Online Help
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AMS Machine Works v2.3 User Guide

Online Help

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Version

2.1

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1 Introduction

1.1 About this manual

The AMS Machine Works Online Help guides you through using the software after installation.

For information on the installation, see the AMS Machine Works System Guide. The System Guide includes information on installing the software and performing administrative functions. The System Guide is included with the installation files. Emerson recommends that administrators should read the System Guide before attempting installation.

Table 1-1: Referenced Documents

MHM Number	Document name
MHM-97924-PBF	AMS Asset Monitor Operating Manual
MHM-97932-PBF	AMS Machine Works v2.3 System Guide

1.2 Symbols

Note
This symbol marks passages that contain important information.

⚠ CAUTION

This symbol marks operations that can lead to malfunctions, faulty measurements, or data loss, but will not damage the device.

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LICENSEE ACKNOWLEDGES THAT LICENSEE HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. LICENSEE FURTHER AGREES THAT IT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN THE PARTIES WHICH SUPERSEDES ANY PROPOSAL OR PRIOR AGREEMENT, ORAL OR WRITTEN, AND ANY OTHER COMMUNICATIONS BETWEEN THE PARTIES RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT. This Agreement is for the sole benefit of the parties hereto and their respective successors and permitted assigns and nothing herein, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement. This Agreement may only be amended, modified, or supplemented by an agreement in writing signed by each party hereto. No waiver by any party of any of the provisions hereof shall be effective unless explicitly set forth in writing and signed by the party so waiving. Except as otherwise set forth in this Agreement, no failure to exercise, or delay in exercising, any right, remedy, power, or privilege arising from this Agreement shall operate or be construed as a waiver thereof; nor shall any single or partial exercise of any right, remedy, power, or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, remedy, power, or privilege. If any term or provision of this Agreement is invalid, illegal, or unenforceable in any jurisdiction, such invalidity, illegality, or unenforceability shall not affect any other term or provision of this Agreement or invalidate or render unenforceable such term or provision in any other jurisdiction.

For purposes of this Agreement, (a) the words "include," "includes," and "including" shall be deemed to be followed by the words "without limitation"; (b) the word "or" is not exclusive; and (c) the words "herein," "hereof," "hereby," "hereto," and "hereunder" refer to this Agreement as a whole. Unless the context otherwise requires, references herein: (x) to Sections, Annexes, Schedules, and Exhibits refer to the Sections of, and Annexes, Schedules, and Exhibits attached to, this Agreement; (y) to an agreement, instrument, or other document means such agreement, instrument, or other document as amended, supplemented, and modified from time to time to the extent permitted by the provisions thereof and (z) to a statute means such statute as amended from time to time and includes any successor legislation thereto and any regulations promulgated thereunder. This Agreement shall be construed without regard to any presumption or rule requiring construction or interpretation against the party drafting an instrument or causing any instrument to be drafted.

The headings in this Agreement are for reference only and do not affect the interpretation of this Agreement.

PRODUCT TERMS:

ADDITIONAL TERMS FOR AMS Machine Works Software: In no case may Licensee use AMS Machine Works Software for control of plant processes. You may make, install, and use a

reasonable number of copies of the Software solely for the purpose of facilitating your use of the Software.

2 AMS Machine Works Overview

AMS Machine Works uses predictive maintenance techniques and comprehensive analysis tools to provide a streamlined and accurate assessment of the health of the machinery in your facility.

The **Network Device Module** simplifies the process of managing a complex network of measurement devices.

The **Design Studio** is used to define the relationships between the machines and measurement devices in your facility into a unified model called a **Machine Train**.

Each **Machine Train** has a **Criticality** set for it, and can have **Alerts** set on the data associated with every **Measurement Point** on every **Component** in the **Machine Train**.

AMS Machine Works Applications

AMS Machine Works provides a group of intuitive dashboards to help keep up with day-to-day activities and monitor machinery health.

Configuration and interaction with the software happens through these applications, which can be launched from a web browser:

- **Design Studio** — configure monitored machines, map measurement locations to device channels. See: Design Studio
- **Machinery Health** — view the health information of every **Machine Train**. See: Machinery Health
- **User Manager** — manage user accounts and control access to various areas of the software. See: User Manager
  - **Your Account** — view the information associated with your account and other functions. See: Your Account
- **Network Device Module** — configure data sources, data collections, check device health, and handle store-on-alert functions. See: Network Device Module
- **Portable Device Module** — manages data collection routes and data transfers between AMS 2140 Machinery Health Analyzer units and AMS Machine Works. See: Portable Device Module
- **Vibration Analyzer** — analyzes the data gathered from the devices monitoring your machines. The installer for the Vibration Analyzer, VibApp, can be launched from a web browser at:

  `https://YOUR_AMS_MACHINE_WORKS_SERVER_NAME/vibapp`

  Once the client is installed, you launch it from the Windows Start Menu. For more information see: Vibration Analyzer

Note
Some essential system functions are performed by web services which do not have a user interface. Examples of such services include processing measurement data and communicating with monitoring devices.

An OPC UA server is available for sending scalar data from AMS Machine Works to any OPC UA compliant client system.

Component

A **Component** is any physical component such as a machine, or piece of equipment being monitored. In AMS Machine Works, a **Component** is typically a physical piece of equipment, such as a motor, fan, pump, etc.

Network Device

A **Network Device** is a data source for information about a **Component** or the environment a **Component** is located in. Monitoring data is sent from every **Network Device**, including data about the **Network Device** itself.

Agents

An **Agent** acts as a connection between every **Network Device** and the **AMS Machine Works Server**.

Examples of agents are the **AMS Asset Monitor Agent**, and the **Emerson Wireless Gateway Agent**. The Emerson Wireless Gateway Agent collects data from wireless vibration devices using a HART TCP connection to an Emerson Wireless Gateway.

Machine Train

A **Machine Train** is a model that defines a collection of **Assets**, how they are connected, and which **Network Devices** are monitoring them.

Alerts

An **Alert** can be defined for every type of **Measurement** or **Analysis Parameter**. Depending on the **Criticality** of the **Machine Train** and the **Alert Level**, an **Alert** can serve as either a basis for immediate action or further analysis with the **Vibration Analyzer**.

AMS Machine Works v2.3 Data Sources

AMS Machine Works v2.3 includes support for the following data sources:

- AMS Asset Monitor
- AMS Wireless Vibration Monitor
- AMS 9420 Wireless Vibration Transmitter
- AMS 6500 ATG
- AMS 2140 Machinery Health Analyzer

2.1 Architecture

AMS Machine Works has a modular architecture which supports communication and deployment in complex network topologies.

