

PROSiren

Quick Start Guide





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Introduction:

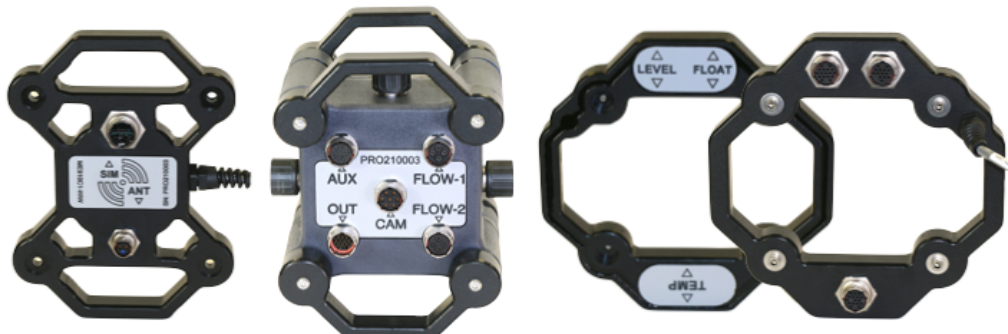
PROSiren™



The PROSiren™ is a rugged multi-sensor wireless environmental monitor used for a variety of applications, such as sewer and storm flow monitoring, wind and weather monitoring, water quality monitoring, pipe line, and industrial monitoring.

The monitor also supports a Vision/Camera (CAM) port with a built in multimedia board, allowing images to be correlated along with sensor readings. Collect time-lapse imaging of sewer overflows, site security, and a multitude of other applications.

Firmware driven options allow the end user to change total functionality, allowing for a greater span of monitoring applications.



Ports and Connections:

Monitor ports allow for connection of sensors, power supplies, communication cables, firmware programmers, etc. See below for a complete list of available ports.

Multimedia Camera and Vision Port

Supports the Blue Siren 5.0 MP Submersible Camera

Captures image when monitor wakes up and records a sensor reading

Captures images during sensor alarms

External super bright 6000K LEDs with disbursed and focused lenses

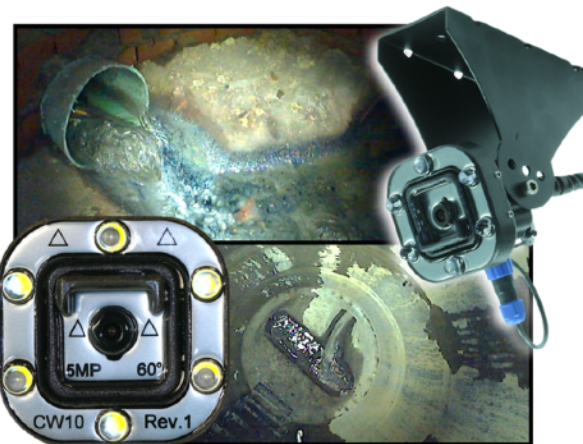
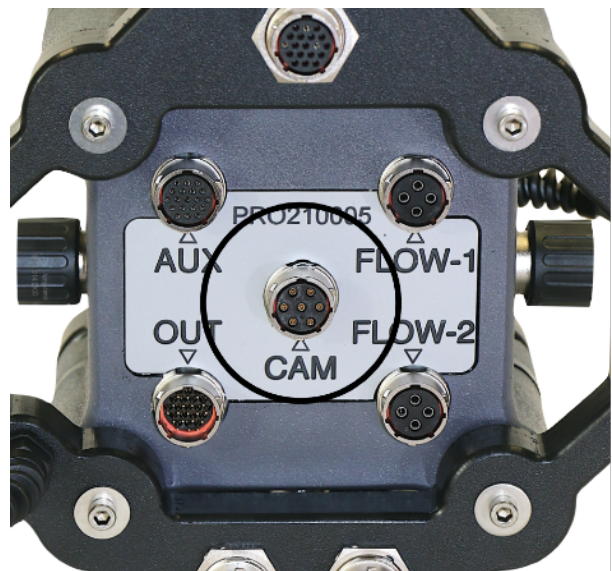
Standard lens with 60 degree angle of view, with 3.6mm focal length

User programmable image compression

Ten different image sizes to choose from

Pixel Resolution :

- 2592x1944 (Default)
- 2048x1536
- 1920x1080
- 1600x1200
- 1280x960
- 1024x768
- 800x600
- VGA
- QVGA
- 160x120



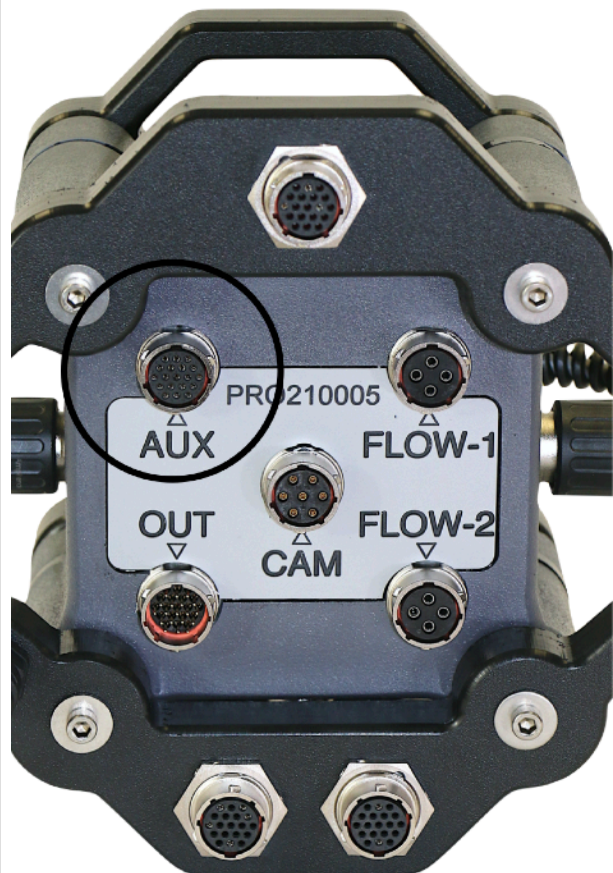
External IOT Wireless Module

4G LTE AT&T, Verizon, and Global
 World Wide 3G 2G LTE
 Integrated GPS with Cellular
 Version
 WiFi Version Available



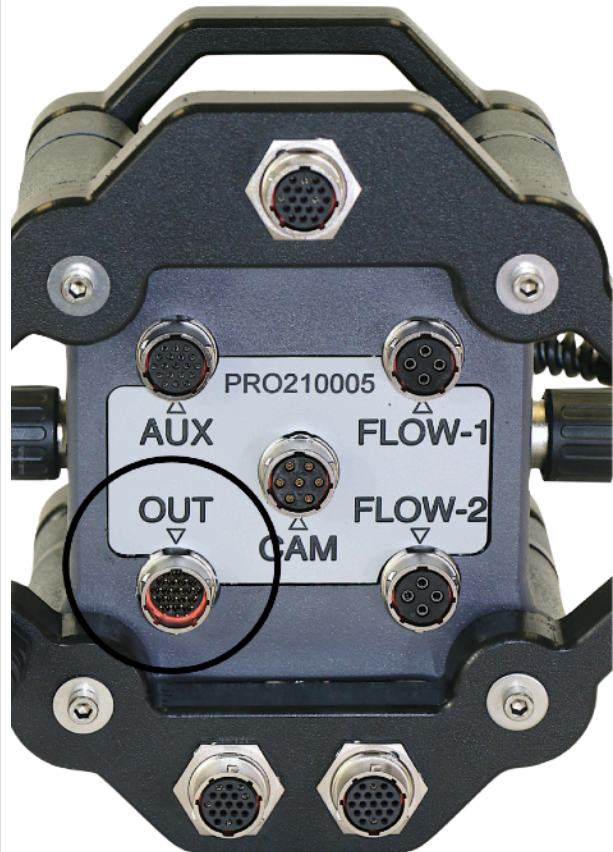
**Auxiliary Port
 Multi-Sensor Expansion Port**

Temperature String for I&I
 Detection
 Surface Radar Velocity Sensor
 Short and Long Range
 Ultrasonic Level
 Low, Warning, and Critical
 Alarming Switches
 Dual Rain Gauge Input
 Water Quality Sensor Inputs
 Two 4-20mA Sensor Inputs
 Four Analog Sensor Inputs
 UART, RS485, and SDI-12
 Compatible



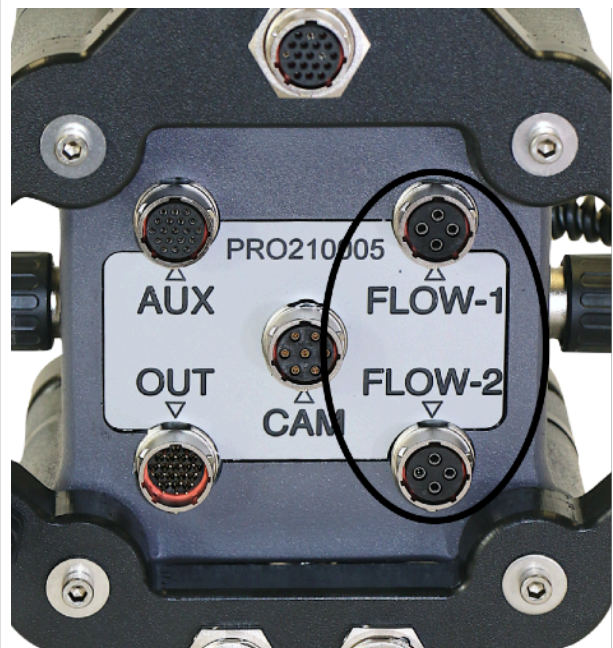
Input/Output Port Options

- USB Data Back-Up
- SCADA RS485 Output
- Dual LCD Screens
- Flow Pace Pulse for Sampling and Control
- Alarm Trigger Pulse for Sampling and Control
- SCADA Modbus Data Output
- Ayyeka Wavelet™ Control Compatible



AV FLOW 1 & 2 Ports

- Single or Dual AV Sensor operation
- Dual-Wave Ultrasonic Doppler Technology
- Precision measurements without interference
- Available in Two Ranges
 - Low Range 5 PSI (0 - 10 ft.)
 - High Range 15PSI (0 - 30 ft.)
- Supports Micro-Velocity Sensor



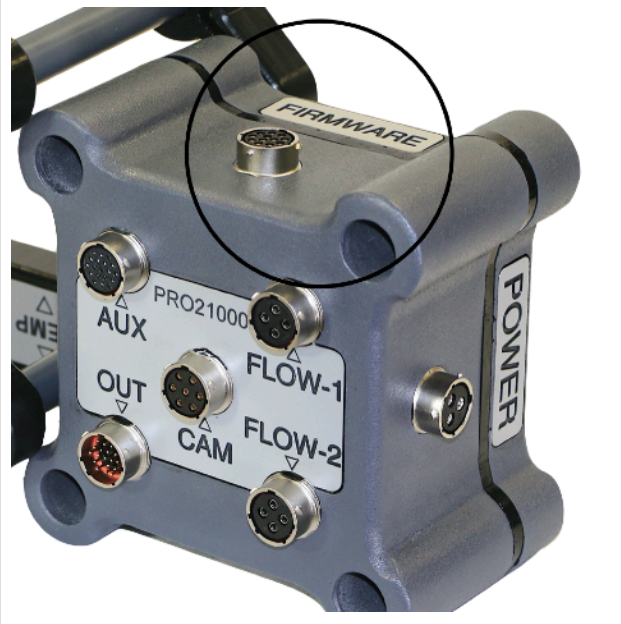
Wireless Modem Connection

4G LTE AT&T, Verizon, and Global
 World Wide 3G 2G LTE
 Integrated GPS with Cellular
 Version
 WiFi version available



Firmware Programming Port

Simple external Firmware
 Programming Port
 Change monitor functionality with
 a wide range of firmware options
 Upgrade wireless protocols and
 carriers
 Forward compatibility with latest
 technology and sensors

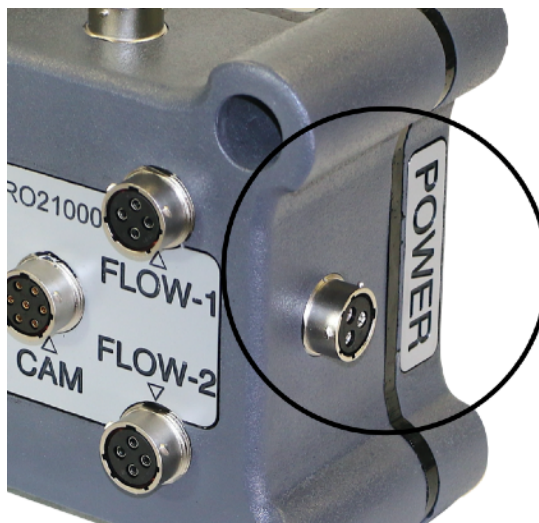


Power Port

Connect a variety of external battery packs for short or long term monitoring programs

User-replaceable battery packs available

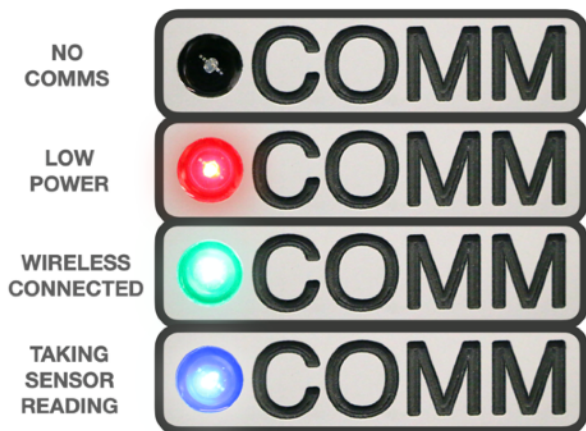
Alkaline and Li-ion rechargeable battery packs available



Communications Port with LED

Communicate with monitor using FIELDSiren™ Software

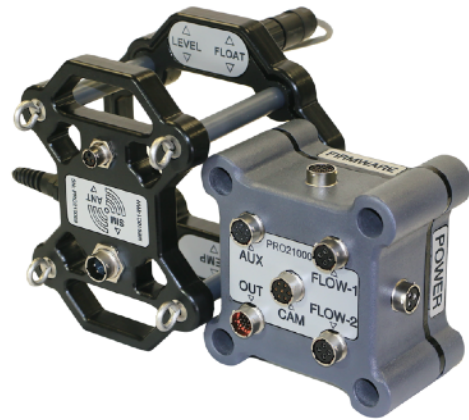
Visibly determine monitor operation with status LED



Rugged Monitor Cage with Handles

External cage design allows for attachment of accessory and wireless modules

316 stainless steel hardware and eye bolts bind cage allowing for a solid mounting position



PWRTower™ External Power Pack

External user-replaceable D-Cell battery pack

Long and short term power solutions



FIELDsiren™ Programming Software

User-friendly PC based field programming software

Program sampling rates, wireless server settings, calibrate sensors, verify monitor date and time, capture images, and set alarm thresholds



BlueLIVE® Hosting Software

Optional cloud analytics platform that automatically collects and organizes data

Includes functions and tools for quick data analysis/exportation and visual sensor alarms



DRIVEServe™ Monitor Driver API

DriveSERVE™ allows direct TCP connections to server

Extract monitor data and decompress into a readable format for integration into any database platform

Two-way communications and remote programming of monitors are also available while using this platform



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 #103 3030 Venture Lane
 Melbourne, Florida, USA

DriveSERVE™ SERVER DRIVER

API Guide



Out of the Box Assembly

The monitor will arrive pre-assembled with all accessories secured within a single package. Sensors, battery packs, cabling, and mounting accessories are organized with labeling contained within the single package. The following guide will demonstrate the standard Out of the Box Assembly procedure. With most standardized monitoring offerings, the equipment will arrive fully assembled, however with additional user selected sensors or accessories, minor assembly could be required.

