Reference Manual
00809-0100-4541, Rev DB
September 2018

Emerson™ Plantweb™ Insight

EMERSON

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Section 1 Introduction

1.1 Using this manual

This document is intended for system administrators and will provide details on how to set up Emerson™ Plantweb™ Insight. For more details and configuration information on specific applications, refer to the appropriate Appendix sections.

It is recommended administrators complete all steps in the order described. An overview of these steps is described below:

1.1.1 Install and launch

1. Make sure system meets minimum requirements.
2. Install the Plantweb Insight virtual machine.
3. Launch Plantweb Insight web interface from a supported web browser.

Refer to Section 2: Installation for more information.

1.1.2 Customize system settings

1. Set up users for access.
2. Connect to Emerson Wireless Gateways and other data systems.
3. Backup and restore your system to avoid loss of settings.

Refer to Section 3: Configuration for more information.

1.1.3 Application configuration

1. Configure your application specific global settings.
2. Add, edit, or delete assets via asset management.

Refer to Section 3: Configuration for more information.

1.2 Product recycling/disposal

Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislation/regulations.

Section 2 Installation

2.1 Safety messages

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

2.2 System requirements

Emerson™ Plantweb™ Insight can be installed on a network server or PC/laptop. Both installations have the same requirements and installation steps. Network connection settings can be made subject to organization policies and are discussed in Appendix A: Advanced Setup. Any pertinent Gateways must be accessible on the network.

Before you begin, verify your system meets the minimum requirements.

2.2.1 Host operating system

Virtualization software

- VMware Workstation Pro™ 10 or higher (requirements can be found here)
- VMware vSphere® 5.5 or higher (requirements can be found here)

OR

- Contact Rosemount™ support if utilizing a different virtualization software (Microsoft® Hyper-V)

2.2.2 Guest operating system

- Processors = 2
- Memory = 1 GB RAM minimum
- Hard drive = 20 GB of free space

2.2.3 Application

Browsers (recent versions supported)

- Chrome™ browser
- Mozilla Firefox®
- Safari®
- Microsoft Windows™ Edge
- Microsoft Internet Explorer™

2.2.4 Other requirements

A DVD drive is required for installations. A DHCP server is required to assign a valid IP address. Static IP addresses can be configured once connected to the Plantweb Insight web interface.

2.2.5 Gateway compatibility

Plantweb Insight is compatible with Emerson Wireless 1410/1420 Gateways on firmware version 4.6.59 or higher.

2.2.6 Device compatibility

Emerson devices must be in Emerson Optimized burst configuration. If devices are not set to this, please change using a device configuration tool.

Devices without this capability must be in either of the two configuration modes to be compatible with Plantweb Insight:

- command 9 and command 48
- command 3 and command 48

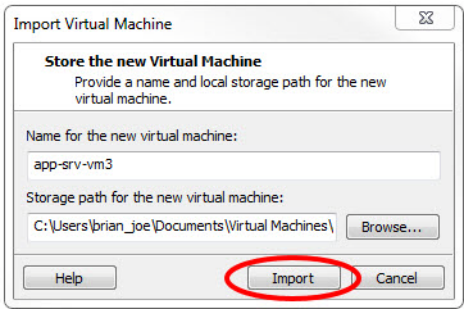
2.3 Installation procedure

Two DVDs will be supplied for installations.

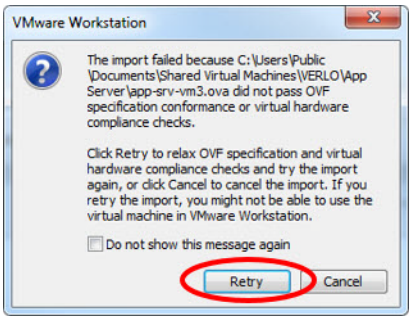
1. Exit/close all programs, including any running in the background.
2. Insert Disk 1 into the DVD drive.
3. Open the app-srv-vm.ova file. This file will prompt VMware to open with an *Import Virtual Machine* pop-up.

Note
This file name may change based on version and type.

4. Name and store the new virtual machine, then select **Import**.

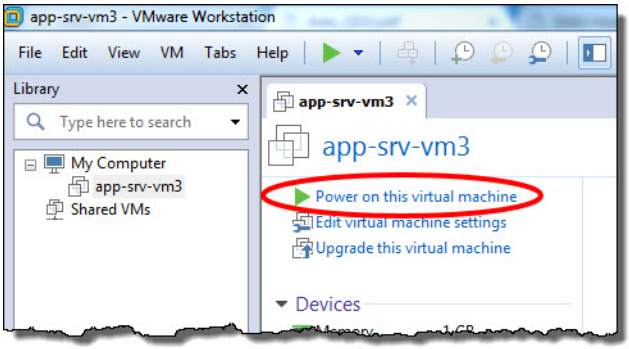


5. (If the following message appears) select **Retry**.

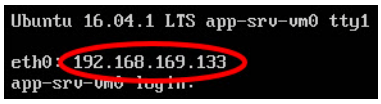


6. Wait for the virtual machine to load.

7. Select **Power on this virtual machine** once the loading process is complete.



8. Find the IP address in the command window.



Note
This IP address will vary depending on installation. What is shown here will not be your IP address. A DHCP server will be required to assign an IP address. If no DHCP server is available, contact Rosemount support (contact information on last page).

Note
The virtual machine login and password are not necessary and will not be provided.

Note
A message about features may pop up during the installation process; select **OK**.

⚠CAUTION

End users should not change any settings besides the ones outlined above. Alterations could impact the performance and functionality of Plantweb Insight.

2.4 Launching the application

The Plantweb Insight web interface can be launched from any of the supported web browsers shown in the system requirements.

1. Open a supported web browser.
2. Beginning with "**https://**", enter the IP address found in step 8 of Installation procedure .
3. Login with the following credentials:
   - Email: **admin@emerson.com**
   - Password: **Default.1234**

   Note
   Both the Email and Password are case sensitive.

4. Change your password as prompted (default settings are listed below and can be changed in *System Settings*).
   - Minimum length: 12
   - Minimum lowercase: 1
   - Minimum uppercase: 1
   - Minimum numbers: 1
5. Login with the updated credentials.

Section 3 Configuration

3.1 Overview

This section contains information on customizing system settings and configuring Emerson™ Plantweb™ Insight.

3.2 Safety messages

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

3.3 Customize system settings

System settings should be configured during the launch of Plantweb Insight.

3.3.1 Users

User accounts

Add users

1. Navigate to *System Settings* > *Users* > *User Accounts* then select the **Add User Account** button.
2. Enter the user's Email, Role, and Password and select **Save**.

Table 3-1. Roles and Privileges

User role	Privileges
Admin	Read and write
User	Read

Edit users

1. Navigate to *System Settings* > *Users*.
2. Select the ✎ button next to the user to be edited.

Note
If the user is disabled, you can enable the user in the modal window.

3. Update the information and select **Save**.

Note
Users can be deleted by selecting the **Delete this account** box.

Password options

Password requirement and settings can be made in the *Password Option* page. These settings include password limitations and requirements (e.g. uppercase letters, lowercase letters, numbers, character), session idle timeouts, and account locking details.

Change password

Login password can be changed in the *Change Password* page.

3.3.2 Data source configuration

Gateway connections

Add Gateway

1. Navigate to *System Settings* > *Gateway Connection*.
2. Select the **Add Gateway** button.
3. Enter the IP Address, Port, and Description and select **Save**.

Note
HART-IP™ Port 5094. Ensure both HART-IP TCP and HART-IP UDP are enabled in the Gateway.

Edit Gateway

1. Navigate to *System Settings* > *Gateway Connection*.
2. Select the button next to the user to be edited.
3. Update the information and select **Save**.

Delete Gateway

1. Select the check box/boxes next to the Gateway/s to be deleted.
2. Select red **Delete Selected** button.

OPC UA® Server Connection

Add OPC UA Server

1. Navigate to *System Settings* > *Data Source Config* > *OPC UA Servers*.
2. Select **Add OPC UA Server** button.
3. Enter the IP Address, Port, Tag, and Description and select **Save**.

Note
The OPC UA Port in Plantweb Insight is designated as 4880 (the OPC UA Server must be set up for this port). Plantweb Insight uses a opc.tcp:// connection to the OPC UA Server. Tag and Description are used for explanatory reasons only.
The IP address field will only accept IP addresses and will not accept full URLs (it assumes the opc.tcp://).The OPC UA Server must be configured to security configuration "none" and "allow anonymous login".

Edit OPC UA Server

1. Navigate to *System Settings* > *Data Source Config* > *OPC UA Servers*.
2. Select the button next to the Server to be edited.
3. Update the information and select **Save**.

