

Ranger Manual



The Ranger is a self-contained, device that provides sensor readings over an LTE-M1 cellular network.

- Powers attached analog (4-20mA / 1-5V) sensor and cellular modem with internal battery
- Dual digital inputs report state, total counts and input frequency. K-Factor configurable for Flow Totalizing
- SPDT Latching relay for local on/off control
- Configurable from the SignalFire Cloud website signal-fire.cloud
- SignalFire Cloud allows for data visualization, trending and alarming
- Supports MQTT Sparkplug B communication protocol for connection to other servers
- Compact and simple to install and maintain
- Local configuration and diagnostics available using the micro-USB port and the SignalFire Ranger ToolKit PC software
- Expansion modules for additional I/O (2AI/1DI, Modbus, HART, SDI-12)
- Internal backlog of a minimum of 200 datapoints (200,000 for Rangers shipped 1/27/2022 or later) in the event of loss of signal. Backlog will be automatically sent when the Ranger reconnects
- Class 1 Division 2 certified

Specifications

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Enclosure Size	7.1" tall × 4.6" diameter
Power Source	Internal Lithium battery pack (SignalFire Part Number: 4DPak) Optional solar or external DC power options also available
Temperature Rating	-40°C to +85°C
Enclosure	IP64 rated. Polycarbonate, ½" NPT fitting
SIM Slot	4FF Nano SIM card (LTE Cat M SIM and data plan required)
Local config port	Standard micro-USB connector
Analog Input	Provides 13/18V,(selectable) to attached 4-20mA / 1-5V sensor. One analog input built-in. Up to three with additional 2AI/1DI module.
Digital Inputs	Two digital inputs. Three with additional 2AI/1DI module. Dry Contact or 30 Volts Max (push-pull), 2kHz max. Capable of reporting on state change
Relay Output	Latching Relay. 2A @ 30VDC, 0.3A @ 110VDC, 0.5A @ 125VAC
Sensor Power Output	Selectable 13V/18V. 60mA max power output
Compliance	- Contains FCC ID: 2ANPO00NRF9160 and IC ID: 24529-NRF9160 - PTCRB and Verizon Network Certified - Certified for use in Class I, Division 2, Groups A, B, C, D areas. Temperature Code T5 EXi [EXi] [UL 121201:2017 Ed.9+R:26Aug2019], [CSA C22.2#213:2017 Ed.3+U1;U2] - IEC 62638-1:2014 (2nd Ed), EN 62368-1:2014+A11:2017

Model Numbers

RANGER	RANGER LTE M1 Transmitter
-4DPak/IntAnt	4 D Cell Pack, Internal LTE Antenna
-HCSolar/IntAnt	High Capacity Solar System, 9.0AH Capacity, Internal LTE Antenna
-DCDC/IntAnt	DC step down adapter 10-30Vdc to 3.3Vdc. Fits in battery compartment, Internal Ant.
-4DPak/ExtAnt	4 D Cell Pack, External LTE SMA Antenna connection. No Antenna provided
-HCSolar/ExtAnt	High Capacity Solar System, 9.0AH Capacity. External LTE SMA Connection. No antenna
-DCDC/ExtAnt	DC step down adapter 10-30Vdc to 3.3Vdc. Fits in battery compartment. External Ant.
-NONE	Standard I/O package 1AI, 2DI, 1Relay
-2AI1DI	Expansion Module. Adds 2 Analog Input and 1 Digital Input for a total of 3AI 3DI
-Modbus	Expansion Module with RS485 Modbus Serial port
-HART	Expansion Module with HART protocol interface. Supports 15 multidrop devices
-SDI12	Expansion Module with SDI protocol interface. Supports 8 multidrop devices
-NoSIM	No SIM Card. No SignalFire Cloud. User provides LTE CAT M1 SIM Card
-SIM/VZ	VERIZON LTE CAT M1 SIM - 1 Year Data Plan, SignalFire Cloud Connectivity
-SFCloud	No SIM Card. 1 year SignalFire Cloud. User provides LTE CAT M1 SIM Card

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Hazardous Location Certification

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The Ranger is rated Class 1 Division 2 non-incendive when powered by its internal battery pack or its internal DC-DC converter. The HCSolar unit is not C1D2 certified so it is for general purpose areas only.



WARNING: EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE COMPONENTS UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.

AVERTISSEMENT : RISQUE D'EXPLOSION . NE PAS RETIRER OU REMPLACER LES COMPOSANTS QUE L'ALIMENTATION EST DÉBRANCHÉ OU ZONE EST LIBRE DE CONCENTRATIONS IGNITIBLE.



WARNING – EXPLOSION HAZARD Substitution of components may impair suitability for Class I, Division 2

AVERTISSEMENT - RISQUE D'EXPLOSION. La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de classe I, division 2



WARNING – EXPLOSION HAZARD Do not disconnect while circuit is live unless area is known to be nonhazardous

AVERTISSEMENT - RISQUE D'EXPLOSION. Ne débranchez pas lorsque le circuit est en direct , sauf si la zone est connue pour être nonhazardous



WARNING – All wiring methods must be in accordance with the NEC

AVERTISSEMENT - Toutes les méthodes de Essorez doivent être en conformité avec la NEC



WARNING - EXPLOSION HAZARD. Do no remove or replace while circuit is live unless the area is free of ignitable concentrations.

AVERTISSEMENT - RISQUE D'EXPLOSION. Ne pas enlever ou remplacer pendant que le circuit est vivant à moins que la zone soit exempt de concentrations ignitibles.



WARNING – EXPLOSION HAZARD. Do not remove or replace lamps, fuses or plug-in modules (as applicable) unless power has been disconnected or the area is free of ignitable concentrations.

AVERTISSEMENT - RISQUE D'EXPLOSION. Ne retirez ni ne remplacez les lampes, les fusibles ou les modules enfichables (le cas échéant) à moins que l'alimentation ait été coupée ou que la zone soit exempte de concentrations inflammables.

Connections and Components

STATUS LED

- The STATUS LED (green) will flash 3 times on a successful data transmission to the server

ERROR LED

- The ERROR LED (red) will blink 3 times to indicate that an attempted data transmission failed

Check-in Button

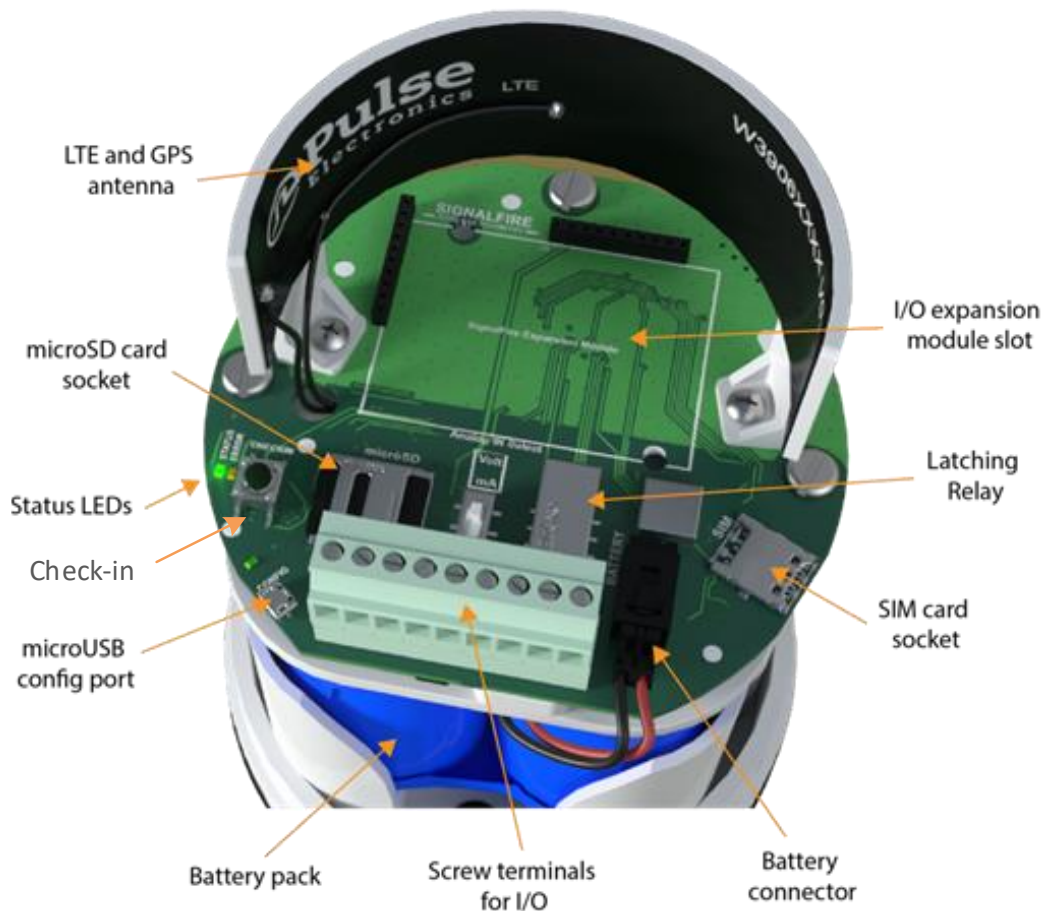
- If this button is pressed the Ranger will blink the Green or Red status LED 3 times to indicate the status of the last transmission to the server. If the Checkin button is pressed and held for more than 1 second, the Ranger will take readings from the attached sensors and send the readings to the server.

MicroSD Card Slot

- The MicroSD card is for future use, it is not yet implemented and should not be installed

SignalFire Expansion Module

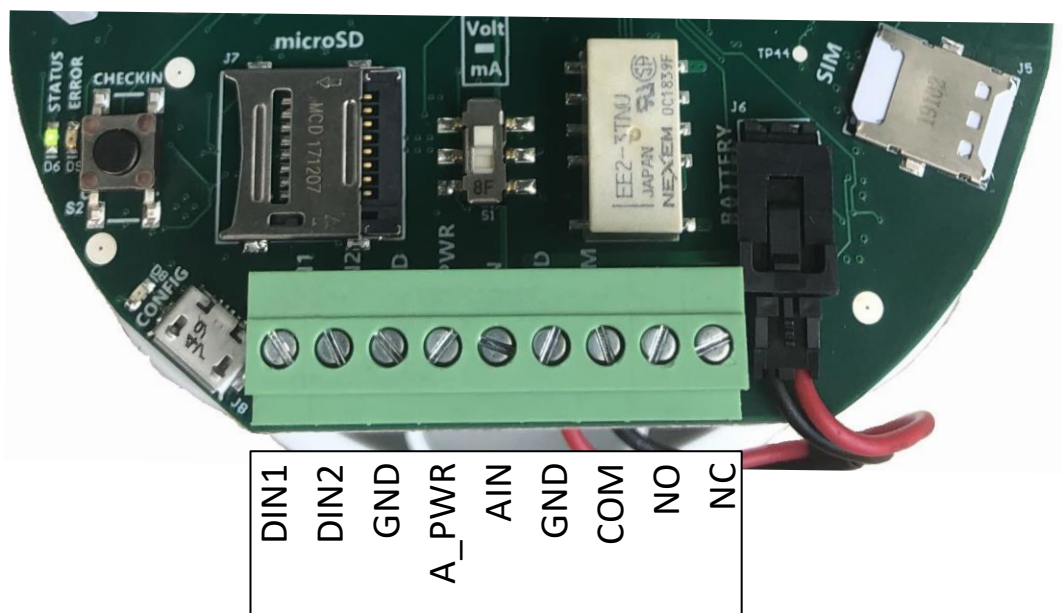
- The SignalFire Expansion Module slot is used for additional sensor support. Available expansion cards are 2AI/1DI, Modbus, and HART.