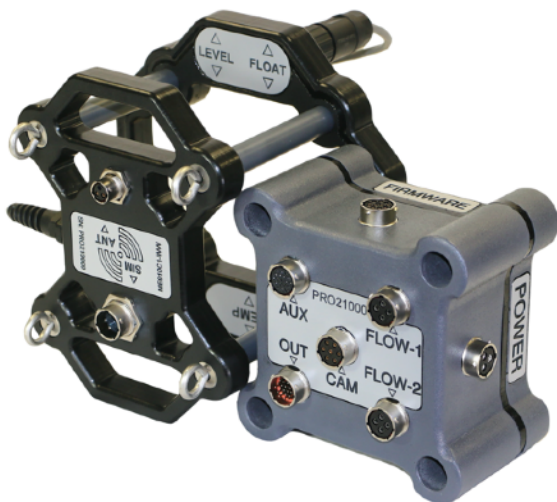
STEP 1.

REMOVE MONITOR FROM BOX

Remove the monitor from packaging and place on work surface.

Monitor could arrive in the following three configurations:

1. Monitor without Wireless Modem and Cage Assembly
2. Monitor with Wireless Modem and Cage Assembly
3. Monitor with Wireless Modem, Cage Assembly, and Accessory Module



**WIRELESS
 MODEM
 MODULE**



MONITOR



**ACCESSORY
 CONNECTOR
 MODULE**



STEP 2.

REMOVE SENSORS FROM BOX

Remove sensors from packaging and place on work surface. Based on application, you may have one or multiple sensors. Sensors you may receive within the packaging are as follows:

1. Area Velocity Flow Sensors
2. Alarm Critical Level Float Sensor
3. Ultrasonic or Radar Level Sensors
4. Water Quality Sensors
5. Vision/Camera Sensor

AREA VELOCITY



FLOAT ALARM



ULTRASONIC LEVEL



RADAR LEVEL



WATER QUALITY



VISION CAMERA SENSOR



STEP 3.

REMOVE CABLES FROM BOX

The monitoring kit will also contain a series of accessory cables for local and wireless communications:

1. Comm Cable for local communications
2. Wireless Antenna
3. SIM Card
4. Firmware Cables

COMMUNICATION CABLE



ANTENNA



SIM CARD



STEP 4.

REMOVE POWER ENCLOSURE FROM BOX and LOAD BATTERIES

Based on the monitoring kit ordered, the package will contain a power source such as the PWRTower self contained battery system. Customer supplied standard alkaline D-Cell batteries are required for the system in quantities of 16 or 32 cells based on the version requested at time of order.

1. Remove PWRTower from Cage Assembly using the supplied 5/32" Hex Wrench to remove four (4) Button Head Socket Screws.
2. Remove the Sealing Lid from the Cylinder Assembly by removing the four (4) Socket Cap Bolts using the supplied 3/16" Hex Wrench.
3. Remove Battery PCB Top Card by removing the two (2) tensioning Socket Cap Bolts with the supplied 5/32" Wrench. Remove Top Card with Back Up Battery Attached and set aside.
4. Install Alkaline D-Cells with Negative terminal contacting springs and Positive terminal contacting pads.
5. Reassemble in reverse order. Align Keyway Pin with Top Card to ensure proper connection. Inspect Sealing O-Ring Gasket and Washers for wear and replace if necessary.



REMOVE BATTERY CAGE

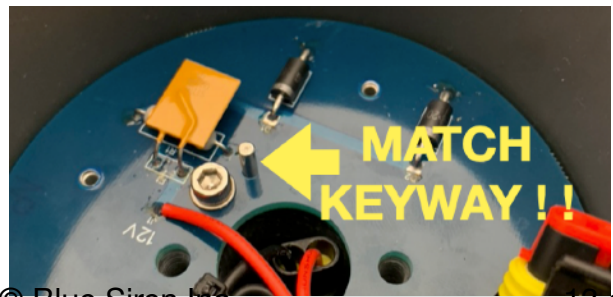


REMOVE BATTERY LID



UNSCREW TWO HEX BOLTS REMOVE BATTERY CARD

LOAD NEW BATTERIES WITH NEGATIVE SIDE TOWARDS SPRING and REASSEMBLE



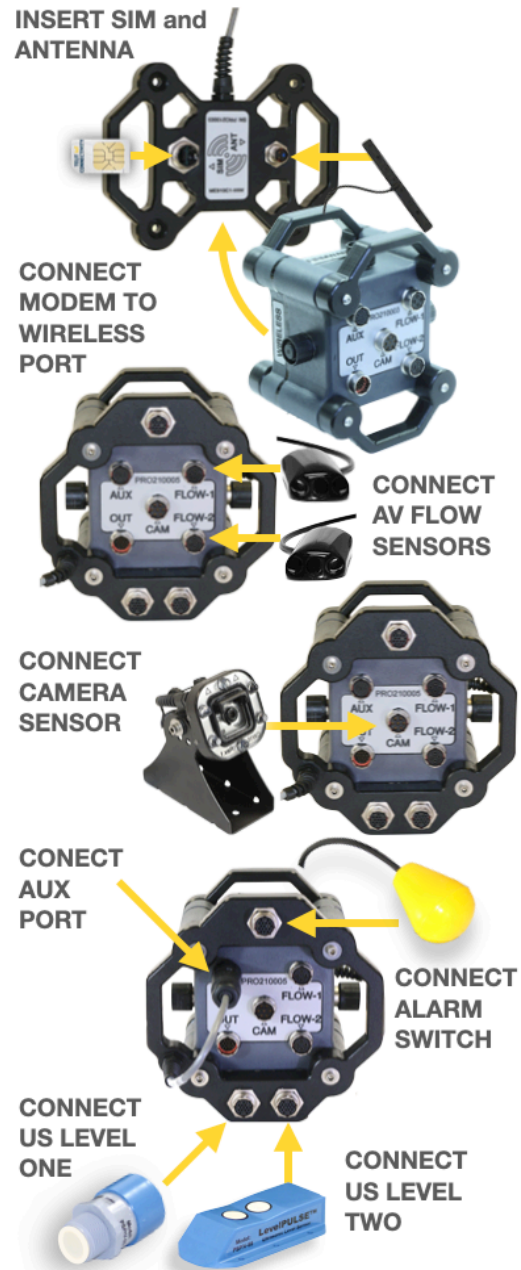
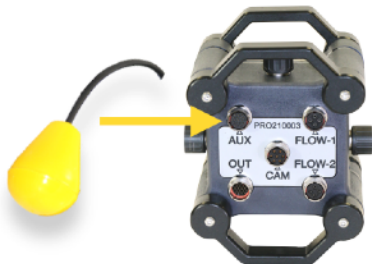
STEP 5.

CONNECT WIRELESS MODEM and SENSORS

Based on the monitoring application, the following connections will need to occur before programming the monitor. Connect sensors and accessories in the manner demonstrated below.

1. Insert SIM Card and Antenna in/onto the Wireless Modem Module. Install SIM Card with Notch Upwards and Contacts Facing Inwards.
2. Connect Wireless Module to designated WIRELESS Port.
3. Connect AV Sensor(s), either Single or Dual, on the designated FLOW Ports.
4. Connect Optional Vision - Camera Sensor to designated CAM Port.
5. Connect Optional Sensor Splitter Accessory to designated AUX Port.
6. Connect Alarm Switch to designated I/O Port.
7. Connect Optional Ultrasonic Level Sensor to designated AUX Port or Sensor Splitter.

! Note: Sensor Splitter Module is only required if operating multiple sensors on AUX and/or I/O Port. Connect single sensors directly to ports demonstrated above.



STEP 6.

CONNECT LOCAL COMMUNICATION CABLE AND POWER SOURCE

Using the supplied USB to RS232 adapter and Local Communication Cable, connect customer supplied PC to monitor. Connect Power Supply to monitoring system.

1. Connect USB to RS232 Adapter to PC. Verify operation of USB adapter using Device Manager and Driver Tools. Connect USB adapter to supplied local communication cable.
2. Connect local Communication Cable to COMM Port.
3. Connect the Power Supply to POWER Port.



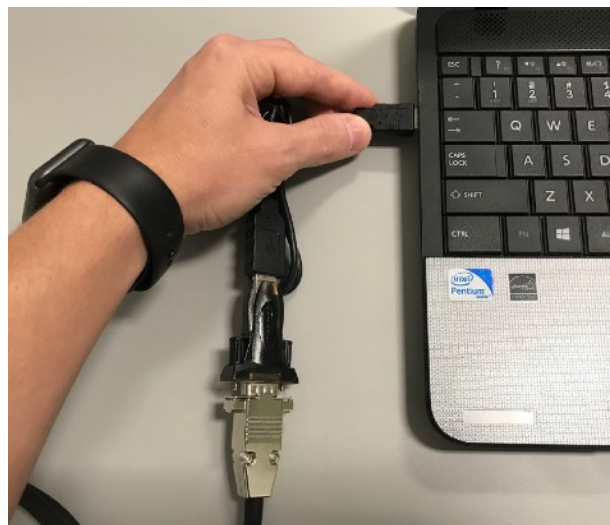
Software Installation

Included with the monitoring system is a proprietary interrogation field software, FieldSIREN™, which is used to communicate and configure the data logger locally. This field software is PC based and does not require permanent installation to be launched. The software included with the kit can be stored on a USB drive and is allowed to be transferred to as many devices as required by the user. Connect the communication cable's DB9 port to a Windows computer with an available DB9 port. If the user's computer does not support the DB9 connection, use the included USB adapter to convert the connector.

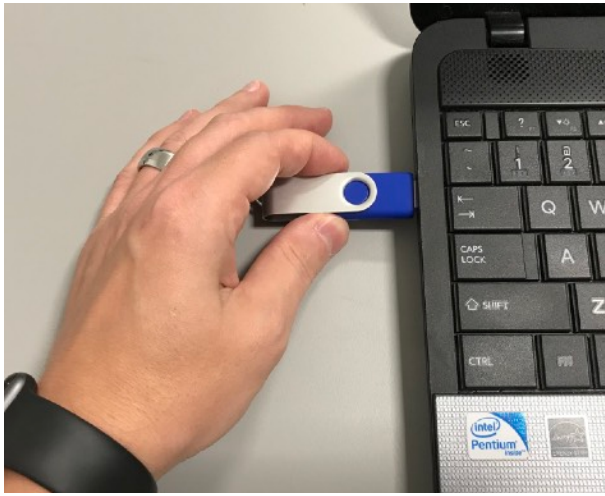
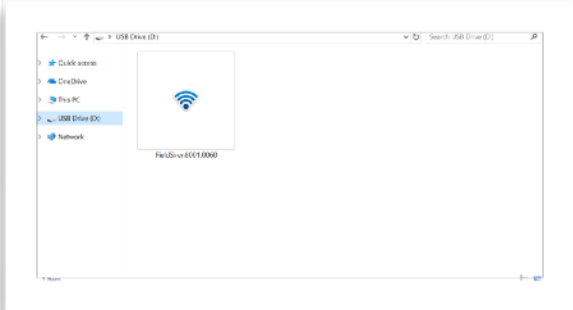
Connect USB to Serial adapter to the Blue Siren COMM cable.

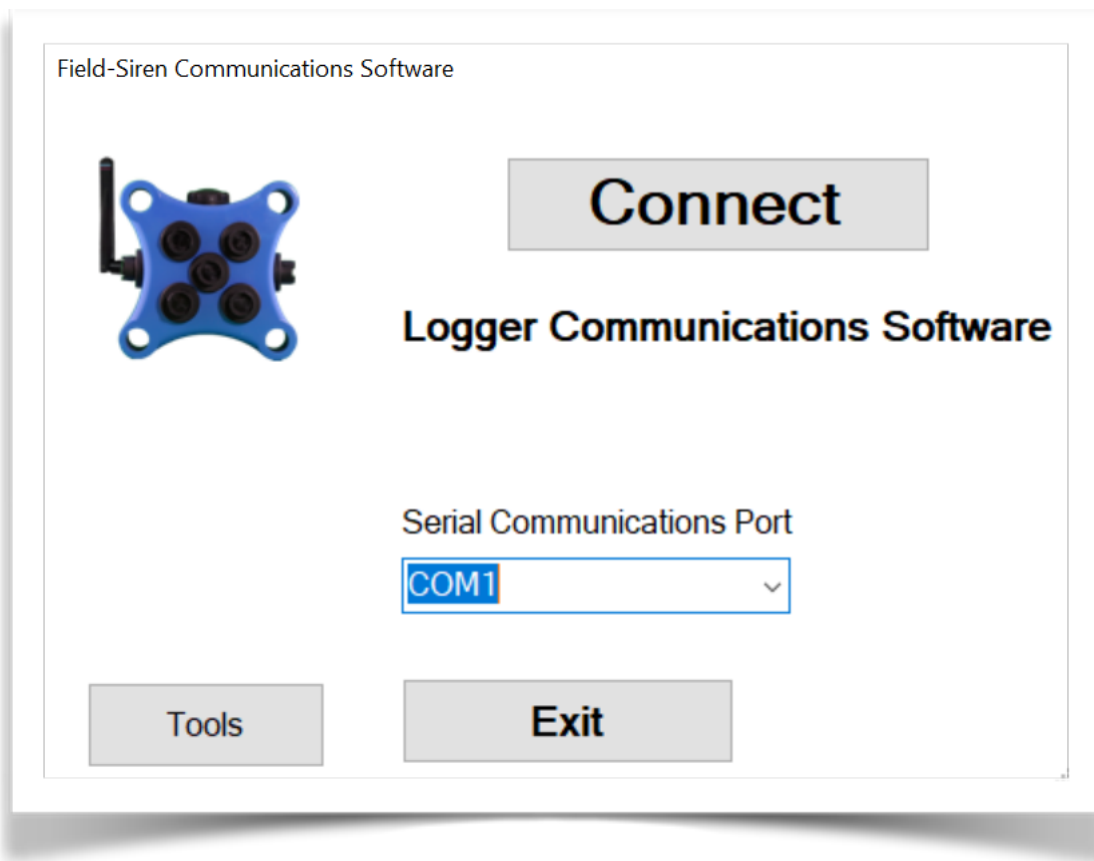


Connect USB to Serial adapter to the field computer.