Delete OPC UA Server

1. Select the check box/boxes next to the Server/s to be deleted.
2. Select red **Delete Selected** button.

3.3.3 Ethernet configuration

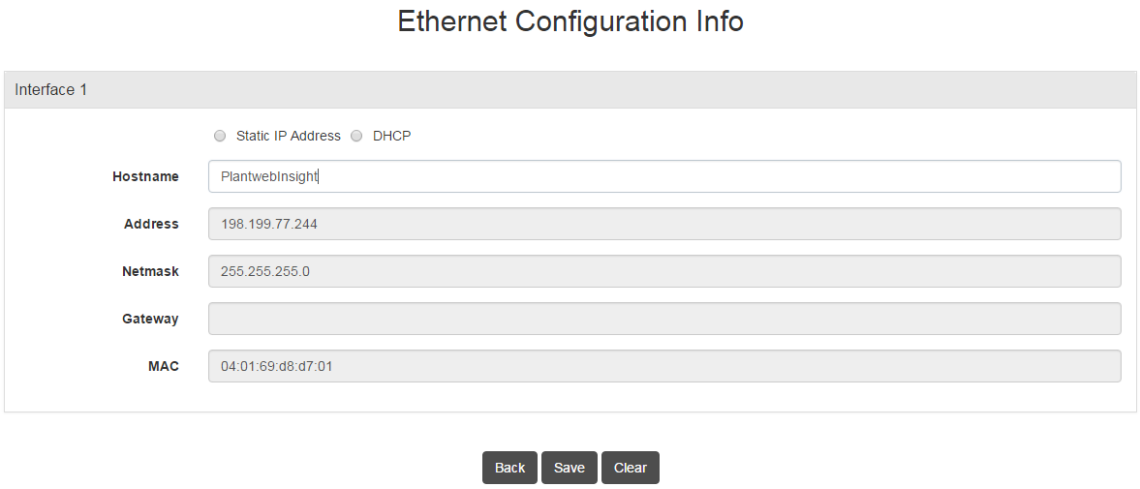
⚠ CAUTION

Use caution when making changes to IP network settings. If they are lost of improperly configured, it may be difficult to log into the application. Contact the network administrator for information on the proper IP network setting to apply.

To change IP Network Settings:

1. Navigate to *System Settings* > *Platform Settings* > *Ethernet Communication*.
2. Select **Static IP Address**.
3. Enter the following:
   - Hostname
   - IP Address
   - Netmask
   - Gateway

4. Select **Save**.



3.3.4 Platform settings

Plantweb Insight has a system backup and restore feature that saves all user configured data. It is best practice that a system backup be performed periodically throughout the installation and configuration process.

Save system backup

1. Navigate to *System Settings* > *Platform Settings* > *Backup and Restore*.
2. Create a Passphrase and select **Save Backup** button.

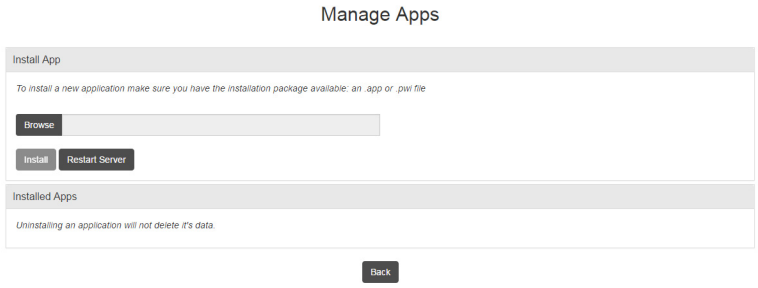
Note
Passphrase is required for restoring your system to these settings.

Restore system

1. Navigate to *System Settings* > *Platform Settings* > *Backup and Restore*.
2. Enter the system backup passphrase.
3. Browse for the backup file and select **Install** button.

3.4 Application installation

1. Insert Disk 2 into the DVD drive.
2. In the web interface navigate to *System Settings* > *Platform Settings* > *Manage Applications*.



3. Under the *Install App* section, select the **Browse** button.
4. Navigate to *Disk 2* and select the pertinent **.app** file and select **Open**.
5. Select **Install**.
6. An action prompt will appear - select **Restart Server** if this is the last app to install. Otherwise, select **Resume** and repeat steps 3-5 for subsequent apps.
7. Navigate to *Home* and the apps installed will appear.

3.5 Application configuration

There are a few configuration steps that are consistent across specific Plantweb Insight Applications. These are briefly discussed below. More information about configuration can be found in the specific Appendix.

Note
All configuration mentioned below is specific to Plantweb Insight. Changes will not be communicated to the Gateway or devices.

3.5.1 Global settings

Each application contains specific global settings that should be set before any asset configuration. Global settings apply to all assets. These settings could include units used for inputs (e.g. inlet pressure units), units used for calculations (e.g. currency), or key performance indicators to be tracked on the dashboard (e.g. overall health index).

3.5.2 Adding assets

There are two ways to add assets. The options are discussed below. Configuration of devices occurs during addition of assets.

Add an asset

Use this method to add a single asset.

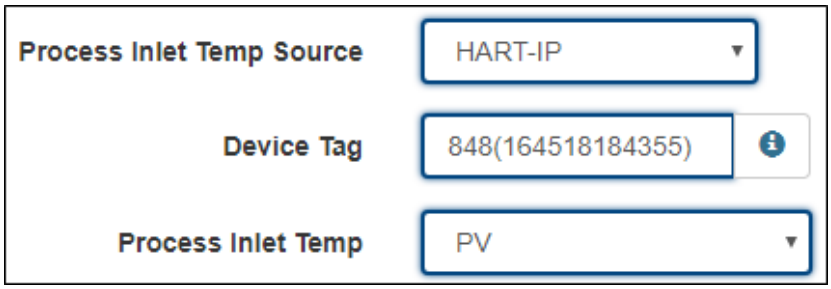
1. Navigate to the *Asset Summary* tab and select the **Add an Asset** button.
2. Complete all information on the *New Asset modal* window and select **Save** (field descriptions can be found in the Appendix.

Add a measurement point

Wireless Device from an Emerson Wireless Gateway

Depending on the application, wireless devices can either be added using a drop-down list or a search function.

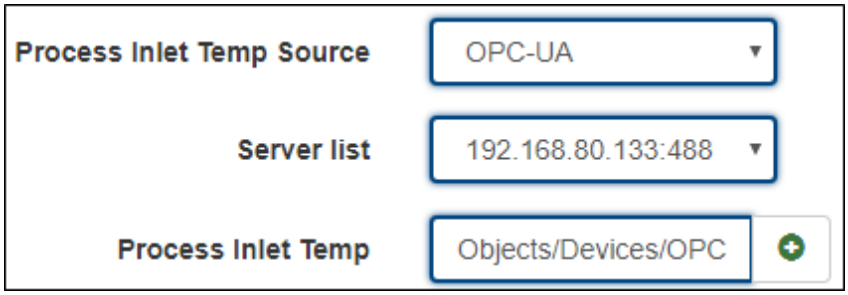
1. For applications (Steam Trap application) requiring specific devices, the devices can be added by selecting the appropriate device via a drop-down list. The drop-down list will contain all devices with the pertinent device type.
2. For applications with generic measurements (pressure, temperature, flow, etc.) the wireless devices can be added using the following procedure.
   - Select Source: HART-IP
   - Begin to type the device tag. After a few characters, a drop-down list of recognized devices will appear. Select the pertinent device.
   - Select the pertinent variable (ex: PV).



OPC-UA tags

OPC-UA tags can be set up for certain measurement points.

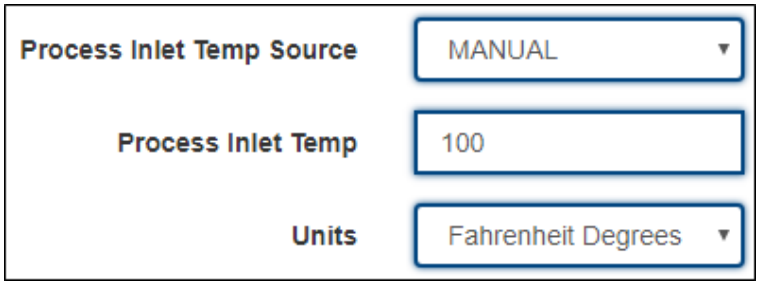
1. Select Source: OPC-UA
2. Select the pertinent OPC-UA server.
3. Type in the complete path to the pertinent measurement point (ex: Objects/Devices/OPC_Server1/3051S/PV).
   - Use forward slashes, "/", for path breaks
   - The entire path is case sensitive



Manual input

Manual inputs should be used sparingly for measurement points. They should only be considered for known consistent conditions (motor speed).

1. Select Source: Manual
2. Type in the manual value
3. Select the pertinent units



Note
Depending on the application, it will likely take time for the calculations to begin processing. Certain applications require capturing a baseline. This process is described in the Appendix.

Import asset config

Use this method to add/edit multiple assets at the same time.

1. Navigate to *Asset Summary* tab and select **Import Asset Config** button.
2. Select **Download asset configuration** and download the csv file.

Note
If there are no assets configured, select the **Empty File** box.

3. Complete the csv file and save files.

Note
Data fields have strict requirements for entries; these can be found in **Import Specs File**.

Configuring device

For configuring the device, please use the following guides.