Ranger Internal components

Sensor Connections

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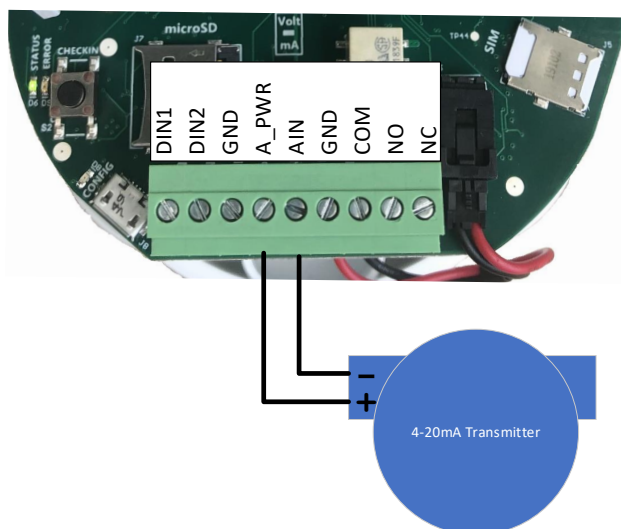


Screw Terminal Connections

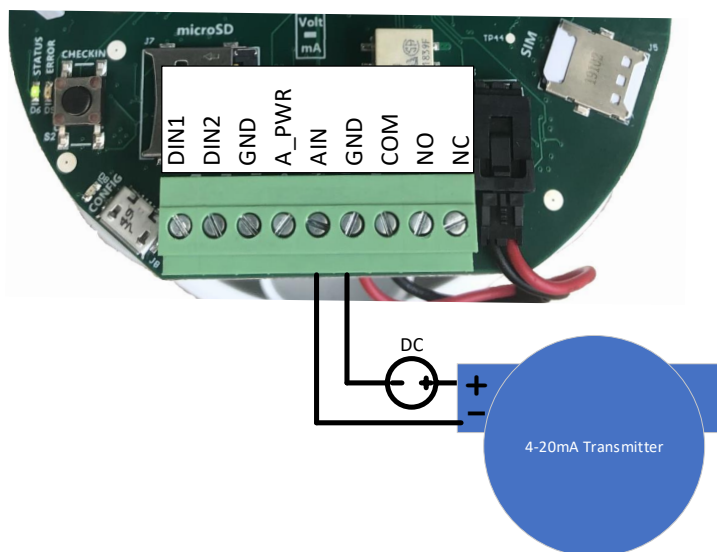
Analog Input

The analog input provides 13V/18V (selectable in software, see page 11) to the attached sensor. The analog input can operate in either current (4-20mA), or voltage (1-5V). The input mode must be set by the slide switch. Slide the switch up to **Volts** for a voltage input, or down to **mA** for a current input.

4-20mA Wiring Diagram

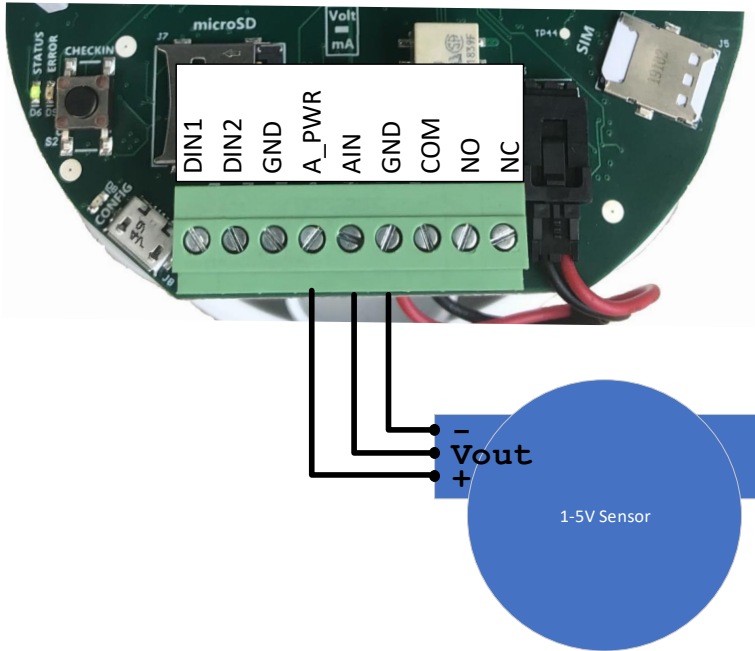


Sensor powered by Ranger



Sensor powered by external source

1-5V Wiring Diagram



Digital Inputs

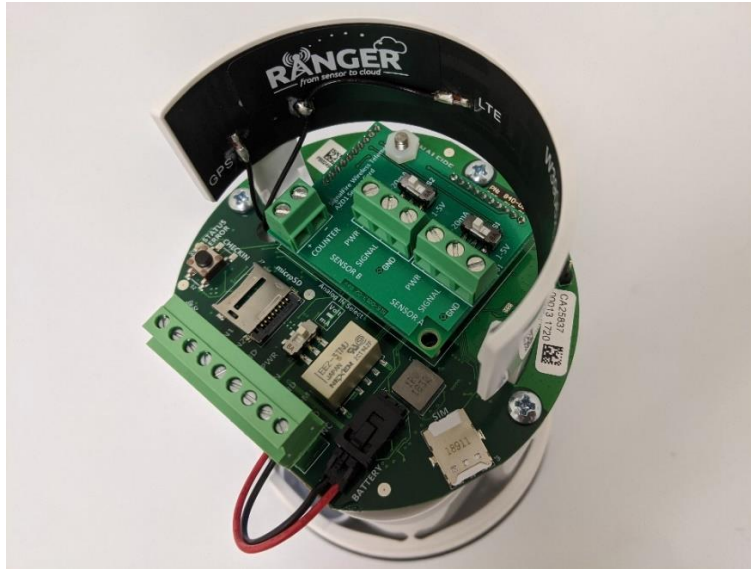
The digital inputs (2 total) can be dry contact or voltage (must be push-pull, 30 Volts max). Be sure to connect the ground bus from the module to either the ground of the voltage pulse device or the dry contact.

Relay Output

The Ranger has a single latching SPDT relay which may be controlled remotely from the server or by using the Ranger's internal relay control logic

Expansion Cards

The Ranger has the option of being ordered with daughter cards to expand the I/O capabilities. Currently, four expansion cards are offered: the 2AI/1DI, Modbus, HART and SDI-12 cards. If the expansion cards are installed separately after first purchasing the Ranger without them, the expansion cards must be enabled using the Ranger ToolKit.



Ranger with a 2AI/1DI installed

2AI/1DI

The 2AI/1DI card provides the Ranger with two (2) additional analog inputs, and one (1) additional digital input.

These inputs operate the same as the analog and digital inputs of the base model. The analog inputs can be set to 4-20mA mode or 1-5V mode via onboard switches. When installed, additional input configuration tiles will become available on the unit's SignalFire Cloud configuration page. An optional junction box provides for easy wiring to multiple sensors.

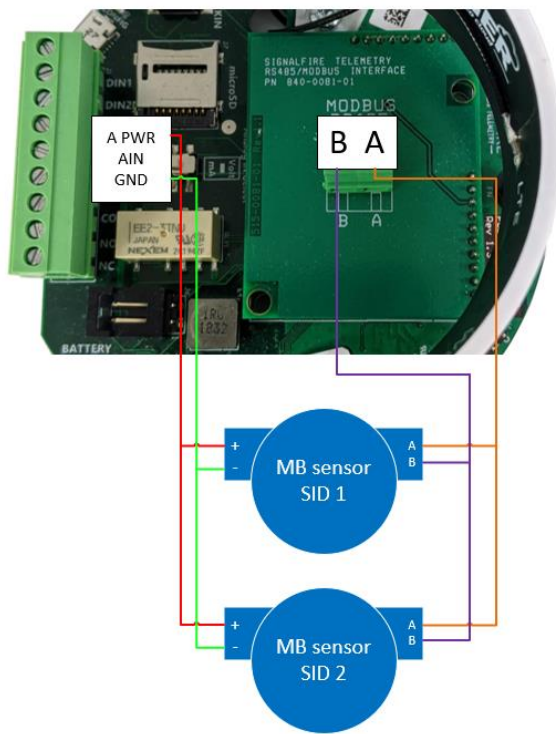
Modbus RS-485

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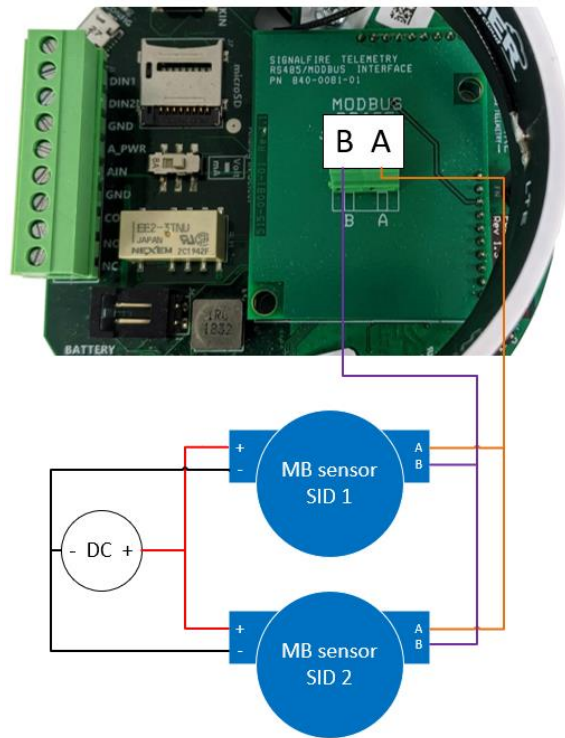
The Modbus card provides the Ranger with the ability to read a Modbus sensor over two-wire RS-485. Follow the diagram below for wiring the Modbus expansion card to a sensor. Sensors can be powered off the Ranger's onboard analog sensor power output. Like the analog sensor, its voltage is set in the Ranger configuration tile (see page 11). The Ranger can provide up to a total of 60mA at 18V for all attached sensors. If more power is needed, or to conserve battery life, it is recommended the sensors be powered with an external DC source. Follow the wiring diagram below for integrated and externally powered options.