Insert the USB drive into an available USB port on the computer in which the communications cable is also attached. Using the file explorer, open the USB drive. Launch the FieldSIREN™ software by clicking on the application file (.exe file).

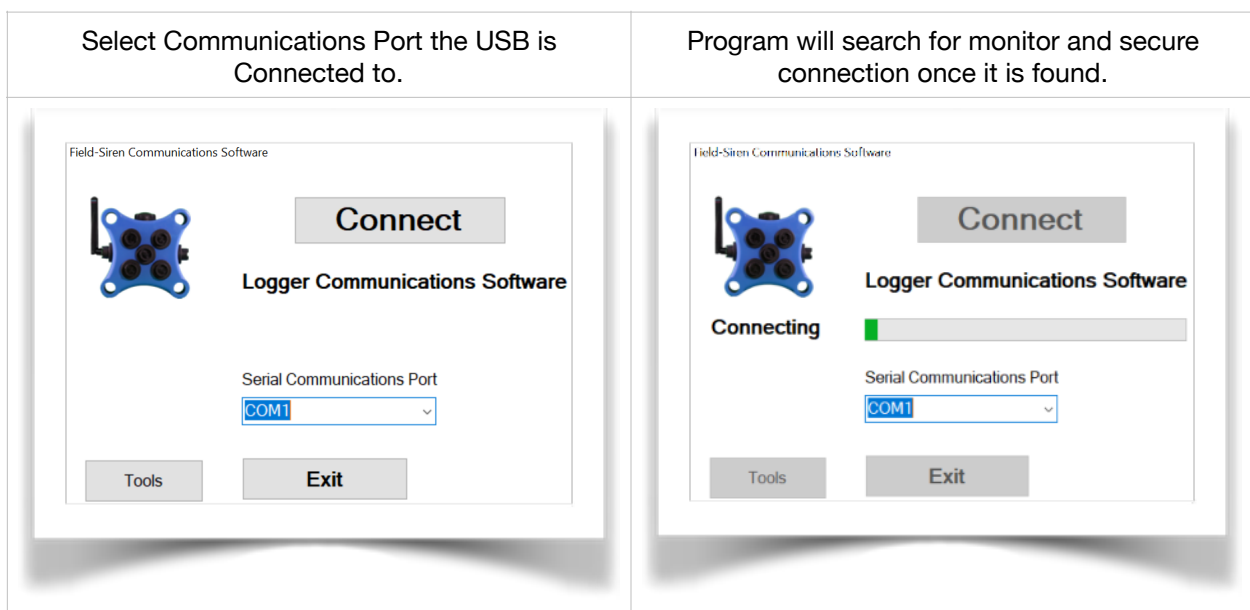
<p>Insert USB drive into computer.</p>	<p>Double click the FIELDSiren™ icon to launch program software.</p>
	



Once the program has launched, select the appropriate serial port for the attach device.

Monitor Connection

With the FieldSIREN™ software launched and ready for operation, select the appropriate serial communications port and press the “Connect” button, located at the top of the window. The software will start a local connection to the monitor and will allow access to the equipment when the connection has been secured.



With the FieldSIREN™ software connected to the monitor, the software will first verify the internal time of the data logger to the actual time of the software. In the event that the monitor’s internal time does not correspond, the software will indicate that the time will need to be corrected. Close the window to advance to the software’s main screen where the time can be corrected. The internal time only advances if the monitor is receiving power from the external power module. If the monitor’s power is removed, the time will no longer advance, and the time will need to be corrected once the power has been restored.

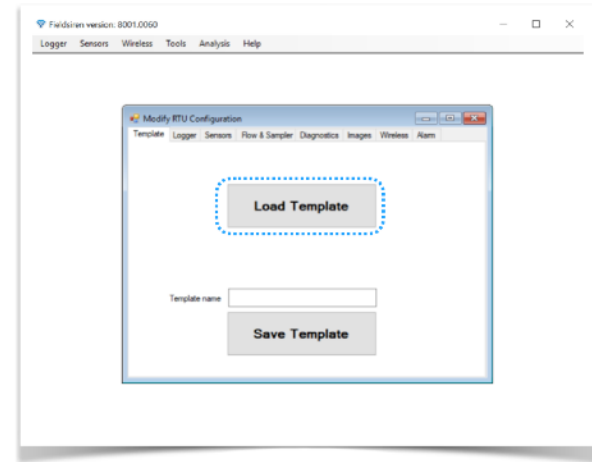
Monitor Setup

Configuring the monitor using FieldSIREN™ is completed by entering the “Set-Up” window located in the upper right hand corner of the main screen. Select the “Set-Up” button to enter the logger configuration window.

Click “Set-Up” button to access and program the monitor.



Entering “Set-Up” will automatically move into the manual programming screens. From these windows, pre-programming templates, sampling rates, sensors, and imaging can be completed.



If you do not have a pre-programmed template, programming the logger must be performed manually. Programming the logger will consist of setting up the following:

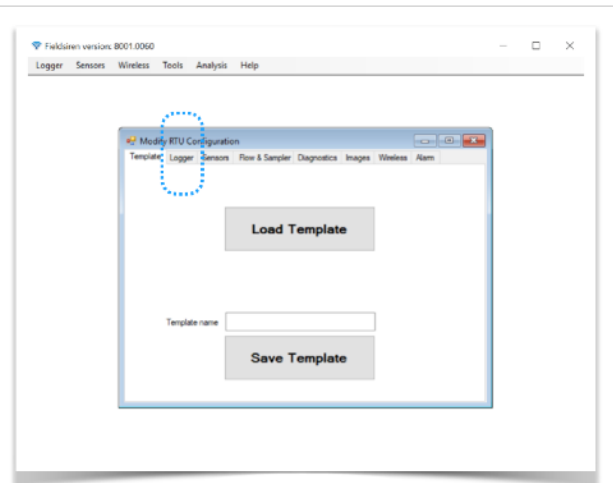
1. Logger and Memory
2. Sensors
3. Images (optional)
4. Sampler and Flow (optional)
5. Alarms
6. Wireless

The following guide will demonstrate the standard manual programming options for the PROSiren™ wireless monitor.

PROGRAM LOGGER

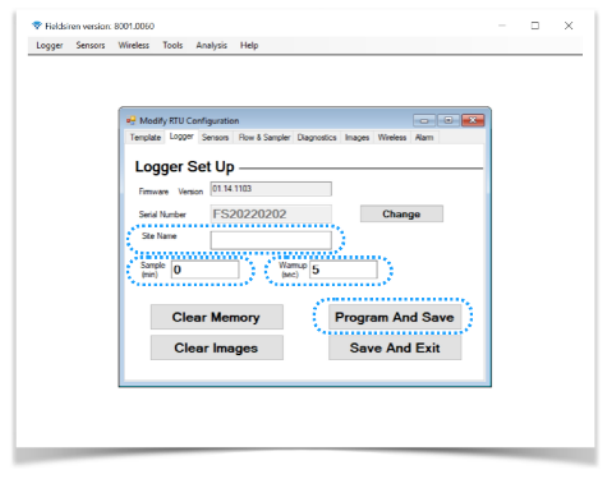
STEP 1.

CLICK LOGGER TAB



STEP 2. - PROGRAM LOGGER

1. Enter Site Name
2. Enter Sensor Warm Up time in Seconds
Default = 5 Seconds
3. Enter Sample Rate in Minutes
Default = 5 min
4. Click “Program and Save” button.

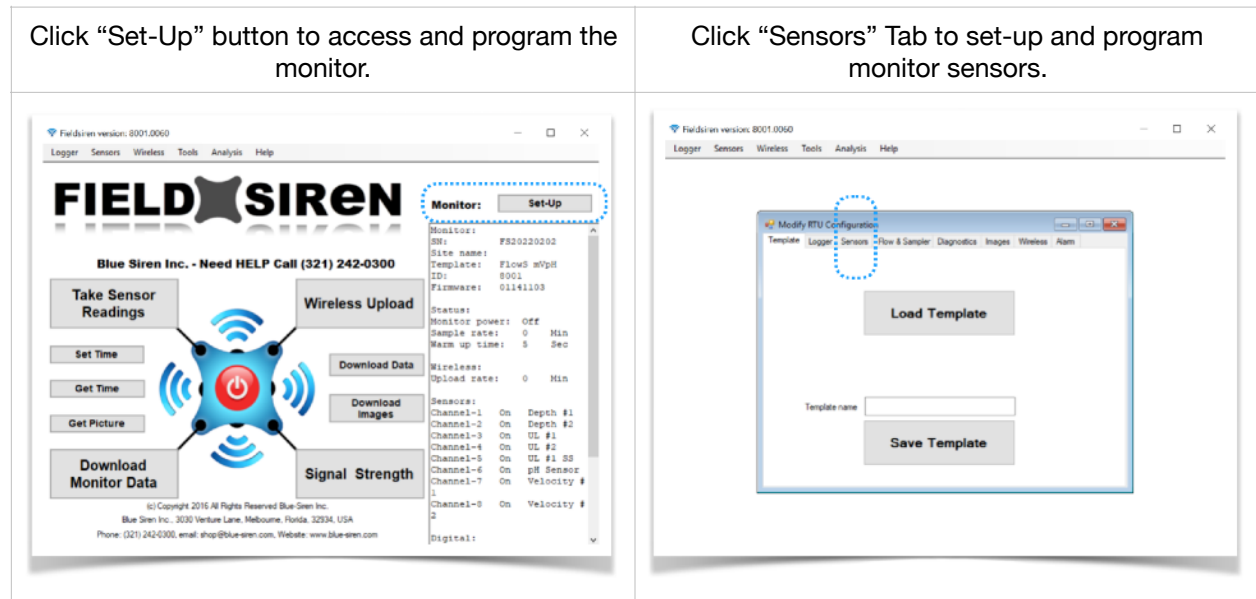


! WARNING !

CLEAR IMAGES and MEMORY - Always manually download monitor data before clearing the logger memory and/or images. Logger memory cannot be retrieved once cleared.

Sensor Setup

Configuring the monitor sensors using FieldSIREN™ is completed by entering the “Set-Up” window located in the upper right hand corner of the main screen. Select the “Set-Up” button to enter the logger configuration window. Locate “Sensors” tab to complete.



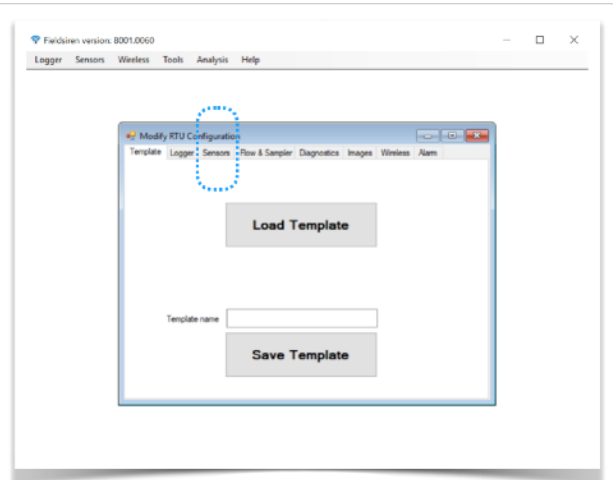
If you do not have a pre-programmed template, programming the monitor sensors must be performed manually. Programming the monitor sensors will consist of setting up the following sensor channels and parameters.

1. Sensor Channels (1 - 8)
 - Serial and Analog Sensors
2. Digital Inputs (1 - 5)
 - Digital Inputs featuring ON/OFF Logic
3. Pulse Inputs (1 - 3)
 - Pulse Sensors, Rain Gauges, Anemometers
4. Sensor Alarms

SENSOR SET UP

STEP 1.

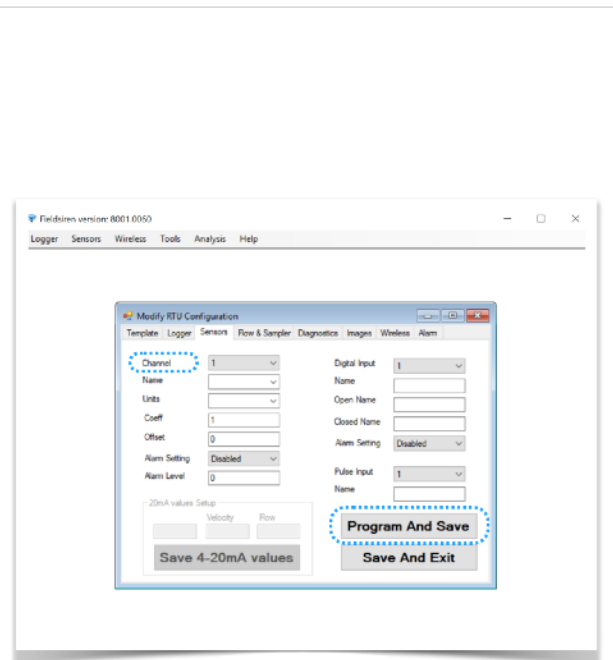
CLICK SENSORS TAB



STEP 2. - PROGRAM CHANNELS

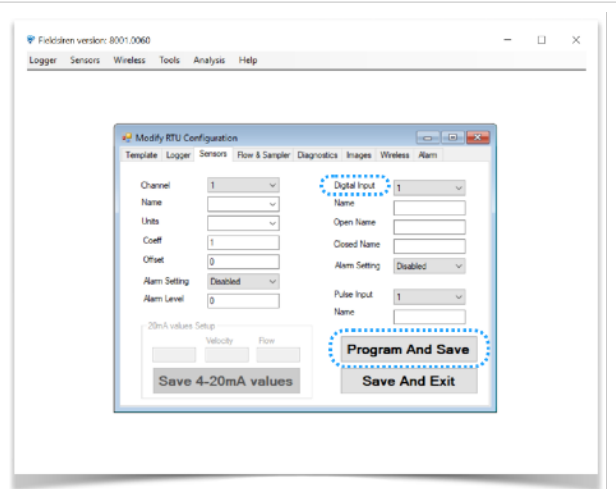
1. Enter Channel Number
2. Enter Channel Name
Default = Blank
3. Enter Sensor Units
Default = Blank
4. Enter Coefficient
Default = 1
5. Enter Offset
Default = 0
6. Set Alarm
Default = Disabled
Setting 1 = High Enabled
Setting 2 = Low Enabled
7. Set Alarm Level
Default = 0

! Note: Complete list of sensor profiles including standard sensor coefficients and offsets can be located in appendix of manual.



