



Interscan Corporation

Instruction Manual

ACCUSAFE Controller Module

Table of Contents

Section 1 - Introduction.....	2
1.1 Important Safeguards.....	2
1.2 Accusafe Conotroller Specifications.....	2
Section 2 - Installation.....	3
2.1 Enclosure Wall Mounting.....	3
2.2 Wiring Connections.....	3
2.3 MODBUS Operation.....	4
2.3.1 RTU RS485 Configuration.....	4
2.3.2 Example Modbus Configuration.....	5
Section 3 - Operation.....	7
3.1 Controller Overview.....	7
3.1.1 Controller Toolbar.....	7
3.1.2 Control Panels.....	7
3.1.3 Sensor Measurements.....	10
3.1.4 Alarms.....	12
3.1.5 Recipes.....	14
3.1.6 Panel Configuration.....	14
3.1.7 Sensor Calibration.....	16
3.1.8 Info.....	16
3.2 Remote Device Control.....	18
3.2.1 Remote Alarm Relay Control – COMMON ALARM.....	18
3.2.2 Remote Alarm Display.....	19
3.2.3 Dual Remote Alarm Output Control.....	19
Section 4 - Controller Remote Web Browser / Launcher App.....	20
4.1 Installing The Launcher App.....	20
4.2 Opening A Controller Browser.....	20
4.3 Other Launcher App Functions.....	22
4.3.1 Download Data.....	22
4.3.2 Cleanup Data.....	24
4.3.3 Panel Editor.....	24
4.3.4 Software update.....	25
4.3.5 MQTT configuration.....	25

4.3.6 MQTT Endpoints.....	27
4.4 Accessing Web Browser on Mobile Devices.....	29
Section 5 - Calibration.....	30
Section 6 - Troubleshooting.....	31
Section 7 - Warranty.....	32

Section 1 - Introduction

1.1 IMPORTANT SAFEGUARDS

To reduce the risk of fire, electrical shock, injury to persons or permanent damage to this device, these safety precautions should always be followed:

- Use the included 5V DC power supply or specified power connector to operate this device. Inappropriate voltage supply or power connector could cause irreparable damage to this device.
- Make sure power plug and Modbus cable are plugged in and secured before powering up the device. The power connector will not make connection to GND if not fully plugged into the socket.
- Do not expose this device to any liquids.

1.2 ACCUSAFE CONOTROLLER SPECIFICATIONS

Power Input	5V DC
Avg. Power Consumption	5W
Weight	0.88 kg
Enclosure	Powder-coated aluminum
Dimensions	8 in x 4.7 in x 2.2 in (dims include mounting flanges)
Communication	Modbus RTU (RS485) & TCP/IP (Ethernet)
User Interface	7" Touch Display, remote web browser, Desktop app
Software Features	Configurable I/O for Modbus-compatible sensors/actuators. Configurable control algorithm (PID, ON/OFF, Open Loop) MQTT cloud API Sound and email alarms Control-event scheduler
Data storage	8GB

NOTE: The model number “F901” as depicted numerous times in this manual in device and software screenshots is the original model number for the Accusafe devices. While no longer in

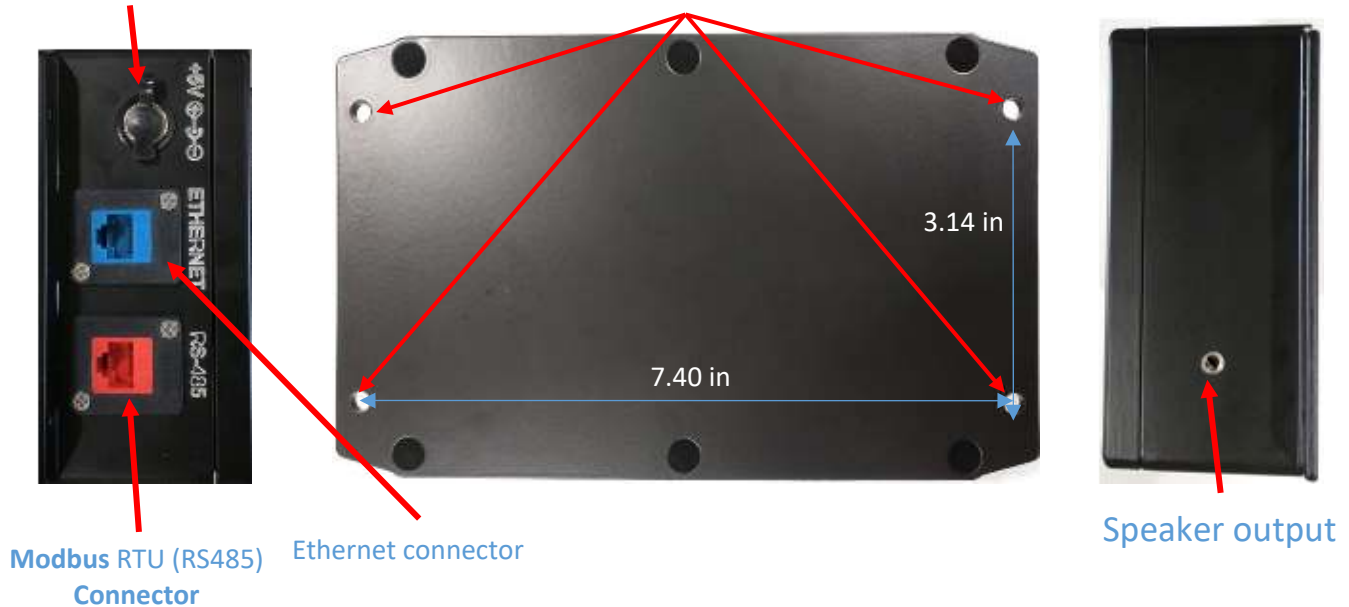
use and not referred to in the manual text, this model number remains in current versions of the firmware and app software. Future versions will eliminate this model number.

Section 2 - Installation

2.1 ENCLOSURE WALL MOUNTING

5V Power Input

Mounting Holes



The Controller module is wall mountable using M5 or #10 screws. Install the module in the immediate area where you wish to view the displayed sensor readings. Consideration should be given to proximity for users to engage the touch screen.

2.2 WIRING CONNECTIONS

Connect the 5V power adapter to the Controller module by inserting the plug into the 5V power receptacle.

For TCP/IP communications applications, connect a standard CAT5 communications cable to the Controller's MODBUS **ETHERNET** port. This cable will then connect to the comm port on the ACCUSAFE Sensor module for single sensor applications or to an Ethernet switch or hub for multi-sensor applications.

For RTU (RS485) communications applications, connect a standard CAT5 communications cable to the Controller's MODBUS **RS485** port. This cable will then connect to the comm port on

the ACCUSAFE Sensor module for single sensor applications or to the next sensor in the daisy chain for multi-sensor applications**.

****NOTE:** Multi-sensor applications using RS485 connections will require a splitter device be used at each node in the chain using a multi-drop (daisy chain) topology.

IMPORTANT:

- MAKE SURE POWER CABLE AND MODBUS CABLE ARE **SECURED** BEFORE POWERING UP DEVICE

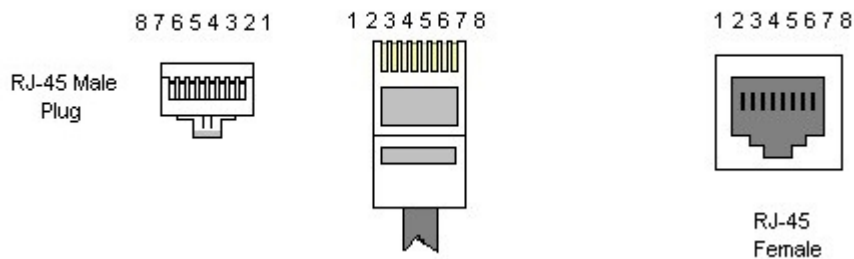
2.3 MODBUS OPERATION

The Controller module supports the standard Modbus protocol in both RTU and TCP/IP mode depending on how the associated sensor module(s) is/are configured and how the controller is physically interfaced with the sensor(s). See section 3.2 of the Sensor Module user manual for details on sensor Modbus setup and implementation.

NOTE: Unless otherwise requested, all Accusafe systems are configured for TCP/IP use as factory default.

2.3.1 RTU RS485 CONFIGURATION

RS485 cabling configuration is shown in the diagrams and table 3-1 below.



Pin	Name	Type	Description
1	3NC		No Connection
2	GND	Reference potential	Local device ground
3	NC		No Connection
4	B (D-)	Bus In/Out	Driver output and receiver input
5	A (D+)	Bus In/Out	Driver output and receiver input
6	NC		No Connection

7	NC	No Connection
8	NC	No Connection

TABLE 2-1

Electrical parameters

Parameter	Min	Max
Voltage Range at A or B	-7V	12V
Differential Threshold Voltage (Receiver)	-0.2V	0.2V
Differential Output Voltage (Transmitter)	1.5V	5V
Input Current (12V)	-0.8mA	1mA
Input Resistance	12k Ω	
Electrostatic Discharge at A and B		± 8 kV