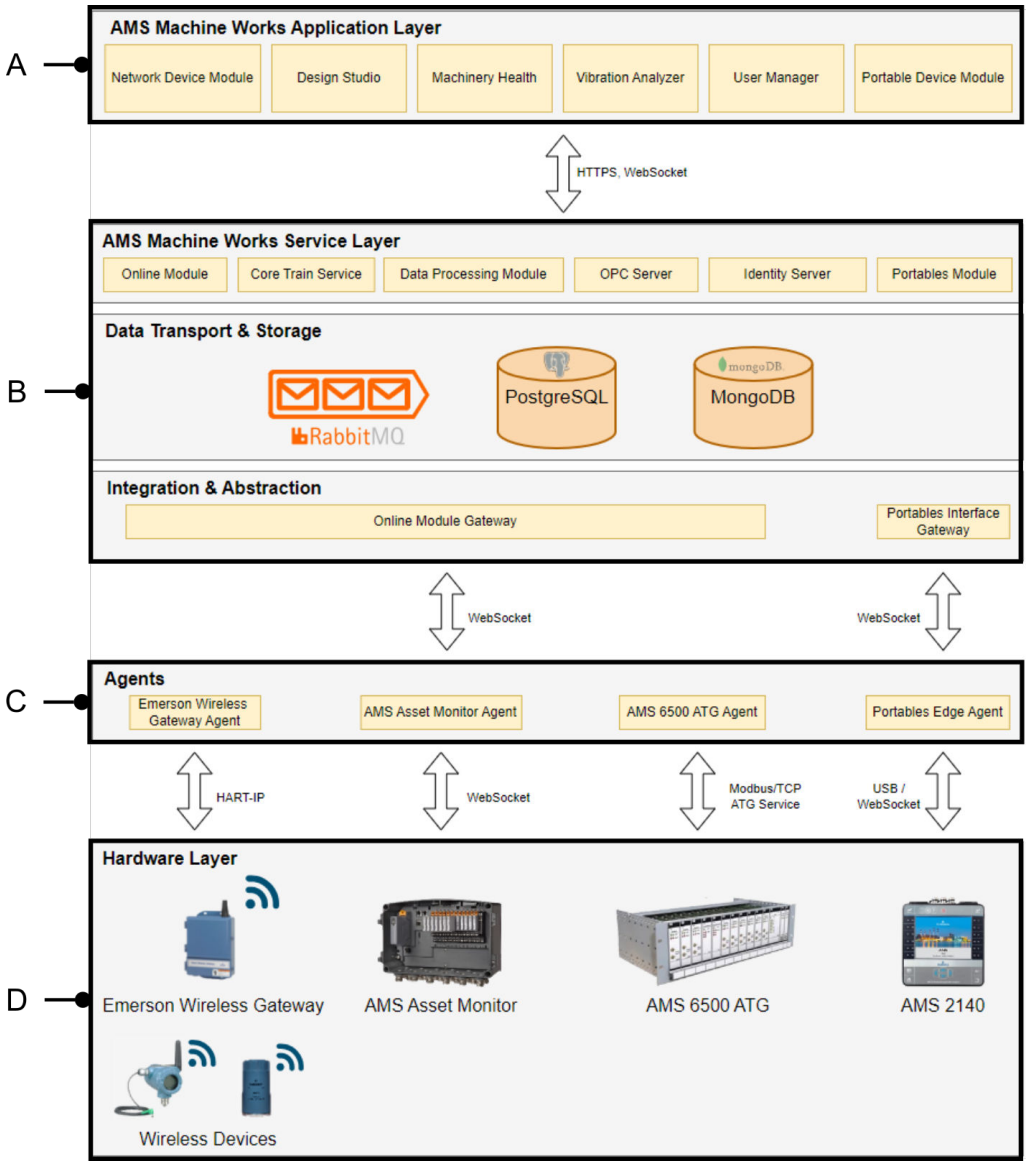
The **Internal** location is the computer or virtual machine where the AMS Machine Works Core is installed. Every other location is an **External** location.

Note
One part of the **AMS Machine Works Core**, the **MongoDB** measurement database, can be installed on an **External** computer or virtual machine.

AMS Machine Works Architecture

AMS Machine Works has four main architectural layers:

Figure 2-1: AMS Machine Works Architecture Diagram



A. ***AMS Machine Works Application Layer*** *— This layer contains web applications for data presentation, configuration, maintenance, security, and data integration.*

B. ***AMS Machine Works Core*** *— This layer processes the vibration data for health, alerts, aggregation, and calculating derived measurements. Manages machine trains, monitors alerts, and assesses the health of assets.*

   A. ***AMS Machine Works Service Layer***

   B. ***Data Transport and Storage Layer***

      A. ***Database***

      B. ***RabbitMQ***

   C. ***Integration and Abstraction Layer***

C. ***Agent Layer*** *— This layer connects the* ***AMS Machine Works Service Layer*** *to the* ***Hardware Layer****. Native measurements, device health, and status information are sent to the Core Module.*

D. ***Hardware Layer*** *— This layer contains all the physical devices which are installed in the site you are monitoring.*

2.2 System Components

AMS Machine Works is comprised of the components described in the table below. For information about installing and configuring these components, refer to the AMS Machine Works System Guide.

Table 2-1: System components

Component	Description
AMS Machine Works Application Layer	The AMS Machine Works Application Layer provides the essential software components and interfaces to the Network Device Module, Design Studio, Machinery Health, User Manager, and the Portable Device Module. The AMS Machine Works Application Layer also enables you to perform analysis in AMS Machine Works Vibration Analyzer, also known as VibApp. It obtains data from various other components, which can be installed on different servers.
Emerson Wireless Gateway Agent	The Emerson Wireless Gateway Agent brings data into AMS Machine Works from wireless devices such as the AMS 9420 Wireless Vibration Transmitter and AMS Wireless Vibration Monitor.
AMS Asset Monitor Agent	The AMS Asset Monitor Agent enables you to bring data into AMS Machine Works from an AMS Asset Monitor.
AMS 6500 ATG Agent	The AMS 6500 ATG Agent reads data from AMS 6500 ATG devices.
AMS 2140 Machinery Health Analyzer Agent	AMS 2140 Machinery Health Analyzer Agent enables connections to AMS 2140 Machinery Health Analyzer units.
AMS Machine Works Vibration Analyzer	The AMS Machine Works Vibration Analyzer, also known as VibApp, enables complex analysis of vibration data with predictive analysis tools and a wide array of visualization options.