STEP 2. - PROGRAM DIGITAL INPUTS

1. Enter Digital Input Number (1-5)
2. Enter Digital Input Name
Default = Blank
3. Enter OPEN Name
Default = NOT ALARMED
4. Enter CLOSED Name
Default = ALARMING
5. Enter Alarm Setting
Default = Disabled
Setting 1 = Open Enabled
Setting 2 = Close Enabled



STEP 3. - PROGRAM PULSE INPUTS

1. Enter Pulse Input Number (1-3)
Input 1 = 16 bit
Input 2 = Not Used
Input 3 = 16 bit

 ⚠ Note: Input 2 available in specified versions of monitor firmware.
2. Enter Pulse Input Name
Default = Blank

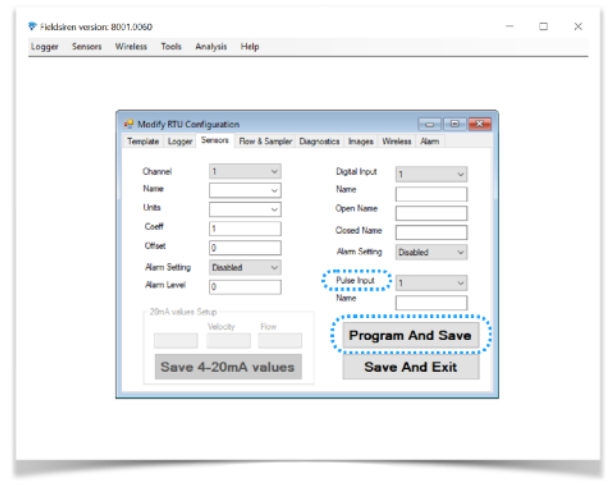
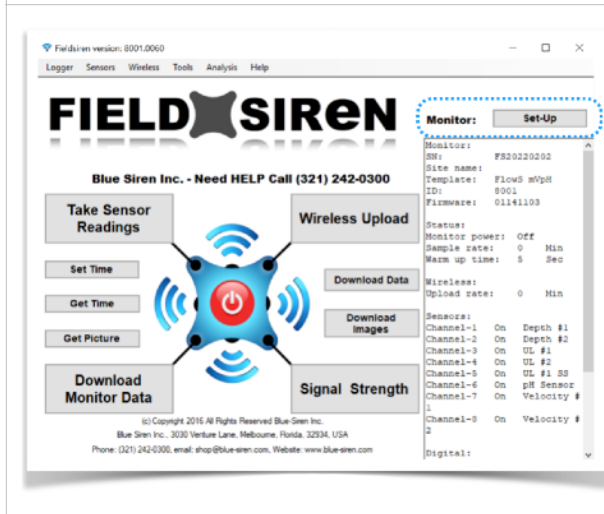


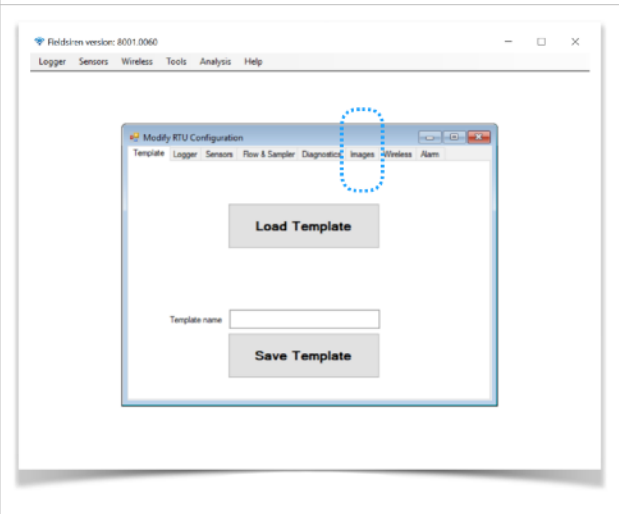
Image Setup

Configuring the monitor Vision Camera using FieldSIREN™ is completed by entering the “Set-Up” window located in the upper right hand corner of the main screen. Select the “Set-Up” button to enter the logger configuration window. Locate “Images” tab to complete.

Click “Set-Up” button to access and program the monitor.



Click “Images” Tab to set-up and program monitor images.



If you do not have a pre-programmed template, programming the monitor camera sensor must be performed manually.

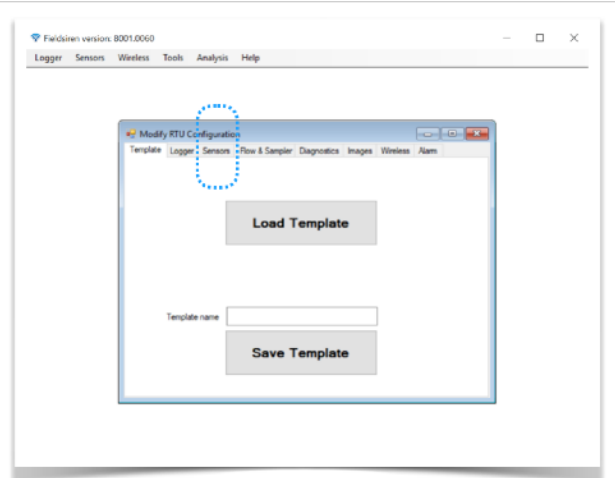
Programming the monitor camera will consist of setting up the following imaging parameters:

1. Image Resolution / Size
2. Image Compression Ratio
3. Image Sample Rate

IMAGE SET-UP

STEP 1.

CLICK IMAGE TAB



STEP 2. - SET IMAGE RESOLUTION

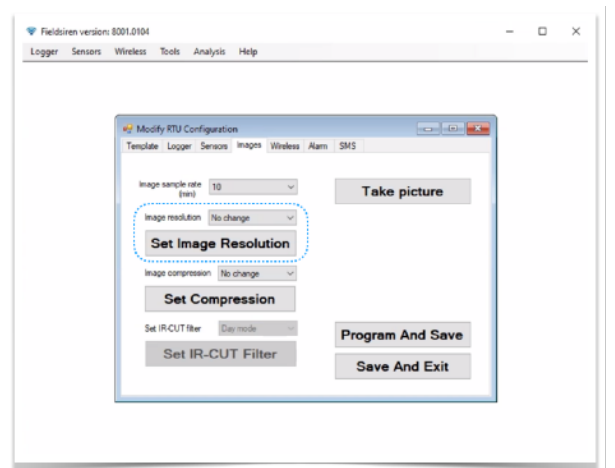
1. Select Image Size

The available 5MP Camera Sensor can be programmed to output various image resolutions to comply with customer requirements or cellular data packages. Select the required resolution or use the pre-programmed default.

⚠ Note: Default = 640 x 480.

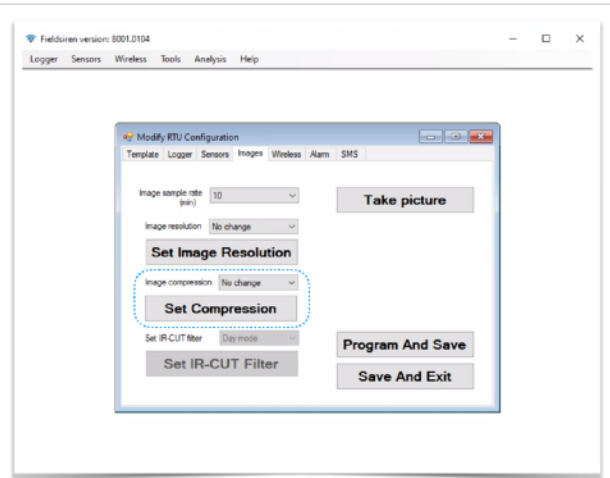
- Size 1 = 0.02MP = 160 x 120
- Size 2 = 0.08MP = 320 X 240
- Size 3 = 0.31MP = 640 X 480
- Size 4 = 0.48MP = 800 X 600
- Size 5 = 0.78MP = 1024 X 768
- Size 6 = 1.23MP = 1280 X 960
- Size 7 = 1.92MP = 1600 X 1200
- Size 8 = 2.08MP = 1920 X 1080
- Size 9 = 3.14MP = 2048 X 1536
- Size 10 = 5.04MP = 2592 X 1944

2. Click “Set Image Resolution” button.



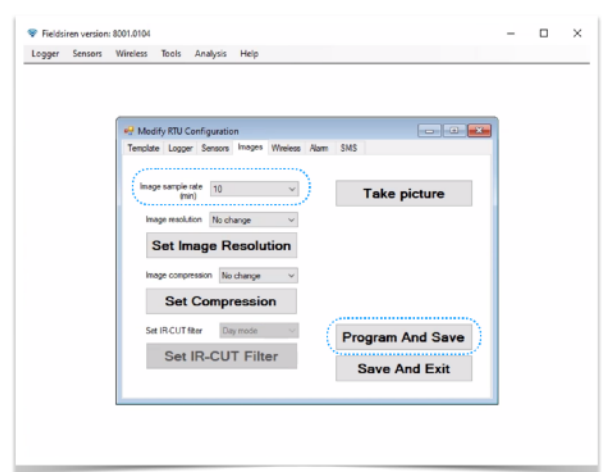
STEP 3. - SET COMPRESSION

1. Enter Compression Value (1-14)
 Default = Compression Level 10
2. Click “Set Compression” button.



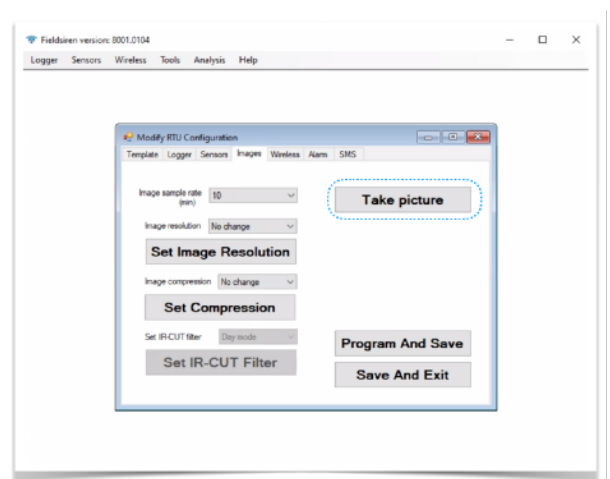
STEP 4. - SET IMAGE SAMPLE RATE

1. Enter Image Sample Rate in Minutes
 Default = 0
 Range = (0 - 255 Minutes)
2. Click “Program and Save” button.



STEP 4. - VERIFY CAMERA SETTINGS AND POSTIONING

1. Click “Take Picture” button to verify settings and camera positioning. Image will display on screen in new window.



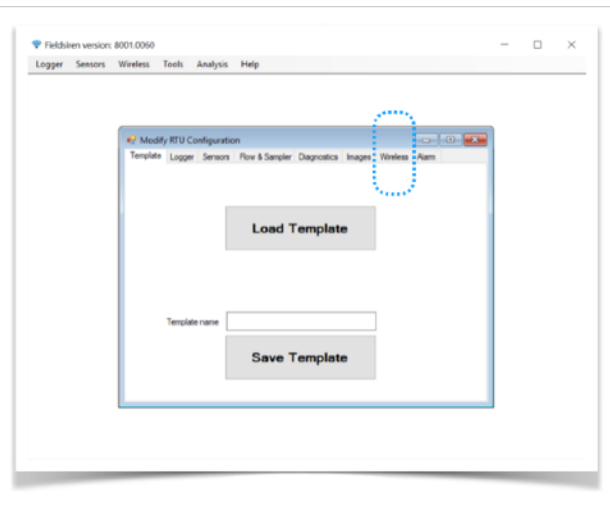
Wireless Setup

Configuring the wireless modem module using FieldSIREN™ is completed by entering the “Set-Up” window located in the upper right hand corner of the main screen. Select the “Set-Up” button to enter the logger configuration window. Locate “Wireless” tab to complete.

Click “Set-Up” button to access and program the monitor.



Click “Wireless” Tab to set-up and program the wireless modem module.



If you do not have a pre-programmed template, programming the wireless modem module must be performed manually.

Programming the wireless modem module will consist of setting up the following wireless parameters.

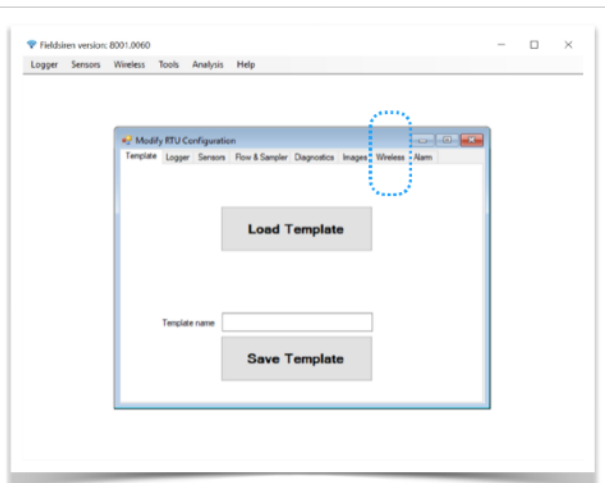
1. Server Port and Location
2. SIM Card APN
3. Upload Rate

If you are not using the BlueLIVE® cloud hosting platform for data transmission, data acquisition is delivered using either email or FTP. Server driver options are available for direct transfer of data without third party routing.