2.3.2 EXAMPLE MODBUS CONFIGURATION

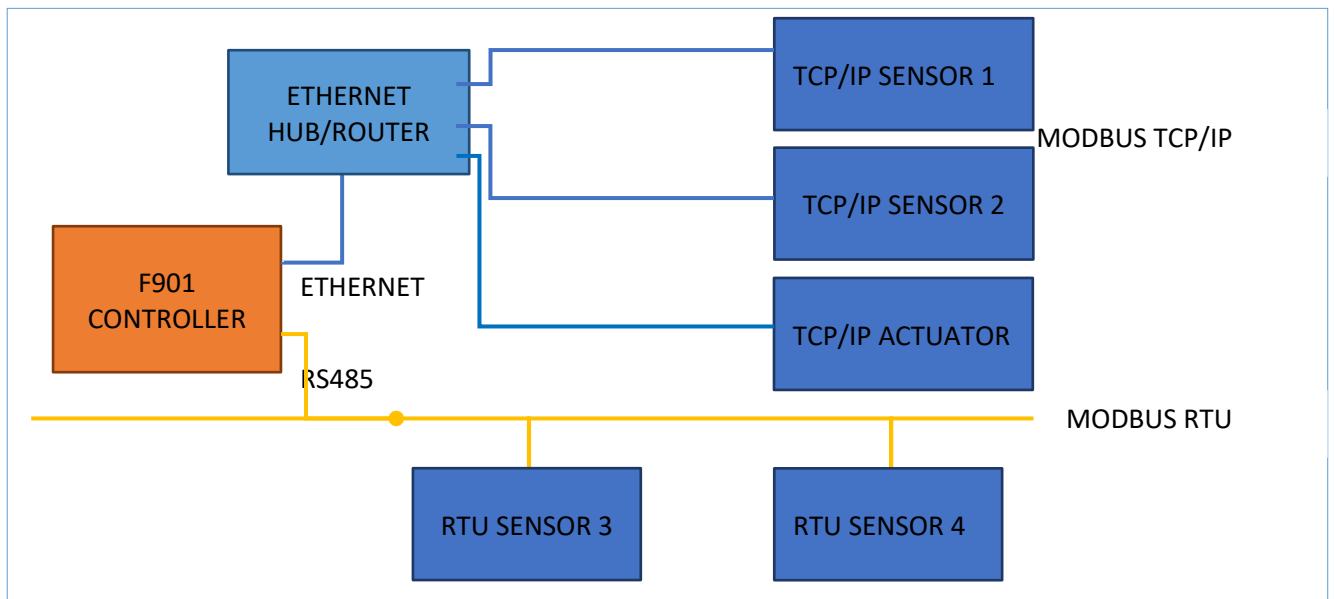


Figure 2-1: Hub connection configuration

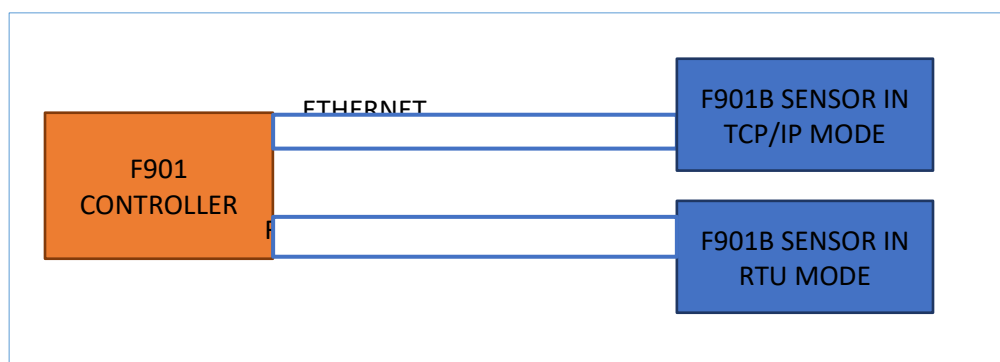


Figure 2-2 F901 Controller and Sensor direct connection

NOTE 1: See Section 3.1.8 on page 16 for details on switching between Hub and Direct Ethernet connection via **P2P Ethernet** setting.

NOTE 2: Refer to the Sensor Module user manual for details on Sensor module setup and interfacing with the Controller.

Section 3 - Operation

3.1 CONTROLLER OVERVIEW

The ACCUSAFE Controller module provides detailed monitoring of the outputs from all connected Sensor module(s). It provides real time display of gas concentration levels measured by all sensor modules in the network as well as alarm status, temperature (T) and relative humidity (RH) and a number of sensor related parameters that are detailed later in this section. The user can choose which of these parameters will be displayed on the primary measurement display by enabling the desired parameters in their control panels.

Each element that can be displayed also has an associated alarm level that can be enabled/disabled and set to the desired value for the element. See section 3.1.4 for details on the alarm feature.

3.1.1 CONTROLLER TOOLBAR

The controller's main toolbar shown below is the primary means of accessing all the features of the controller. Tapping an icon on the toolbar opens the menu screen associated with the icon as described in the following sections. The currently active menu will be indicated by a blue highlighted icon on the toolbar.



3.1.2 CONTROL PANELS



All elements controlled and displayed by the controller are organized into “Panels” that determine all the parameters associated with the element. The Control Panels menu gives the user access to these panels where they can be enabled for display on the SENSOR MEASUREMENTS screen (see section 3.1.3 on page 10) and included in the logged data or where the user can temporarily view the desired data for diagnostic purposes while keeping the data off the main display screen and out of the data log.

The screenshot below shows a Control Panels window for a 2 channel monitoring system for H2S. The left side menu is a list of all the panels available to access. If there are more panels than will fit in a single view, the list can be scrolled by touching and dragging the list. Touching any panel on the list will open the panel. Each panel lists the name, data for that particular element(s) and a ON/OFF button for omitting the data from the Sensor Measurements screen and data log. Touch the ON/OFF button will cycle the button to the opposite of its current status.

NOTE: Gas/location labels can be changed to suit the user's need in the Panel Configuration Menu as well as in the Panel Editor. See section 3.1.6 on page 14 and 4.3.3 on page 22 for details on these options.

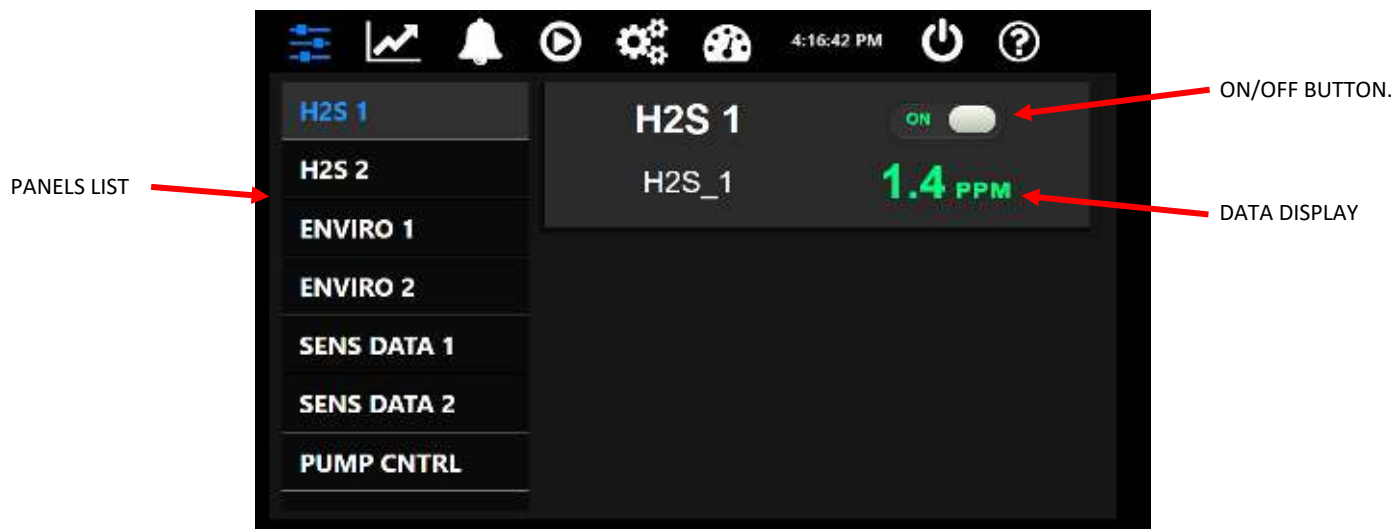


FIGURE 3-1

NOTE: Turning any panel off disables its display on the Sensor Measurement screen as well as turning off the data display on its Control Panel window as shown below. The panel's data will also be omitted from logged data and local alarms are disabled for all devices associated with the panel.

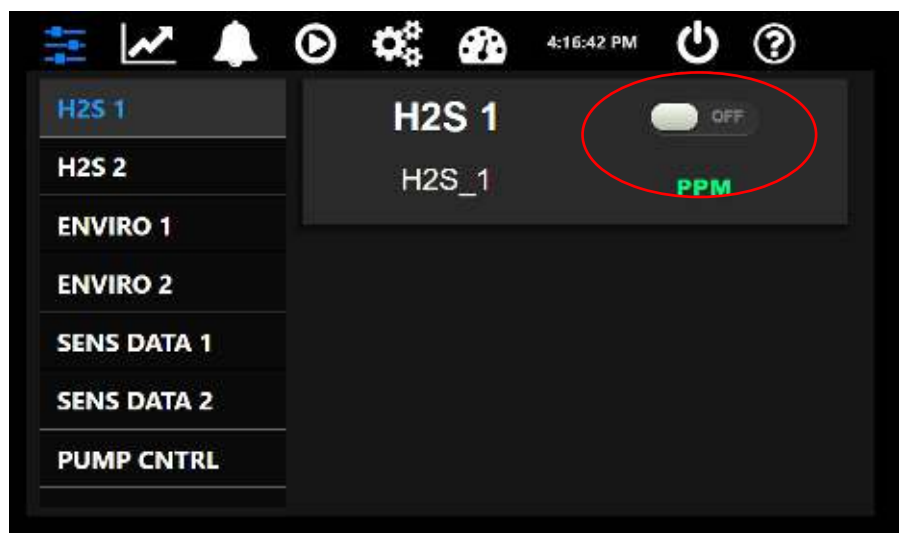


FIGURE 3-2

One exception to this layout is the PUMP CNTRL Panel which contains a slider controller for changing the value associated with the pump speed. See Figure 3-5 on page 10 for details on the PUMP CNTRL panel.

All ACCUSAFE instruments will contain the following panels:

- One GAS CONCENTRATION panel for each sensor module in the system. These will typically be factory labeled according to the target gas and numbered sequentially for each sensor module in the system as shown above (the first two panels listed). In some cases, sensors will be combined in a single panel titled SENSORS.
- One SENS DATA panel for each sensor module in the system. These panels provide data for real time raw sensor output, the current ZERO correction value and the current SPAN value. Panels are numbered sequentially for each sensor module in the network. See figure 3-3 below.
- One ENVIRO panel for each sensor module that addresses Temperature (TEMP) and Relative Humidity (RH) at the channel's location. These will be numbered sequentially for each sensor module in the system. See figure 3-4 below.
- One PUMP CONTROL panel containing one pump control slider for each sensor module allowing the user to raise or lower the pump speed and affectively increase or decrease the flowrate. See figure 3-5 on page 10.