For HART-IP™ from a *Wireless*HART® Gateway:

Entry tag	Description	Data type	Values	Example
XXXX_source	Data source	String	HART-IP	HART-IP
XXXX_tag	Device tag	String	String	3051S
XXXX_value	Device parameter	String	• PV • SV • TV • QV	PV

For OPC UA data points:

Entry tag	Description	Data type	Values	Example
XXXX_source	Data source	String	OPC UA	OPC UA
XXXX_tag	Device tag	String	String	3051S.PV

For Manual data entry:

Entry tag	Description	Data type	Values	Example
XXXX_source	Data source	String	Manual	Manual
XXXX_tag	Parameter value	Float	Any value	100.00

4. Browse and upload the csv file via the *Import Asset Config modal* window and select **Save**.
5. Check all assets were successfully downloaded.
6. If assets fail download, check all fields are filled out correctly and download again.

3.5.3 Editing assets

There are two ways to edit assets. The options are discussed below.

Edit singular asset

1. Navigate to **Asset Summary** tab.
2. Select **Asset** to edit. The *Details modal* window will pop up with all fields to edit.
3. Select **Save** when complete.

Note
Assets can be deleted by selecting the *Delete Asset* button.

Import asset config

1. Navigate to *Asset Summary* tab and select the **Import Asset Config** button.
2. Select **Download asset configuration** and download the csv file.
3. Edit the csv file and save files.

Note
Data fields have strict requirements for entries; these can be found in the appropriate manual supplement.

4. Browse and upload the csv file via the *Import Asset Config modal* window and select **Save**.
5. Check all assets were successfully downloaded.
6. If assets fail download, check all fields are filled out correctly and download again.

3.6 Version upgrades

Backup all files before installing a new version.

3.6.1 Virtual machine upgrades

1. Ensure an up to date backup has been saved following the steps in the Save System Backup procedure.
2. Install the new Plantweb Insight virtual machine following the steps in Installation procedure .
3. Restore the backup file following the steps in the Restore System procedure.

3.6.2 Application upgrades

1. Navigate to *System Settings* > *Platform Settings* > *Manage Applications.*
2. Install the new version following the steps in "Application installation" on page 11. You will receive a prompt to replace the old version of the application.
3. If applicable, restore the system backup to retrieve configuration.

3.6.3 Platform upgrades

1. Navigate to System *Settings* > *Platform Settings* > *Manage Base* Platform.
2. Browse and upload the pertinent upgrade file.
3. Select **Update**.
4. Select **Restart Server**.
5. If applicable, restore the system backup to retrieve configuration.

3.7 Modbus TCP mapping

1. Modbus TCP registers and tags are pre-populated in Plantweb Insight and cannot be changed.
2. Registers and codes can be found in each app by going to the app settings (Global Settings) and then selecting **Download Modbus Mapping**. The pertinent Modbus TCP port for each application are listed in the table below.

Application	Modbus TCP port
Steam trap	502
Pump	503
Heat exchanger	505
Air cooled heat exchanger	506

3. A csv file will open with the listed registers and tags.

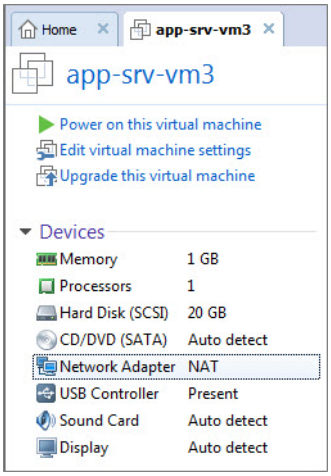
Appendix A Advanced Setup

Advanced settings around network connection and IP addresses can be made inside the virtual software and in the host operating system. The virtual machine must be powered down for changes to be made. Setting changes will be finalized when the virtual machine is powered on.

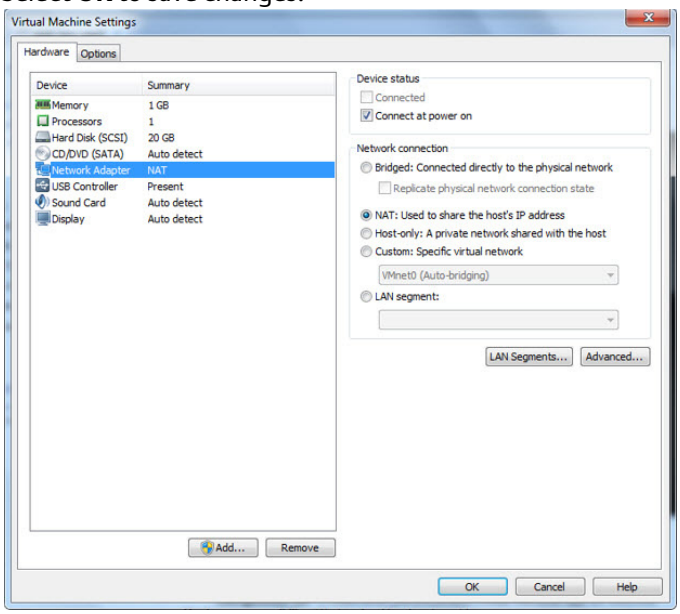
A.1 Network connection settings

Network connection changes can be made within the virtual machine.

1. Select **Network Adapter**. Network settings can be made here.



2. Select **OK** to save changes.



Appendix B Steam Trap Application Configuration and Information

B.1 Overview

This document provides information on set up and configuration of the Steam Trap Application within Emerson™ Plantweb™ Insight.

Prior to configuring your Steam Trap Application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in the guide will be reiterated in this document in more detail.

B.2 Global settings

Global settings should be set before any asset configuration is completed. These settings apply to all assets within a specific application but do not change any settings within the Gateway or devices.

Navigate to *Settings* tab.

Table B-1. Units of Measurement

Field	Input type	Description/use
Currency	Drop down selection	Used for determining the currency unit of your energy costs
Steam cost	Number entry	Used for calculations
Steam units	Drop down selection	Used for steam cost units
Pressure units	Drop down selection	Used for inlet and outlet pressure entries
Boiler fuel type	Drop down selection	Used for calculations
Linear measurement units	Drop down selection	Used for orifice size and pipe size entries
Boiler efficiency	Number entry (0–1)	Used for calculations

Table B-2. Key Performance Objectives

Field	Input type	Description/use
Energy loss goal	Number entry	Used on dashboard for energy costs gauge goal
Carbon emissions goal	Number entry	Used on dashboard for carbon emissions gauge goal

B.3 Adding assets

Fields of note

Pressure inlet

The inlet pressure can be tracked using a manual input, HART-IP™ variable, or OPC-UA® variable. To configure HART-IP and OPC-UA variables, follow the instructions from "Adding assets" on page 11.

Orifice size

If orifice size information is not available, the table below can be used as a guide.

Table B-3. Orifice Specifications

		Pressure (PSIG)											
		0	5	10	20	25	50	75	100	125	150	200	250
Line size (in.)	0	0.000			0.000								
	1/4				0.125	0.125	0.125	0.094	0.094	0.094	0.094	0.094	0.094
	3/8				0.188	0.188	0.125	0.125	0.125				
	1/2				0.250	0.250	0.188	0.156	0.156	0.125	0.125		
	3/4				0.375	0.313	0.250	0.219	0.188	0.156	0.125	0.125	0.125
	1				0.500	0.438	0.344	0.313	0.281	0.250	0.219	0.188	0.188
	1 1/2					0.500	0.469	0.438	0.375	0.375	0.344	0.313	0.281
	1 3/4						0.500	0.469	0.438	0.438	0.375	0.344	0.344
	2							0.500	0.500	0.500	0.469	0.438	0.375

		Pressure (BARG)										
		0	0.3	0.7	1	2	3.5	5	7	8.5	11	15	20
Line size (mm)	0	0			0								
	5				3	3	3	2.5	2.5	2.5	2	2	2
	10				5	5	4	3	3	2.5	2.5	2	2
	15				7	7	5	4	3.5	3	3	3	2.5
	20				10	9	7	6	5.5	5	4.5	4	3
	25				13	11	9	8	7.5	7	6	5.5	5
	40					12.5	12	11	10.5	10	9	7.5	7
	45					13	13	12	11.5	11	10	9.5	9
	50					13	13	13	13	13	11	10	9.5

Noise filter level

In noisy environments it may become necessary to filter out the surrounding noise so sensitivity to leaking steam noise is restored. This can be accomplished by using the *Noise Filter Level* advanced setting.

Temp deadband

Use *Temperature Deadband* settings to slow or contain state change “flipping”. Flipping may occur when a trap is operating under “swinging” temperature conditions, including heavy loads and rapidly modulating steam supply.

Temp rate alarm

Some critical steam systems require rapid indication of condensate accumulation. The thermal mass of the trap and piping system introduce a significant thermal lag that can be compensated through calculation. When *Temp Rate Alarm* is enabled, transition occurs quickly.

B.4 Calculated fields

The Rosemount™ 708 Acoustic Transmitters update period must be between one and five minutes due to polling and filtering considerations. The steam trap application will take at least 90 minutes to complete its filtering and calculation cycle. During this time period, the steam trap status will indicate “NO DATA/ERROR”.

B.4.1 Trap status

Trap state calculations are derived from ultrasonic amplitude (acoustic) and temperature readings from the Rosemount 708 Acoustic Transmitters as well as static configuration information. The following states are calculated.