WIRELESS SET-UP

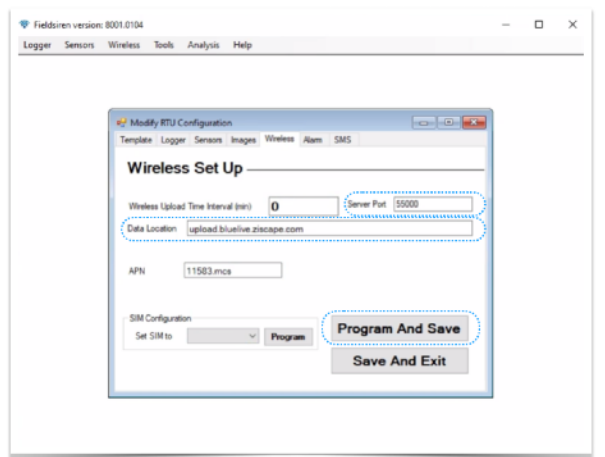
STEP 1.

CLICK WIRELESS TAB



STEP 2. - ENTER DATA LOCATION AND PORT NUMBER

1. Enter data location. Data location can include a DNS name or IP address.
 Default =
 upload.scada.ziscap.com
2. Enter sever port number. Server port number associated with the direct data transfer driver.
 Default = 55000
3. Click "Program and Save" button.

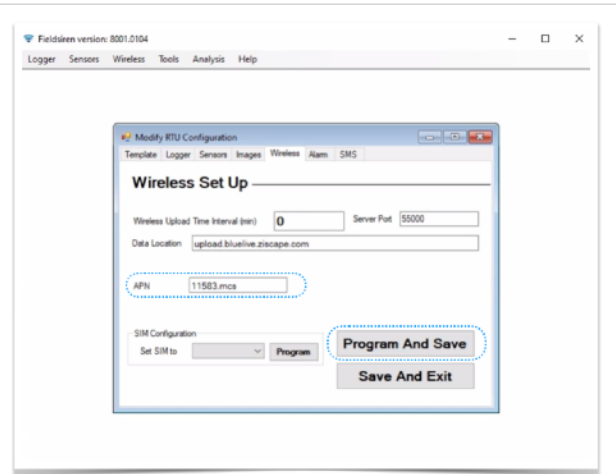


STEP 3. - ENTER SIM CARD APN

1. Enter APN. APN is provided by the cellular wireless carrier. Blue Siren offered options are provided below.

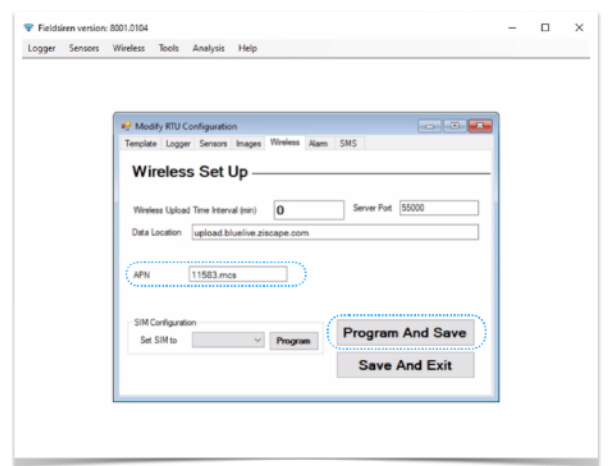
Telit = 11583.mcs
Verizon = TELIT.VZWENTP

2. Click “Program and Save” button.



STEP 4. - SET WIRELESS UPLOAD

1. Enter Upload Rate in minutes
Default = 0
Range = (0 - 255 Minutes)
2. Click “Program and Save” button.

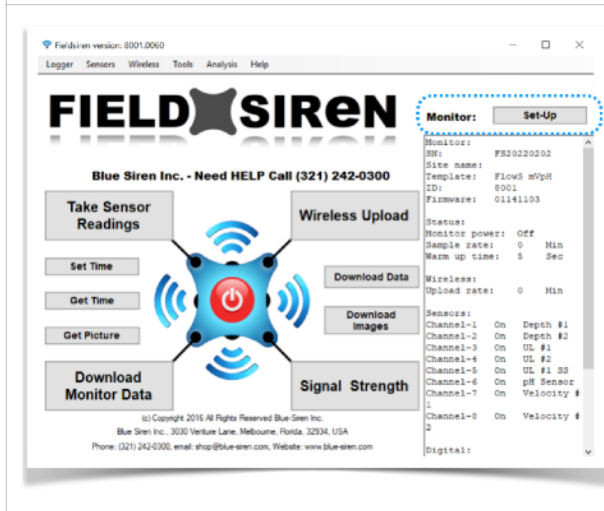


⚠ Note: If utilizing the Verizon cellular network, additional modem programming may be required. Setting the “SIM Configuration” to “Verizon” and clicking the “Program” button will re-configure the modem to the carrier’s specified requirements for data transmission. Due to the requirements put forth by the carrier, this task may be performed in order to access the data network. Following the re-configuration of the wireless modem module, the system will report “Programming Successful”. If this does not occur, turn off the sampling function located on the “Logger” Tab found within the “Set-Up” menu and select “Program” again.

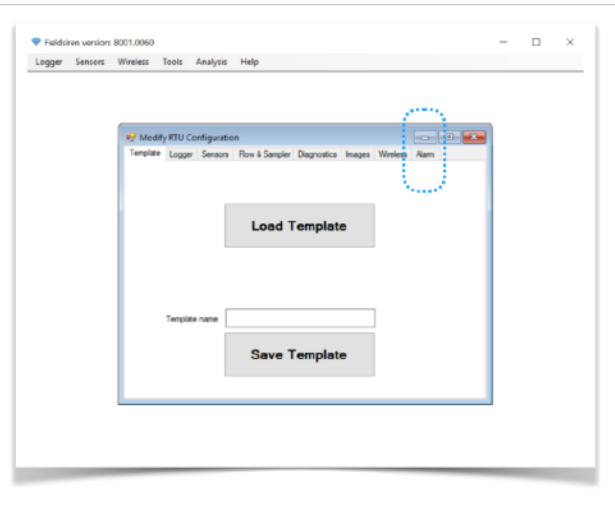
Alarm Setup

Configuring the alarming task using FieldSIREN™ is completed by entering the “Set-Up” window located in the upper right hand corner of the main screen. Select the “Set-Up” button to enter the logger configuration window. Locate “Sensors” and “Alarm” tab to complete.

Click “Set-Up” button to access and program the monitor.



Click “Alarm” Tab to set-up and program the alarming task.



If you do not have a pre-programmed template, programming the monitor alarms must be performed manually.

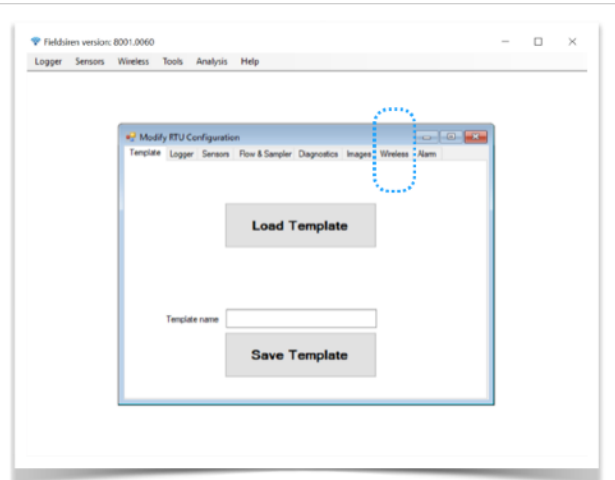
Programming the alarming task will consist of setting up the following parameters:

1. Sensor Alarm Trigger
2. Alarm Sample Rate
3. Alarm Image Sample Rate
4. Alarm Time Out

ALARM SET-UP

STEP 1.

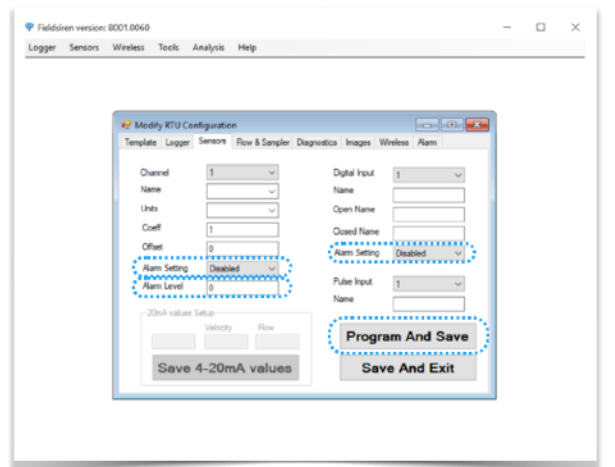
CLICK SENSORS TAB



STEP 2. - PROGRAM SENSOR ALARM

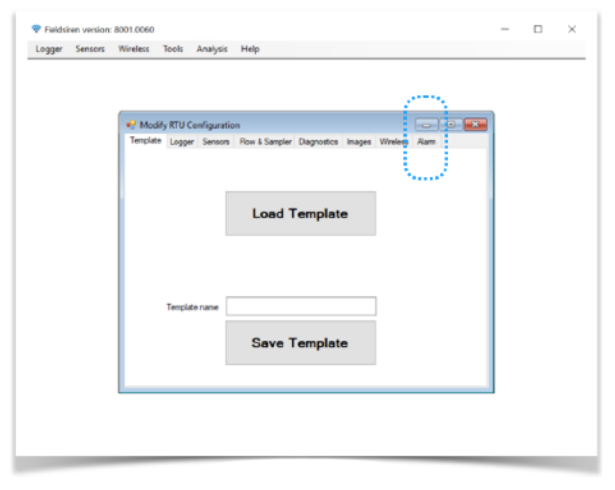
Sensor alarms can be configured for Channel or Digital Input Sensors.

1. Change alarm settings for:
 - Channel Sensors
 - Digital Input Sensors
2. Change alarm level
3. Click "Program and Save" button.



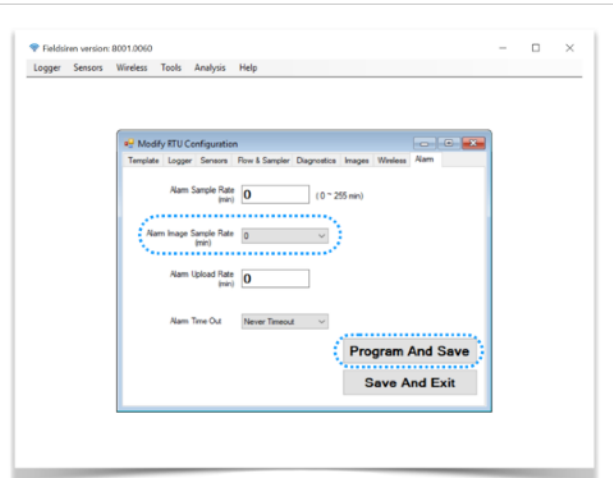
STEP 3.

CLICK ALARM TAB



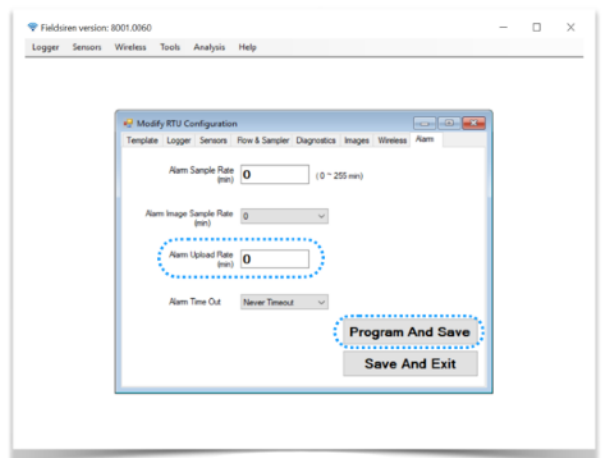
STEP 4. - ENTER ALARM SAMPLE RATE

1. Enter required Sample Rate to be programmed in alarming mode. Typically this value is lower or more frequent than the normal operating sampling rate programmed with the “Logger” tab.
2. Click “Program and Save” button.



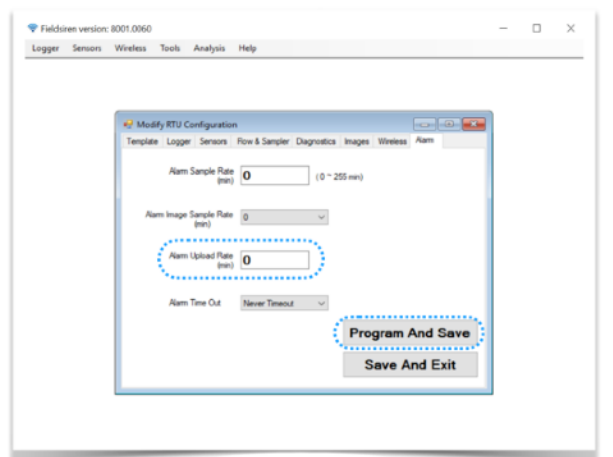
STEP 5. - ENTER ALARM IMAGE SAMPLE RATE

1. Select required Alarm Image Sample Rate. Typically this value is lower or more frequent than the normal operating imaging sampling rate programmed with the “Images” tab.
- ⚠ Note: If camera sensor is not utilized, set Alarm Image Rate to “0”.
2. Click “Program and Save” button.



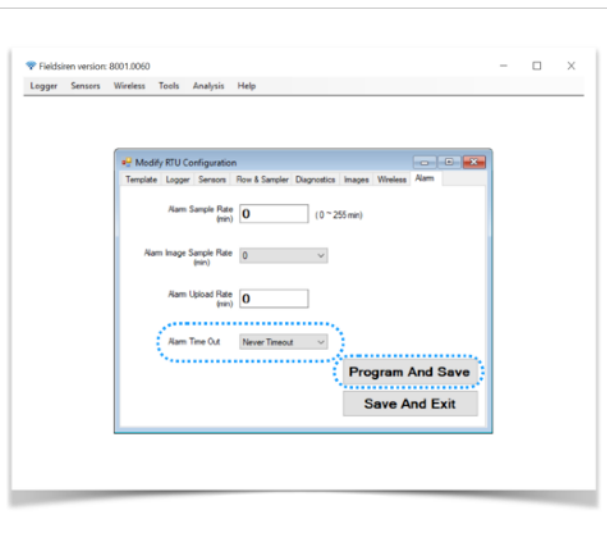
STEP 6. - ENTER ALARM UPLOAD RATE

1. Enter required Alarm Wireless Upload Rate. Typically this value is lower or more frequent than the normal operating upload rate programmed with the “Wireless” tab.
2. Click “Program and Save” button.