NOTE: CHANGING PUMP SPEED WILL AFFECT CALIBRATION ACCURACY. RECALIBRATION WILL BE NECESSARY IF PUMP SPEED IS ALTERED.

- One PUMP SPEED panel that displays active pump speed data for each sensor module in the network. See figure 3-6 on page 10.

The series of screenshots below show examples of these various panels in the ON (Enabled) state.

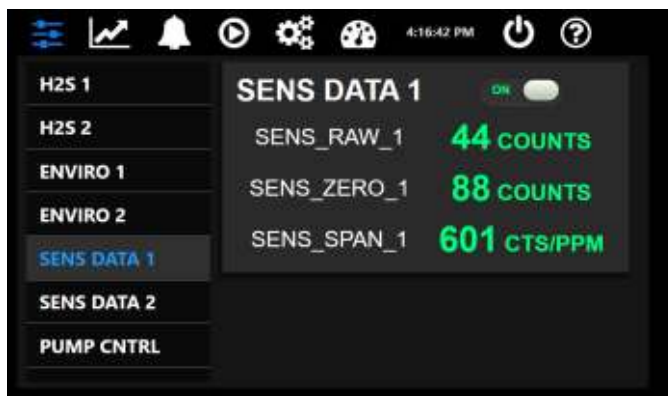
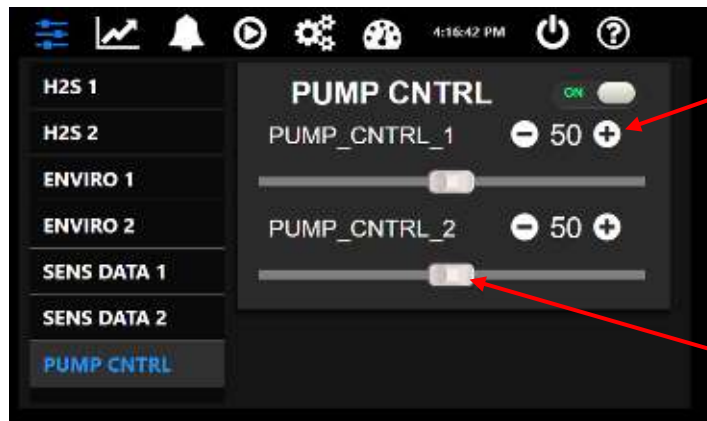


FIGURE 3-3
SENSOR DATA PANEL FOR CHANNEL 1



FIGURE 3-4
ENVIRONMENTAL PANEL FOR CHANNEL 1



TOUCH + OR – BUTTONS
TO FINE TUNE VALUE UP
OR DOWN.

TOUCH AND MOVE SLIDER
RIGHT TO INCREASE OR LEFT TO
DECREASE VALUE.

FIGURE 3-5
PUMP CONTROL PANEL FOR CHANNELS 1 & 2

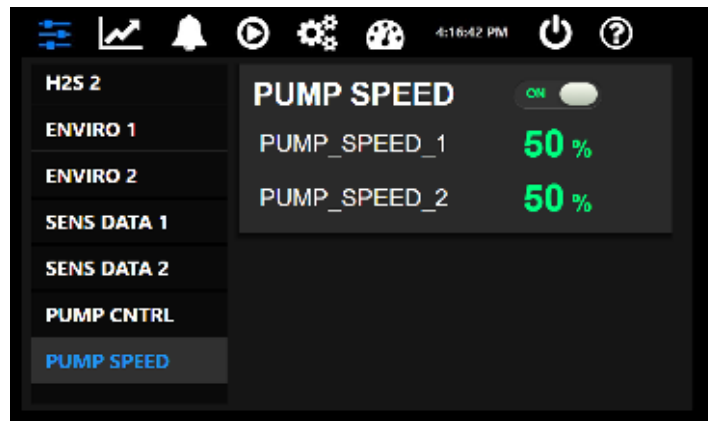


FIGURE 3-6
PUMP SPEED PANEL FOR CHANNELS 1 & 2

IMPORTANT: Pump speed is normally factory set at 50% but can differ depending on the gas and range. **DO NOT CHANGE PUMP SPEED WITHOUT CONSULTING WITH THE FACTORY AS IT WILL AFFECT CALIBRATION ACCURACY!!**

NOTE: Applications involving external remote alarm, display or analog output devices will include custom control panels that are detailed in section 3.2 later in this manual.

3.1.3 SENSOR MEASUREMENTS



The **SENSOR MEASUREMENTS** panel is the display panel typically viewed during normal operation. This panel will contain a numeric and graphical display of all data from the panels enabled in the Control Panels menus. Typically this will only be the gas concentration data but some users may wish to view Environmental data as well (ENVIRO Panels).

The default display chart length (horizontal time period displayed) is 3 hours. This period can be lengthened or shortened to the user's need – see section 3.1.8 for details on changing display chart length.

The screenshot below shows a typical measurements screen for a 2 channel H₂S system displaying only the gas concentration data. The numeric display shows the real time value and all graphical data is displayed oldest to newest from left to right.



FIGURE 3-7

Enabling more data panels will effectively squeeze the existing graphs into less vertical space as shown in the screenshot below and depending on how many panels are enabled will require scrolling of the displays to view the data underneath the gas concentration data.

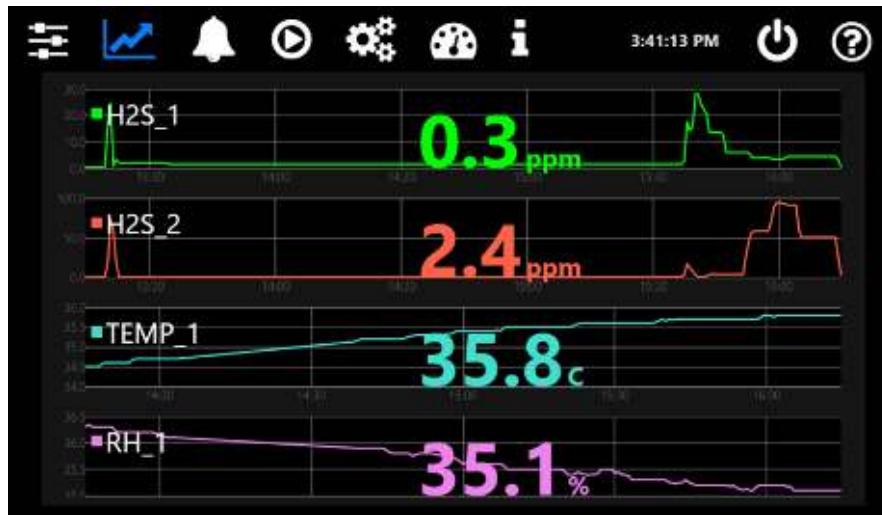


FIGURE 3-8

3.1.4 ALARMS



Any device created in a Control Panel can have a single associated alarm level that actuates an alarm indication on the Sensor Measurements screen. This will typically be applied to gas concentrations but could feasibly also be applied to any device in the menu.

To access the Alarms menu and enable or set values for the alarms, touch the ALARM Icon as shown above. This will open the screen shown below in Figure 3-9. This is the default view with no alarms enabled or values set.

Sensor	Comparison	Greater Than Value	Greater Than Unit	Less Than Value	Less Than Unit	Enabled
H2S 1	greater than	100	ppm	0	ppm	<input type="radio"/>
H2S 2	greater than	100	ppm	0	ppm	<input type="radio"/>
TEMP 1	greater than	100	c	0	c	<input type="radio"/>
RH 1	greater than	100	%	0	%	<input type="radio"/>
TEMP_2	greater than	100	c	0	c	<input type="radio"/>
RH_2	greater than	100	%	0	%	<input type="radio"/>
SENS_RAW_1	greater than	100	COUNTS	0	COUNTS	<input type="radio"/>

FIGURE 3-9

The following describes the options for this screen:

Greater Than setting – change this value to set the alarm level ABOVE which an alarm will activate for the panel device. EX: set the H2S 1 level at 50.0 PPM for an alarm activation above

50.0 ppm. Touch the numeric field to open the numeric entry window and enter the desired value.

Less Than setting – change this value to set the alarm level BELOW which the alarm will activate for the panel device. EX: Set the H2S 2 level at 20.0 PPM for an alarm activation below 20.0 ppm. Touch the numeric field to open the numeric entry window and enter the desired value.

Radio Enable button – Touch this button to enable the alarm for the associated panel device. Button will light green when enabled.

Sound – Touch this icon to turn on or off the audible alarm (pulsating beep tone) that will sound on any alarm condition. This option is ON when the icon is highlighted in blue as shown above.

Email – Touch this icon to turn on or off the email notification of alarm activity. The icon will be highlighted in blue when on. To enter the email settings for the receiver address, touch the gear icon located to the right of the email icon (see Figure 3-10 on the next page).

Figure 3-11 on the next page shows an example of an alarm panel with alarms enabled for both gas sensors and alarm setpoints of 25.0 PPM (greater than).

NOTE: ALARMS WILL ONLY FUNCTION WHEN THE DEVICE’S CONTROL PANEL HAS BEEN ENABLED OR TURNED “ON”.

