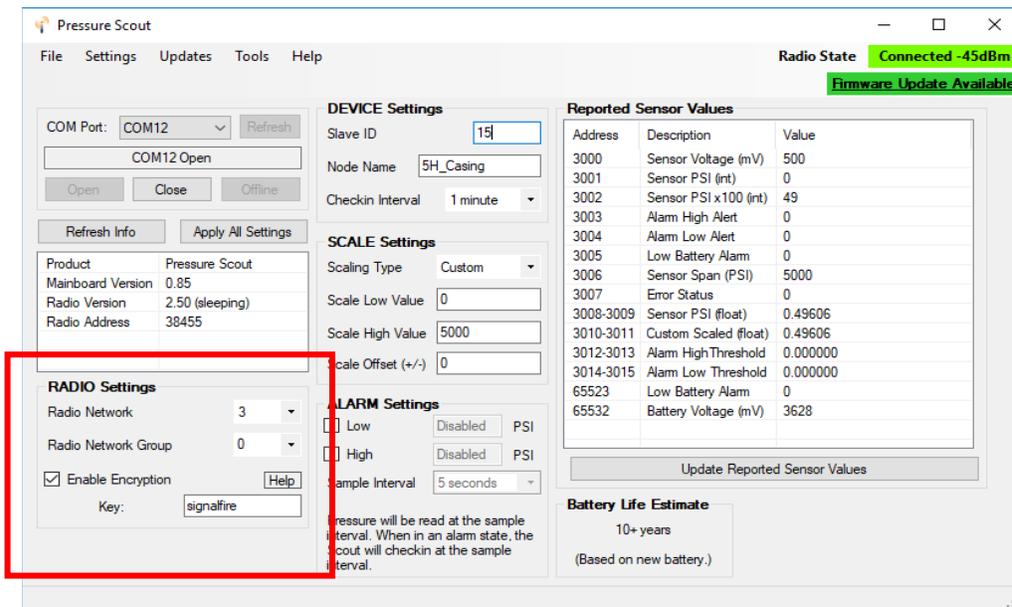
Accessible on the SignalFire website after registering for an account, this user-friendly PC application provides users with an interface to set a device's parameters, read their Modbus registers, and connect them to their network. The configuration cable converts from a user's computer USB to either a Serial DB-9 (typically for Gateway devices) or Serial 4-Pin (typically for node devices).

Once connecting the cable, it's time to set up the SignalFire network if not already established. (See Screen Image 1.)



Screen image 1: After connecting the USB Serial cable to the Gateway or the USB 4 Pin cable to the node, click Autodetect on the main page of the SignalFire Toolkit to get started.

Next, nodes are added to the network to send information from the sensors to the Gateway (see Screen Image 2). You must set their radio, radio group, and encryption key to match the same values as the Gateway. It will, then, automatically show up under the Gateway's list of nodes. From that point, nodes are very easily added or removed, simply by matching those three settings.



Screen Image 2: This screen shows the configuration of a Pressure Scout node. The steps are the same when adding any node, regardless if the node has an attached sensor as the Pressure Scout.

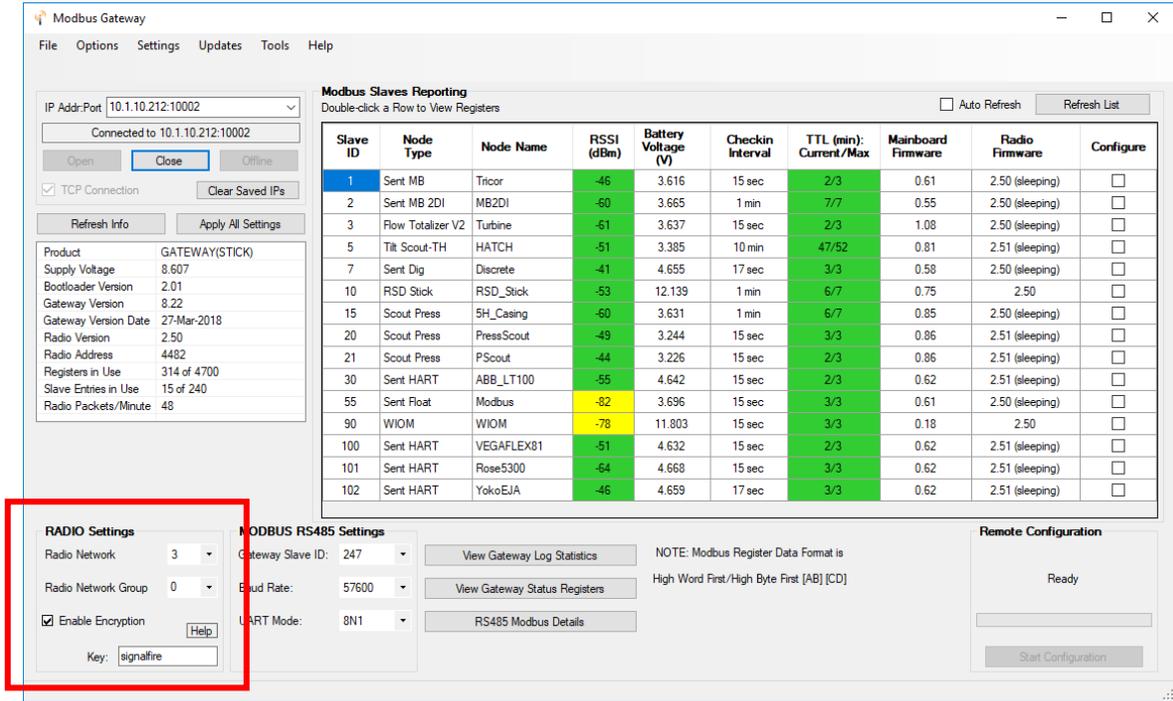
## Steps to Configure a Device into the Network