The attached sensors need to each have a unique Modbus ID.

RS-485 Wiring Diagram



Sensor powered by Ranger



Sensor powered by external source

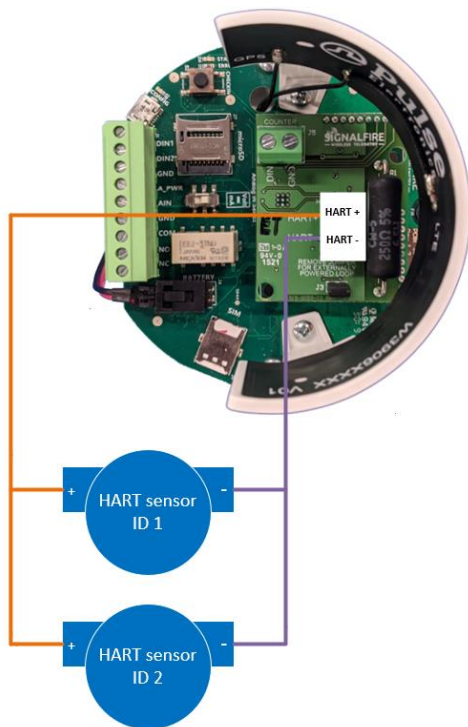
The HART card provides the Ranger with the ability to power a HART transmitter and read its variables. The HART sensor should be wired to the Ranger's HART terminals as shown below. Note that the HART card also has 1 digital input available.

The system can supply up to 18V to the sensors and then read the HART data from each sensor. Due to the 250Ω series resistance, every additional sensor will draw 4mA in multi-drop mode, dropping the output voltage by 1V. For example, if 4 HART devices are connected the total loop current will be 16mA, resulting in 4V being dropped across the 250Ω load resistor in the SignalFire node. If the Ranger is configured to output 18V, this leaves 14V available to power the sensors.

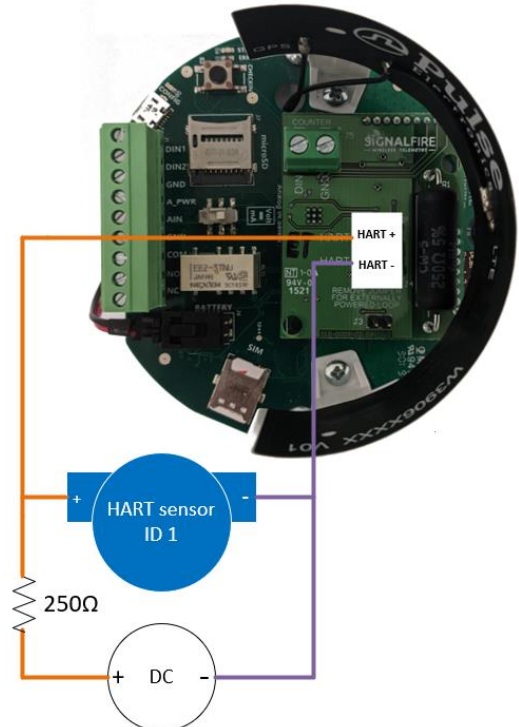
If using an external power source, remove the jumper from the HART card. It is recommended to place a 250Ω resistor in series with the source unless the supply already has a series resistor, to ensure proper HART communication across the bus. It is up to the operator to ensure that the resulting voltage of the source minus the drop across the series resistor meets the minimum voltage requirements of all attached sensors.

The attached sensors need to each have a unique HART ID. If their ID's have not been set up before connecting, they can be set up through the Ranger ToolKit.

HART Wiring Diagram



*Sensor powered by Ranger.
Jumper is on.*



*Sensor powered by external source.
Jumper is off.*

SDI-12

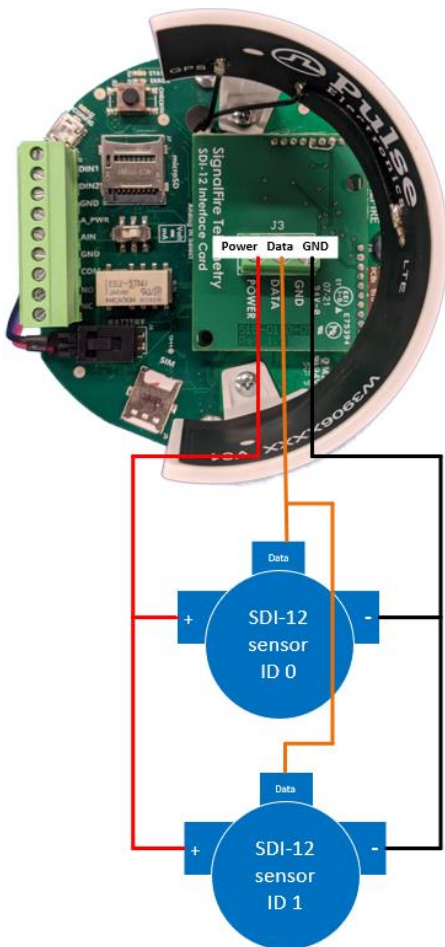
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The SDI-12 card provides the Ranger with the ability to read from SDI-12 sensors. The SDI-12 bus contains three lines, Power (12V), Data, and GND. Across multiple sensors, these three lines must be connected in parallel, such that all the Power lines are connected together, the Data lines are all connected together, and GND lines are connected together.

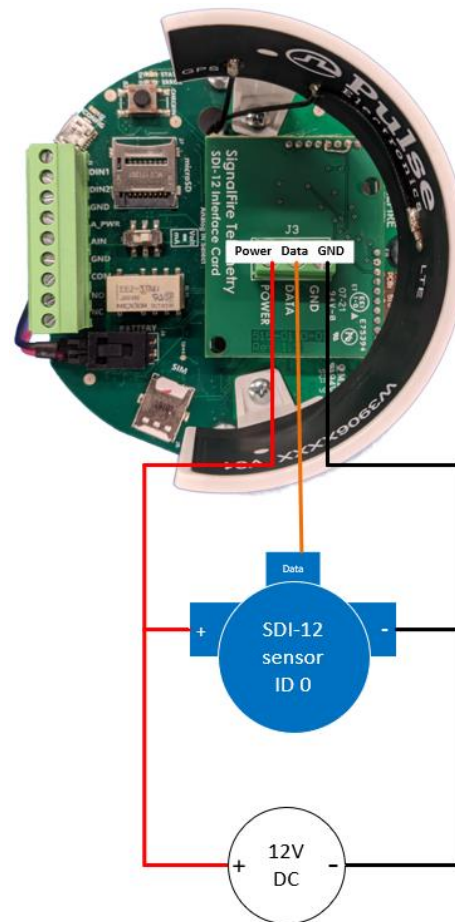
If the Ranger is powering the sensors, it can provide up to 60mA at 12V for all attached sensors. It is up to the operator to ensure this limit is not exceeded. If the sensors are powered externally, the Power terminal of the SDI-12 card must still be connected to the positive power terminal of each sensor and the external voltage source.

The attached sensors need to each have their own unique SDI-12 ID. If their ID's have not been set up before connecting, they can be set up through the Ranger ToolKit.

SDI-12 Wiring Diagram



Sensor powered by Ranger



Sensor powered by external power supply. Positive terminals connected

Lithium Battery Pack (4DPak)

The internal lithium battery pack is the default power source for the ranger, simply plug the battery pack into the Ranger PCB battery connector to power the Ranger on.

DC-DC converter

In situations where DC power is available, the Ranger can be ordered with an internal DC-DC converter that accepts 9-36VDC from an external source. The DC-DC converter is installed in the battery compartment of the Ranger and has a pigtail cable to connect to the Ranger PCB. Simply connect your DC power source to the "GND" and "Vin" screw terminals on the converter to power on the system.

HC-Solar System

SignalFire offers a solar system that consists of a bracket containing a solar panel and integrated battery and solar charger assembly. The solar system is connected to the Ranger PCB using the battery connector.

Internal Lithium Battery Replacement

Battery Packs can be changed with the node in place.

1. Unscrew the cover from the base.
2. Unplug the battery from the PCB, by depressing the locking clip on the connector.
3. Loosen the three screws that attach the circuit board assembly to the base. **Do not remove the two screws that attach the antenna assembly**
4. Remove/replace battery
5. Re-install circuit board assembly. Do not overtighten the screws
6. Connect the battery to the main PCB battery connector.
7. Install the enclosure cover.

Devices purchased with the SignalFire Cloud service come with a pre-installed SIM card. Customers will require a login to access the SignalFire Cloud server (signal-fire.cloud). Fill out the request form here: <https://signal-fire.com/lte-m1-cellular-products/cloudregister/> to setup your company site.

Adding the Ranger to your SignalFire Cloud Group

1. Plug in the battery so the Ranger can connect to the cellular network
2. Verify that the Ranger is connected to the cellular network by pressing the "CHECKIN" button on the device and observe 3 strobes of the green status light.
3. Login to the SignalFire Cloud with your account login/password
4. From the Home page click "Add Device"
5. Enter the Ranger serial number and click "Claim". The serial number is located on the bottom of the Ranger with a format of "RA" followed by 6 numbers. (e.g. RA123456)
6. A message will be sent to the Ranger to claim it to your group account
7. Within approximately one minute the device will connect to your account, and you will be automatically redirected to the device status page

Mounting and Care

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The Ranger unit comes with an integrated ½" NPT fitting with leads for connection to the sensors. It is important to mount the Ranger so it is vertically oriented with the NPT fitting facing down.

Junction Box

The Ranger can also be purchased with a junction box to make wiring more convenient. Shown below are the Ranger and Junction Box assembled, as well as the interior of the junction box. The inside cover of the junction box contains a wiring color-code guide.

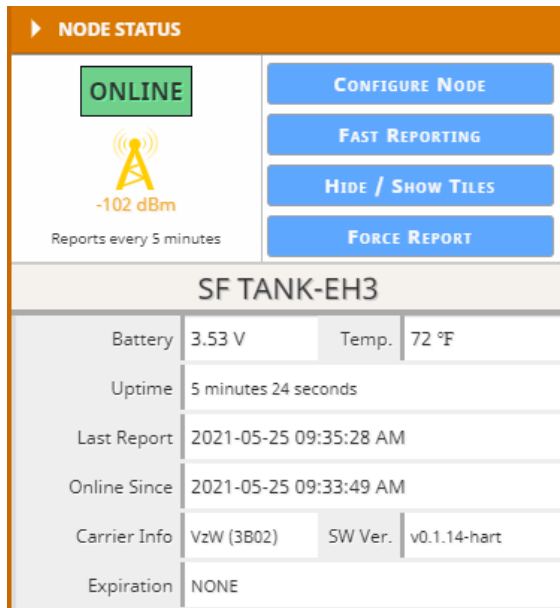


Ranger Settings

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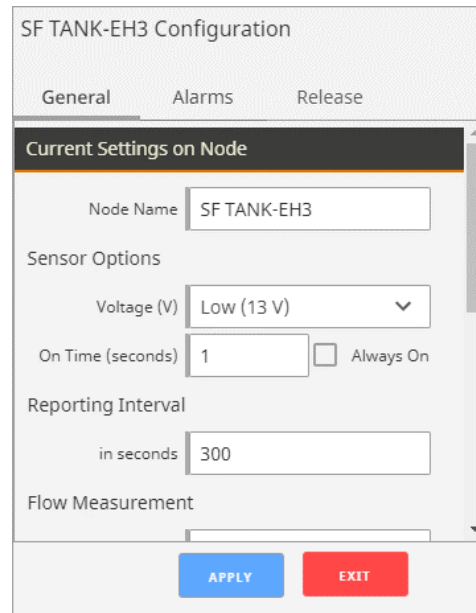
Select a Ranger from the list on the Home tab to see the device status, sensor readings and settings. The detail display is organized as a “tile” view with each tile representing a specific input or function. Each tile with configurable settings has a “Configure” button that will bring up the related settings.