2.3 User Interface

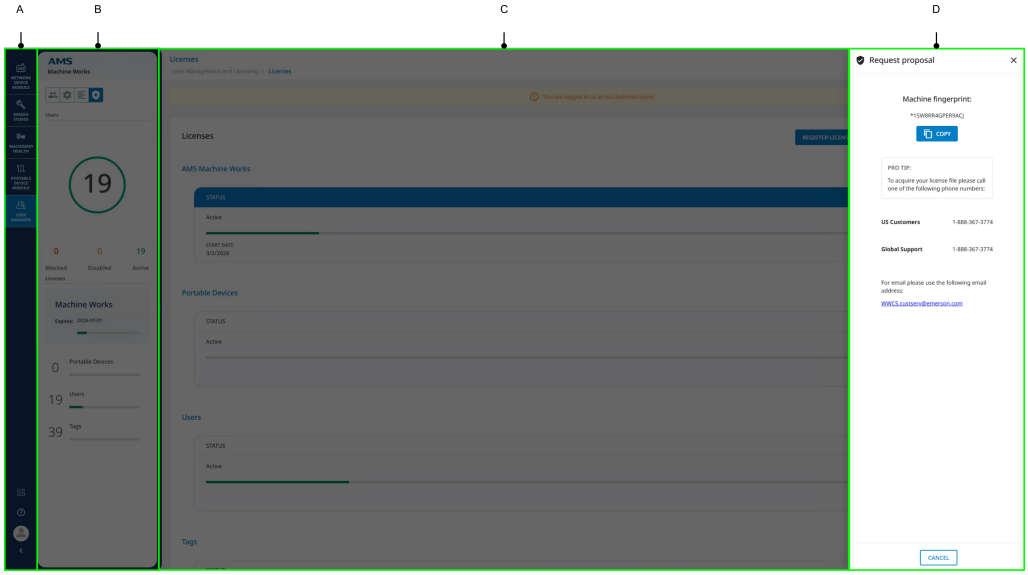
AMS Machine Works v2.3 has a unified user interface for most applications. This section gives an overview of this interface. The details of each application are given in their own chapters.

Legacy components have their own user interfaces which are detailed in their own chapters.

- Vibration Analyzer (VibApp) — See: Vibration Analyzer

User Interface Overview

Figure 2-2: AMS Machine Works v2.3 User Interface



A. ***Sidebar*** *— The AMS Machine Works sidebar has icons for switching between applications and accessing other functionality. See: Sidebar*
B. ***Navigator*** *— The content of the* ***Navigator*** *changes when you change between applications. See: Navigators, Work Areas, and Side Panels*
C. ***Work Area*** *— The* ***Work Area*** *displays information specific to both the application you are in and the selections you have made in the* ***Navigator****. See: Navigators, Work Areas, and Side Panels*
D. ***Side Panels*** *— Each* ***Side Panel*** *opens in response to a specific action or selection in the* ***Work Area*** *with specific information or settings to select or configure. See: Navigators, Work Areas, and Side Panels*

Text Searches and Pattern Matching

Search fields in AMS Machine Works can match plain text, and can also use wildcards for pattern matching.

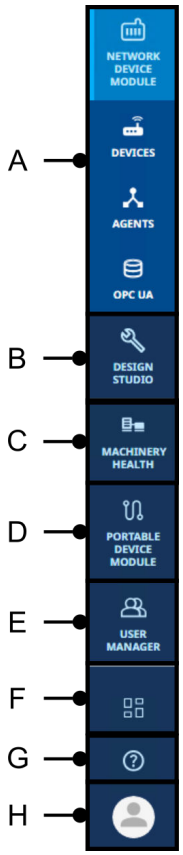
AMS Machine Works supports the use of the following wildcards in search fields:

1. **%** — The percent symbol in a search field matches zero or more characters at that location in the search string.
2. **_** — The underscore symbol in a search field matches to exactly one character at that location in the search string.

2.3.1 Sidebar

The **Sidebar** enables you to change between AMS Machine Works applications, and to access the **Your Account** information and controls, and the **Online Help** version of this documentation.

Figure 2-3: AMS Machine Works Sidebar



A. ***Network Device Module*** *— The* ***Network Device Module*** *manages access to measurement sources located on your network. See: Network Device Module*
   - ***Devices*** *— Each type of* ***Device*** *can provide measurement or status information, and provides access to connected devices. (****ATG Cards****,* ***Asset Monitor CHARMs****,* ***Wireless Devices****) See: Devices*
   - ***Agents*** *— Each type of* ***Agent*** *enables access to a particular class of* ***Device****. See: Agents*
   - ***OPC UA*** *— Users can define* ***OPC UA Tags*** *as endpoints to receive data from* ***OPC UA*** *compliant external systems. See: OPC UA Tags*

B. ***Design Studio*** *— The* ***Design Studio*** *application enables you to define your* ***Machine Trains****, set* ***Measurement Locations****, map* ***Devices*** *to those locations, and set* ***Alerts****. See: Design Studio*
C. ***Machinery Health*** *— The* ***Machinery Health*** *application enables you to navigate through all the* ***Machine Trains*** *which you have defined and view their status. See: Machinery Health*
D. ***Portable Device Module*** *— The* ***Portable Device Module*** *manages access and data collection for AMS 2140 Machinery Health Analyzer handheld units. See: Portable Device Module*

E. ***User Manager*** — *The **User Manager** module has functionality for **Admin** or **Co-Admin** users to manage other users. See: User Manager*
F. ***Status Page*** — *The **Service Status** page icon opens a page with information about the services that AMS Machine Works uses in its operation. See: Service Status Page*
G. ***Online Help*** — *The **Online Help** icon links to a searchable online version of this documentation.*
H. ***Your Account*** — *The **Your Account** icon links to your personal account settings. See: Your Account*
   - *The **Your Account** section contains settings for each user account. See: Responsibilities / Unit Settings / Language Settings Notifications*

2.3.2 Navigators, Work Areas, and Side Panels

Every AMS Machine Works module has a similar interface with:

- A customized **Navigator**. A selection in the **Navigator** sets the context for the **Work Area**.
- A **Work Area** where most of the information is displayed and where most tasks are performed.
- Some single purpose **Side Panel** items.

Note
The Vibration Analyzer (VibApp) has its own interface design.

Navigator

The **Navigator** is a collapsible drawer area which has contextual information and controls for each module.