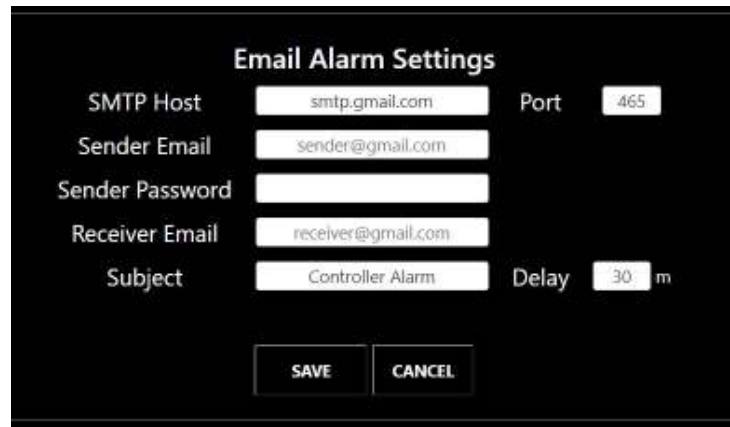


Figure 3-10 is a screenshot of the "Email Alarm Settings" screen. The screen has a black background with white text and input fields. The title "Email Alarm Settings" is centered at the top. Below the title, there are several rows of settings, each with a label and a corresponding input field or button. The settings are: "SMTP Host" with a text field containing "smtp.gmail.com", "Port" with a text field containing "465", "Sender Email" with a text field containing "sender@gmail.com", "Sender Password" with an empty text field, "Receiver Email" with a text field containing "receiver@gmail.com", and "Subject" with a text field containing "Controller Alarm". To the right of the "Subject" field, there is a "Delay" setting with a text field containing "30" and a unit "m". At the bottom of the screen, there are two buttons: "SAVE" and "CANCEL".

FIGURE 3-10
Email Alarm Notification settings screen

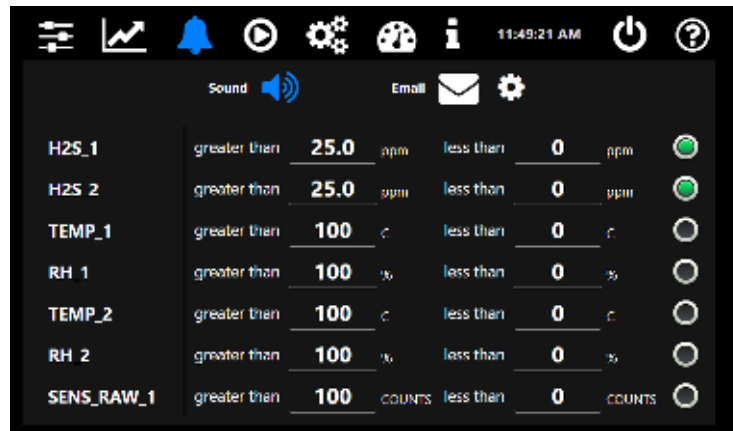


FIGURE 3-11
Example Alarm Panel

When alarm conditions are active, there will be a visual indication on the Sensor Measurement screen next to the sensor label as shown below (Alarm on H2S-2 channel). This will be accompanied by an audible beep tone from the controller module.



FIGURE 3-12

3.1.5 RECIPES

The Recipes menu provides a programmable scheduler for properly configured control panels. This generally applies to panels containing both a sensor and an actuator which is **not** the case for most instances of the ACCUSAFE system. As such, no recipe examples are provided for the purposes of this manual.

3.1.6 PANEL CONFIGURATION

The Panels Configuration menu provides access to the internal parameters of the numerous control panels found in the ACCUSAFE controller module. A common change a user may wish to make to an existing panel is renaming the gas sensor channels to better reflect the locations to which they correspond. Figure 3-13 below shows the Sensor Measurement screen

shown earlier with renamed gas sensor channels (circled in red). These new names will also be reflected in the Control Panels view of each panel as shown in Figure 3-14 below. Notice the Panel names themselves do not change. These names are fixed and cannot be changed.

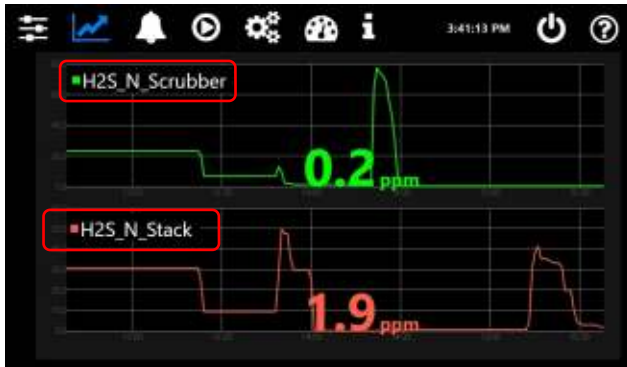


FIGURE 3-13

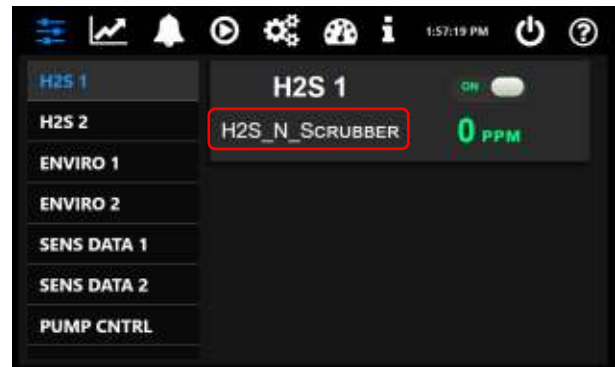


FIGURE 3-14

To make changes to the sensor channel names, open the Panel Configuration menu by touching the icon shown above. You will be prompted for a passcode as shown below left. Touch in the passcode field to open an entry window and enter “1111” as shown below, right. Press the blue enter button to save entry then press “OK” and the screen will open as shown in Figure 3-17 on the next page.

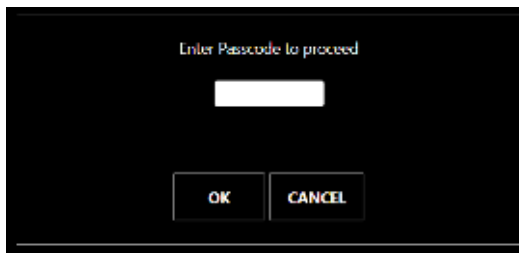


FIGURE 3-15

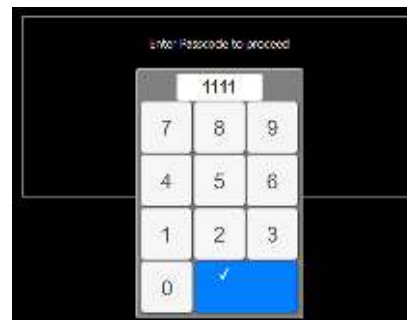


FIGURE 3-16

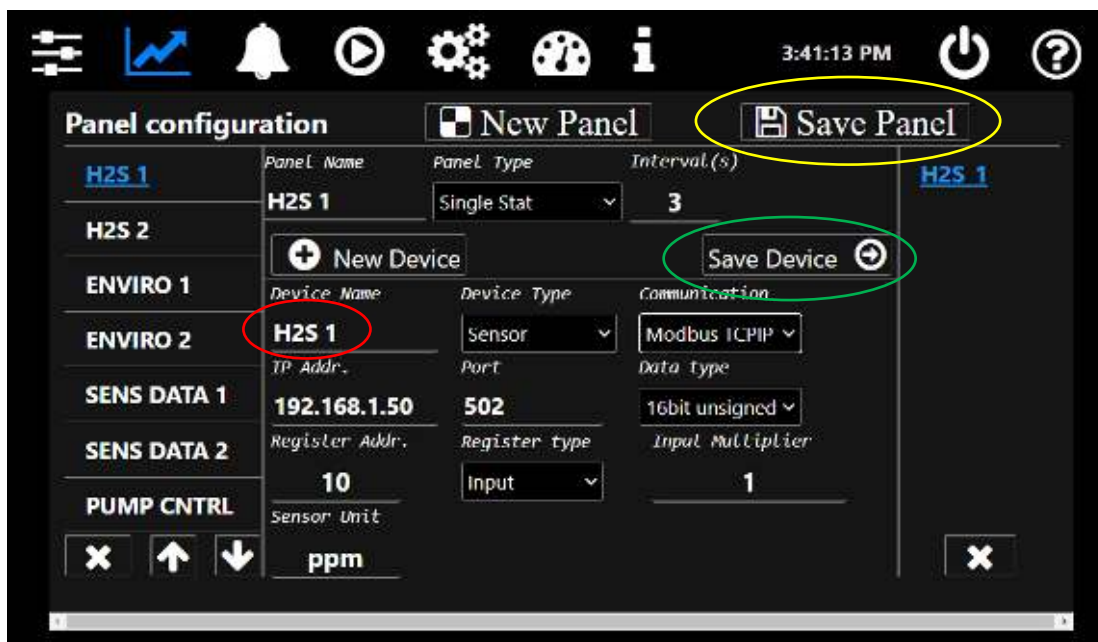


FIGURE 3-17

Figure 3-17 above shows the Panel Configuration for the H2S 1 Panel. The field titled “*Device Name*” (circled in red) is the text that appears on the key viewing screens. This name can be changed to anything desired with a 24 Character limit (more characters can be input but other display elements may be impacted). **NOTE:** “Device Name” and “Panel Name” may be the same as set at the factory. The Panel Name is fixed and cannot be altered. Be sure to address the Device Name when making the described changes.

To change this text, do the following:

- 1) Touch in the text field to open a keyboard window where you can enter the desired text including numbers and symbols. When completed, press the blue “accept” key.
- 2) Save your device changes by touching the “Save Device” button (shown above circled in green) followed by touching the “OK” button on the confirmation screen that appears.
- 3) Save the panel changes by touching the “Save Panel” button (shown above circled in yellow) followed by touching the “OK” button on the confirmation screen that appears.
- 4) Change names for any other panels desired by selecting the panel from the list on the left and repeat the steps above.

IMPORTANT: Be careful NOT to make any other changes on the Panel Configuration screen as it may affect operation of your system. If you suspect you’ve inadvertently altered another value on the screen, simply exit the screen by selecting another icon from the main menu bar without saving your changes. You can return to the Panel Configuration screen and start over.

NOTE: The changes noted above can also be made using the Panel Editor contained in the Launcher App included with the Accusafe system. See section 4.3.3 on page 21 for more on this option.

3.1.7 SENSOR CALIBRATION 

This menu provides access to all the Calibration options for each sensor module in the system as shown below in Figure 3-18. The Calibration procedures are detailed fully in Section 4 of the **Sensor Module User Manual**. Refer to this manual for more regarding Calibration.