STEP 7. - ENTER ALARM TIMEOUT

1. Select required Alarm Time Out Rate. This feature is utilized to silence an alarm created by a sensor over a period of time. This feature is used to conserve battery life in the event a sensor's alarm threshold is inaccurately programmed.
2. Click "Program and Save" button.



Wireless Operation

After configuring the wireless modem module using FieldSIREN™, cellular connectivity testing is recommended. The following guide will demonstrate the standard manual cellular wireless testing sequence for the PROSiren™ monitor.

NETWORK REGISTRATION TEST

NETWORK REGISTRATION TEST

1. Click “Signal Strength” button.

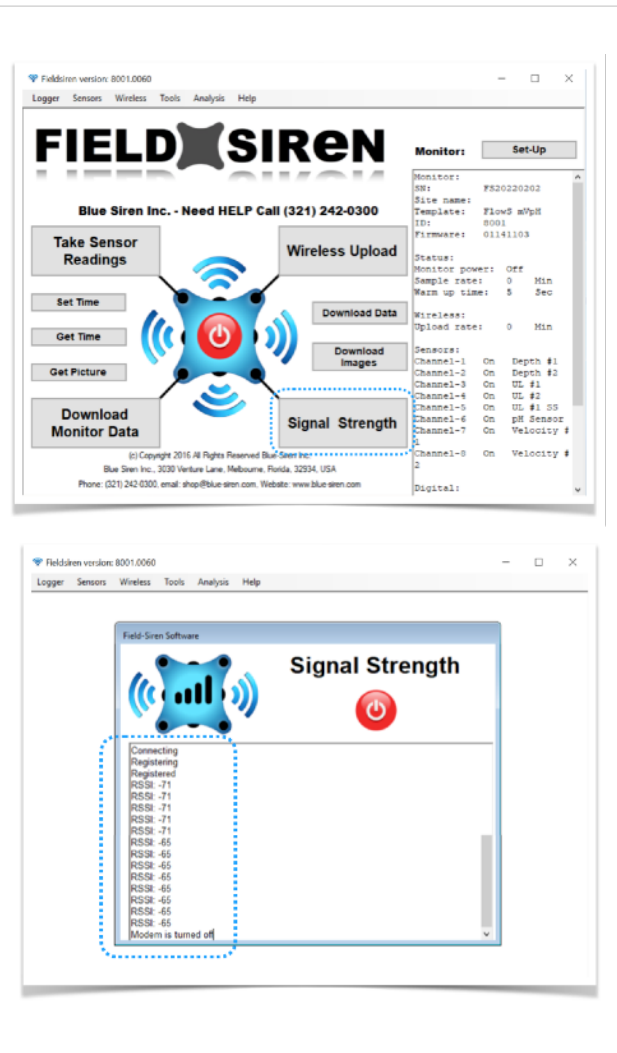
PASS = Monitor successfully registers to cellular network. Monitor will respond with a series of signal strength values.

⚠ Note: Signal Strength is measured as RSSI. (Relative Signal Strength Indicator)

- RSSI = -50 to -70 (GOOD)
- RSSI = -70 to -80 (MODERATE)
- RSSI = -80 to -100 (POOR)
- RSSI = -113 (NO SIGNAL)

FAIL = Monitor will not register to cellular network. Monitor will not respond with signal strength and automatically disables modem. Check SIM card installation and APN information in the “Wireless” Tab within the “Set-Up” menu. Verify Wireless Modem Module is connected to “Wireless” Port of monitor.

2. Click red “Power” button.



SERVER UPLOAD

TEST SERVER UPLOAD

1. Click “Wireless Upload” button.

PASS = Monitor successfully registers to cellular network and transmits data to server. Monitor responds “Wireless Upload Successful”.

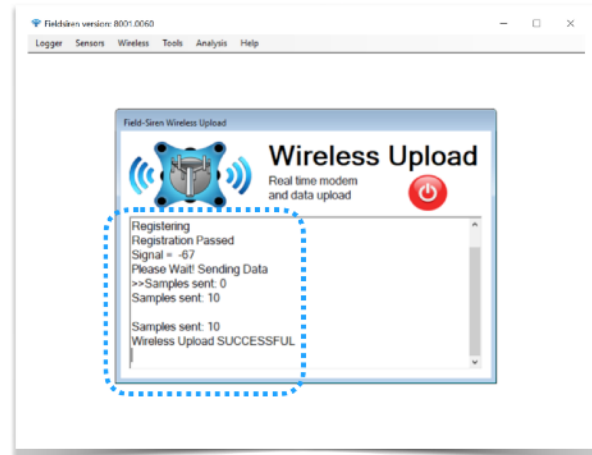
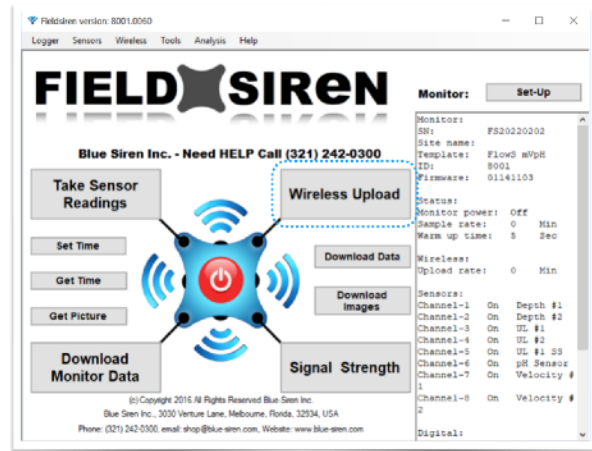
FAIL = Monitor successfully registers to cellular network, but will not send data. Monitor responds “Wireless Upload Failed”. Verify “Data Location” and “Server Port” in “Wireless” Tab within the “Set-Up” menu.

FAIL = Monitor will not register to cellular network. Check SIM card installation and APN information in the “Wireless” Tab within the “Set-Up” menu. Verify Wireless Modem Module is connected to “Wireless” Port of monitor.

! Note: Signal Strength is measured as RSSI. (Relative Signal Strength Indicator)

RSSI = -50 to -70 (GOOD)
 RSSI = -70 to -80 (MODERATE)
 RSSI = -80 to -100 (POOR)
 RSSI = -113 (NO SIGNAL)

2. Click red “Power” button.



Manual Download

The PROSiren™ monitor is equipped with internal memory that enables it to store both data and images for manual data collection. To access and download the internal data memory, select the “Download Monitor Data” feature located on the main screen. To avoid extended download data times, turn monitor sampling off before downloading data manually.

DOWNLOAD DATA

MANUAL DATA DOWNLOAD

1. Click “ON/OFF” button to disable sampling and wireless transmissions.
 RED = Monitor Sampling (OFF)
 GREEN = Monitor Sampling (ON)
2. Click “Download Data” button.

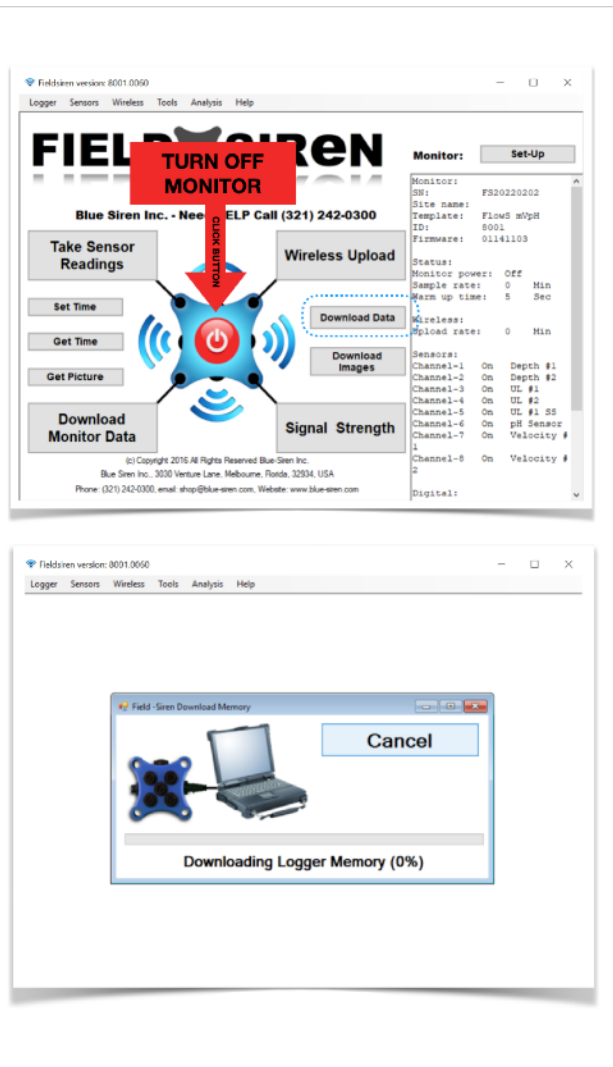
Monitor will scan the internal memory and begin to download data. Supported versions of FieldSIREN™ will have multiple time based data download options. Legacy versions of FieldSIREN™ do not support this function.

Download Options:

1. All Data
2. 1 Day through 180 Days

A complete memory download can contain several megabytes of data. Download times vary based on data collected.

3. Click “ON/OFF” button to re-enable sampling and wireless transmissions.



DOWNLOAD IMAGES

MANUAL IMAGE DOWNLOAD

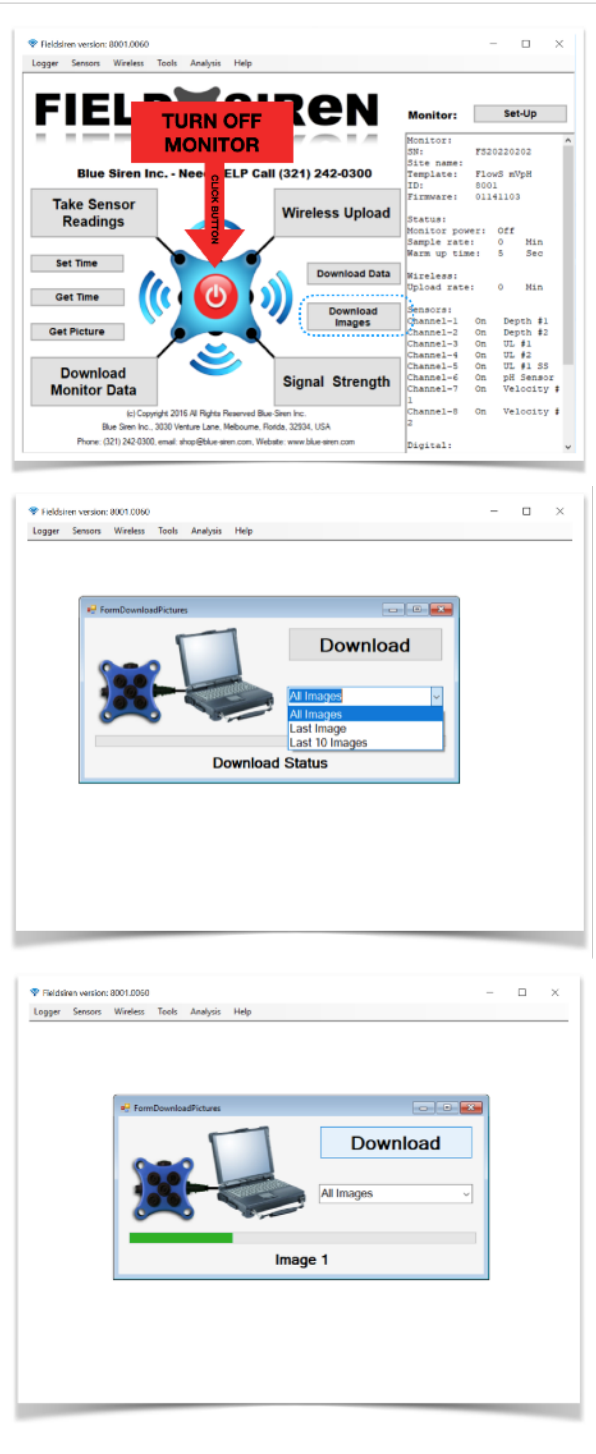
1. Click “ON/OFF” button to disable sampling and wireless transmissions.
 RED = Monitor Sampling (OFF)
 GREEN = Monitor Sampling (ON)
2. Click “Download Images” button.

Monitor will scan the internal memory and begin to download data. Supported versions of FieldSIREN will have multiple time based data download options. Legacy versions of FieldSIREN do not support this function.

Download Options:
 All Images
 Last Image
 Last 10 Images

A complete memory download can contain several megabytes of data. Download times vary based on data collected.

3. Click “ON/OFF” Button to re-enable sampling and wireless transmissions.



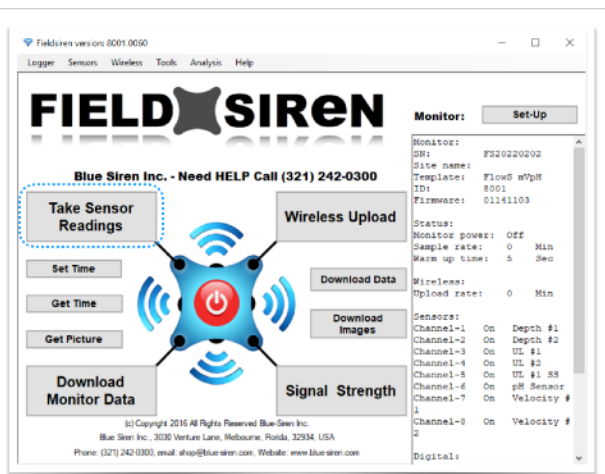
Sensor Reading

“Take Sensor Readings” button manually controls the monitor sampling and is used to capture either a single or multiple data point reading of all attached sensors. The results will be displayed on screen after all sensors have responded within the specified “warm-up” period. This feature is used to verify sensors results to match previous calibration results or to set-up sensors initially. Select “Exit” to return to the main screen.