Table B-4. State Descriptions

Value	Name	Description	Action
0	GOOD	Trap operating normally	None
1	INACTIVE	Trap is near room temperature	None
2	UNUSED	N/A	N/A
3	BLOW-THROUGH	Trap is within operational temperature limits and is continuously allowing steam to escape into the condensate return	Investigate trap
4	NO DATA/ERROR	The Rosemount 708 is not publishing data or is publishing a fault condition	Investigate Rosemount 708
5	NO CONFIG	Critical user configuration information is missing	Configure asset
6	OUT OF SERVICE	The trap is out of service (user writable)	None
7(1)	PLUGGED	The trap is stuck in the closed position or there is a blockage in the trap inlet or outlet	Investigate trap
8(1)	FLOODED	The trap temperature is below expected operation limits but acoustic energy is present (trap is operating)	Investigate trap sizing and/or load conditions

1. To ensure safety, check trap temperature before performing maintenance on a cold trap.

B.4.2 Lost energy cost

When a steam trap is in a blow through state, unnecessary energy is used to produce excess stream. The lost energy cost value represents the projected annual avoidable energy costs due to faulty traps.

B.4.3 Emissions lost

When a steam trap is in a blow through state, unnecessary emissions are expended to produce excess steam. The emissions lost value represents the projected annual avoidable emissions due to faulty traps.

B.4.4 Device status

Device health	Description	Action
GOOD	Device operating normally	None
POWER_MODULE_LOW	Power module has low battery	Prepare to replace power module
POWER_MODULE_CRITICAL	Power module has a critically low battery	Replace power module
DEVICE_MALFUNCTION	Device has a malfunction	Investigate device
NO_DATA	No polling data was found	Investigate device
ASSET_OUT_OF_SERVICE	The asset is set to out of service (user writable)	None
DEVICE_NOT_FOUND	The asset's device can not be found	Investigate device
DEVICE_OUT_OF_SERVICE	The asset's device is set to out of service	None
GATEWAY_NOT_FOUND	The Gateway associated with the asset's device can not be found	Investigate Gateway
GATEWAY_OUT_OF_SERVICE	The Gateway associated with the asset's device is set to out of service	None
NO_APP_TYPE	The steam trap type is not configured	Configure the steam trap type
NO_O_SIZE	The steam trap orifice size is not configured	Configure the steam trap orifice size
NO_L_SIZE	The steam trap line size is not configured	Configure the steam trap line size
NO_P_IN	The steam trap inlet pressure is not configured	Configure the steam trap inlet pressure
NO_P_OUT	The steam trap outlet pressure is not configured	Configure the steam trap outlet pressure
UPDATE_RATE<60s	The Rosemount 708 update rate is less than 60 seconds	Configure the Rosemount 708 update rate to the recommended 5 minutes
DATA_TOO_OLD	Polling data period is longer than anticipated	Investigate device

B.5 Modbus TCP mapping

1. There are three Modbus® TCP outputs and one Modbus TCP input that are pre-defined in the steam trap app for every asset

Input	Out of service
Output	Steam trap status (value described in Table B-4 on page 22)
Output	Lost energy cost
Output	Emissions lost

2. Modbus TCP registers and tags are pre-populated in Plantweb Insight and cannot be changed.
3. Registers and codes can be found in each app by going to the app *Settings* (Global Settings) and then selecting **Download Modbus Mapping**.
4. A csv file will open with the listed registers and tags.

Appendix C Pump Application Configuration and Information

C.1 Overview

This document provides information on set up and configuration of the pump application within Emerson™ Plantweb™ Insight.

Prior to configuring your pump application, be sure to complete all steps in the Plantweb Insight Quick Start Guide. Some steps in this guide will be reiterated in this document in more detail.

C.2 Global settings

Global settings should be set before any configuration is completed. These settings apply to all assets within a specific application but do not change any setting within the Gateway or devices.

Navigate to *Settings* tab.

C.2.1 Overall health index goal

Overall Health Index Goal is a number entry from 0–100 percent (100 percent = completely healthy). It is used on the dashboard for the overall health index goal indicator.

C.2.2 Alert weights

Select the **Alert Weights** button on the *Settings* page.

Alert weights correspond to the severity of an alert (0 least severe, 100 most severe). Defaults values are preconfigured for the application and can be changed at any time. The most severe alert weight will be used for the health index indication for a given pump. See Table C-1 on page 26.

Table C-1. Alert Weights

Alert Weight	Severity
0–15	Good
16–50	Warning
50+	Critical

C.3 Configuring assets

To finish configuring assets, navigate to the specific asset *Details* page by selecting the asset from the *Asset Summary* page.

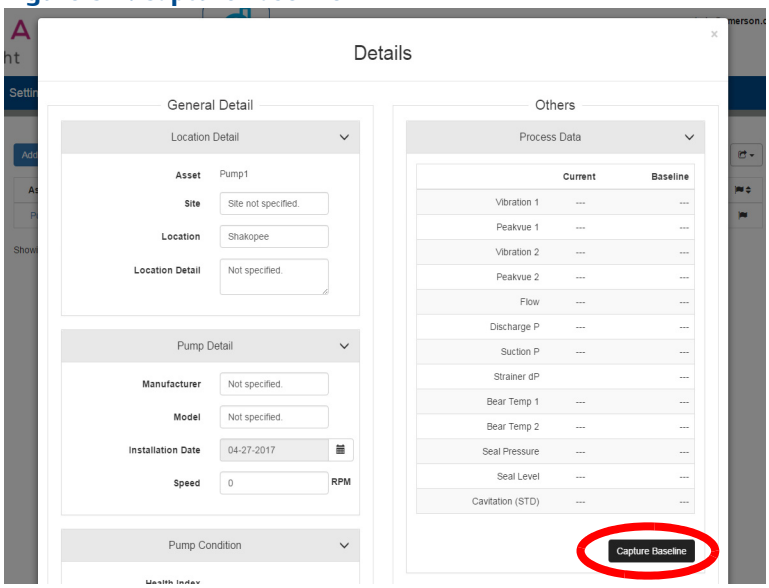
C.3.1 Capture baseline

The pump application compares the current state of a pump against a baseline. The baseline should be captured after all pertinent measurement points are configured and the pump is in an ideal/typical operating state.

Once these criteria are met, the admin should capture a baseline using the following steps:

1. Select the **Capture Baseline button** on the *Details* page. See Figure 2 on page 26.

Figure C-1. Capture Baseline



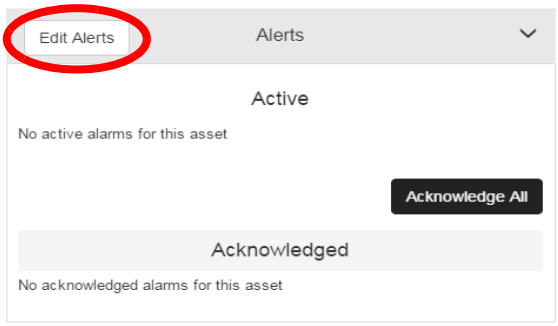
2. Ensure this is the indented baseline pump condition and select **Yes**.

C.3.2 Editing alerts

After the baseline is captured, the pump application will automatically set alert thresholds and limits for measurement points and calculations. Alerts can be disabled and thresholds can be manually configured.

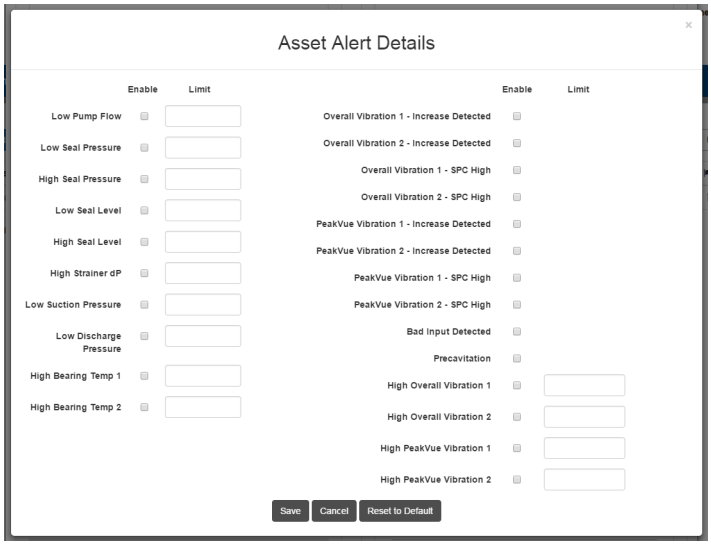
1. Select the **Edit Alerts** button on the *Details* page, as shown in the figure below.

Figure C-2. Edit Alerts



2. Use the **Enable** check boxes to enable/disable alerts.
3. Configure alert limits by manually filling in boxes. See figure below.

Figure C-3. Asset Alert Details



Note
Some alerts may have complex calculations that do not allow configuration.

Note
Alerts can be reset to defaults at any time using the **Reset to Default** button.