Each **Navigator** can have a few common features and behaviors:

- Context Tabs — These are used with the context of the **Work Area**.
- Display Order Controls — These are used to search for and sort information displayed in the **Navigator**.
- **Vertical Ellipsis** — These menu functions are context dependent.
- Contextual Content — The contextual content is customized for each module and purpose.
- Action Buttons — These buttons are customized for each module and purpose.

Work Area

The **Work Area** is the largest area of the interface, and it displays the main information and configuration items necessary to perform each particular task in that module.

Each **Work Area** can have a few common features and behaviors:

- Breadcrumb Display — These show which **Module** / **Sub-Module** / **Context** the **Work Area** is currently displaying.
- Language Preference Icon — This menu enables a **User** to select the interface language.

- Three dot menu — These menu functions are context dependent.
- Step Selection — Some modules have multistep configuration processes. Step selection enables to **User** to easily switch to the step they need to configure.
- Items per page setting — Control how much information you want to see per page.
- Page selector controls — Navigate forwards and backwards between pages.

Side Panels

Each **Side Panel** is dedicated to a specific purpose, and opens in response to a selection or action in the **Work Area**.

Each **Side Panel** can have a few common features and behaviors:

- Three dot menu — These menu functions are context dependent.
- Display Order Controls — These are used to search for and sort information displayed in the **Side Panel**.
- List Area — An area for listing information relevant to the function of the **Side Panel**.
- **Apply** and **Close** buttons.

3 Design Studio

Launching the Design Studio

The **Design Studio** is accessed by the **Design Studio** icon is the **Sidebar**. See: Sidebar

The landing page of the **Design Studio** is:

```
https://<Your_AMS_Machine_Works_Server_Name>/design-studio/
```

Design Studio Process

Building a **Machine Train** in AMS Machine Works is divided into eight steps which we can group into three phases:

1. Phase One: Definition of Component Interactions, Measurement Locations, and Device Mappings
2. Phase Two: Data Collection, Processing, Analysis, and Alerts
3. Phase Three: Portable Device Configuration

Note
You can go back to a **Machine Train** and edit it in any step at any time, even after a **Machine Train** has been collecting data for a long time.

Phase One: Definition of Component Interactions, Measurement Locations, and Device Mappings

AMS Machine Works can monitor equipment effectively due to its ability to precisely define the interactions between each **Component** in a **Machine Train**. There are three steps to completing this phase.

- Step One: Build Train — You begin by adding a representation of every **Component** in your **Machine Train** and connecting them together. There are two types of **Machine Train**, **regular** and **specialized**. The main difference between them is which types of **Component** you use to build them.
    1. **Regular Machine Train** — You can select from a large list of **Component** types to describe any generic **Machine Train**. See: Regular Machine Train Component Configuration Tasks
    2. **Specialized Machine Train** — There is only one type of **Specialized Machine Train**, a **Roll / Pulley Section**.
        a. **Roll / Pulley Section** — You can only select from two types of **Component**, a **Pulley / Roll**, or a **Transfer Gear**. See: Roll / Pulley Section Component Configuration Tasks
- Step Two: Measurement Locations — Once you have added every **Component**, you can add **Measurement Points** to the **Measurement Locations** on each **Component**.
- Step Three: Device Mappings — By mapping measurement devices found on your network to **Measurement Points** with a **Device Mapping**, your **Machine Train** is able to begin collecting data. See: Network Device Module

Phase Two: Data Collection, Processing, Analysis, and Alerts

The next phase is to define how AMS Machine Works should react to the data collected. Each type of **Device** provides different **Parameters** to AMS Machine Works, and each **Parameter** has a **Measurement Definition** associated with it. Once a **Machine Train** is defined there are four steps (4-7) for defining processing, analysis, and alerts.

- Step Four: Device Parameter Alerts — **Parameters** can be used to set **Device Parameter Alerts** which are triggered based on raw sensor data.
- Step Five: Transient Waveform Processing — **Design Studio** can define **Transient Waveform Processing** for measurements provided by **AMS 6500 ATG** units.
- Step Six: Analysis Parameters — AMS Machine Works can derive sets of **Analysis Parameters** from four types of input:
    1. **PeakVue Input**
    2. **Acceleration Input**
    3. **Velocity Input**
    4. **Displacement Input**
- Step Seven: Analysis Alerts — Every **Analysis Parameter** can have an **Analysis Alert** set for it.

Phase Three: Portable Device Configuration

The **Portable Device Configuration** step is only used for systems which use **AMS 2140** portable units. See: Portable Device Module

- Step Eight: Portable Device Configuration — **Portable Device Configuration** enables you to add **Analysis Parameter Sets** and **Analysis Alert Sets** to the **Measurement Points** on each **Component** in a **Machine Train** which will have data collected by an engineer operating an **AMS 2140 Machinery Health Analyzer** portable device.

3.1 Design Studio Interface

The **Design Studio** interface is divided into three sections:

Figure 3-1: Design Studio Interface — Landing Page View



A. ***Navigator*** *— This* ***Navigator*** *contains different functionality and information for the landing page view, and for each step of the Design Studio process. See: Design Studio Navigator*
B. ***Breadcrumb Path*** *— The* ***Breadcrumb Path*** *shows which* ***Machine Train*** *you are editing. You can click on the* ***Design Studio*** *element of the* ***Breadcrumb Path*** *to return to the landing page of the* ***Design Studio*** *module.*
C. ***Work Area*** *— The* ***Work Area*** *changes its contents depending on the task you are performing. See: Design Studio Work Area*
   - ***Side Panels*** *— In the* ***Design Studio****, side panels open from the right side of the* ***Work Area*** *when you double click on a* ***Component*** *or any other item which has a side panel associated with it. In each side panel you can configure additional information for that item.*

3.1.1 Design Studio Navigator

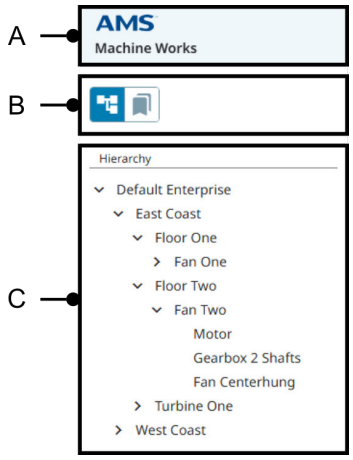
The **Design Studio Navigator** area displays different information and controls for each of the landing page tabs, and for each of the nine **Design Studio** steps. For more information about the functionality available in the **Navigator** on each step of the **Design Studio** process, refer to the instructions for each step. See: Design Studio Process

Design Studio Navigator — Landing Page with the Hierarchy Tab Selected

The **Navigator** contains the following information and controls.