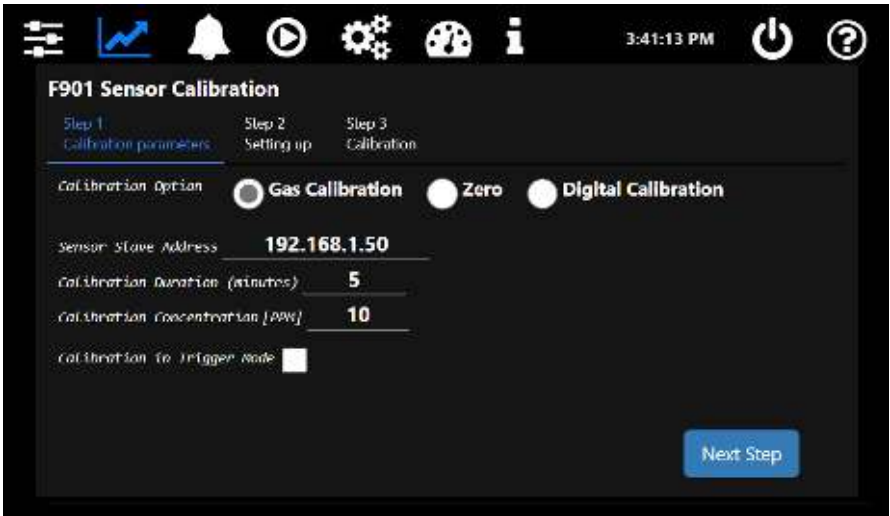


FIGURE 3-18

3.1.8 INFO 

The INFO screen is shown in figure 3-19 below.

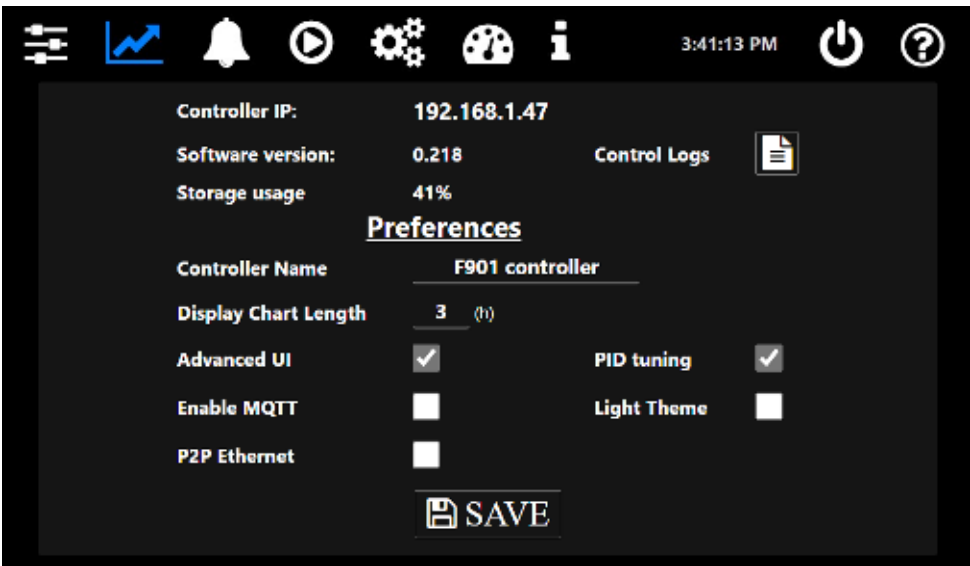
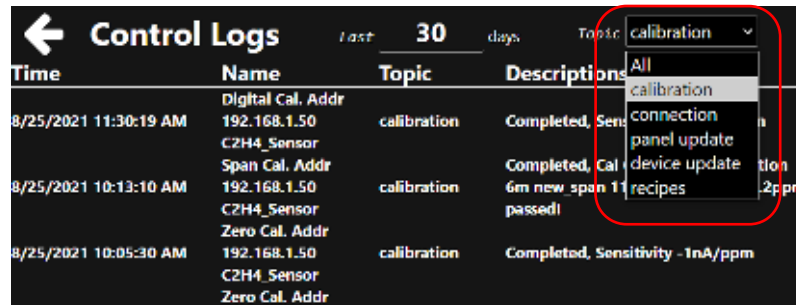


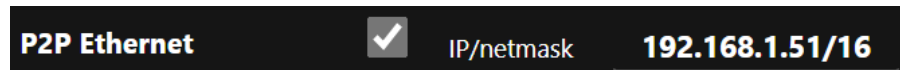
FIGURE 3-19

The following parameters are displayed and/or accessed/changed on this screen:

- **Controller IP:** Displays the existing IP address for the controller.
- **Software Version:** Displays the current software version.
- **Storage Usage:** Displays current controller % disk usage (data storage). Should this value approach 100%, user has the option to clean up recorded data using the LAUNCHER APP. See section 4.3.1 on page 20 for details on using the LAUNCHER APP.
- **Control Logs** – Tapping the icon opens the Control Logs screen shown below. This provides access to activity logs relating to the items shown in the “topic” drop down menu circled in red. Select the desired category or “All” then enter the days period of interest in the “Last__ days” field. The screenshot below shows logs for Calibration activity over the past 30 days. If entries exceed display area, scrolling down will display additional entries.



- **Controller name:** The factory programmed controller name will be “ASXX-XX.X Controller” where the Xs represent the gas and range designations for the user’s system. This name can be changed if desired by touching the name text field and entering a new name using the pop up keyboard. Be sure to save changes by touching “SAVE” at the bottom of the screen.
- **Display Chart Length:** Represents the amount of time displayed horizontally on the Sensor Measurements Panel graph displays. Change this value by touching the numeric field and entering a new value on the pop-up numeric window. Save any changes by touching the SAVE button at the bottom of the screen.
- **Advanced UI:** Toggle between advanced UI and simple UI. Simple UI removes a number of features from the display. Advanced UI is the recommended selection.
- **PID Tuning:** Enables PID tuning parameters in the Control Panels menu. This is enabled but generally not used in the ACCUSAFE systems.
- **Enable MQTT:** Enables remote access to controller via cloud services. Save any changes by touching the SAVE button at the bottom of the screen. See section 4.3.5 on page 23 for more on this feature.
- **Light Theme:** Toggle between dark or light screen display. Save any changes by touching the SAVE button at the bottom of the screen.
- **P2P Ethernet:** Should be checked if connecting directly via Ethernet to a single sensor module or other device (point-to-point) without the use of a hub. Selecting P2P will enable the option to configure the controller’s own IP address as shown below. Enter the address shown:



3.2 REMOTE DEVICE CONTROL

Some applications will entail the use of remote alarm, display or analog output devices that require special controller setup panels. These setups are detailed in the sections below when included.

3.2.1 REMOTE ALARM RELAY CONTROL – COMMON ALARM

Remote alarm relays are controlled via a special panel named REMOTE ALARM as shown below. This panel controls the remote devices via a COMMON ALARM configuration where any sensor in the system whose output is above the setpoint will trigger the alarm condition.

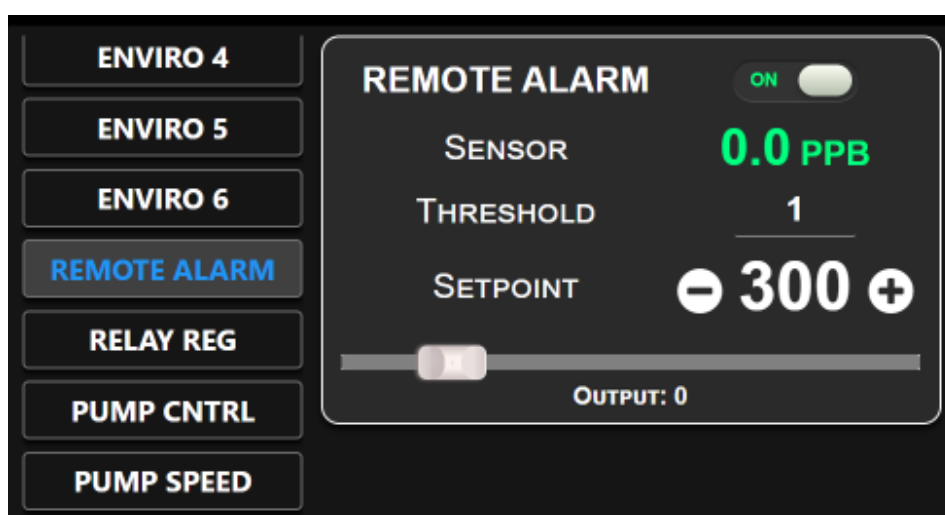


FIGURE 3.2.1

The panel contains the following controls and displays:

ON/OFF – slider button that enables/disables the panel.

NOTE: Panel must be ENABLED for communications between the controller and remote device to be active.

SENSOR – Concentration display indicating the current highest value from the group of sensors.

THRESHOLD – Entry field for the hysteresis amount below the setpoint at which the alarm output will be deactivated and device de-energized. This helps prevent alarm chatter when noise is present in the sensor signal. Recommended value for this parameter is a minimum of 1% of the full scale range of the system.

SETPOINT** – Display indicating the concentration value above which the alarm will be activated. The slider control below this display sets the coarse adjustment of this value while the + and – buttons on either side of the display set the fine adjustments. Setpoint range is between 0 and the full scale value of the system. **Full Scale = 2001 PPB.**

OUTPUT – This display indicates the value currently stored in the Remote Alarm device's control register. **"0" = Alarm OFF / "1" = Alarm ON.**

3.2.2 REMOTE ALARM DISPLAY

When the Remote Alarm controller is enabled, there will be an associated numeric and graphical display enabled on the Sensor Measurement screen as shown in the figure below. The value displayed will indicate the highest concentration from all of the sensors in the system. The figure below shows a 6 sensor system with the Remote Alarm tracking sensor #4 as the current highest concentration.