TAKE SINGLE SENSOR READING

STEP 1. CLICK TAKE SENSOR READINGS

1. Click “Take Sensor Readings” button.

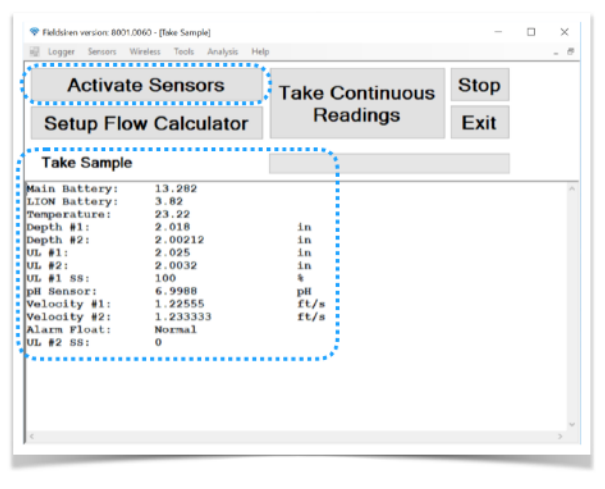


STEP 2. CLICK ACTIVATE SENSOR

1. Click “Activate Sensors” button.

“Activate Sensors” will communicate with all attached sensors based on the pre-programmed “warm-up” period and capture results. Results will be displayed on screen.

2. Click “Exit” button



TAKE MULTIPLE SENSOR READINGS

STEP 1. CLICK TAKE SENSOR READINGS

1. Click "Take Sensor Readings" button.

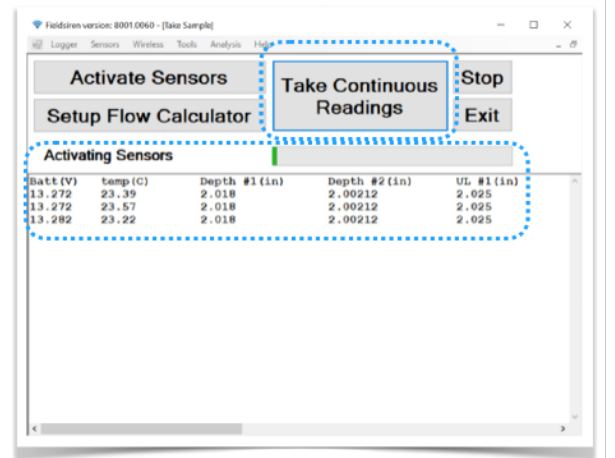


STEP 2. CLICK TAKE CONTINUOUS READINGS

1. Click "Take Continuous Readings" button.

Activates real-time sensor reading mode based on the pre-programmed "warm-up" period and capture results.

2. Click "Stop" button.
3. Click "Exit" button.



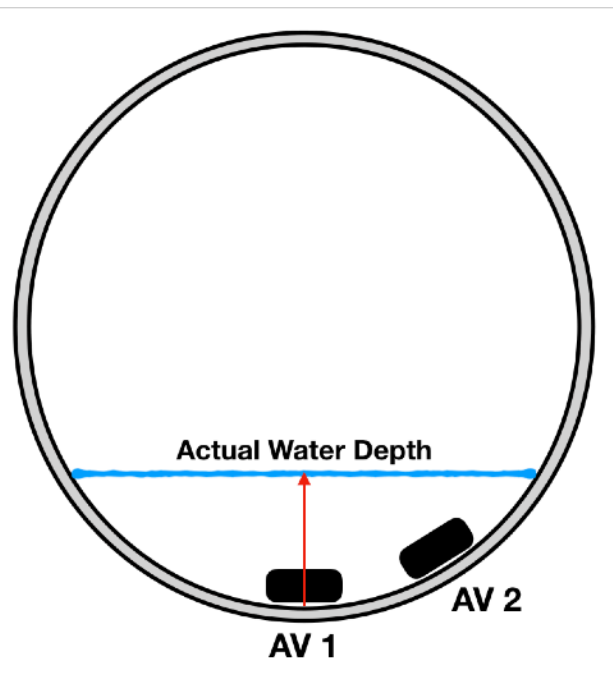
Calibrate Sensors

Several tools within FieldSIREN™ have been developed allowing the end user to calibrate any type of sensor, simply by taking a field reading. Calibration values are automatically stored within the “Sensors” set-up menu as coefficients and offsets when using the onboard tools. Users have the option of using the automated calibration tools or manually modifying calibration equation values. Due to the complex nature of covering all sensor calibrations the guide will demonstrate how to calibrate Pressure Depth, Ultrasonic Level, and Ultrasonic Doppler Velocity.

CALIBRATE (AV) PRESSURE DEPTH SENSOR

STEP 1. INSTALL AV / DEPTH SENSOR AT BOTTOM OF PIPE

Prior to calibration, actual water depth value must exceed 50mm or approximately 2 inches. Single or dual AV installations should always have primary sensor positioned at the invert of the pipe. Always measure water distance from the lowest part of the installation pipe.



STEP 2. CLICK SENSOR CALIBRATE

1. Click “Sensor Calibrate” located within the “Sensors” drop down menu.



STEP 3. CALIBRATE DEPTH SENSOR

1. Click checkbox “Depth 1”. If installing dual AV Sensors, also click checkbox “Depth 2”.

Automated Calibration will compensate for a single or dual calibration based on a single field reading.

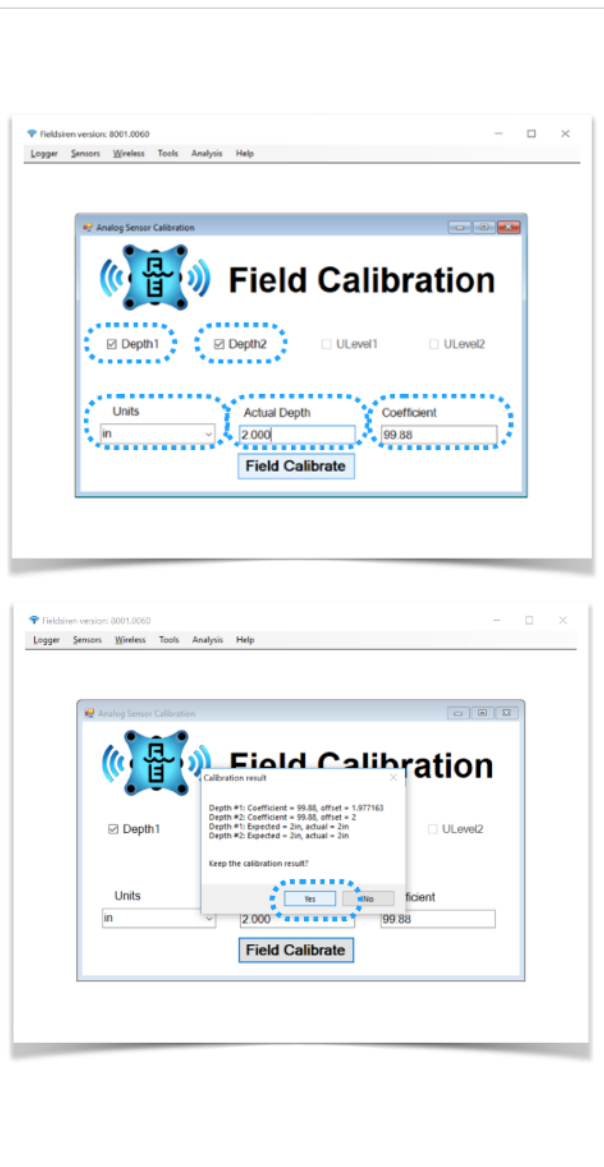
2. Enter the standard sensor coefficient in the “Coefficient” box.

! Note: Standard Depth Coefficients
 15 PSI Sensor (in) = 99.88
 15 PSI Sensor (mm) = 2537
 5 PSI Sensor (in) = 33.46
 5PSI Sensor (mm) = 850

3. Select “Units” of field measurement.

4. Physically measure and enter the actual water/fluid depth.

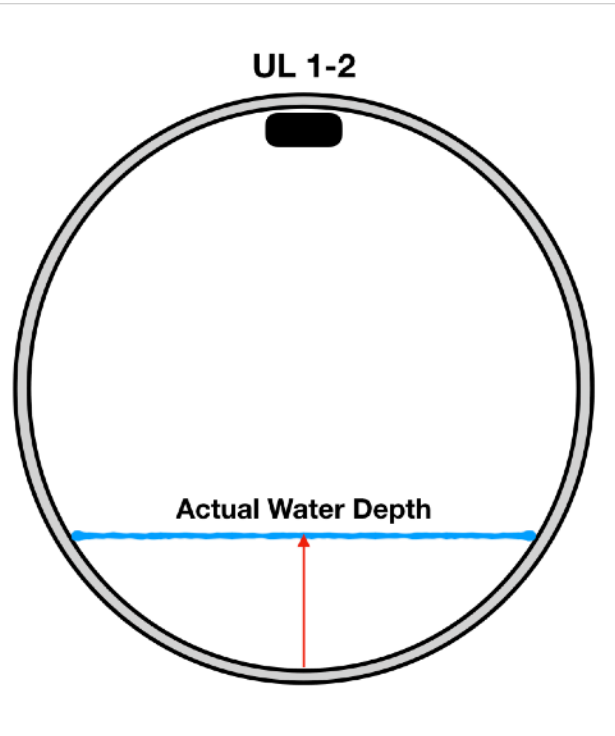
5. Click “Field Calibrate” button. Allow sequence to finalize. Click “Yes” to save calibration or “No” to re-calibrate.



CALIBRATE ULTRASONIC LEVEL SENSOR

STEP 1. INSTALL ULTRASONIC LEVEL ABOVE THE CENTER OF THE FLOW AREA

Ultrasonic level sensor options are offered in both a high range variation as well as a low range. High range offerings are typically installed within in the manhole column where as the short range variation would be installed within the pipe to be monitored. Regardless of variation, sensors must be installed above the centerline of the flow stream, bench, and/ or flume with a direct line of sight to the intended target. Field measurements are recorded from the lowest point in the pipe or stream resulting in the highest flow depth.



STEP 2. CLICK SENSOR CALIBRATE

1. Click “Sensor Calibrate” located within the “Sensors” drop down menu.



STEP 3. CALIBRATE LEVEL SENSOR

1. Click checkbox “ULevel 1”. If installing dual Ultrasonic Sensors, also click checkbox “ULevel 2”.

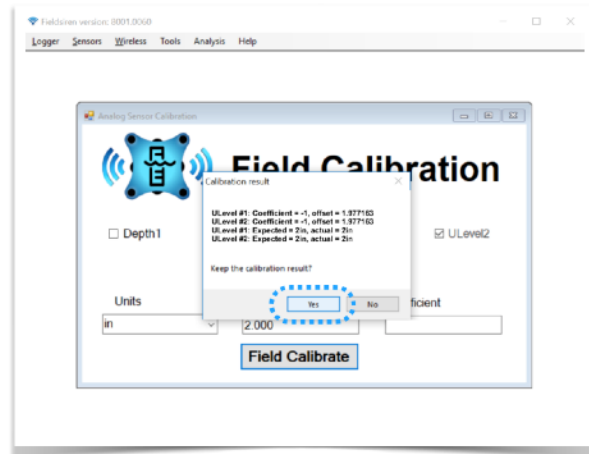
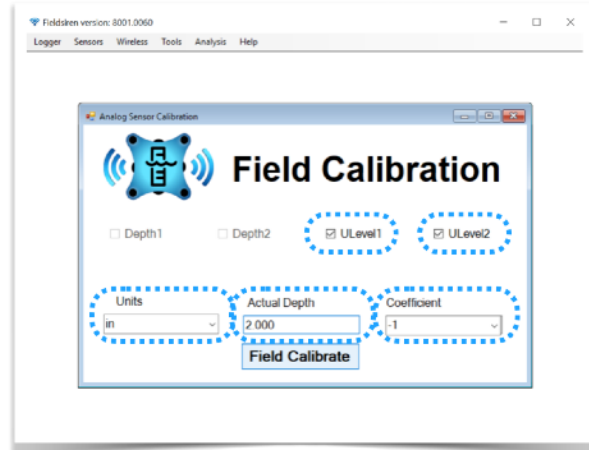
Automated Calibration will compensate for a single or dual calibration based on a single field reading.

2. Enter the standard sensor coefficient in the “Coefficient” box.

! Note: Standard coefficients for all variations of level sensors.

Level (in) = -1
 Level (mm) = -25.4

3. Select “Units” of field measurement.
4. Physically measure and enter the actual water/fluid depth/level.
5. Click “Field Calibrate” button. Allow sequence to finalize. Click “Yes” to save calibration or “No” to re-calibrate.

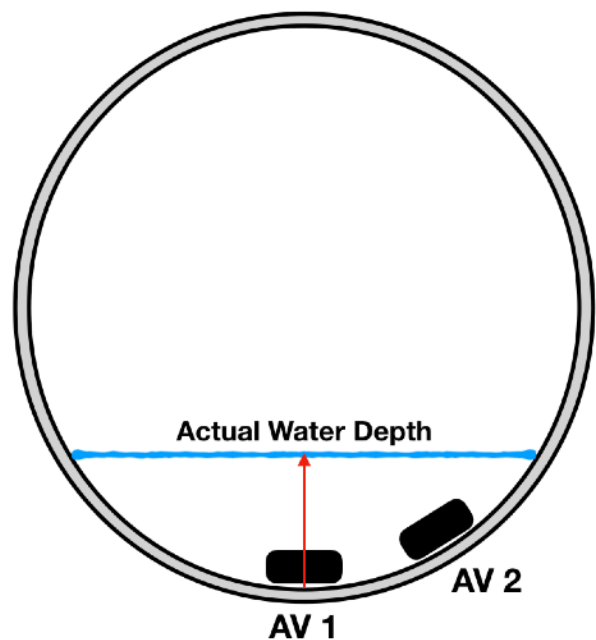


CALIBRATE VELOCITY SENSOR

Dual-Wave and Micro-Velocity Sensors are calibrated, verified, and tested in a fully submerged pipe under controlled flow conditions. Ultrasonic Doppler velocity is a linear relationship in which the sensor retrieves and averages the return velocity of particulate carried by the flow stream, known as the Doppler effect. Available sensor variations support multiple calculated statistical equations and averaging methods, with the more common consisting of an average of all measured return velocities. When monitoring large diameter installations with a single sensor or locations with less than ideal hydraulic conditions, it is imperative that sensor verification is performed on site and calibrated, if required. Verification of the velocity sensor is performed using industry standard hydraulic profiling techniques such as a T-Section or 9-Point hydraulic profile using a certified calibrated flow probe.