C.4 Calculated fields

C.4.1 Measurement point thresholds

Based on the baseline capture, the pump application will automatically configure thresholds for measurement points (Example: low pump flow, high DP across the strainer, etc.). These thresholds are meant to alert the user to abnormal conditions pertaining to the pump that could affect the overall health and performance.

C.4.2 Vibration and PeakVue increase

The “increase detected” and “SPC” (statistical performance calculation) alerts for both vibration and PeakVue are used to identify statistically relevant changes in the vibration measurements. These calculations use statistical analysis to detect an increase in vibration readings over a period of time.

C.4.3 Cavitation detection

Pump cavitation is detected from a significant increase in the discharge pressure (standard deviation) and an increase in the PeakVue parameter of the pump. If the pump vibration is not available, the standard deviation of the discharge pressure can be used to indicate “precavitation” with less certainty.

C.4.4 Pump health index

The Pump Health Index is a 0 -100 percent variable determined by the severity of pump alerts. The Pump Health is 100 percent if there are not active alerts. Otherwise, the Pump Health is calculated based on the following equation (100 percent – highest alert weight). Therefore, pump status and health index are correlated to the alert weights. See Table C-2 on page 28 and Table C-3 on page 29.

Table C-2. Pump Health Index

Health Index	Pump Status
86–100%	Good
51–85%	Warning
≤50%	Critical

C.4.5 Pump status

Table C-3. Pump Status

Value	Pump State	Description
0	GOOD	Pump health > 85%
4	NO DATA/ERROR	There is not enough data for the pump state to calculate
5	NO CONFIG	Baseline has not been captured for the pump
6	OUT OF SERVICE	Pump is out of service (user writable)
7	WARNING	Pump health is between 50% and 85%
8	CRITICAL	Pump health is < 50%

C.5 Modbus TCP mapping

There are three Modbus® Transmission Control Protocol (TCP) outputs and one Modbus TCP input that are predefined in the pump app for every asset. See table below.

Table C-4. Modbus TCP Definitions

Modbus TCP	Definition
Input	Out of service
Output	Pump state (value described in Table C-3 on page 29)
Output	Pump alert
Output	Pump health

Note
Modbus TCP registers and tags are automatically populated in Plantweb Insight and cannot be changed.

1. Registers and codes can be found in each app by going to the app *Settings* (Global Settings) and then selecting **Download Modbus Mapping**.
2. A csv file will open with the listed registers and tags.

Appendix D Heat Exchanger Application Configuration and Information

D.1 Overview

This document provides information on set up and configuration of the Heat Exchanger Application within Emerson™ Plantweb™ Insight.

Prior to configuring your Heat Exchanger Application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in this guide will be reiterated in this document in more detail.

D.2 Global settings

Global settings should be set before any configuration is completed. These settings apply to all assets within a specific application but do not change any setting within the Gateway or devices.

Navigate to the *Settings* tab.

D.2.1 Energy loss goal

Used in the dashboard for energy costs gauge goal.

D.2.2 Alert weights

Select the **Alert Weights** button on the *Settings* page.

Alert weights correspond to the severity of an alert (0 least severe, 100 most severe). Defaults values are preconfigured for the application and can be changed at any time. The most severe alert weight will be used for the health index indication for a given heat exchanger. See table below.

Table D-1. Alert Weights

Alert weight	Severity
0–15	Good
16–50	Warning
50+	Critical

D.3 Configuring assets

To finish configuring assets, navigate to the specific asset *Details* page by selecting the asset from the *Asset Summary* page.

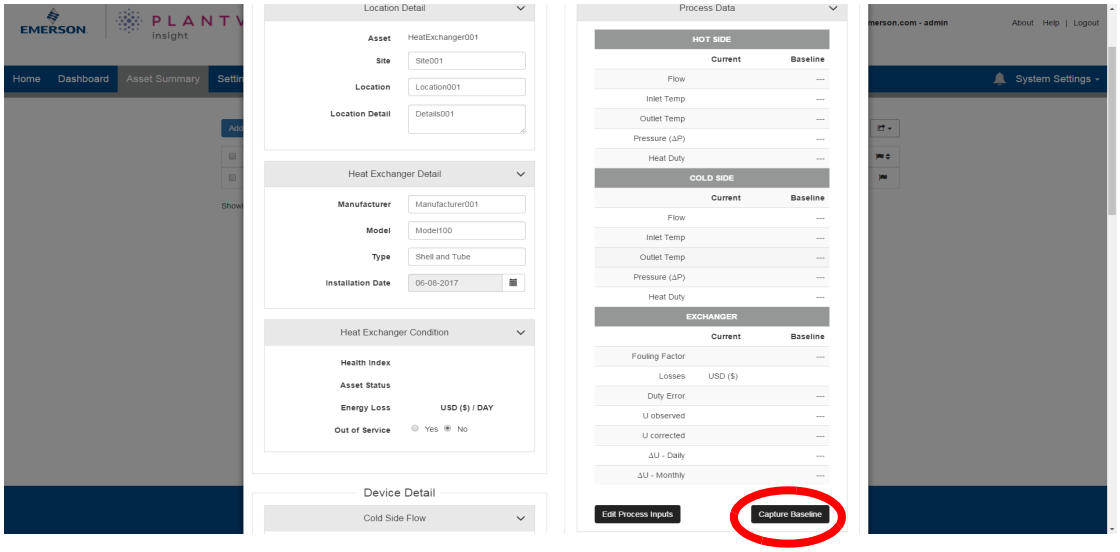
D.3.1 Capture baseline

The heat exchanger application compares the current state of a heat exchanger against a baseline. The baseline should be captured after all pertinent measurement points are configured and the heat-exchanger is in an ideal/typical operating state (usually after cleaning).

Once these criteria are met, the admin should capture a baseline using the following steps:

1. Select the **Capture Baseline** button on the *Details* page. See Figure D-1 on page 32.
2. Ensure this is the intended baseline heat exchanger condition and select **Yes**.

Figure D-1. Capture Baseline

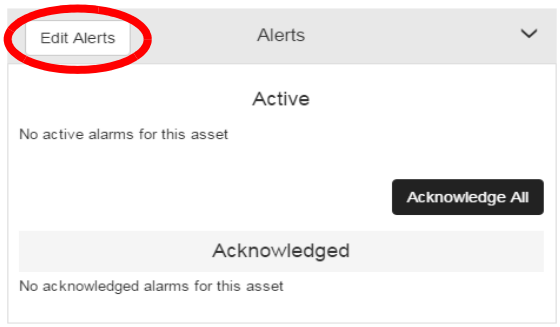


D.3.2 Editing alerts

After the baseline is captured, the heat exchanger application will automatically set alert thresholds and limits for measurement points and calculations. Alerts can be disabled and thresholds can be manually configured.

1. Select the **Edit Alerts** button on the *Details* page, as shown in figure below.

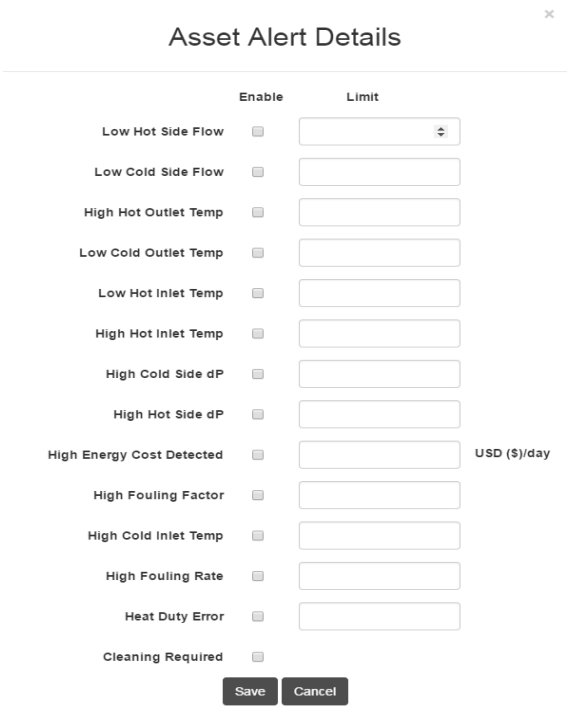
Figure D-2. Edit Alerts



2. Use the **Enable** check boxes to enable/disable alerts
3. Configure alert limits by manually filling in boxes. See Figure D-3 on page 33.

Note
Some alerts may have complex calculations that do not allow configuration.

Figure D-3. Asset Alert Details



Note
Alerts can be reset to defaults at any time using the **Reset to Default** button.

D.4 Calculated fields

D.4.1 Measurement point thresholds

Based on the baseline capture, the heat exchanger application will automatically configure thresholds for measurement points (Example: low hot side flow, high cold side DP, etc.). These thresholds are meant to alert the user to abnormal conditions pertaining to the heat exchanger that could affect the overall health and performance.

D.4.2 Heat duty

Heat duty is calculated using flow, temperature, heat capacity, vapor fractions and heat of vaporization. It can be used as an indication of the amount of heat transferred from one fluid to another. Heat duty is calculated for both the hot and cold sides as well as a delta to check degradation.

D.4.3 Heat exchanger coefficient

The heat exchanger coefficient is a indication of current heat transfer coefficient.