Node Status Tile



The Node Status tile for SF TANK-EH3 displays the following information:

- Node Status:** ONLINE (indicated by a green box and a signal icon).
- Signal Strength:** -102 dBm.
- Reporting Interval:** Reports every 5 minutes.
- Configuration Buttons:** CONFIGURE NODE, FAST REPORTING, HIDE / SHOW TILES, and FORCE REPORT.
- Node Name:** SF TANK-EH3.
- Sensor Readings:**
 - Battery: 3.53 V
 - Temp.: 72 °F
 - Uptime: 5 minutes 24 seconds
 - Last Report: 2021-05-25 09:35:28 AM
 - Online Since: 2021-05-25 09:33:49 AM
 - Carrier Info: VzW (3B02)
 - SW Ver.: v0.1.14-hart
 - Expiration: NONE



The SF TANK-EH3 Configuration screen shows the following settings:

- General Tab:**
 - Node Name:** SF TANK-EH3
 - Sensor Options:**
 - Voltage (V): Low (13 V)
 - On Time (seconds): 1 (with an Always On checkbox)
 - Reporting Interval:** 300 in seconds
 - Flow Measurement:** (empty field)
- Buttons:** APPLY and EXIT.

The Node status tile contains general information about the ranger and allows setting the Ranger system parameters.

Force Report

Causes the Ranger to take a new sensor reading and send the data to the server on its next “ping” interval. This can take up to 40 seconds.

Node Name

The Node name is a user configurable string used to easily identify the Ranger.

Report Interval

The setting controls the interval at which the Ranger will apply power to the attached sensor and forward the sensor readings to the Cloud. Clicking on “Settings” will open up the Fast Reporting Interval window.

FAST REPORTING TRIGGERS			
Current Settings on Node			
Metric	Value	Comparison	Threshold
AIN1	-0.02	>	8
None	0	N/A	0
None	0	N/A	0
None	0	N/A	0
FAST REPORTING SETTINGS			
Fast Reporting is	Enabled	Current State:	Inactive
Trigger when	Any Fast Reporting triggers are TRUE		
Remain Fast Reporting	for Fast Reporting Duration		
Fast Reporting Duration (seconds)	3,600		
REPORT SETTINGS USED WITH FAST REPORTING			
Report Interval (seconds)	60	Sensor On Time (seconds)	-1 ☒ Always On

The Ranger can be configured such that if certain inputs cross a threshold, the Ranger will temporarily update at an increased rate. Fast Reporting can trigger when one or all conditions are met and can stay on for the entire time the input(s) are above the threshold, or a set time. In the above example, if Analog Input 1 goes above 8mA, the Ranger would begin reporting its sensor values every 60 seconds, for 3,600 seconds (1 hour).

Sensor Voltage

Sets the output voltage applied to the analog sensor output. It is user configurable to 13V or 18V.

Sensor on Time

Configures the amount of time the Sensor Voltage is applied to the sensor prior to taking the reading. This needs to be long enough for the attached sensor to power on and stabilize, but should be minimized to optimize battery life. **If the Ranger is not powering a sensor or if the sensor is powered externally, set this value to 0.**

Flow Measurement

By default, the digital inputs report input state (open/closed) and input frequency. Optionally one or both digital inputs can be configured for Flow Measurement Mode. This is used for connection to a flow meter with a pulse output and allows the user to configure a pulse k-factor and see the flow rate and total in volume units.

The analog inputs can also be used for flow measurement, where a current/voltage corresponds to a flow rate. The Ranger can sample the analog input at the report time only and do a rough approximation of a flow total by assuming that the flow rate stays constant between report samples. Note that there will always be some inaccuracy when using an analog input for flow totalization. A digital pulse is recommended whenever possible for best accuracy and low power operation.

The Alarm Group ID

This defines which alarm group will receive alarms from this device. Each user configured in the Users tab can be assigned an alarm group number. Any users with a matching alarm group will receive alarms from this Ranger. Multiple alarm groups may be entered separated by commas and all groups entered will receive alarms.

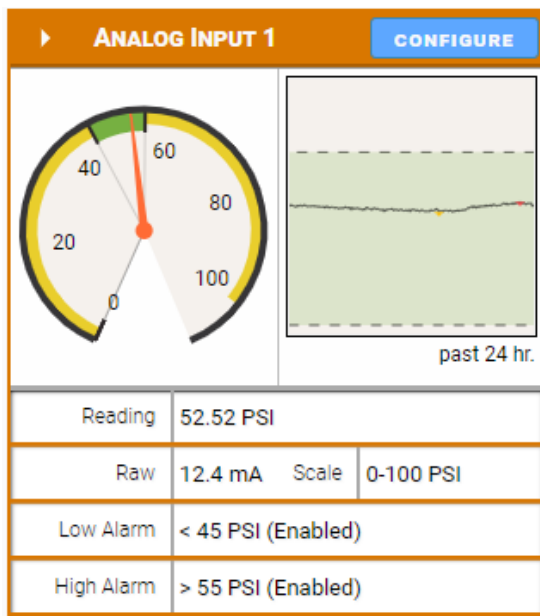
Offline Alarm

The Ranger will send an alarm if the device is offline for more than the configured 'Offline Threshold' setting.

Release

If the Ranger has been added to the wrong group and needs to be claimed under a different group, the Ranger can be released through the Release tab of the "Configure Node" window.

Analog Input Tile



The Analog Input 1 Settings window shows the following configuration options:

- General Tab:**
 - Analog Mode: V
 - Scale Units: PSI
 - Scale Low: 0
 - Scale High: 10,000
- Buttons:** APPLY (blue), EXIT (red)

The Analog input tile displays the details for the analog input, including scaling and alarms. If the 2AI/1DI expansion card is installed, "Sensor A" and "Sensor B" on the card will appear as their own Analog Input 2 and Analog Input 3 tiles, respectively.

Analog Mode

This will display the input mode (4-20mA or 1-5V) that is set by the slide switch on the Ranger.

Scale Units

This is a user definable string to identify the engineering units.

Scale Low / Scale High

The scaling allows the user to span the analog sensor. The Scale low is the sensor value at 4mA/1V and the Scale High is the sensor value at 20mA/5V.

Alarm Thresholds

The analog input supports a high and/or low alarm threshold. This threshold is configured using the scaled engineering units. If the configured threshold is crossed and the alarm is enabled, a SMS and/or email message will be sent to each user in the alarm group of the Ranger.

Digital Input Tile

DIGITAL INPUT 1
CONFIGURE

CLOSED

State
Count

past 24 hr.
Average Frequency

Count	4
Avg. Freq.	0 Hz
Inst.	0 Hz
State Alarm	Alarm on CHANGE (Enabled)
Debounce	10 ms
Report On Change	Enabled

Digital Input 1 Settings

DIN Alarms Display

Current Settings on Node

Reset Counter ☐

Report On Change ☒

Debounce Delay (ms) 0

APPLY EXIT

There is a Digital Input tile for each of the two digital inputs, unless they are configured for Flow Mode. If the 2AI/1DI expansion card is installed, it will appear as its own Digital Input 3 tile.

Reset Counter

Selecting this check box and click apply will zero the input cycle count.

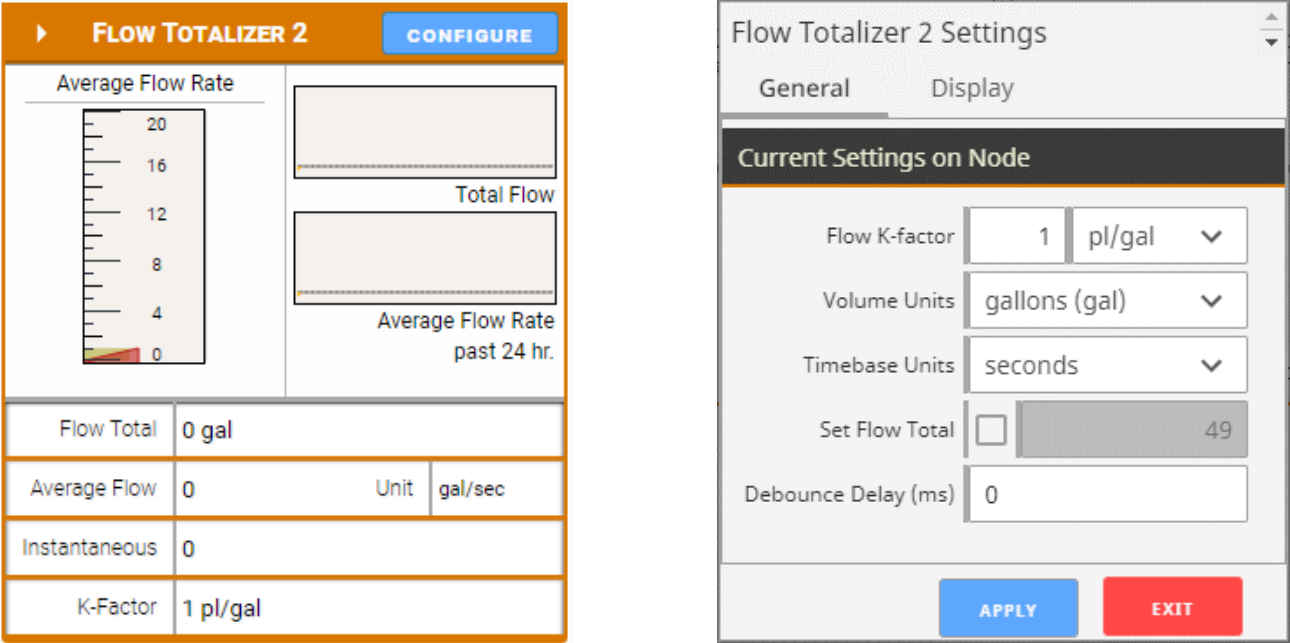
Report on Change

If selected, the Ranger will report any changes on state of the input to the Cloud within 2-seconds rather than waiting until its next scheduled report.