FIGURE 3.2.2

3.2.3 DUAL REMOTE ALARM OUTPUT CONTROL

In instances where dual alarm setpoints are requested, there will be 2 Remote Alarm panels configured in the controller. They will be titled **REMOTE ALARM 1** and **REMOTE ALARM 2** and will control independent remote relay devices via independent setpoints. Both will activate when ANY of the sensors in the system show concentrations that exceed the respective setpoints and will de-activate when the sensor concentration falls below the setpoint minus the Threshold value.



Section 4 - Controller Remote Web Browser / Launcher App

All functions of the Accusafe Controller can be fully viewed and accessed via a desktop web browser allowing control and display on a desktop or laptop computer connected to the Accusafe network. This browser is accessed via the Accusafe Launcher Application which is provided on a USB drive with your system.

This app also provides access to downloading of data and saving/loading of the controller setup.

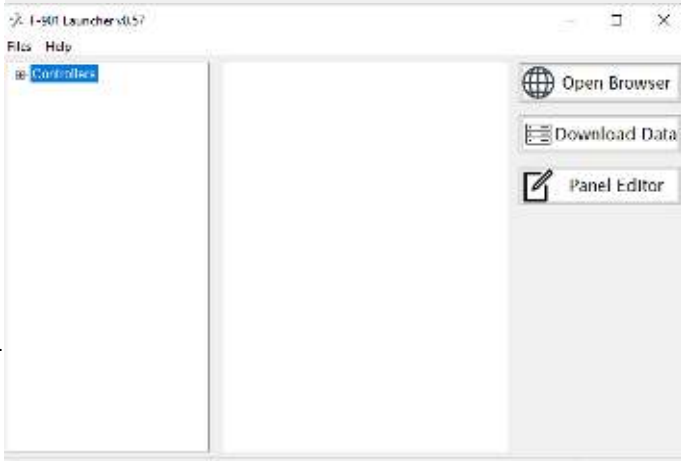
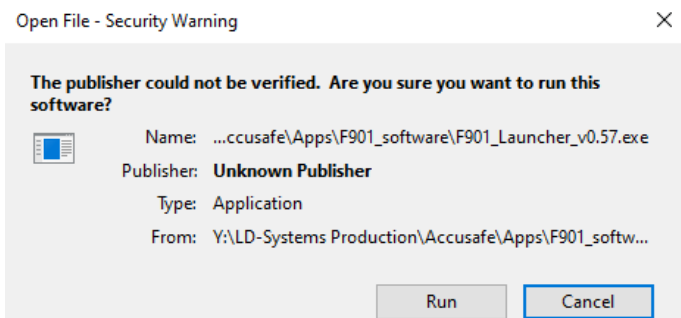
4.1 INSTALLING THE LAUNCHER APP

The Launcher app is provided as a simple .exe file titled “F901_Launcher”. This file can be copied anywhere on your computer and opened directly without Windows or other installation. The executable file is pictured below in a typical Windows folder.

Name	Date modified	Type	Size
 F901_Launcher_v0.57.exe	7/8/2021 2:47 PM	Application	13,375 KB
 F901_Tester_v1.1.exe	7/8/2021 2:47 PM	Application	12,700 KB

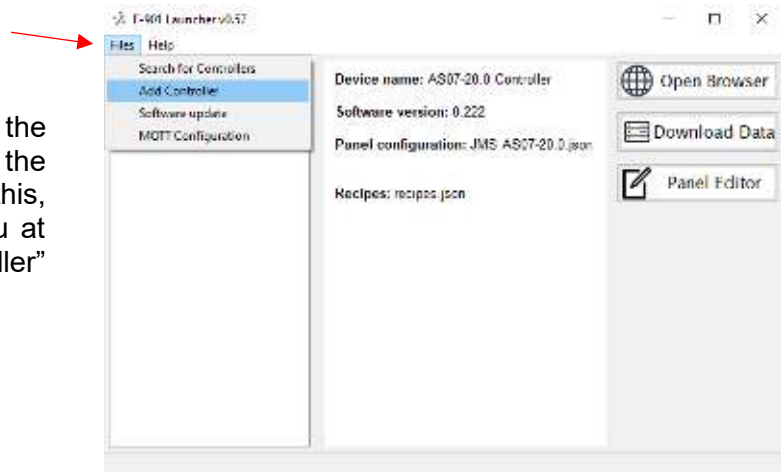
4.2 OPENING A CONTROLLER BROWSER

Double clicking on the Launcher app .exe file will open the security window shown on the right.

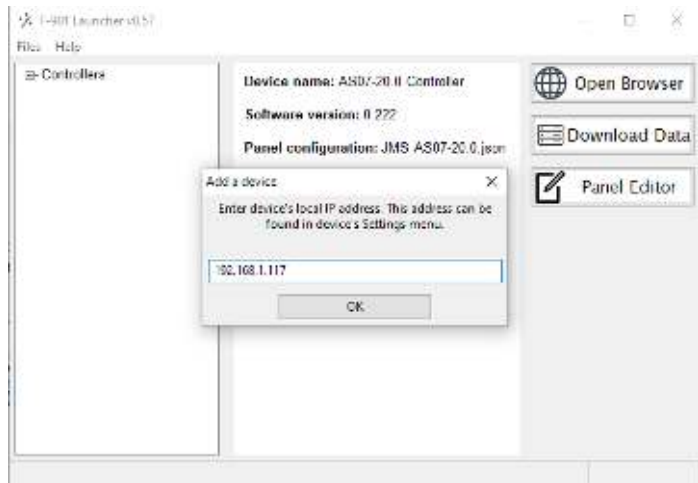


Clicking “Run” then opens the Launcher window shown on the right.

The first step in connecting the controller to the browser is adding the controller to the device list. To do this, click on the “Files” tab in the menu at the top then click on “Add Controller” as shown to the right.

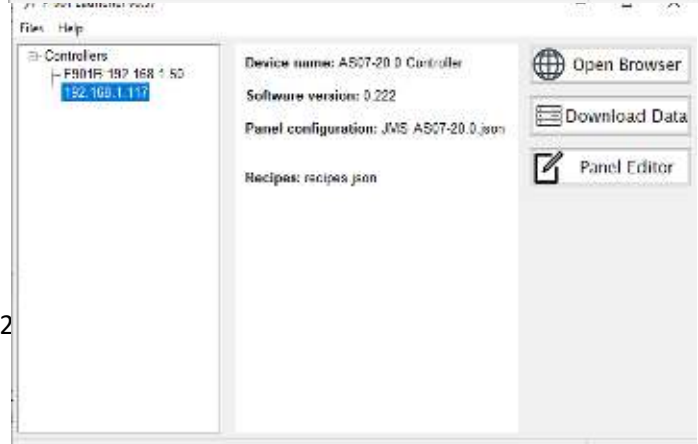


In the “Add a device” window that opens as shown to the right, enter the controller’s IP address. This address can be found by opening the controller’s INFO screen noted earlier in section 3.1.8. The IP address is noted on the top line of the INFO screen. Enter this value and click OK. A message will indicate that the device was successfully added.

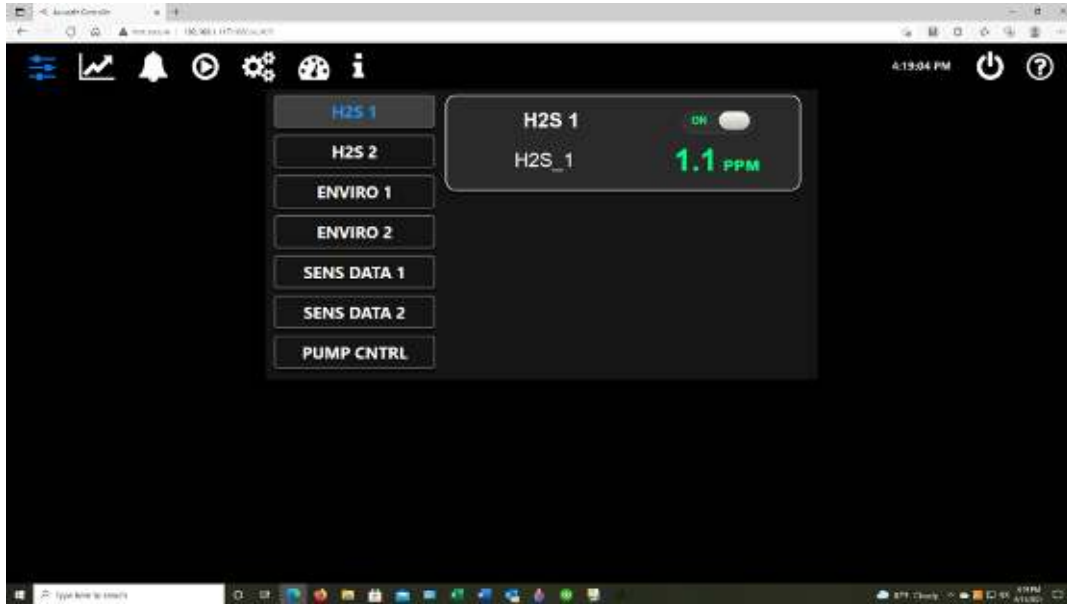


You can now go to the Controllers list and highlight your controller as shown on the right.

Once your controller is selected, click on the OPEN BROWSER button on



the right side menu and the web browser window of your controller will open as shown below. From here you can carry out all the same functions described earlier in section 3.1.