D.4.4 Fouling factor

The current heat exchanger coefficient is compared to the baseline value to determine the fouling factor. When the fouling rate is higher than anticipated, an alert will be triggered.

D.4.5 Lost energy cost/cost of degradation

The cost of degradation is an indication of the lost energy costs resulting from a fouled heat exchanger.

D.4.6 Cleaning required indication

When multiple alarms are triggered (lost energy cost, fouling factor, dP) the “exchanger cleaning required” alert will be shown.

D.4.7 Heat exchanger health index

The heat exchanger health index is a 0–100 percent variable determined by the severity of heat exchanger alerts. The heat exchanger health is 100 percent if there are not active alerts. Otherwise, the heat exchanger health is calculated based on the following equation (100 percent– highest alert weight). Therefore, pump status and health index are correlated to the alert weights. See Table D-2 on page 34 and Table D-3 on page 35.

Table D-2. Heat Exchanger Health Index

Health index	Heat exchanger status
86–100%	Good
51–85%	Warning
≤50%	Critical

D.4.8 Heat exchanger status

Table D-3. Heat Exchanger Status

Value	Heat Exchanger State	Description
0	GOOD	Heat exchanger health > 85%
4	NO DATA/ERROR	There is not enough data for the heat exchanger state to calculate
5	NO CONFIG	Baseline has not been captured for the heat exchanger or required inputs are not entered
6	OUT OF SERVICE	Heat exchanger is out of service (user writable)
7	WARNING	Heat exchanger health is between 50% and 85%
8	CRITICAL	Heat exchanger health is < 50%
9	CHECK PROCESS VALIDITY	One of four process conditions are not met: Hot inlet temp > hot outlet temp Cold inlet temp < cold outlet temp Hot inlet temp > cold outlet temp Hot outlet temp > c old inlet temp

D.5 Modbus TCP mapping

1. There are four Modbus® Transmission Control Protocol (TCP) outputs and one Modbus TCP input that are predefined in the heat exchanger app for every asset. See table below.

Table D-4. Modbus TCP Definitions

Modbus TCP	Definition
Input	Out of service
Output	Heat exchanger state (value described on the table in section 5.8)
Output	Heat exchanger alert
Output	Heat exchanger health
Output	Heat exchanger lost energy costs

2. Modbus TCP registers and tags are automatically populated in Plantweb Insight and cannot be changed. The Modbus TCP port for the heat exchanger application is 505.
3. Registers and codes can be found in each app by going to the app *Settings* (Global Settings) and then selecting **Download Modbus Mapping**.
4. A csv file will open with the listed registers and tags.

Appendix E Wireless Pressure Gauge Application Configuration and Information

E.1 Overview

This document provides information on set up and configuration of the Emerson™ Wireless Pressure Gauge Application within Plantweb™ Insight.

Prior to configuring your Wireless Pressure Gauge Application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in this guide will be reiterated in this document in more detail.

E.2 Adding devices

Pressure threshold alerts

When pressure drops below or rises above the configured limit, a pressure threshold alert is triggered.

Low pressure warning limit

User configurable low pressure threshold. When the pressure drops below this value, a *Low Pressure Warning* alert will be triggered.

High pressure warning limit

User configurable high pressure threshold. When the pressure rises above this value, a *High Pressure Warning* alert will be triggered.

E.3 Calculated fields

E.3.1 Pressure status

The Wireless Pressure Gauge Application within Plantweb Insight calculates the following pressure value (PV) states, shown below.

Table E-1. Calculated Pressure Status

Name	Description
NORMAL	Pressure is within the anticipated range
LOW PRESSURE WARNING	Pressure is below the anticipated range
HIGH PRESSURE WARNING	Pressure is above the anticipated range
OVERPRESSURE NOTIFICATION	Pressure exceeded 105% of the maximum working pressure of the device. Physical device must be reset.

Appendix F Air-cooled Heat Exchanger Application Configuration and Information

F.1 Overview

This document provides information on set up and configuration of the air-cooled heat exchanger application within Emerson™ Plantweb™ Insight.

Prior to configuring your Air-Cooled Heat Exchanger Application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in this guide will be reiterated in this document in more detail.

F.2 Global settings

Global settings should be set before any configuration is completed. These settings apply to all assets within a specific application but do not change any setting within the Gateway or devices.

Navigate to the *Settings* tab.

F.2.1 Overall health index goal

Overall Health Index Goal is a number entry from 0–100 percent (100 percent = completely healthy). It is used on the dashboard for the overall health index goal indicator.

F.2.2 Alert weights

Select the **Alert Weights** button on the *Settings* page.

Alert weights correspond to the severity of an alert (0 least severe, 100 most severe). Defaults values are preconfigured for the application and can be changed at any time. The most severe alert weight will be used for the health index indication for a given air-cooled heat exchanger. See table below.

Table F-1. Alert Weights

Alert weight	Severity
0–15	Good
16–50	Warning
50+	Critical

F.3 Configuring assets

To finish configuring assets, navigate to the specific asset *Details* page by selecting the asset from the *Asset Summary* page.

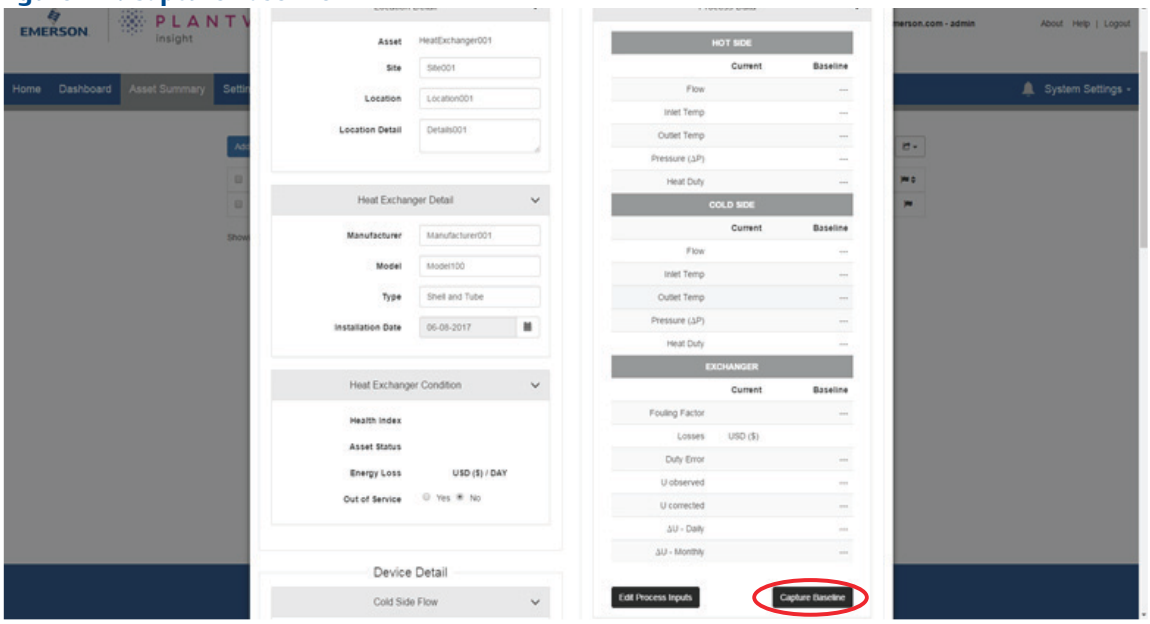
F.3.1 Capture baseline

The air-cooled heat exchanger application compares the current state of a heat exchanger against a baseline. The baseline should be captured after all pertinent measurement points are configured and the air-cooled heat exchanger is in an ideal/typical operating state (usually after cleaning).

Once these criteria are met, the admin should capture a baseline using the following steps:

1. Select the Capture Baseline button on the *Details* page. See Figure F-1 on page 48.
2. Ensure this is the indented baseline air-cooled heat exchanger and select **Yes**.

Figure F-1. Capture Baseline

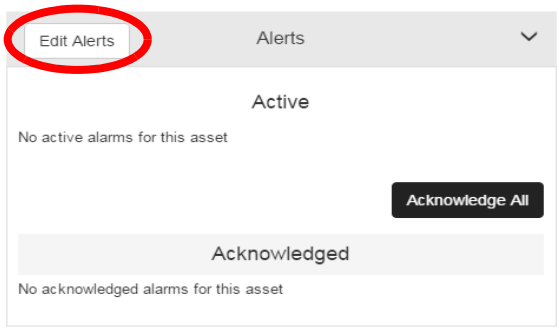


F.3.2 Editing alerts

After the baseline is captured, the air-cooled heat exchanger application will automatically set alert thresholds and limits for measurement points and calculations. Alerts can be disabled and thresholds can be manually configured.