DIN Alarm

The Ranger can send an alarm when the DIN opens, closes or on any change.

DIN Flow Totalizer Tile



If a digital input is configured for Flow Mode, the flow totalizer tile will replace the default Digital Input tile. When in flow mode the Ranger will display the flow rate and total flow volume. The Average Flow is the average flow rate over the configured Ranger Report Interval, while the Instantaneous Flow rate is the flow rate calculated over the 2 seconds immediately before the report.

Flow K-Factor

Enter the number of pulses per unit volume that the flow meter outputs. The volume pulse units can be selected.

Volume Units

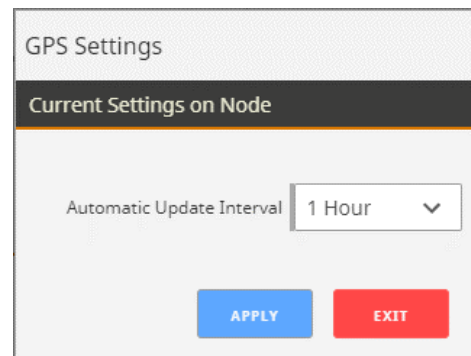
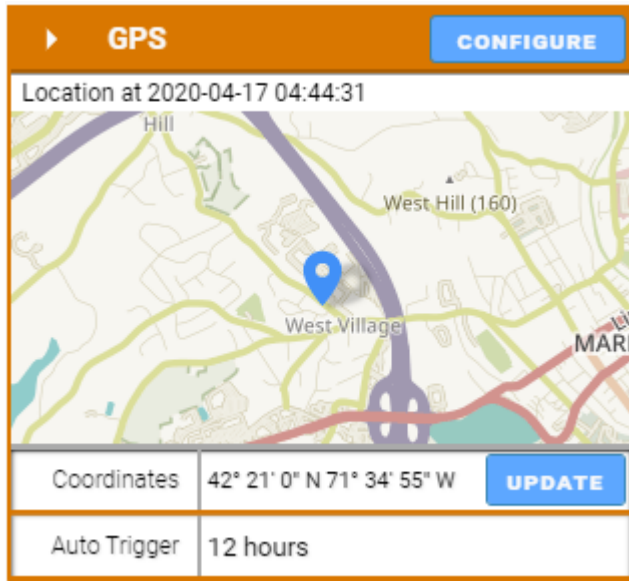
The Volume Units is used to select the volume units to use to for the flow rate and total volume calculations.

Timebase Units

The Time base units select the time units for the flow rate calculations.

Set Flow Total

This allows the user to set or reset the total volume measured. Click the checkbox then enter the volume.



The Ranger has an internal GPS receiver/antenna to provide location data to the server. The Ranger requires a clear view of the sky for the GPS functionality. GPS will often not work inside even if the Ranger is near a window.

A GPS update may be triggered on demand, or an automatic location update interval between 1 and 12 hours can be configured. For an on-demand location update, click the "UPDATE" button. Note that an initial "cold" GPS fix may take up to 5 minutes.

While the GPS receiver is active commands sent to the Ranger may take up to 80 seconds to be delivered.

DIGITAL OUTPUT 1 (DOU1)

CONFIGURE

○ OPEN

Toggle State: ☐

past 24 hr.

RELAY CONTROL

Failsafe Timer Disabled

Digital Output 1 Settings

GeneralDisplay

Current Settings on Node

Failsafe Timer Disabled

APPLYEXIT

The relay output can be toggled by setting the Toggle State switch. The command will reach the Ranger on its next “ping” interval which can take up to 40 seconds. The Toggle State switch will change to blue and the OPEN/CLOSED indicator will change once the message has reached the Ranger.

The relay output also has an optional failsafe timer. If this is configured, the relay will go to the open (failsafe) state if the Ranger loses connection to the server for the configured time.

Relay Control

The digital output on the Ranger can be configured to energize and de-energize based on its other inputs. This control logic is run locally in the Ranger and does not depend on cellular connectivity. First, the “Relay Control” field should be Enabled. The trigger logic can be entered by specifying which input to control the relay from, and then specifying which values of that input energize and de-energize the relay.

If the relay is being triggered from multiple inputs, the user can select whether all the triggers need to be true (Boolean AND), or any of the triggers need to be true (Boolean OR). The Minimum Energize Time field determines the amount of time the relay, once energized, will stay on even if the de-energize condition becomes true.

RELAY CONTROL TRIGGERS: SF TANK-EH3

APPLYEXIT

Current Settings on Node

Metric	Value	Energize When	Threshold	De-energize When	Threshold
DIN1	0	=	0	=	1
DIN2 Avg Hz	0	>	20	<=	18
None	0	N/A	0		0
None	0	N/A	0		0
None	0	N/A	0		0
None	0	N/A	0		0
None	0	N/A	0		0
None	0	N/A	0		0

RELAY CONTROL SETTINGS

Relay Control is EnabledCurrent State: Active

Energize Relay when Any Relay Control triggers are TRUE

Minimum Energize Time (seconds) 1

Failsafe Enabled (Missing Source data sets trigger to de-energize)

MODBUS

CONFIGURE

Passing / Total Reads:

32

Polled Devices:

Enabled Alarms:

Baud Rate

9600

Mode

8N1

Request Delay

0

Response Timeout

1000

If the Ranger has the Modbus expansion card installed, users can configure the Ranger to read Modbus registers from any attached sensors. To set the RS-485 communication parameters and configure Modbus reads, click on the “Configure” button on the Modbus tile.

MODBUS SETTINGS

APPLY

EXIT

Current Settings on Node

Baud

57600

Serial Mode

8N1 (8 Data Bits, No ...

Byte Order

ABCD (High word, Hi...

Request Delay

0

Response Timeout

1,000

REGISTERS: 5

DELETE ROWS

APPLY

	Tag Name	ID	Address	Type	Unit	Access	
0.	Density	1	248	INPUT FLOAT	Lbs/Gal	Read Only	
1.	Temperature	1	250	INPUT FLOAT	DegF	Read Only	
2.	Vol_ Flow Rate	1	252	INPUT FLOAT	GPM	Read Only	
3.	Vol_ Batch Total	1	260	INPUT FLOAT	Gallons	Read Only	
4.	Volume Grand Tot	1	264	INPUT FLOAT	Gallons	Read Only	

Use the top portion of the menu to configure communication parameters. These settings must match all the sensors on the RS-485 multidrop network. The default configuration is shown in the figure above.

The Ranger can read up to 32 datapoints from up to 8 connected devices. To add a new register read, click on the ‘+’ button. Each line needs to be specified with a Tag Name, and point to a Modbus Slave ID, register type, register address, register data type (INT16, UINT16, INT32, UINT32, INT64, UINT64, FLOAT, DOUBLE, or BIT), and read/write access. The register can also be tagged with units if needed. Click Apply to send the changes to the Ranger.

The Ranger can read individual bits of a 16-bit register. This can be useful for bitmask registers where each bit position represents a flag/status alarm. To select the bit, change the Type to "Bit Pos" and then the bit position number. Bit Pos 0 reads the Least Significant Bit, and Bit Pos 15 reads the Most Significant Bit of a 16-bit register.

To select lines for deletion, click on the trash can icon at the end of each line, and then click on the "Delete Rows" button to delete all the rows selected.

Once the registers have been set up as desired and applied, click "Exit" to return to the Ranger's main page. The registers and their values will appear in a table below, where they can be organized in ascending or descending order by clicking on each header. The Modbus register configuration can also be done locally using the Ranger ToolKit.

MODBUS REGISTERS CONFIGURE								
Tag Name	Value	Units	Status	Alarm Low	Alarm High	Configure	Enable View History	Enable Custom Tile
Density	0.001 Lbs/Gal	Lbs/Gal	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☐
Temperature	69.112 DegF	DegF	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☒	☐
Vol_ Batch Total	0 Gallons	Gallons	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☐
Vol_ Flow Rate	0 GPM	GPM	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☐
Volume Grand Tot	91,164.875 Gallons	Gallons	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☐

Clicking on the slider for "Enable View History" will add that register to the historical data view at the bottom of the page. Clicking on "Modify" will bring a pop-up to configure alarms, or to do a register write to set a Modbus value in a register. Every register can be individually set up with Low and High alarm thresholds. Click "Apply" to save alarm settings for each register.

Clicking on the slider for "Enable Custom Tile" will make that metric viewable as a tile similar to the analog and digital inputs.

FLOAT 1 APPLY

Current Settings on Node

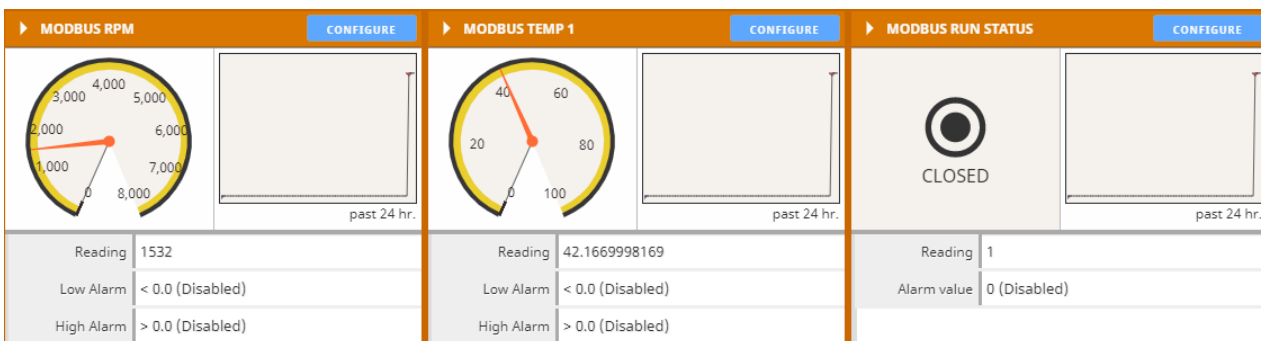
Register Value: 700.553100

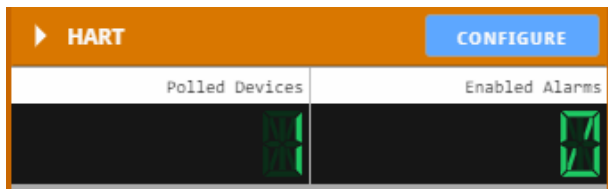
ALARMS APPLY

Current Settings on Cloud

Low Alarm Threshold: 0 Disabled

High Alarm Threshold: 0 Disabled





The 'Configure HART IDs' dialog box has an orange header with 'HART', 'APPLY', and 'EXIT' buttons. It displays 'Current Settings on Node' and a table to configure HART IDs. The table has 16 rows (IDs 0-15) and 4 columns. ID 1 is selected with a blue checkmark.