By following these steps, you can now configure your device into a network.

1. Power on the device either with the supplied battery/solar panel or line power. Note, the Gateway must be set up and powered before configuring the node.
2. Plug one end of the configuration cable into your computer's USB port and the other end into the device's configuration port, either a DB-9 or 4-pin header. Connecting the USB cable to the node is necessary every time to set the parameters that need to match the parameters of the Gateway
3. Open the SignalFire ToolKit.
4. Select the appropriate COM port and click "Auto-Detect Device on COM Port."
5. Set the desired radio network, radio network group, and encryption key.
6. Set a unique Slave ID. Nodes can be set to ID 1-240, while ID's 241-255 are reserved for Gateways.
7. For nodes, set a check-in time (by a rotary switch in A2 devices) and node name.

A Modbus master, such as PLC or RTU, can, then, poll the Gateway for any needed registers using Modbus protocol commands, either directly over RS-485 lines or through an Ethernet interface module. Modbus master can address the individual slave IDs directly, though the data is cached at the Gateway.

Double-clicking a node in the Gateway interface will pull up a list of available registers with their addresses and values. The Modbus registers can be found in the manual of a given node. You can remap node registers in the Gateway so the Modbus master can do one poll from the Gateway’s slave ID instead of multiple node registers.



**Modbus Slaves Reporting**

Double-click a Row to View Registers

Slave ID	Node Type	Node Name	RSSI (dBm)	Battery Voltage (V)	Checkin Interval	TTL (min): Current/Max	Mainboard Firmware	Radio Firmware	Configure
1	Sent MB	Tricor	-46	3.616	15 sec	2/3	0.61	2.50 (sleeping)	<input type="checkbox"/>
2	Sent MB 2DI	MB2DI	-60	3.665	1 min	7/7	0.55	2.50 (sleeping)	<input type="checkbox"/>
3	Flow Totalizer V2	Turbine	-61	3.637	15 sec	2/3	1.08	2.50 (sleeping)	<input type="checkbox"/>
5	Tilt Scout-TH	HATCH	-51	3.385	10 min	47/52	0.81	2.51 (sleeping)	<input type="checkbox"/>
7	Sent Dig	Discrete	-41	4.655	17 sec	3/3	0.58	2.50 (sleeping)	<input type="checkbox"/>
10	RSD Stick	RSD_Stick	-53	12.139	1 min	6/7	0.75	2.50	<input type="checkbox"/>
15	Scout Press	SH_Casing	-60	3.631	1 min	6/7	0.85	2.50 (sleeping)	<input type="checkbox"/>
20	Scout Press	PressScout	-49	3.244	15 sec	3/3	0.86	2.51 (sleeping)	<input type="checkbox"/>
21	Scout Press	PScout	-44	3.226	15 sec	2/3	0.86	2.51 (sleeping)	<input type="checkbox"/>
30	Sent HART	ABB_LT100	-55	4.642	15 sec	2/3	0.62	2.51 (sleeping)	<input type="checkbox"/>
55	Sent Float	Modbus	-82	3.696	15 sec	3/3	0.61	2.50 (sleeping)	<input type="checkbox"/>
90	WIOM	WIOM	-78	11.803	15 sec	3/3	0.18	2.50	<input type="checkbox"/>
100	Sent HART	VEGAFLEX81	-51	4.632	15 sec	2/3	0.62	2.51 (sleeping)	<input type="checkbox"/>
101	Sent HART	Rose5300	-64	4.668	15 sec	3/3	0.62	2.51 (sleeping)	<input type="checkbox"/>
102	Sent HART	YokoEJA	-46	4.659	17 sec	3/3	0.62	2.51 (sleeping)	<input type="checkbox"/>

**RADIO Settings**

Radio Network: 3  
 Radio Network Group: 0  
 Enable Encryption  
 Key: signalfire

**MODBUS RS485 Settings**

Gateway Slave ID: 247  
 Baud Rate: 57600  
 UART Mode: 8N1

**Remote Configuration**

Ready  
 Start Configuration

For more information or support, call SignalFire at (978)-212-2868, or email support@signal-fire.com. Our hours are 8 A.M. – 5 P.M. EST, Monday to Friday.