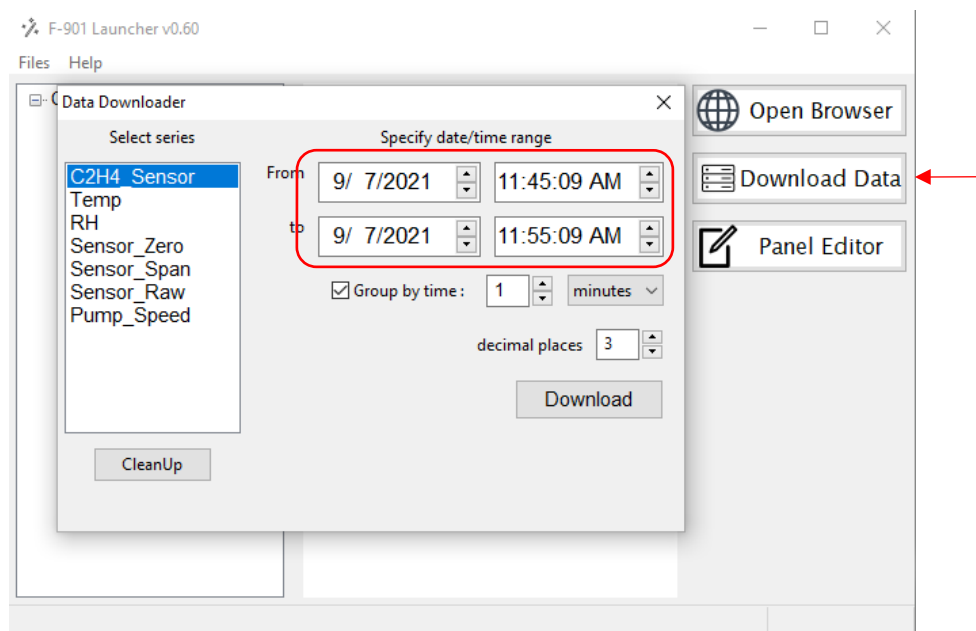


4.3 OTHER LAUNCHER APP FUNCTIONS

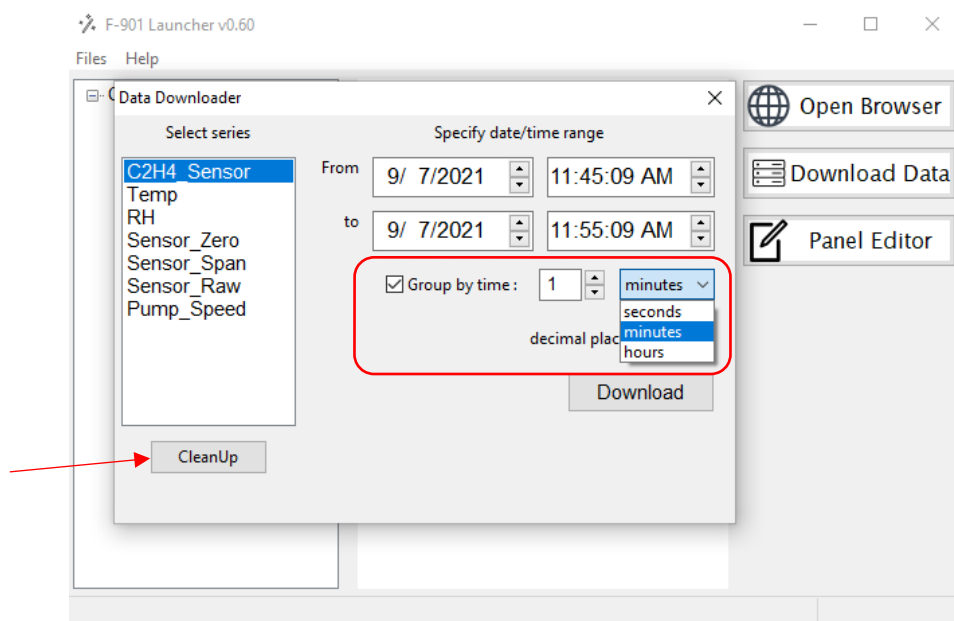
4.3.1 DOWNLOAD DATA

To download device data to computer in CSV Excel format,

- Click on the “Download Data” button as indicated by the red arrow in the screenshot below.
- Select the device(s) for which you want data downloaded from the list on the left (as shown by highlighted field).
- Select the date and time range of interest from the “From” and “to” windows (circled in red).



- You can download data in intervals of one or more seconds, minutes or hours by checking the “Group by time (minutes)” checkbox and selecting the interval value and units value desired from the 2 dropdown menus circled below. Or leave the “Group by time” box unchecked to download ALL available data for the devices and time span selected.



- When “Group by time” is selected, you can also select the number of decimal places you wish to see in your data. This selection is hidden in the screenshot above by the time units dropdown.

Generally, it's best to download one set of data at a time (i.e. only select one data item from the list) as this will result in a cleaner dataset.

NOTE: Data is only logged for panels that are enabled on the controller display. If you want a log of any data, be sure the associated panel is enabled during the period of interest for the data being collected.

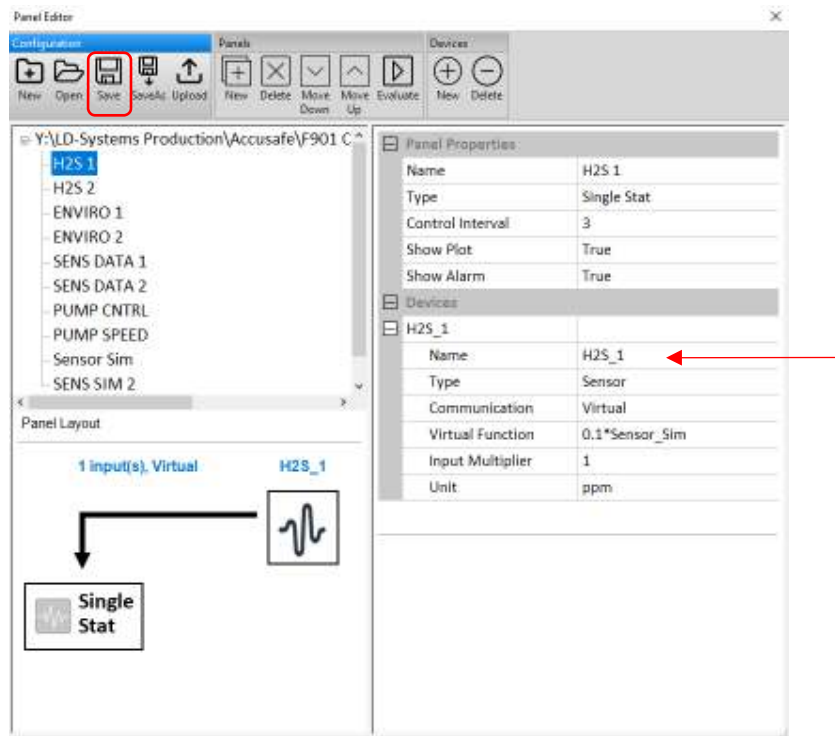
4.3.2 CLEANUP DATA

Click the “Cleanup” button (red arrow in screenshot above) to erase all currently stored data as needed. This will free up internal storage space.

4.3.3 PANEL EDITOR

The panel editor offers all of the same panel editing features available on the controller and web browser in a different view format. With the editor the user can edit and/or save existing panel configurations and open/edit previously saved configurations in the editor and upload them to the controller. A typical editor window is shown below.

A common use of the panel editor for most Accusafe users would be to change their device name(s) to better reflect location or purpose of the sensor in question. This can be done by clicking on the device name line indicated by the red arrow as shown below and entering the new name. This change can then be saved to the controller by pressing “Save” on the main menu at the top (shown circled in red).



NOTE 1: If changing device names, use care not to change any other parameters in the panel as this may affect the functionality of your Accusafe system.

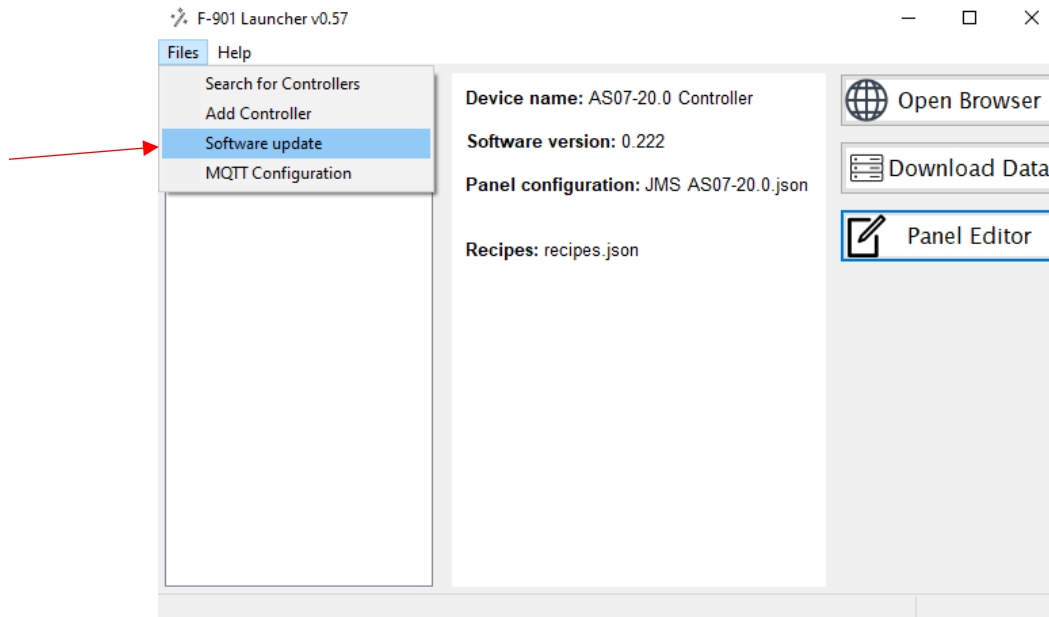
NOTE 2: If you are editing the configuration currently on the controller, you can apply the changes to the target controller by clicking the **Save** button. The controller will briefly refresh and execute the new configuration. If the configuration is a local edit (no controller connected), the **Save** button will simply save the changes on the local file.

Using the Panel Editor, you can also backup your customized configuration to your computer as follows:

- Click **SaveAs** button.
- Select location to save your panel configuration on your computer.