STEP 1. INSTALL AV VELOCITY SENSOR AT BOTTOM OF PIPE

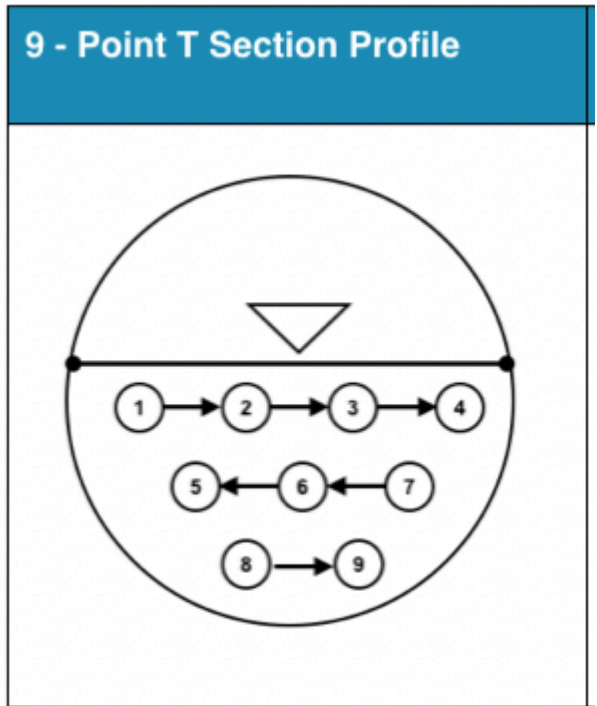
Prior to calibration, actual water depth value must exceed 50mm or approximately 2 inches. Single or dual AV installations should always have primary sensor positioned at the invert of the pipe. Always measure water distance from the lowest part of the installation pipe.



STEP 2. MEASURE ACTUAL VELOCITY USING 9-POINT PROFILE

Prior to calibration, actual water depth value must exceed 50mm or approximately 2 inches. Single or dual AV installations should always have primary sensor positioned at the invert of the pipe. Always measure water distance from the lowest part of the installation pipe.

In the event the water level is insufficient for a 9-point velocity profile, the T-Section can be modified and conducted by measuring only three points in the pipe profile. Typically measurements are recorded left to right with the center measurement conducted at the invert of the installation site.



STEP 3. CLICK VELOCITY CALIBRATE

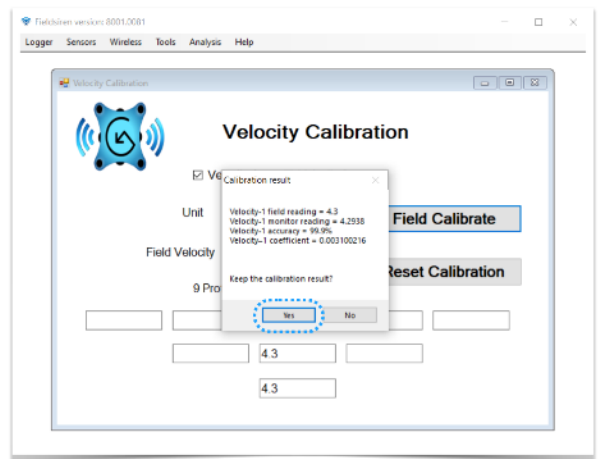
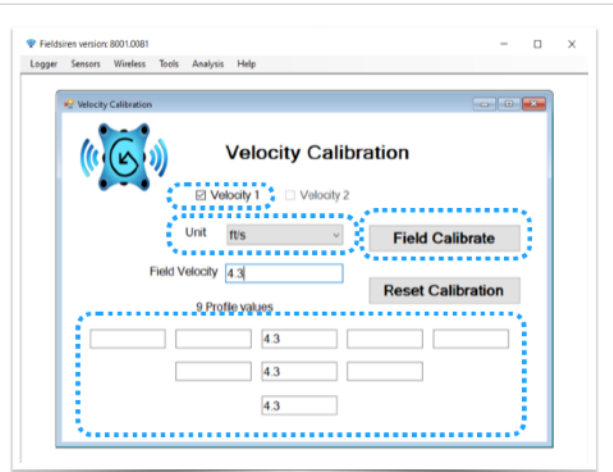
1. Click “Velocity Calibrate” located within the “Sensors” drop down menu.



STEP 4. CALIBRATE VELOCITY SENSOR

1. Click checkbox “Velocity 1”. If installing dual AV Sensors, also click checkbox “Velocity 2”.
2. Select “Unit” of field measurement.
3. Physically measure actual velocity using a calibrated flow probe. Enter the results within the t-chart. Minimum of 3 data points should be entered with a maximum input of 9 data points.
4. Click “Field Calibrate” button. Allow sequence to finalize. Click “Yes” to save calibration or “No” to re-calibrate.

⚠ Note: If performed calibration is not acceptable, Click “Reset Calibration” to restore factory calibration standards.



LED Indicator

The PROSiren™ monitor is equipped with a high intensity RGB status LED located on the COMM port. LED operation is demonstrated below.

BLUE - Sensor Power Active, Sampling Enabled

! WARNING !

DO NOT UNPLUG SENSORS WHEN BLUE LED ACTIVE! FAILURE TO COMPLY WILL RESULT IN DAMAGE TO EQUIPMENT AND VOID ALL IMPLIED WARRANTIES!

RED - Sensor Power Active, Sampling Enabled, Sensor Battery Low

! Note: Replace 12V Sensor Battery if RED LED Active/Present

GREEN - Monitor Wirelessly Connected to Server, Sending Data

LED Operation:

 COMM	 COMM	 COMM
WIRELESS CONNECTION AND SENDING DATA TO SERVER	TAKING SENSOR READINGS POWER IS ON	TALKING SENSOR READINGS AND MAIN POWER IS LOW (Less than 8.5V)

Installation of AV Sensor with Mounting Band

Step 1:

Gather the AV sensor and the mounting band.

- Ensure you have (4) four #4-40 screws of appropriate length: two 3/8-inch screws for the front holes and two 1/2-inch screws for the back hole, have Phillips screwdriver ready.
- Lay out the mounting band on a flat and stable surface. Place the AV sensor on the center of the mounting band, making sure the front and back screw holes on the sensor align with the corresponding holes on the band.
- With one hand, hold the AV sensor in place on the center of the mounting band. With your other hand, take 3/8-inch screw and insert it through one of the front screw holes on the sensor, into the corresponding hole on the band. Turn the screwdriver counterclockwise to loosely fasten.
- Repeat the same process for the other front hole. Now, move on to the back holes, insert 1/2-inch screw through a back screw hole on the AV sensor, aligning it with the hole on the mounting band. Ensure that the AV sensor is properly aligned on the center of the mounting band.
- Once you have confirmed proper alignment, proceed to tighten all four screws. Make sure all screws are tightened evenly and adequately to ensure a secure fit.

Single AV Sensor Installation



Single AV Sensor with Band and Screw-Jack

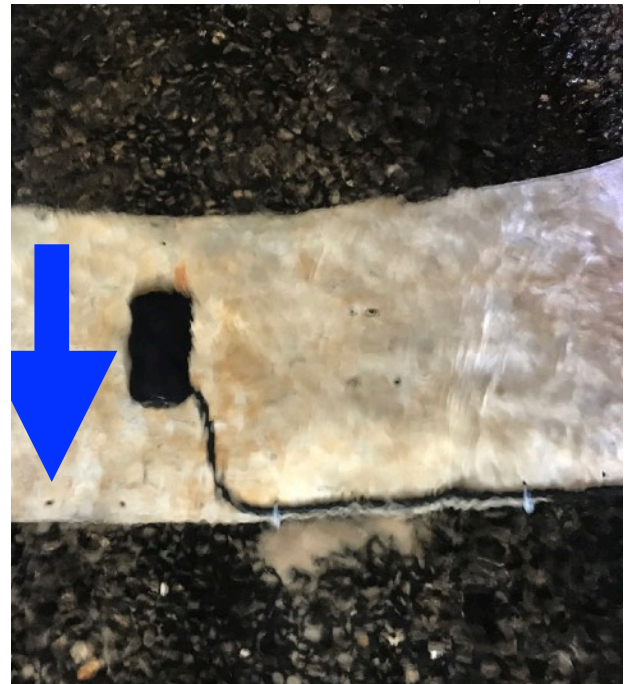


Dual AV Sensor Installation
Dual AV Sensors with Band and Screw-Jack

Step 3:

Proceed to area of installation or open manhole and find suitable pipe, that has ideal hydraulic conditions, minimal siltation and debris.

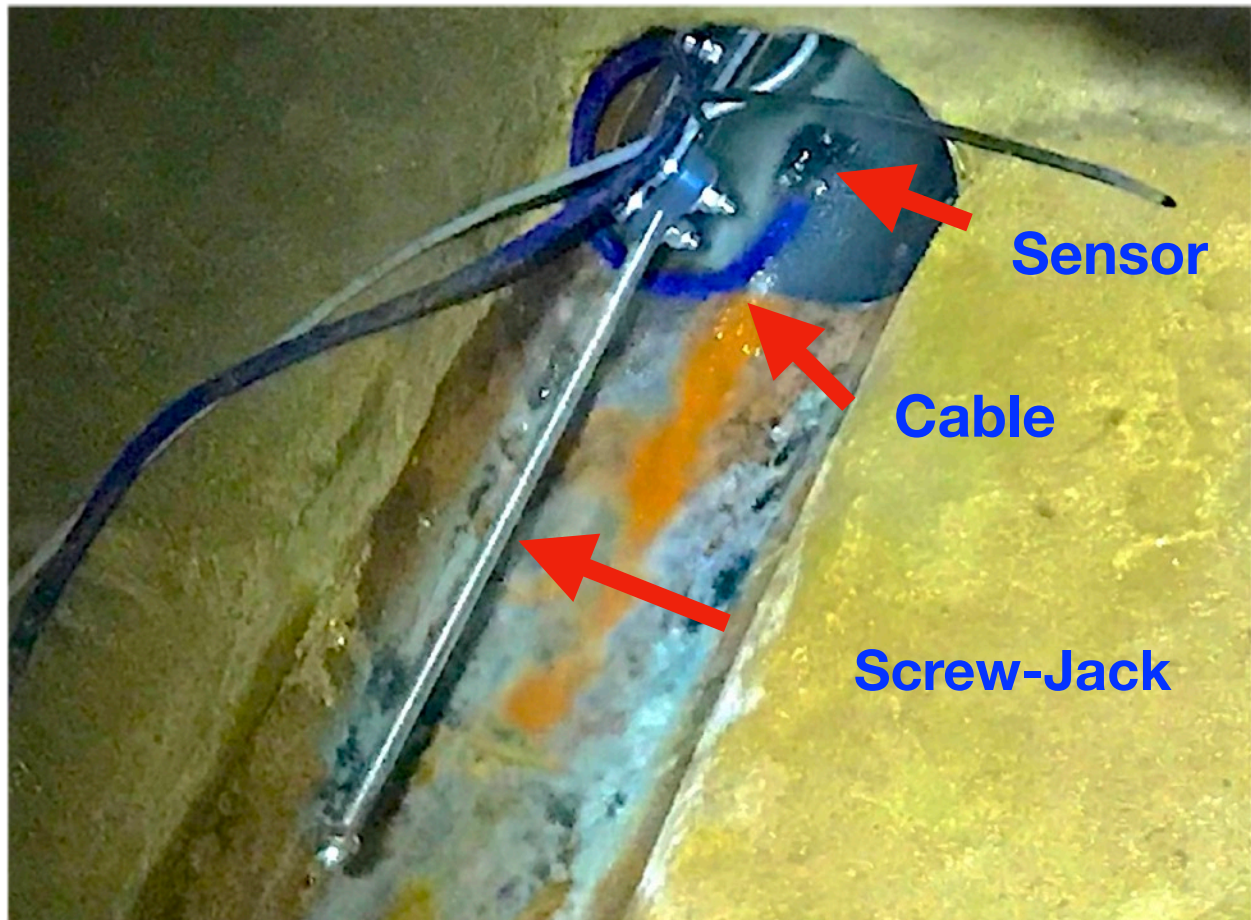
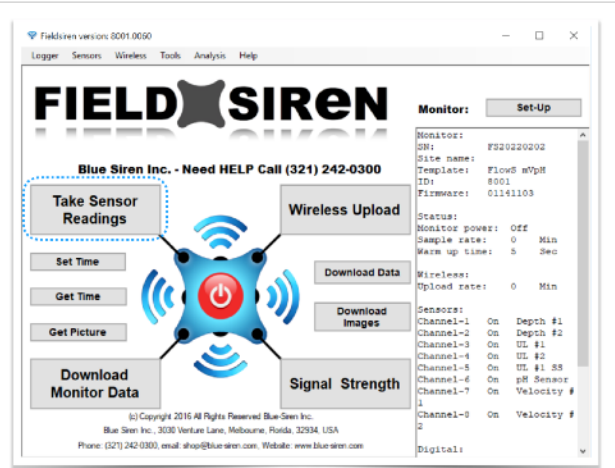
- Slide Band into pipe.
- To expand the Mounting Band and make it seamlessly fit around the pipe, use the 1/2-inch socket on the drill end or the manual socket wrench. Put the drill (if using a drill) in reverse mode, and slowly turn the drill or socket wrench until the mounting band expands and fits snugly around the pipe.
- Leave the mounting band and screw-jack in its expanded position around the pipe, ready for its intended purpose. The AV sensor is placed upstream facing into the water flow direction.
- Secure sensor cables with zip ties along the top of the mounting band, starting from the hole nearest to sensor.



Ensure cable is against the band and out of the way from water flow to prevent catching anything.

Step 4:

Once AV sensor is secured in water flow to take readings, connect sensor to monitor.
 Take a test reading.



IMPORTANT



Contact **Blue Siren®** for technical support at +1 (321) 242-0300.



Warranty covers Blue Siren® products and software for the duration of the warranty period per the warranty's terms and conditions.



Blue Siren® is **NOT LIABLE** for damage or injury due to any handling, installation, or maintenance of supplied products.



BlueLive® Cloud based hosting with FieldSIREN™ that supports 2G, 3G, and 4G



Always **service** your Blue Siren® products according to the manufacturing instructions.

Always **calibrate and verify** sensors when installing hardware.

Periodically verify sensors and monitor operation.