On the landing page of the **Design Studio** you can click on the **Hierarchy Tab** in the **Navigator**:

Figure 3-2: Design Studio Navigator — Hierarchy Tab Selected



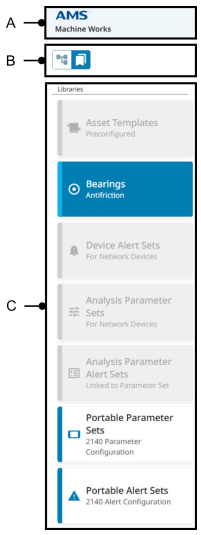
A. ***Header*** *— Clicking the* ***Header*** *resets your view to the landing view from any step in the* ***Machine Train*** *design process.*
B. ***Tab Area*** *—* ***Tab Area*** *with the* ***Hierarchy Tab*** *selected.*
C. ***Hierarchy*** *— This is a hierarchical list of your entire* ***Default Enterprise****.*
   - ***Default Enterprise*** *— The root of your* ***Hierarchy****, it contains* ***Site*** *elements.*
   - ***Site*** *— See: Create, Edit, and Delete Sites*
     - *A* ***Site*** *can contain* ***Folders****,* ***Machine Trains****, or* ***Roll/Pulley Sections****.*
     - *The* ***Name*** *or* ***Line Frequency*** *of a* ***Site*** *can be edited. See: Create, Edit, and Delete Sites*
     - *A* ***Site*** *can be deleted if it is empty. See: Create, Edit, and Delete Sites*
   - ***Folder*** *— See: Create, Rename, and Delete Folders*
     - *A* ***Folder*** *can be in a* ***Site****, or inside another* ***Folder****.*
     - *A* ***Folder*** *can contain* ***Folders****,* ***Machine Trains****, and* ***Roll/Pulley Sections****.*
     - *A* ***Folder*** *can either* ***Move up*** *or* ***Move down*** *within a* ***Site*** *or a* ***Folder****. See: Sort Elements in the Hierarchy*
     - *The* ***Name*** *of a* ***Folder*** *can be edited. See: Create, Rename, and Delete Folders*
     - *A* ***Folder*** *can be deleted if it is empty. See: Create, Rename, and Delete Folders*
   - ***Machine Trains*** *and* ***Roll/Pulley Sections*** *— See: Step One: Build Train*
     - ***Machine Trains*** *and* ***Roll/Pulley Sections*** *can be in* ***Sites****, or* ***Folders****.*
     - *Each* ***Machine Train*** *or* ***Roll/Pulley Section*** *can either* ***Move up*** *or* ***Move down*** *within a* ***Site*** *or a* ***Folder****. See: Sort Elements in the Hierarchy*
     - *You can copy any* ***Machine Train*** *or* ***Roll/Pulley Section*** *listed within the hierarchy. See: Copy Machine Trains and Roll / Pulley Sections*
     - *You can delete any* ***Machine Train*** *or* ***Roll/Pulley Section*** *listed within the hierarchy. See: Copy Machine Trains and Roll / Pulley Sections*
   - ***Asset*** *—*

  - — *Every **Asset** is part of either a **Machine Train** or a **Roll/Pulley Section**.*
  - — *You can either **Move up** or **Move down** each **Asset** within the list of assets of a **Machine Train** or a **Roll/Pulley Section**. See: Sort Elements in the Hierarchy*
- ***Measurement Point** —*
  - — *Every **Measurement Point** is part of either a **Machine Train**, **Roll/Pulley Section** or a piece of **MHM Equipment**.*
  - — *You can either **Move up** or **Move down** each **Measurement Point** within the list of assets of a **Machine Train** or a **Roll/Pulley Section**. See: Sort Elements in the Hierarchy*

Design Studio Navigator — Landing Page with the Library Tab Selected

On the landing page of the **Design Studio** a user can click on the **Library Tab** in the **Navigator** to select it.

Figure 3-3: Design Studio Navigator — Library Tab Selected



With the **Library Tab** selected, a list of every **Library** available in AMS Machine Works is displayed.

A. ***Header** — Clicking the **Header** resets your view to the landing view from the library view.*
B. ***Tab Area** — **Tabs Area** with the **Library Tab** selected.*
C. ***Library List** — A list of every available **Library**. See: Design Studio Libraries*

Design Studio Navigator — Building Process

The **Navigator** in the **Design Studio** contains different information and controls depending on what step you are in.

Refer to the instructions for each particular step for more details:

1. Step One: The **Build Train** step has two possible configurations depending on if you are building a regular **Machine Train**, or a specialized **Roll / Pulley Section**.

a. See: Set Machine Train Parameters

b. See: Set Roll / Pulley Section Parameters

2. Step Two: Measurement Locations
3. Step Three: Device Mappings
4. Step Four: Device Parameter Alerts
5. Step Five: Transient Waveform Processing
6. Step Six: Analysis Parameters
7. Step Seven: Analysis Alerts
8. Step Eight: Portable Device Configuration

Create and Edit the Hierarchy

The hierarchy of your AMS Machine Works installation is defined and edited in the **Navigator** area of the **Design Studio**.

The following tasks can be performed:

- Create, Edit, and Delete Sites
- Create, Rename, and Delete Folders
- Sort Elements in the Hierarchy
- Sort Elements in the Hierarchy
- Delete Machine Trains and Roll / Pulley Sections
- Recalculate Historical Derivatives

Create, Edit, and Delete Sites

You can create **Site** elements in you **Default Enterprise** to build the hierarchy of your AMS Machine Works installation.

Prerequisites

Open the **Design Studio** with the **Hierarchy Tab** selected in the **Navigator**.

Procedure

1. (Option 1: Create a **Site**.) To create a **Site**, select **Default Enterprise** → **Add site**.
   a) Set the **Name**.
   b) Set the **Line Frequency**.

      Choose between:

      1. **50 Hz**
      2. **60 Hz**

⚠ CAUTION

The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations.

To get accurate results you must set the electrical line frequency for each **Site**.

Correct configuration of this setting is essential for accurate system performance!

c) Click **Apply** to record your changes.

2. (Option 2: Edit a **Site**.) To edit a **Site**, select **Site** → **Edit** from the list under the **Default Enterprise**.
   a) Set the **Name**.
   b) Set the **Line Frequency**.