4.3.4 SOFTWARE UPDATE

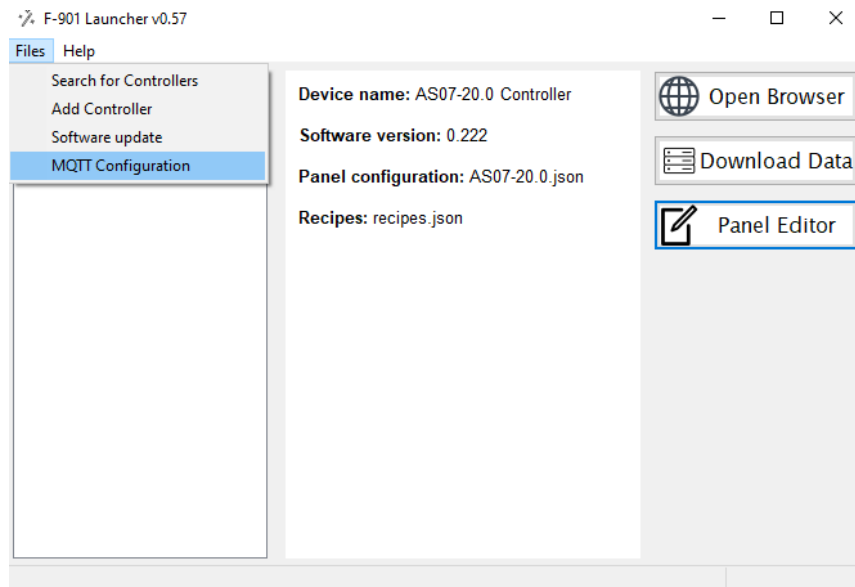
This feature allows the user to upload any new controller software revisions from a saved location on their computer. To access this feature, click on the “Files” tab then select “Software update” as shown below.



Follow the resulting onscreen instructions to update the software. Upon upload, there will be a prompt on the controller screen (as well as the web browser if open) to accept the upload. Press “OK” to complete the upload. The controller will then reboot and execute the new software.

4.3.5 MQTT CONFIGURATION

The Controller MQTT API allows remote access to your Controller via secured cloud services. To configure your controller MQTT settings, select **Files > MQTT Configuration**:



- Enter the Username/Password of your cloud service account. If your cloud service uses SSL/TLS connection, obtain and save the secure certificate, Private key, and CA Certificate files to your computer.
- Enter your cloud Server name.
- If using SSL/TLS connection, select your certificate, Private key, and CA Certificate files to be uploaded

MQTT Endpoint Setup

Server
data.iot.us-west-2.amazonaws.com

Port
8883

☒ use SSL/TLS

Username Password

Certificate
certificate.crt

Private Key
private.key

CA Certificate
rootCA.pem

Connection Status

- Click **Verify** to verify the connection to your MQTT server
- Once the connection is successful, click **Upload**
- On your Controller, enable the MQTT service under [Info menu](#) (must be done **after** successful Upload)
- Your Controller MQTT API is now ready for remote access.

4.3.6 MQTT ENDPOINTS

Subscribing

Topic: *[Controller name] EP0*

Return: Json object {topic, payload}

Note: default controller name is **controller**. You can set controller name under [Info menu](#)

Example API call from paho-mqtt client:

```
Client.subscribe(topic="F901 controller EP0", qos=0)
```

Example return:

```
topic: F901 controller EP0
payload: {"id1556576356539": {"enable": false, "name": "Generator
Manual", "devices": {}}, "id1556575675503": {"enable": true, "name":
"C2H4 PID", "devices": {"C2H4": {"status": 0, "value": 75.0},
"Generator": {"status": 0, "value": 800}}}, "id1556575918560":
{"enable": true, "name": "Environment", "devices": {"CO2": {"status":
0, "value": 0.59}, "RH": {"status": 0, "value": 34.2}, "Temperature":
{"status": 0, "value": 26.0}, "O2": {"status": 0, "value": 19.5}}}}
```

Payload object hierarchy:

```
Payload {
  panel_id : {
    "enable": [true/false],
    "name": [string],
    "devices": {
      device_name: {"status": [number], "value": [number]},
      ...// other devices
    }
  }
  ...//other panels
}
```

Publishing

Topic: *[Controller name] EP1*

Payload: json object specifies control parameters of a panel/device

Control parameters:

panel_param: set a panel parameter.

- **id** : panel id [string]
- **attr**: controllable panel attribute [string]
 - **controllerEnable**: enable/disable current panel
 - **setValue**: Panel setpoint . Applicable for *PID* and *ON-OFF controllers* only
- **value**: control value [true/false/number]

Example:

```
msg = {
    'panel_param': {
        "id": "id1556575675503",
        "attr": "controllerEnable",
        "value": False
    }
} // disable panel

client.publish(topic="F901 controller EP1",
payload=json.dumps(msg))
```

device_param: set a device (in a panel) parameter. Applicable for actuator devices only

- **id** : panel id [string]
- **Index**: device index in the panel's devices list [number]
- **attr**: controllable panel attribute. Default attribute is "**value**"
- **value**: control value [number]

Example:

```
msg = {
    'device_param': {
        "id": "id1556575675503",
        "index": 0, // in the panel device list
        "attr": "value",
        "value": 40
    }
} // in a panel, set actuator output to 40

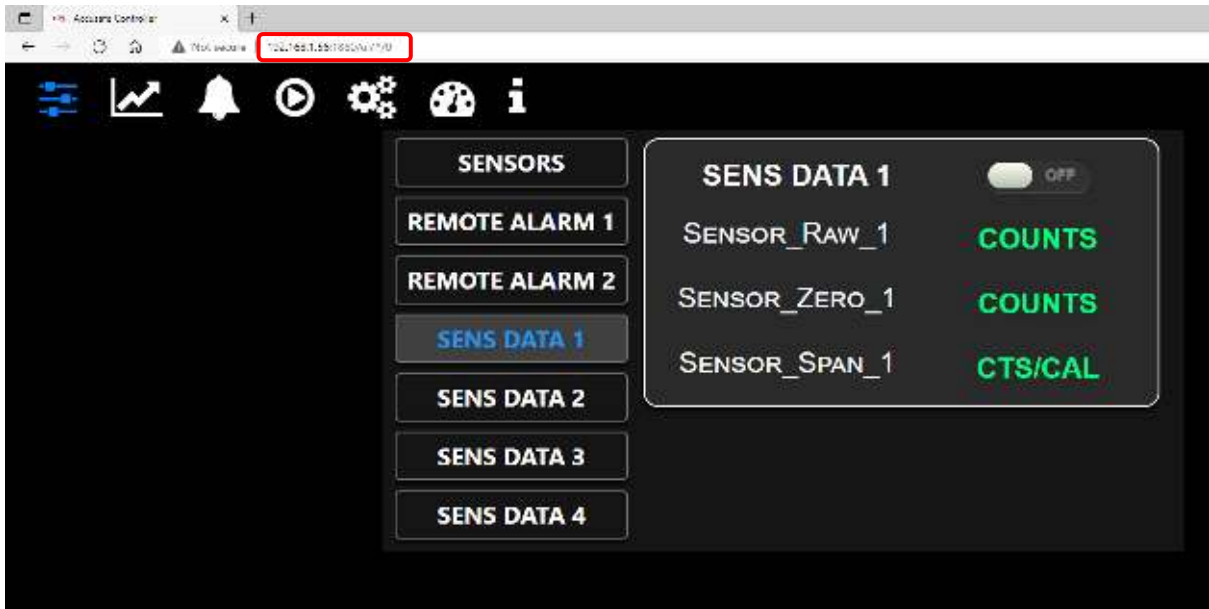
client.publish(topic="F901 controller EP1", payload=json.dumps(msg))
```

4.4 ACCESSING WEB BROWSER ON MOBILE DEVICES

All functions of the Accusafe Controller can be fully viewed and accessed via a mobile device or tablet** provided there is Wifi access to the network on which the Accusafe system resides and you can access this Wifi network on your mobile device.

To access Accusafe remotely via mobile device:

- Login to the Wifi network associated with the Accusafe system on the device.
- Open your preferred browser on your mobile device.
- Type in the URL of the Accusafe web browser. You can obtain this URL from the same browser open on your PC application as shown in the figure below circled in red.
- From here you can view and control the system just as you can from your PC. This can be very handy when performing calibrations at the sensor module(s).



** **NOTE:** Some mobile browsers may have display issues making manipulation of certain functions difficult. Larger screens generally offer better results i.e. tablets & larger cell phones.

Section 5 - Calibration

Calibration of the Accusafe system is fully detailed in **section 4** of the dedicated **Accusafe Sensor Module manual**. Refer to that manual for details on all calibration procedures.

Section 6 - Troubleshooting

Below are a few common troubleshooting issues that you can likely solve on your own. If your issue is not shown on this list or the solutions do not solve your issue, contact the Interscan Service dept. for further assistance.

Symptom	Corrective Action or Probable Cause
Controller shows communication error: “Offline” or “Error Connection: Sensor!”	<ul style="list-style-type: none">• Check all cable connections for firm connection.• Power down both the Sensor module and the Controller. Wait several seconds then power up the Sensor module followed by the Controller one minute later.• Power down the Accusafe components as well as your Ethernet hub/router then power everything back up.
Alarm function not working.	<ul style="list-style-type: none">• Confirm that alarm is enabled for the desired panel on the alarms page (right side radio button).• Confirm that the set point is selected in the “Greater Than” column of the alarm parameters.
Sensor output not displayed on sensor measurement screen.	<ul style="list-style-type: none">• Check that the sensor is enabled in the sensor's panel.

Section 7 - Warranty

INTERSCAN CORPORATION warrants any ACCUSAFE series instrument and gas sensor to be free from defects in material and workmanship for a period of one year from date of shipment.

INTERSCAN CORPORATION's sole obligation under this warranty is limited to repairing or replacing, at its option, any item covered under this warranty, when such item is returned intact, prepaid to the Factory (or designated service center).

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons, or which have been subject to misuse, negligence, or accident, incorrect wiring by others, installation or use not in accordance with instructions furnished by the manufacturer, or which have had the serial numbers altered, effaced, or removed. The sensors are factory-sealed and must not be opened or modified in the field for the warranty to remain in effect. This warranty is in lieu of all other warranties whether expressed or implied.

This warranty does not apply to any of our products, that have had any program and/or software changes incurred, without written authorization from **INTERSCAN CORPORATION**.

Additionally, warranty on any component shall not exceed the manufacturer's warranty given to **INTERSCAN CORPORATION**.