Configure HART IDs			
0	☐	1	☒
2	☐	3	☐
4	☐	5	☐
6	☐	7	☐
8	☐	9	☐
10	☐	11	☐
12	☐	13	☐
14	☐	15	☐

If the Ranger is configured with a HART expansion card, the HART tile will show up on its Cloud page. Clicking “Configure” on the HART tile will open a window that allows you to choose which devices the Ranger will read from by HART ID.

As per HART protocol, the Ranger can read one device at HART ID 0, or up to 15 devices in multi-drop mode addressed 1 through 15. Note that if the Ranger is supplying power, each sensor requires an additional 4mA, and will drop the output voltage by 1V. The Ranger cannot supply more than 60mA total to all connected sensors (including 4-20mA/1-5V analog).

Once the Ranger is set up to read HART transmitters, their variables will appear above the trend graph as shown below.

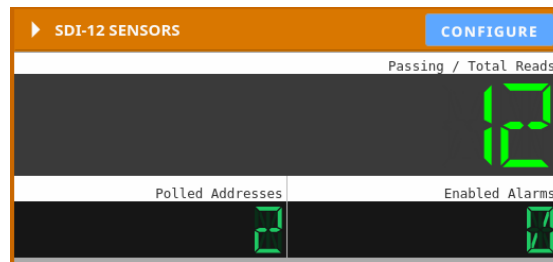
HART VARIABLES								CONFIGURE
Metric	Value	Status	Alarm Low	Alarm High	Configure	Enable View History	Enable Custom Tile	
HART 1 Primary Variable	63.849 %	✓ Passing	60.0 (DISABLED)	99.0 (DISABLED)	MODIFY	☐	☒	
HART 1 Secondary Variable	11.857 ft	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☒	
HART 1 Tertiary Variable	28 dB	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☒	
HART 1 Quaternary Variable	72.126 °F	✓ Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY	☐	☒	

Clicking on the slider for “Enable View History” will add that variable to the trend graph. Clicking on “Modify” will create a pop up that allows the user to set a custom name, and trigger alarms from that variable.

The 'HART 1 PRIMARY VARIABLE' configuration dialog box has an orange header with 'HART 1 PRIMARY VARIABLE' and 'EXIT' buttons. It contains several sections:

- Metadata:** Mfc. (VEGA Grieshaber KG), ID (1), Variable (Primary), Units (ft), Tag (SENSOR).
- ALARM CONFIGURATION:** Includes 'APPLY' button and 'Current Settings on Cloud' for Low Alarm Threshold (0, Disabled) and High Alarm Threshold (0, Disabled).
- DISPLAY:** Includes 'APPLY' button and 'Current Settings on Cloud' for Name (HART 1 Primary Variable) and Short Name (HART1 PV).

SDI-12 Tile



If the Ranger is configured with the SDI-12 expansion card, the SDI-12 tile will appear on its Cloud page. Click on "Configure" to set up the values for the Ranger to read. To add a line, click on the "+" button, and specify the value name, sensor address, SDI-12 request, and which position of the response to read in. To remove a line, click on the trash can icon followed by clicking "Delete Rows". Hit Apply to set the lines, and the Ranger will begin reading the values specified in the table.

SDI-12 SETTINGS

EXIT

READINGS: 12

DELETE ROWS

APPLY

	Tag Name	Sensor Address	Measurement Request		Value Position	Unit	+
0.	Press_0	0	M!	▼	1	psi	
1.	Temp_0	0	M!	▼	2	°C	
2.	Voltage_0	0	M!	▼	3	V	
3.	Comp_DH_Press_0	0	M5!	▼	1	psi	
4.	Comp_DH_Temp_0	0	M5!	▼	2	°C	
5.	Comp_Surf_Temp_0	0	M5!	▼	3	°C	
6.	Press_1	1	M!	▼	1	psi	
7.	Temp_1	1	M!	▼	2	°C	
8.	Voltage_1	1	M!	▼	3	V	
9.	Comp_DH_Press_1	1	M5!	▼	1	psi	
10.	Comp_DH_Temp_1	1	M5!	▼	2	°C	
11.	Comp_Surf_Temp_1	1	M5!	▼	3	°C	

Once the Ranger begins reading, the values will appear on the Ranger's page, below the tiles and above the historical trend view. Click on the "Modify" button to set up High and Low Alarms. Click the slider on "Enable View History" to have the value show up in the graph below.

SDI12 SENSOR READINGS

CONFIGURE

Tag Name	Value	Units	Status	Alarm Low	Alarm High	Configure	Enable View History	Enable Custom Tile
Comp_DH_Press_0	-0.034 psi	psi	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Comp_DH_Press_1	-14.452 psi	psi	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Comp_DH_Temp_0	21.812 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Comp_DH_Temp_1	0 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Comp_Surf_Temp_0	21.75 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Comp_Surf_Temp_1	21.938 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Press_0	14.486 psi	psi	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Press_1	14.452 psi	psi	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Temp_0	21.625 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Temp_1	21.875 °C	°C	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Voltage_0	13.195 V	V	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		
Voltage_1	13.097 V	V	Passing	0.0 (DISABLED)	0.0 (DISABLED)	MODIFY		

The server maintains a database containing the historical data view of all reported readings. The data may be viewed as a graph or a table view. Select which data values to display and the time range to view. The selected data for the configured time interval may be exported to a .csv file by clicking the “Export” button.



Default View

A user can configure the default trend view they wish to see when they open the view for a Ranger. Simply configure the desired data to display and the desired default time display and click the “Set as Default” button. This view will be saved and be the default view for your account for that Ranger device.

Users can create custom dashboards that can display data from multiple Rangers on a single dashboard. Within each dashboard users can create groups to logically group data views. To create or edit a dashboard the user must have "Dashboard Admin" rights on their account.

Create Dashboards and Data Groups

1. select the "Dashboards" menu item, then click "Manage Dashboards" and then click "add a Dashboard" and enter a name for the custom dashboard and click the "rename" button to save.
2. Click the "+ Add Data Group" button to create your first data group and click the edit button to edit this group.
3. Name the data group and click the "rename" button to save. Each dashboard can have multiple data groups

Add data points to Data Group

In each data group users can add data points one at a time or in bulk.

To add a single data point, click the "Add Data Point" button. From here select the Ranger, metric and then the display type. The options for display type will vary depending on the metric type. Options include the Device tile which mirrors the tiles on each Ranger detail page, additionally there are other simple data views like a gauge, tank alarm status icon, or value display.

Each tile will have a title bar indicating the Ranger name along with the Ranger connectivity status.

If you want to add the same data point from multiple Rangers to a data group, click the "Bulk Add Data Points" button. Select multiple Rangers in the select device list by holding the Ctrl key. Once one or more Rangers is selected, a list of common metrics will be displayed in section. Select a metric then select the display type and click Save to Data Group to apply changes.

Add Data Points to Data Group: Sample Data Group

1) Select one or more devices

- 352656100597312 [RA000000]
- 352656100923278 [RA000060]
- 352656102536243 [RA001460]
- Josh Rev 2.0 Test [I751931]
- Josh Test Ranger [I597486]
- RP A2D1 [RA000006]
- RP HART [RA000005]
- RP MODBUS [RA000004]
- RP Modbus 96 [RA000566]
- RP PRESSURE [RA000003]
- RP Rev2 [I751998]
- RP SDI-12 [RA000007]

2) Select a metric common across selected devices

- Analog Input 1
- Digital Input 1
- Digital Input 1 Count
- Digital Input 1 Average Frequency
- Digital Input 1 Instantaneous Frequency
- Digital Input 2
- Digital Input 2 Count
- Digital Input 2 Average Frequency
- Digital Input 2 Instantaneous Frequency
- Digital Input 3
- Digital Input 3 Count
- Digital Input 3 Average Frequency

3) Select a display type

- Device Tile
- 24 Hour History
- Alarm Indicator
- Value Reading
- Dial Gauge
- Tank Gauge

Save to Data Group

Go back to Data Group

Example of bulk adding datapoints

Users

To have access to your company's Rangers, you will need a SignalFire Cloud account user login. Contact your company's Cloud user admin to set up your account. If your company does not have an account and you are performing first time setup, complete the form at <https://signal-fire.com/lte-m1-cellular-products/cloudregister/> to request a new user account group.

User Settings

Once logged in, select your username in the upper right to change your user settings. Enter your contact phone number and/or email address and enable Alarms to have alarm notifications sent to you. Enable billing to receive reports on which Rangers are about to expire and need to have their Cloud subscription renewed. After making changes (highlighted in yellow), click Save or Undo to apply or revert the changes made.

 **User Settings: signalfire**

First Name

Last Name

Alarm Group ID CHANGE ALARM GROUP

Alarm Message Timezone UTC Current time: 20:24:46 UTC

SMS # ☐ Alarms

Email Address ☐ Alarms ☐ Billing
Alarm emails will be sent from ignition-noreply@signal-fire.com, please add this email address to your whitelist.

User Roles

☐	User Admin
☒	Device Admin
☒	Alarm Admin
☒	Alarm Ack
☐	Report Admin
☐	Dashboard Admin
☐	Power Chart Admin

SAVE UNDO

User Roles

All users in the group can view any Ranger, but their ability to change settings can be restricted by their user roles. There are five user roles: User Admin, Device Admin, Alarm Admin, Alarm Ack, and Report Admin.

User Admin – Can add, edit, and remove users in the user group, including changing other users' permissions. The User Admin cannot view anyone's password, but they may reset the password for a user who forgets theirs. It is recommended to restrict the number of users with this permission to as few people as possible.

Device Admin – Can add, edit, and remove Rangers in the user group, toggle the relay output and initiate firmware updates. Note that device admins can change any settings in any Ranger without restriction.

Alarm Admin – Can configure just the alarm settings for Rangers and users.

Alarm Ack – Can acknowledge active alarms.

Report Admin – Can add, edit, and remove automated reports.

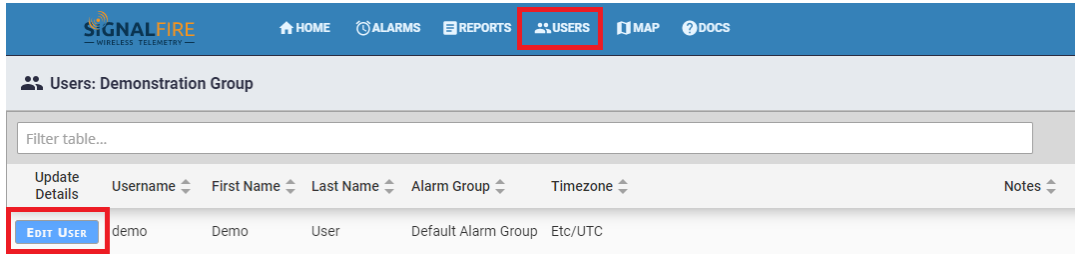
Dashboard Admin – Can create and edit custom dashboards. All users can view created dashboards

Power Chart Admin – Can create and edit Power Charts. All users can view Power Charts

User View

A list of users in the group can be viewed by clicking on the Users icon in the top menu. User Admins will be able to edit any user by clicking on the “Edit User” button. This will bring up the same User Settings as shown above, with an additional option to delete the user.