      Choose between:

      1. **50 Hz**
      2. **60 Hz**

      ⚠ CAUTION

      The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations.

      To get accurate results you must set the electrical line frequency for each **Site**.

      Correct configuration of this setting is essential for accurate system performance!

   c) Click **Apply** to record your changes.
3. (Option 3: Delete a **Site**.) To delete a **Site**, select **Site** → **Delete** from list under the **Default Enterprise**.

   Note
   To be able to **Delete** a **Site**, it must be empty.

   a) Click **Confirm** to delete the **Site.**

Create, Rename, and Delete Folders

You can create **Folders** to organize your **Default Enterprise**. Each **Folder** is added to either a **Site** or another **Folder**.

Prerequisites

Open the **Design Studio** with the **Hierarchy Tab** selected in the **Navigator**.

Procedure

1. To create a **Folder** either:
   a) With a **Site**, select that **Site** → **Add folder**
   b) With a **Folder**, select that **Folder** → **Add folder**
2. To edit a **Folder**, select a **Folder** → **Rename folder**
3. To delete a **Folder**, select a **Folder** → **Delete folder**

Note
To be able to **Delete** a **Folder**, it must be empty.

Sort Elements in the Hierarchy

Every element in the hierarchy, except **Sites**, can move up or down within its context.

1. **Folder** — The context for **Folders** is the enclosing **Site** or **Folder**.
2. **Machine Train**, **Roll / Pulley Section**, or **MHM Equipment** — The context for **Machine Trains**, **Roll / Pulley Sections**, and **MHM Equipment** is the enclosing **Site** or **Folder**.
3. **Asset** — The context is the enclosing **Machine Train** or **Roll / Pulley Section**.
4. **Measurement Point** — The context is the enclosing **Asset** or **MHM Equipment**.

Note
MHM Equipment is a type of **Machine Train** with one **Asset** migrated from Machinery Health Manager. Each **MHM Equipment Asset** is contained within an **MHM Equipment Machine Train** of the same name.

Prerequisites

1. Open the **Design Studio**.
2. Select an element to move.

Procedure

1. (Optional) To move an element up select: **Right-Click** → **Move up**

   Note
   When an element is at the top of its context the **Move up** function has no effect.

2. (Optional) To move an element down select: **Right-Click** → **Move down**

   Note
   When an element is at the bottom of its context the **Move down** function has no effect.

3. (Optional) Repeat Step 1 and Step 2 with every element as many times as necessary until every element is in the correct order.

Copy Machine Trains and Roll / Pulley Sections

Any **Machine Train** or **Roll / Pulley Section** can be copied.

When you use the **Copy** function the following items **are copied**:

1. All the configuration of the **Machine Train** or **Roll \ Pulley Section** from the **Build Train** and **Measurement Locations** steps is copied except as noted below.

When you use the **Copy** function the following items **are not copied**:

1. The **Name** is not copied; a default **Name** is set with the time that the **Machine Train** or **Roll \ Pulley Section** was copied.
2. The **Engineering ID** is not copied; a unique **Engineering ID** must be assigned.

Prerequisites

1. Open the **Design Studio**.
2. Select a **Machine Train** or **Roll \ Pulley Section** which is fully and properly configured.

⚠ CAUTION

Ensure that source is properly configured to avoid replicating errors.

Procedure

1. Right-click on the **Machine Train** or **Roll \ Pulley Section** and select **Copy**.
2. When the **Select Train Location** panel opens from the right side of the screen, select a **Site** or **Folder** to place this copied **Machine Train** or **Roll \ Pulley Section**.

Note
Machine Train or **Roll \ Pulley Section** cannot be moved to different **Sites** or **Folders** after they have been created.

3. (Optional) Enter a customized name for the **Machine Train** or **Roll \ Pulley Section**. The default name of the **Machine Train** or **Roll \ Pulley Section** is the time it is created.
4. (Required) Enter an **Engineering Id** for the **Machine Train** or **Roll \ Pulley Section**.

Delete Machine Trains and Roll / Pulley Sections

Any **Machine Train** or **Roll / Pulley Section** can be deleted from the hierarchy.

Prerequisites

1. The **Design Studio** must be open, with the **Hierarchy Tab** selected.

Procedure

1. Find the **Machine Train** or **Roll / Pulley Section** that you want to delete in the hierarchy.

2. Right-click on the **Machine Train** or **Roll / Pulley Section** that you want to delete, and select **Delete.**
3. In the confirmation dialog:
   - Click **Confirm** to delete the **Machine Train** or **Roll / Pulley Section**.
   - Click **Cancel** to cancel the action.

Recalculate Historical Derivatives

To have results consistent with previous data you must recalculate the historical derivatives of every **Machine Train** or **Roll / Pulley Section** which meets any of the following conditions:

1. Had a change to its **Analysis Parameters**.
2. Has had **Analysis Parameters** set after migration from another AMS Machine Works installation.

⚠ CAUTION

If any of the conditions are met, it is essential for the accuracy of system predictions that you recalculate the historical derivatives.

Prerequisites

Open the **Design Studio** module.

Procedure

1. **Design Studio → Select Hierarchy Tab → Right-click on a Machine Train or Roll / Pulley Section → Recalculate Historical Derivatives**
2. Repeat Step 1 for every **Machine Train** or **Roll / Pulley Section** which meets any of the conditions listed above.

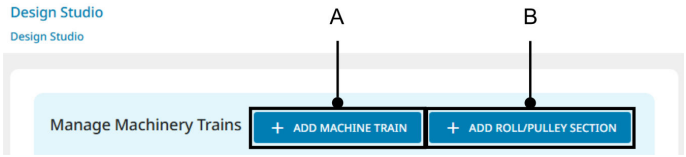
3.1.2 Design Studio Work Area

The **Design Studio Work Area** has three different views:

1. Landing View
2. Library View
3. Design Studio Process Views

Landing View

Figure 3-4: Work Area — Landing View



A. ***+ Add Machine Train*** — *Click* ***+ Add Machine Train*** *to begin building a* ***Machine Train****. See: Step One: Build Train and Set Machine Train Parameters*
B. ***+ Add Roll / Pulley Section*** — *Click* ***+ Add Roll / Pulley Section*** *to begin building a* ***Roll / Pulley Section****. See: Step One: Build Train and Set Roll / Pulley Section Parameters*

Library View

When you select the **Library Tab** and a **Library** in the **Navigator** you see a list of the **Library Entries** in the **Work Area**.