1. Select the **Edit Alerts** button on the *Details* page, as shown in Figure F-2 on page 49.

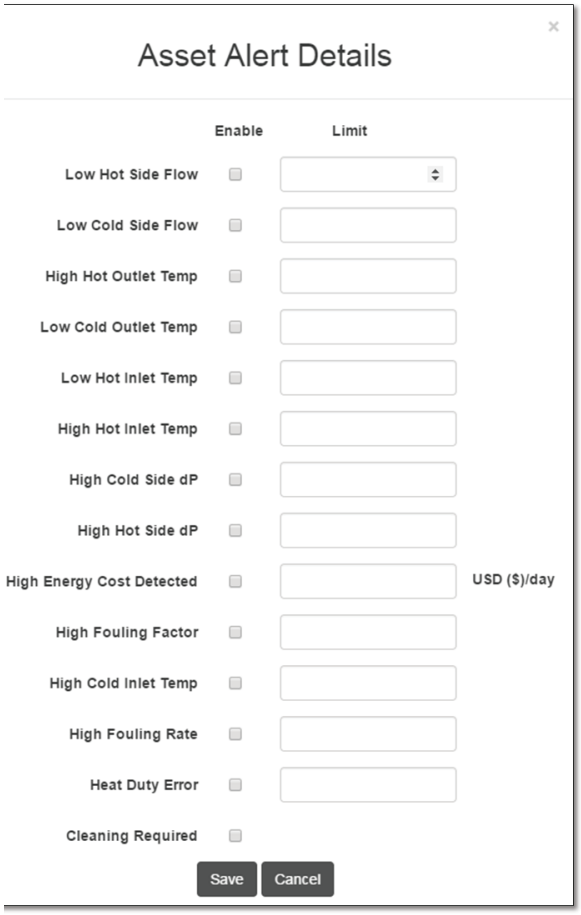
Figure F-2. Edit Alerts



2. Use the **Enable** check boxes to enable/disable alerts.
3. Configure alert limits by manually filling in boxes. See Figure F-3 on page 50, as an example.

Note
Some alerts may have complex calculations that do not allow configuration.

Figure F-3. Asset Alert Details



Note
Alerts can be reset to defaults at any time using the **Reset to Default** button.

F.4 Calculated fields

F.4.1 Measurement point thresholds

Based on the baseline capture, the air-cooled heat exchanger application will automatically configure thresholds for measurement points (e.g. high vibration, low process flow, etc.). These thresholds are meant to alert the user to abnormal conditions pertaining to the air-cooled heat exchanger that could affect the overall health and performance.

F.4.2 Reverse fan suggestions

If the inlet air temp falls below the low temperature inlet threshold (stop), a stop fan suggestion alert will be triggered.

F.4.3 Stop fan operation suggestion

If the inlet air temp falls below the low temperature inlet threshold (stop), a stop fan suggestion alert will be triggered.

F.4.4 Fouling detected

If the differential temperature of the air temperature falls below the minimum differential temperature, a fouling alert will be triggered.

F.4.5 Excessive cooling

If the differential temperature of the process fluid exceeds the maximum differential temperature, an excessive cooling alert will be triggered.

F.4.6 Louver defect

A mismatch between the implied and actual louver position can imply a louver mechanical defect. If both variables are available, a comparison between the two will be performed.

F.4.7 Pitch defect

A mismatch between the implied and actual louver position can imply a pitch actuator mechanical defect. If both variables are available, a comparison between the two will be performed.

F.4.8 Air-cooled heat exchanger health index

The air-cooled heat exchanger Health Index is a 0-100 percent variable determined by the severity of pump alerts. The air-cooled heat exchanger health is 100 percent if there are not active alerts. Otherwise, the air-cooled heat exchanger Health is calculated based on the following equation (100 percent – highest alert weight). Therefore, air-cooled heat exchanger status and health index are correlated to the alert weights.

Table F-2. Air-cooled Heat Exchanger Health Index

Health index	Air-cooled heat exchanger status
86–100%	Good
51–85%	Warning
≤ 50%	Critical

F.4.9 Air-cooled heat exchanger status

Table F-3. Air-cooled Heat Exchanger Status

Value	Air-cooled heat exchanger state	Description
0	GOOD	Air-cooled heat exchanger health > 85%
4	NO DATA/ERROR	There is not enough data for the air-cooled heat exchanger state to calculate
5	NO CONFIG	Baseline has not been captured for the air-cooled heat exchanger
6	OUT OF SERVICE	Air-cooled heat exchanger is out of service (user writable)
7	WARNING	Air-cooled heat exchanger health is between 50 and 85%
8	CRITICAL	Air-cooled heat exchanger health is < 50%

F.5 Modbus TCP mapping

There are four Modbus® Transmission Control Protocol (TCP) outputs and one Modbus TCP input that are predefined in the air-cooled heat exchanger app for every asset. See table below.

Table F-4. Modbus TCP Definitions

Modbus TCP	Definition
Input	Out of Service
Output	Air-cooled heat exchanger state (value described in Table F-3 on page 52)
Output	Air-cooled heat exchanger alert
Output	Air-cooled heat exchanger health

Note
Modbus TCP registers and tags are automatically populated in Plantweb Insight and cannot be changed.

1. Registers and codes can be found in each app by going to the app *Settings* (Global Settings) and then selecting **Download Modbus Mapping**.
2. A csv file will open with the listed registers and tags.

Appendix G Pressure Relief Device (PRD) Application Configuration and Information

G.1 Overview

This document provides information on set up and configuration of the Pressure Relief Device

Application within Emerson™ Plantweb™ Insight.

Prior to configuring your Pressure Relief Device Application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in the guide will be reiterated in this document in more detail.

G.2 Global settings

Global settings should be set before any asset configuration is completed. These settings apply to all assets within a specific application but do not change any settings within the Gateway or devices.

Navigate to *Settings tab*.

Table G-1. Unit of Measurement

Field	Input type	Description/use
Currency	Drop down selection	Used for determining the currency unit of production costs
Gas units	Drop down selection	Used for calculations
Pressure units	Drop down selection	Used for pressure inlet and set pressure entries
Temperature units	Drop down selection	Used for gas temperature entry
Linear measurement units	Drop down selection	Used for orifice size entry

Table G-2. Key Performance Objectives

Field	Input type	Description/use
Number of releases	Number entry	Used on dashboard for number of releases horseshoe
Total Release Duration Goal	dd:hh:mm	Used on dashboard for release duration horseshoe goal
Lost emissions goal	Number entry	Used on dashboard for lost emissions horseshoe goal
Lost product cost goal	Number entry	Used on dashboard for lost product cost horseshoe goal

G.3 Adding assets

G.3.1 Add an asset

Fields of note

Temperature consideration

If enabled, temperature will be considered when determining whether a PRD is releasing. This can be used when multiple PRDs are in close proximity. This should be activated for situations such as shared headers.

G.4 Baseline

G.4.1 Capturing baseline

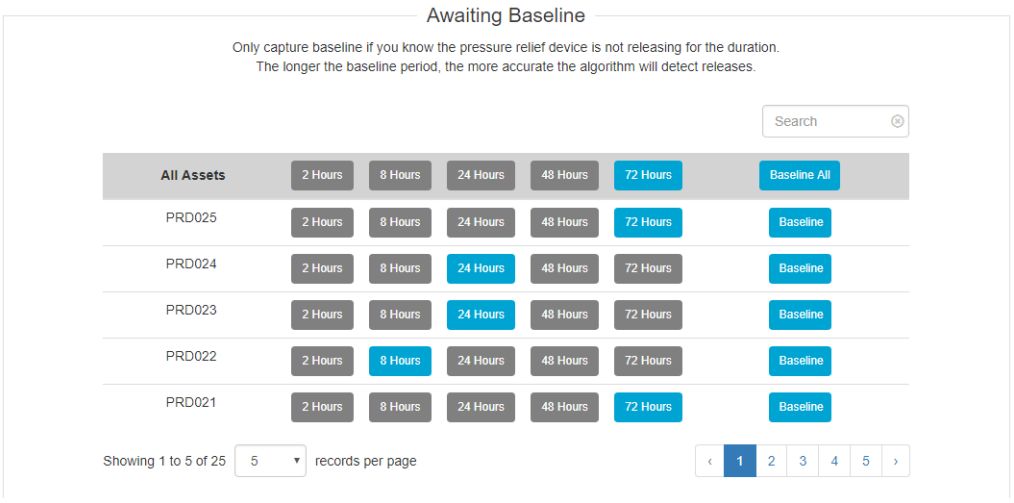
Once assets are configured within the Pressure Relief Device application the user needs to complete a baseline. The baseline is used to characterize background noise from the PRD surroundings. To capture a baseline, first ensure the PRD does not release for the extent of the baseline. This allows the application algorithm to correctly identify and characterize releases. If a release does occur during, the baseline can be stopped and restarted or can be deleted later. To capture a baseline, complete the following steps:

1. Navigate to *Asset Summary* tab and select **Baseline** button.
2. Under *Awaiting Baseline* section, select a baseline time frame for all assets or individually for each asset.

Note
The longer the baseline, the more accurate the release algorithm. Allowing the baseline to run longer helps characterize background noise to its full extent.

3. Select the **baseline** button for each individual asset, or select **baseline all** to run all baselines

Figure G-1. Baseline Page



The baseline will page will show the user progress through the baseline process.