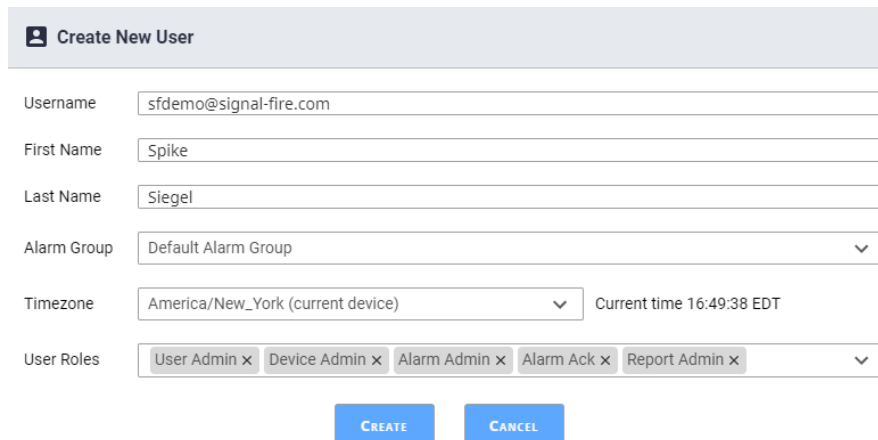
32



Update Details	Username	First Name	Last Name	Alarm Group	Timezone	Notes
EDIT USER	demo	Demo	User	Default Alarm Group	Etc/UTC	

Adding Users

User Admins may add additional users in the User view by clicking Add User in the upper right-hand corner. Fill in the fields, configure permissions, and click “Create”. A window will pop up with a temporary password for the new user once complete. It is recommended that an email address is used for the username so it is unique.



Create New User

Username

sfdemo@signal-fire.com

First Name

Spike

Last Name

Siegel

Alarm Group

Default Alarm Group

Timezone

America/New_York (current device)

Current time 16:49:38 EDT

User Roles

User Admin x Device Admin x Alarm Admin x Alarm Ack x Report Admin x

CREATE

CANCEL

Alarms

The SignalFire Cloud provides a robust and flexible system that allows users to be notified by email and/or text message when a specified metric from a Ranger enters and clears an alarm state. The alarms can be set up so only certain users get alarms for certain Rangers with the alarm group function.

To enable an alarm on an account with the Alarm Admin role, go to the Ranger, click “Configure” on the tile for the metric that you’d like to trigger an alarm on, and set its alarm threshold through the Alarms tab. The screenshot below shows the Configure window for Analog Input 1. If Analog Input 1 goes below 6mA or above 18mA, an alarm notification will go out to every user subscribed to this Ranger’s alarms. A user with Alarm Ack permissions may acknowledge the alarm to signal that the alarm and/or its cause have been taken care of. Unacknowledged alarms can be seen accumulated in the upper right-hand corner of the Cloud page.

Analog Input 1 Settings

General Alarms Display

Press Apply to set values

Alarm Thresholds

Low	6	Enabled
High	18	Enabled

APPLY EXIT

Alarm Views

Clicking on the Alarms button in the top bar will open a table of all alarm trigger events. The list of events can be sorted in ascending or descending order by any of the display columns by clicking on the column name.

The Alarm Status view contains the current state of the alarm system, while the Alarm Journal contains a history of all alarm events. Both the status and journal alarm tables can be exported to a csv file.

The upper-right hand corner of the table contains a gear  icon, sort  icon, and search  icon that help filter and find alarm triggers. The gear icon is used to enable/disable the display columns used for ascending/descending sort. The sort icon is used to filter alarms by their cleared/acknowledge state. The search icon is used to search alarms by keyword in any of its enabled columns. For example, if there is a Ranger named “Tank 6R” and the name column is enabled, typing in “Tank 6R” will show all alarm events from that Ranger. Hovering the mouse over a line will show a  icon. Clicking on it will reveal a detailed view for that alarm.

State

Ranger alarms, once triggered, can be in one of four states: “Active, Unacknowledged”, “Active, Acknowledged”, “Cleared, Unacknowledged”, and “Cleared, Acknowledged”. Active means that the alarm still meets the alarm

trigger criteria, while Cleared means it no longer does. Unacknowledged means that the alarm has not been dismissed by someone with Alarm Ack privileges, while Acknowledged means a user had seen and acknowledged the alarm.

For example, a digital input set to flow mode may have an alarm set to trigger when the average flow rate goes above 15 gallons/sec. When that threshold is first crossed, the alarm will appear in the Alarms table as "Active, Unacknowledged". If the average flow rate goes down to 12 gallons/sec, the state will change to "Cleared, Unacknowledged". Once an Alarm Ack user acknowledges the alarm, the state will change to "Cleared, Acknowledged". In other words, the inputs control the Active/Clear state, while users control the Unacknowledged/Acknowledged state.

To Acknowledge an alarm, a user with the Alarm Ack user role must click on the alarm and click "Acknowledge" in the bottom right corner. A user may alternatively select "Shelve", which prevents the alarm from triggering for a time period.

The screenshot shows the SIGNALFIRE Alarms page. The top navigation bar includes links for HOME, ALARMS, REPORTS, USERS, MAP, DOCS, DASHBOARDS, and CHARTS. The ALARMS tab is selected. Below the navigation bar, there are tabs for Alarm Status, Alarm Journal, Configure Alarms, and Alarm Groups. The Alarm Status tab is active, showing a table with one active alarm. The table has columns for Active Time, Display Path, State, and Label. The alarm is dated 03/03/2022 14:40:58, labeled Ranger Demo, and its state is Active, Unacknowledged. The label is Analog Input 1 HIGH. The bottom of the page shows a dropdown for 25 rows and a blue circle with the number 1.

Active Time	Display Path	State	Label
03/03/2022 14:40:58	Ranger Demo	Active, Unacknowledged	Analog Input 1 HIGH

Configure Alarms

Users may also edit alarm settings by clicking on "Configure Alarms" in the tab list of the Alarms page. This view shows all possible alarm sources on all possible devices in the user group. The interface on the right side can be used to filter which devices, input types, and alarm groups show up in the table. This interface provides a convenient way of modifying alarms across multiple rangers and multiple types of alarms.

For example, clicking on Select Devices will pull up a list of all devices available. Select the Rangers to filter by and click "Select" to add it to the list. Hold the Ctrl key as you click to select multiple at a time, or the Shift key to select a range. Once you have all the devices you'd like to see on the Included Devices list, click View Selected. Click "Clear Filter" to view all devices again.

SIGNALFIRE — WIRELESS TELEMETRY —

HOME ALARMS REPORTS USERS MAP DOCS DASHBOARDS CHARTS SIGNALFIRE 1 ALARM

Alarms

Alarm Status Alarm Journal **Configure Alarms** Alarm Groups

Alarm Configuration Table APPLY

Current Settings on Devices					
Device	Alarm	Type	Current Value	Setpoint	Deadb
Ranger Demo	BATTERY LOW	Low Alarm	3.561904	3	0
Ranger Demo	Flow Totalizer 1 Total HIGH	High Alarm	0.271136	0	0
Ranger Demo	Flow Totalizer 1 Average Flow Rate HIGH	High Alarm	0	0	0
Ranger Demo	Flow Totalizer 1 Average Flow Rate LOW	Low Alarm	0	0	0
Ranger Demo	Flow Totalizer 1 Instantaneous Flow Rate HIGH	High Alarm	0	0	0
Ranger Demo	Flow Totalizer 1 Instantaneous Flow Rate LOW	Low Alarm	0	0	0
Ranger Demo	Digital Input 2	Digital Alarm	☐	☒	0
Ranger Demo	Digital Input 2 Average Frequency HIGH	High Alarm	0	0	0
Ranger Demo	Digital Input 2 Average Frequency LOW	Low Alarm	0	0	0
Ranger Demo	Digital Input 2 Count HIGH	High Alarm	0	0	0
Ranger Demo	Offline Alarm	Digital Alarm	☒	☐	0
Ranger Demo	Analog Input 1 HIGH	High Alarm	7.858577	7	0

25 rows 1 2

HIDE FILTER

SELECT DEVICES

Showing all device alarms

SELECT INPUTS

Showing all input types

SELECT GROUPS

Showing all alarm groups

35

To change a field, double click the field, enter the desired value, and then press the Enter key. Fields that have been edited but not set will be highlighted yellow. Clicking cancel will undo the yellow highlighted fields. Once all fields have been edited as needed, click the green Apply button in the upper-right hand corner. The yellow highlighted fields will change to green to indicate the changes have been set.

For a digital input, if the setpoint column is checked off that means the alarm will trigger when that input is Close or logic 1. For analog alarms, it sets the high or low threshold value depending on if it's a High Alarm type or Low Alarm type.

The **Deadband** column changes the Clear threshold for an analog alarm. As an example, if the high alarm level is 4,000, and the deadband is 200, after the analog input has gone above 4,000 and activated the alarm, it will have to go below 3,800 for the alarm to clear. Similarly, if the low alarm is 2,000 and the deadband is 200, the input will have to go above 2,200 to clear an active low alarm. This setting is useful to prevent multiple alarms when a reading is at the alarm threshold.

The **Delay** column adds a countdown timer to the alarm that starts once the threshold has been crossed. If the input stays past the threshold for entire duration of the Delay countdown, the alarm becomes active and alert messages are sent out. However, if the Ranger reports a reading below the threshold during that countdown, the timer is reset, and the threshold must be crossed again for the countdown to start again. **The Delay value should be greater than the Ranger's report interval** so there's at least one new reading before the countdown ends.

The Delay timer takes the Deadband value into consideration. Consider the previous example where the high alarm threshold is 4,000 and the deadband is 200, but now there is a 120 second Delay. Once the Ranger reports a reading above 4,000, a 120 second countdown begins. If the Ranger reports a reading of 3,900 before

the timers hits 0, the alarm still activates because it's within the deadband. If it instead goes to 3,700, the timer is reset and the input has to go back above 4,000 for the Delay timer to count down again.

Alarm Groups

When alarms are triggered, the Cloud sends messages out to users based on alarm groups. Click on the "Configure Groups" button in the upper-right corner of the Alarms tab to edit user and Ranger alarm groups. **Only users with Alarm Admin privileges may edit settings here.**

New users and newly added Rangers will be assigned to the Default Alarm Group, which cannot be removed or renamed. To add a new group, click on the "+ New" button in the Groups tab, and then rename it in the Name field. To select which Rangers you'd like to have in the group, click on the Configure button, check off the desired Rangers, and click Apply.

To add a single Ranger to multiple groups at once, go to the Rangers tab, click on the Ranger, check off the groups to add it to in the panel on the right, and click Apply. When any of that Ranger's alarms become active or clear, the Cloud will send messages to every user in the groups the Ranger is a part of.