If your **Site** has many instances of a standardized piece of equipment you can enter a definition for that **Component**, enter definitions for the **Parameter Sets** you want to collect, and create **Alert Sets** for consistent monitoring.

AMS Machine Works has three types of **Library**: **Components**, **Parameter Sets**, and **Alert Sets**.

- **Components** — A **Component** is a representation of the equipment used in your site.
  - **Bearing Library** — The **Bearing Library** is preloaded with many industry standard **Bearing** elements. You can add your own custom **Bearing** definitions, or create modified versions of an industry standard **Bearing**. See: Bearing Library
- **Parameter Sets** — A **Parameter Set** is a collection of measurements.
  - **Portable Parameter Sets** — See: Portable Parameter Set Library
- **Alert Sets** — An **Alert Set** is a collection of alerts defined on data source.
  - **Portable Alerts Sets** — This type of **Alert Set** is defined on data provided from a **Portable Device**. See: Portable Alert Set Library

Design Studio Process Views

The **Work Area** contains different information and controls for each step of the train building process.

Refer to the instructions for each particular step for more details:

1. Step One: The **Build Train** step has two possible configurations depending on if you are building a regular **Machine Train**, or a specialized **Roll / Pulley Section**.
   a. See: Set Machine Train Parameters
   b. See: Set Roll / Pulley Section Parameters
2. Step Two: Measurement Locations
3. Step Three: Device Mappings

4. Step Four: Device Parameter Alerts
5. Step Five: Transient Waveform Processing
6. Step Six: Analysis Parameters
7. Step Seven: Analysis Alerts
8. Step Eight: Portable Device Configuration

3.1.3 Design Studio Side Panels

Side Panels in the **Design Studio** open from the right side of the screen when you double-click on a **Component** or some other control which has a side panel associated with it. In the side panel you can view and configure additional information for that item.

3.2 Machine Train Definitions

Machine Train Definition

In AMS Machine Works a functional **Machine Train** is made of the following elements:

- **Component** — See: Component Definitions and Specialized Component Definitions
- **Measurement Location** — See: Measurement Location Definition
- **Measurement Point** — See: Measurement Point Definition
- **Measurement Device** — See: Measurement Device Definition

Types of Machine Trains

There are three types of **Machine Train** in AMS Machine Works:

1. **Machine Train** — A regular **Machine Train** is a collection of **Driver**, **Intermediate**, and **Driven Components** which must be connected with **Coupling Components**. See: Component Definitions
2. **Roll / Pulley Section** — A **Roll / Pulley Section** is a specialized type of **Machine Train** which is collection of **Roll / Pulley** and **Transfer Gear Components**. See: Specialized Component Definitions
3. **MHM Equipment** — **MHM Equipment** consists of a list of **Portable Points**. **MHM Equipment** cannot be created directly within AMS Machine Works, and is only available within AMS Machine Works when it has been migrated from the Machinery Health Manager. See: MHM Equipment Definition

AMS Machine Works — Smallest and Largest Machine Train Definitions

- Smallest functional **Machine Train**:
  - One **Component**.
  - One **Measurement Point** added to a **Measurement Location** on the **Component**.
  - One **Measurement Device** mapped to a **Measurement Point**.
- Largest functional **Machine Train**:

— **Component** — (Recommended Maximum) 72 **Components** per **Machine Train**

⚠ CAUTION

AMS Machine Works supports the definition of **Machine Trains** with up to 72 components each. Larger **Machine Trains** may result in an error.

- (Max) 62 **Measurement Points** per **Component**

— **Measurement Location** — Each type of **Component** supports a different number of **Measurement Locations** and one **Custom Location**. See: Component Definitions and Specialized Component Definitions
- (Max) 9 **Bearings** per **Measurement Location**

— **Measurement Device** — Maximum number: 1 per **Measurement Point**

3.2.1 Machine Works Hierarchy

The hierarchy of your AMS Machine Works installation has four different elements:

1. **Default Enterprise** — This is the highest point in the hierarchy. There is only one **Default Enterprise**.
2. **Site** — Each **Site** is added to the **Default Enterprise**.
3. **Folder** — Each **Folder** is added to either a **Site** or another **Folder**.
4. **Machine Train** — Each **Machine Train** is added to either a **Site** or a **Folder**.
    a. A **Machine Train** contains **Components.** See: Component Definitions and Specialized Component Definitions

3.2.2 Regular Machine Train Definition

In AMS Machine Works a **Regular Machine Train**, usually called just a **Machine Train**, is made of the following types of **Component**. See: Component Definitions

- **Driver** — A **Driver** provides power into the **Machine Train**. See: Driver Components
- **Coupling** — A **Coupling** is automatically added between every other type of **Component** when you connect them. See: Coupling Components and Connect Components.
- **Intermediate** — **Intermediate Components** are gearboxes which can distribute power from their **Input Shaft** to the **Output Shaft**. See: Intermediate Component
- **Driven** — A **Driven Component** performs work of some type. See: Driven Components

Note
If you do not see a **Driven Component** which matches your needs, a single shaft **Component** can be defined with a **User Defined Driven Component**. See: Configure Other Driven Components

Component Definitions

Every **Component** definition has a unique **General** configuration step, and can have other configurations steps as necessary.

1. **General** — The **General** step has all the unique configuration items for each type of **Component**. See: Regular Machine Train Component Configuration Tasks and Roll / Pulley Section Component Configuration Tasks
2. **Bearings** — Each **Measurement Location** in a **Component** can have from 2 to 9 **Bearing** elements. See: Add / Edit / Delete Bearings

   Note
   The **Custom Location** cannot have **Bearing** elements.

3. **Gears** — Some types of **Component** have internal **Gear** configurations. See: Define the Number of Teeth per Gear
4. **Blades** — Some types of **Component** have internal configurations for **Blades**. See: Add Blades
5. **Lobes** — Some types of **Component** have internal configurations for **Lobes**. See: Define the Number of Lobes per Rotor
6. **Fault Frequencies** — Some types of **Component** have a range of **Fault Frequencies** which can be used to aid analysis and set alerts. See: Set Fault Frequencies

Driver Component Definitions

A **Driver** component provides energy into a **Machine Train**.

There are three types of **Driver** to choose from in AMS Machine Works:

- **Turbine** — A **Turbine** uses mechanical energy from the environment to rotate a **Shaft**. See: Turbine Configuration
- **Engine** — An **Engine** uses combustion to rotate a **Shaft**. See: Motor Configuration
- **Motor** — A **Motor** uses electrical energy to rotate a **Shaft**. See: Engine Configuration

Coupling Component Definitions

A **Coupling** component is added between other types of components when you connect them. See: Connect Components

To configure a **Coupling** see the Configure a Coupling.