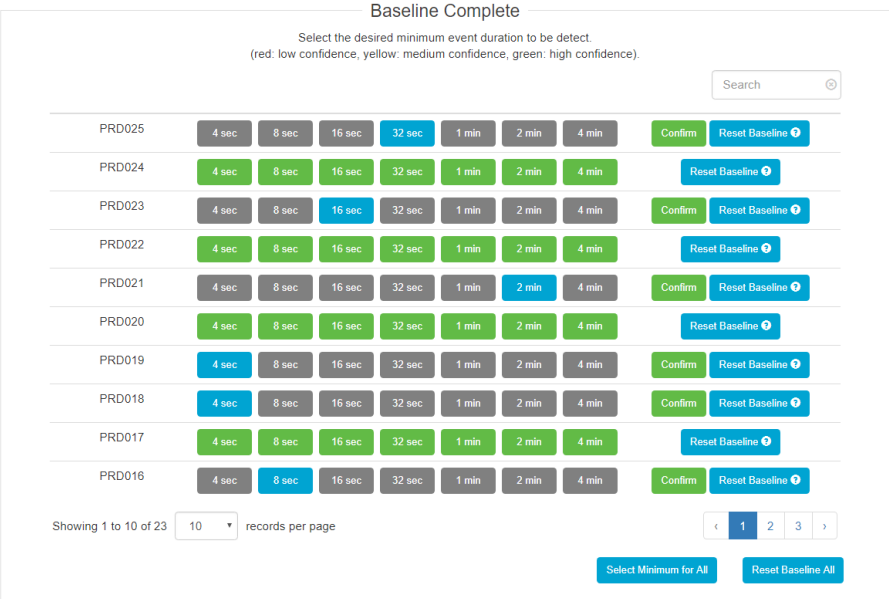
G.4.2 Selecting minimum event duration

Once baselines are completed, the user must select a minimum event duration. The minimum event duration is the quickest release the PRD application will detect. For example, if the user is only receiving data every eight seconds from the acoustic transmitter, it is impossible to detect to a four second release. A rule of thumb is to multiply the Rosemount 708 Acoustic Transmitter update rate by four to get the shortest available release length. To select a minimum event duration, complete the following steps:

1. Navigate to *Asset Summary* tab and select **Baseline** button.
2. Under *Baseline Complete* section, select the minimum event duration individually for each asset or select **Minimum for All** button.

Note
Selecting a longer minimum event duration increases the confidence interval of the algorithm by allowing it to analyze more data over a possible release.

Figure G-2. Baseline Complete



G.5 Calculated fields

G.5.1 PRD status

PRD state calculations are derived from ultrasonic amplitude (acoustic) readings from the Rosemount™ 708 Acoustic Transmitters and the built-in Plantweb Insight algorithm. The following states are calculated.

Table G-3. State Descriptions

Value	Name	Description	Action
0	NORMAL OPERATION	PRD operating normally	None
1	RELEASE	Plantweb Insight has recognized a potential PRD release	Investigate event log and/or PRD
4	NO DATA/ERROR	The Rosemount 708 is not publishing data or is publishing a fault condition	Investigate Rosemount 708
5	NOCONFIG	Critical user configuration information is missing	Configure asset
6	OUT OF SERVICE	The PRD is set to out of service (user writable)	None
7	BASELINE_ NEEDED	PRD Asset it configured and is waiting for the user to prompt a baseline	Run baseline function (see Section B.4.1)
8	CAPTURING_ BASELINE	Baseline is being captured	None
9	AWAITING_ EVENT_ DURATION	Baseline is complete and asset is awaiting a minimum event duration to be selected	Select minimum event duration (see Section B.4.2)

G.5.2 Emissions loss

When a PRD is releasing, excess emissions are lost. The emissions loss value represents the total aggregated emissions due to releasing PRDs over the selected time period.

G.5.3 Lost production cost

When a PRD is releasing, production materials may be lost. The lost production costs value represents the total aggregated production loss due to releasing PRDs over the selected time period.

G.5.4 Device status

Device health	Description	Action
GOOD	Device operating normally	None
POWER_MODULE_LOW	Power module has low battery	Prepare to replace power module
POWER_MODULE_CRITICAL	Power module has a critically low battery	Replace power module
DEVICE_MALFUNCTION	Devide has a malfunction	Investigate device
NO_DATA	No polling data was found	Investigate device
DEVICE_NOT_FOUND	The asset's device cannot be found	Investigate device
DEVICE_OUT_OF_SERVICE	The asset's device is set to out of service	None
GATEWAY_NOT_FOUND	The Gateway associated with the asset's device cannot be found	Investigate Gateway
GATEWAY_OUT_OF_SERVICE	The Gateway associated with the asset's device is set to out of service	None

G.5.5 Modbus TCP mapping

1. There are three Modbus® TCP outputs and one Modbus TCP input that are pre-defined in the app for every asset.

Input	Out of service
Output	PRD status (value described in Table G-3 on page 56)
Output	Lost energy cost
Output	Emissions lost

2. Modbus TCP registers and tags are pre-populated in Plantweb Insight and cannot be changed.
3. Registers and codes can be found in each app by going to app *Settings* (Global Settings) and then selecting **Download Modbus Mapping**.

Appendix H Network Management Application Configuration and Information

H.1 Overview

This document provides information on set up and configuration of the Network Management application within Emerson™ Plantweb™ Insight.

Prior to configuring the application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in the guide will be reiterated in this document in more detail.

H.2 Global settings

Global settings should be in place before any Network application configuration is completed. These settings apply to all Networks within the application but do not change any settings within the Gateway or devices.

Navigate to *Settings* tab.

H.2.1 Alert weights

Alert weights correspond to the severity of an alert (informational, warning, critical). Defaults values are preconfigured for the application and can be changed at any time.

H.3 Calculated fields

H.3.1 Network status

Network Status is based on a pre-defined network reliability calculation. This is different than the reliability displayed in Gateway web page.

Table H-1. State Descriptions

Name	Description	Action
GOOD	Operating normally	None
WARNING	Network Reliability is below best practices.	Investigate Network Details for areas of improvement
CRITICAL	Network Reliability is severely below best practices.	Investigate Network Details for areas of improvement

H.3.2 Device status

Device Status is based on the reliability of the device.

Table H-2. State Descriptions

Name	Description	Action
GOOD	Operating normally	None
PROBLEM	Device Reliability is below expected.	Investigate Network Details and Diagram for areas of improvement
UNREACHABLE	Device has dropped off the network.	Locate device to troubleshoot. Possible Power Module replacement

H.4 Network load index

Based on the network load of each Gateway. Results are bucketed into high, medium, and low Load networks.

H.4.1 Gateway best practices (details page)

Total live devices

Each network should contain at least five active devices

Gateway neighbors

25 percent of active devices should be direct Gateway neighbors

Device neighbors

Every device should have at least three neighbors with 70 percent path stability or higher

Hops (fast sampling)

Fast sampling devices (eight second update rate or faster) should have less than two hops to the Gateway

Hops (regular sampling)

Regular sampling devices (more than eight second update rate) should have less than seven hops to the Gateway

H.4.2 Network diagram

A network diagram for each network will be available in the Network Management app. The following navigation tools are available.

Drag and drop

Click and hold a device or Gateway to move around the diagram

Device details

Hover over a device to see more information (device name, device type, etc.)

Device neighbors

Double click a device to highlight the device's neighbors. Double click again on the device to display the normal view.

Appendix I Power Module Management Application Configuration and Information

I.1 Overview

This document provides information on set up and configuration of the Power Module Management application within Emerson™ Plantweb™ Insight.

Prior to configuring the application, be sure to complete all steps in the Emerson Plantweb Insight Quick Start Guide. Some steps in the guide will be reiterated in this document in more detail.

I.2 Global settings

Global settings should be in place before any power module configuration is completed. These settings apply to all power modules within this application but do not change any settings within the Gateway or devices.

Navigate to *Settings* tab

I.2.1 Estimated remaining life

The estimated remaining life configuration is used to set the second dashboard donut.

I.2.2 Estimated total lifespan

The estimated total lifespan configuration is used to set the third dashboard donut

I.3 Adding power modules

I.3.1 Add power modules

Use this method to add power modules with default settings.

1. Navigate to *Power Module Summary* tab and select **Add Power Modules** button. The Power Module Configuration will appear.
2. Select **Power Modules** to add then select **Add Selected** button or select **Add All** button.
3. Select **Save** and **OK.**
4. After adding power modules, ensure the installation date is correct. This field is used for calculations and should be set to the date the power module was installed.

Calculated fields

Power module status

Power module status is determined using the supply voltage symptoms.

Name	Description	Action
GOOD	Operating normally	None
LOW	Device is in a low power condition.	Replace power module
CRITICAL	Device is in a critical power condition.	Replace power module

Estimated remaining life

Based on the conditions of the power module and the installation date, the remaining estimated life of the power module can be determined. This is a high-level estimate and should be treated as such, but can provide an indication for maintenance planning.

Estimate total lifespan

Based on the current configuration of the device (update rate, etc.), a total lifespan can be estimated. This is a high-level estimate designed to notify the users of power modules that will need to be replace frequently.

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