To edit each user's group, click the Configure button to bring up a list of all users. You may then one-by-one edit which single group a user is assigned to. **Users may only be assigned to a single group.**

Configure Rangers in Alarm Group

Alarm Group: Alarm Group 2

Press Apply to set values

Name	In Group
SignalFire-Lab Rev 1.2 (AT&T) [I604589]	☐
RA000497 [RA000497]	☐
SF TANK-EH3 [I604480]	☒
352656100817868 [I817868]	☐
SignalFire-Lab Rev 1.3 (VzW) [I817835]	☒
352656100818007 [I818007]	☒
352656100817991 [I817991]	☐
352656100817751 [I817751]	☒
RA000503 [RA000503]	☐
352656100817983 [I817983]	☐
352656100302614 [I302614]	☐
352656100817892 [I817892]	☐
352656100818015 [I818015]	☐
352656100597817 [RA000498]	☐
Murphy TTD [I597486]	☐
352656100926891 [I926891]	☐
SandroPool RANGER900 [RA000582]	☐
352656102543801 [RA000566]	☐
352656100923278 [RA000060]	☐
Contract Hour Flow Test [I597312]	☐

APPLY CLOSE

Alarm Groups per Ranger CONFIGURE

Device Name View

SignalFire-Lab Rev 1.2 (AT&T) [I604589] VIEW

RA000497 [RA000497] VIEW

SF TANK-EH3 [I604480] VIEW

352656100817868 [I817868] VIEW

SignalFire-Lab Rev 1.3 (VzW) [I817835] VIEW

352656100818007 [I818007] VIEW

352656100817991 [I817991] VIEW

Alarm Groups for Ranger APPLY CANCEL

Ranger: SF TANK-EH3 [I604480]

Current Settings on Cloud

Group Name	In Group
Alarm Group 88	☐
Alarm Group 23	☐
Default Alarm Group	☒
Alarm Group 2	☐
Troy's Alarm Group	☐
Alarm Group 4	☐
Alarm Group 9	☒
Alarm Group 93	☐
Alarm Group 72	☐

Alarm Groups + NEW

Group Name View

Alarm Group 88 VIEW

Alarm Group 23 VIEW

Default Alarm Group VIEW

Alarm Group 2 VIEW

Troy's Alarm Group VIEW

Alarm Group 4 VIEW

Alarm Group 9 VIEW

Alarm Group 93 VIEW

Alarm Group 72 VIEW

Alarm Group 2 CHANGE CANCEL

Name: Alarm Group 2

REMOVE Warning: Removing alarm group cannot be undone

Users in Alarm Group CONFIGURE

Username	First Name	Last Name	Alarm Group
sfdemo@signal-fire.com	Spike	Siegel	Alarm Group 2

Rangers in Alarm Group CONFIGURE

Name	Alarm Groups
Have a HART [RA001664]	Alarm Group 2

Reports

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The SF Cloud has an automated reporting function that can send either a snapshot of data or a historical csv data dump to a group of recipients on a schedule.

To create a report, go to the Reports tab and then click on the “Add Report +” button and set the report filename and display name. Next select the type of report which can be either a snapshot or history report. The enabled checkbox enables the report to run automatically on the configured schedule.

Snapshot reports can be sent out up to 4 times a day, while history reports support daily or weekly data.

Change Recipients allows you to configure one or more email addresses that the reports will be sent to

Change Columns is only valid for snapshot reports and allows the user to device up to 6 columns of data

Change Devices allows the user to select which set of Rangers the report could contain.

Report Settings: new_report1

Filename

new_report1

Display Name

Custom Report

Type

snapshot

Enabled

☐

1 time(s) daily at 12AM (midnight)
Next 5 occurrences:
1. Wed Nov 24, 2021 12:00AM UTC
2. Thu Nov 25, 2021 12:00AM UTC
3. Fri Nov 26, 2021 12:00AM UTC
4. Sat Nov 27, 2021 12:00AM UTC
5. Sun Nov 28, 2021 12:00AM UTC

CHANGE SCHEDULE

Please specify recipients

CHANGE RECIPIENTS

6 columns:
NAME, LASTREPORTED, AIN1, DIN1, DIN2, BATTERY

CHANGE COLUMNS

All group devices

CHANGE DEVICES

PREVIEW

SAVE

CLONE

UNDO

DELETE

Note that history reports generate one .csv file per selected Ranger containing all historical data for that Ranger. If multiple Rangers are selected one .csv file for each Ranger will be included in a .zip file.

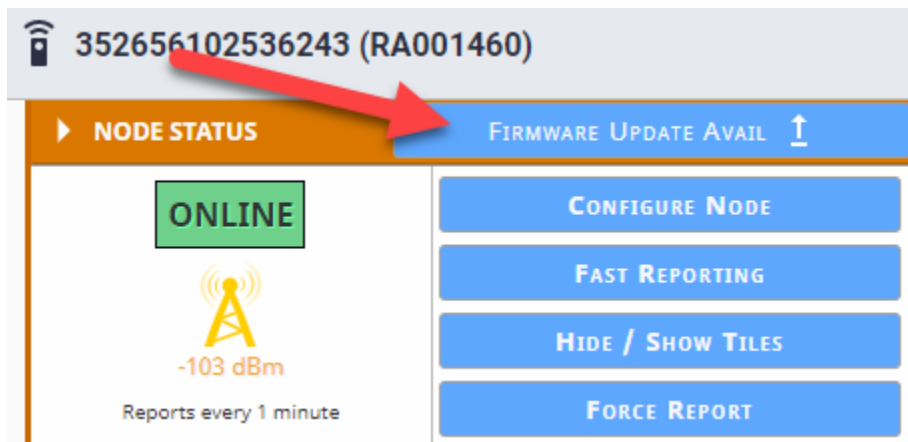
Updating Ranger Firmware

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Rangers support Over the Air (OTA) updating of firmware. The Signal Fire Cloud Platform has tools built in to help you do this.

Single Ranger Firmware Update

On the Node Status of any Ranger, if there is an applicable firmware update available and the Ranger is online, the tile will display a button allowing you to upgrade the Ranger's firmware:

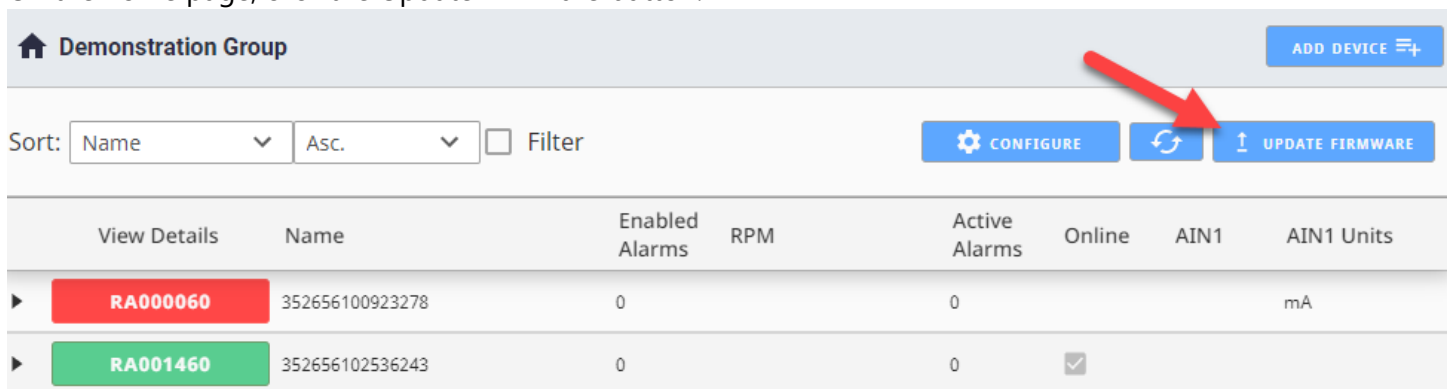


Upon clicking the button, the Bulk Firmware update page will be brought up with the target device pre-selected for receiving an update. You may review the list of nodes eligible for a firmware update to go through with a bulk firmware update.

Bulk Firmware Update

If you have multiple Rangers, you can update one or more of them at the same time using the Bulk Firmware Update tool.

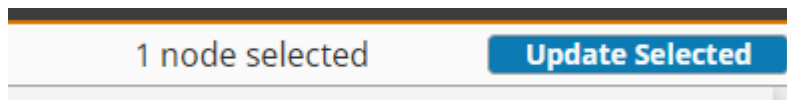
On the home page, click the Update Firmware button:



You will see a screen which lists the Rangers in your group, along with their current firmware version, and any available firmware version. You will also see buttons to review Release Notes for the latest firmware version available.

Available Version ⇅	Release Notes
v0.1.21-v1-A-modbus	VIEW RELEASE NOTES
v0.1.21-v1-A-3v	VIEW RELEASE NOTES

You can select one or more Rangers to update simultaneously, and then click the Update Selected button to begin the OTA firmware update process.



You will see each step of the firmware update process:

Update Status ⇅	Device ⇅	Current Version ⇅
Downloading Firmware	352656102536243 [RA001460]	v0.1.19-3v (Downloading v0.1.20-v1-3v)

Update Status ⇅	Device ⇅	Current Version ⇅
Rebooting Ranger	352656102536243 [RA001460]	v0.1.19-3v (Downloading v0.1.20-v1-3v)

You will also see the status of recently updated Rangers:

Update Status ⇅	Device ⇅	Current Version ⇅	Available Version ⇅
Recently Updated	352656102536243 [RA001460]	v0.1.20-v1-3v	v0.1.20-v1-3v

If you trigger a firmware update and it doesn't complete successfully within 10 minutes, you will get a message that the firmware update failed. This can happen if the Ranger loses power during the update or if the download of the firmware software over the air fails. You can try again by selecting the checkbox again. There are many fail-safes in place to ensure that firmware updates will not leave the Ranger in an inoperative state.

If there is more than one person in your organization logged into the Signal Fire Cloud platform, you will be able to see firmware status updates that others perform in real time.

Technical Support and Contact Information

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support@signal-fire.com

Revision History

Revision	Date	Changes/Updates
1.0	11/12/19	Initial release
1.2	1/27/20	Added section on GPS
1.3	1/31/20	Added detail about linking Ranger using its serial number
1.4	4/24/20	Updated to reflect changes to the SignalFire Cloud
1.5	5/29/20	Updated to reflect changes to SF Cloud and C1D2 certification
1.6	7/21/20	Added 2AI/1DI and Modbus expansion cards
1.7	5/26/21	Added HART, SDI-12, Fast Reporting, Relay Control, Ranger junction box, updated Cloud screenshots
1.8	7/30/2021	Added support for bitmask registers, new alarm settings, reports
1.9	11/30/21	Minor formatting edits, added detail on history reports, added detail on new dashboard section
1.10	3/3/22	Added OTA firmware information and rearranged mounting instruction pages. Updated screenshots and paragraphs to match the current cloud updates. Simplify user guide for claiming devices.