Every **Coupling** has a **Connection Type**. Some **Connection Types** can change the rotational **Speed Ratio** of a connection by a factor from 0.001 to 1000 by defining the input and output sizes of the **Connection Type**.

There are three kinds of **Coupling**:

- **In-Line** — By default this is a **Direct** connection.
- **Parallel** — By default this is a **Belt** connection.
- **Angular** — By default this is a **Gear** connection.

There are nine **Connection Types**:

- **Belt** — Supports the definition of a **Speed Ratio**, or **Sheave** definitions.
- **Chain** — Supports the definition of a **Speed Ratio**, or **Sprocket** definitions.
- **Direct** — (Default) A **Direct** connection is always defined as 1:1.
- **Flexible** — Supports the definition of a **Flexible Type**.
- **Fluid/Magnetic** — Supports the definition of a **Speed Ratio**.
- **Gear** — Supports the definition of a **Speed Ratio**, or **Gear** definitions.
- **Integral** — Has no special features.
- **Sheet/Web Drive** — Has no special features.
- **Spline** — Has no special features.

Intermediate Component Definitions

For **Gearbox** configuration instructions see: Configure a Gearbox

An **Intermediate** asset is a **Gearbox** which takes energy from every **Input Shaft**, and transfers it to every **Output Shaft**.

A **Gearbox** can have from 2 to 7 **Shaft** elements.

Each **Shaft** has a minimum of two **Bearing** elements.

Each **Shaft** has two **Measurement Locations**.

Each **Measurement Location** can have multiple **Measurement Points**.

Each **Shaft** has a **Gear** to mesh with the previous **Shaft** and the next **Shaft** in the sequence.

There are two ways to define the **Output Speed** for every **Shaft**:

- (Recommended) By default the **Specify Speed Ratio** toggle is turned **Off**, and every **Output Shaft** has an **Output Speed** which is defined by an **Output Ratio** of 0.001 to 1000, multiplied by the **Input Speed**.
  - For example: **Output Ratio** * **Input Speed** = **Output Speed**
  - **Output Ratio** = 0.1
  - **Input Speed** = 3600
  - **Output Speed** = 0.1 * 3600 = 360
- When the **Specify Speed Ratio** toggle is turned **off**, you can use the **Gears Tab** to define the **# of Teeth** of each **Gear** on each **Shaft** in sequence.
  When the **Specify Speed Ratio** toggle is turned **on**, you can set a different speed ratio than the default of one.

  Note
  An error in defining the number of teeth on a **Gear** will affect the speed calculations of all the following **Shafts**.

Driven Component Definitions

In AMS Machine Works there are 29 different types of predefined **Driven Component**, and one generic **User Defined Driven Component** which can be used to simulate any simple **Component** which does not have its own template.

List of Driven Components

1. **Fan Centerhung**
2. **Fan Overhung**
3. **Pump Centerhung**
4. **Pump Overhung**
5. **Compressor Centrifugal / Axial**
6. **Compressor Centrifugal (Bull Gear)**
7. **Compressor Reciprocating Horizontal**
8. **Compressor Reciprocating Vertical**
9. **Compressor Rotary (Dry Screw) - single stage**
10. **Compressor Rotary (Dry Screw) - 2 stage**
11. **Compressor Rotary (Flooded Screw)**
12. **Generator**
13. **Centrifuge**
14. **Spindle**
15. **Grinder**
16. **Chipper / Crusher**
17. **Agitator**
18. **Crane**
19. **Chiller**
20. **Detrasher**
21. **Dynamometer**
22. **Exciter**
23. **Mixer**
24. **Pulverizer**
25. **Radar**
26. **Rotating Kiln**
27. **Bearing Housing**

28. **User Defined**
29. **Roll / Pulley**

3.2.3 Roll / Pulley Section Definition

A **Roll / Pulley Section** is a special type of **Machine Train** designed for use with installations where many pieces of rolling equipment are used such as paper mills, or other types of rolling mills.

A **Roll / Pulley Section** can have a maximum of 72 **Components**, and is made of two types of specialized **Component**:

1. **Pulley / Roll** See: Pulley / Roll Component Definition
2. **Transfer Gear** See: Transfer Gear Component Definition

Note
A **Roll/Pulley Section** does not use **Coupling Components**.

Specialized Component Definitions

A **Roll / Pulley Section** is a special type of **Machine Train** which is composed of two types of **Components** :

- **Pulley / Roll** — These have a **Measurement Location** at each end of the **Pulley / Roll**. See: Pulley / Roll Component Definition
  There are two icons for **Pulley / Roll Components**:
  - First type — With black and white center.
  - Second type — Plain.

  The two icons are only for visualization purposes, and the configuration of these two items is the same.
- **Transfer Gear** — can have a **Measurement Location** at each end of the **Gear**. See: Transfer Gear Component Definition
  There are two icons for **Transfer Gear Components**:
  - First type — With black and white center.
  - Second type — Plain.

  The two icons are only for visualization purposes, and their configuration is the same.

Pulley / Roll Component Definition

A **Pulley / Roll** is used for transferring or conditioning the material that passes across it. A **Pulley / Roll** is moved by the material passing through it.

Transfer Gear Component Definition

A **Transfer Gear** gets power from some source on **Gear#1** and can send power to another **Transfer Gear** on **Gear#2**.

3.2.4 MHM Equipment Definition

MHM Equipment cannot be created directly within AMS Machine Works. It is only available within AMS Machine Works after it has been migrated from a Machinery Health Manager installation.

MHM Equipment is a type of **Machine Train** with one **Asset**. In the hierarchy, the **Machine Train** level and **Asset** level have the same name.

The **MHM Equipment** / **Asset** is made up of a list of **Portable Points**. To edit **MHM Equipment** see: MHM Equipment Configuration Process

Note
Points cannot be added or removed from **MHM Equipment**. To create a new **Machine Train** which can include both **Portable Devices** and **Network Devices** see: Step One: Build Train

3.2.5 Measurement Location Definition

A **Measurement Location** represents where a **Measurement Device** is located on a **Component**, for example on a **Shaft**.

Each **Component** has a certain number of **Measurement Locations** to configure, and one **Custom Location**.

Each **Measurement Location** and **Custom Location** can have some **Measurement Points** added to it. See: Measurement Point Definition

Note
For users of AMS Machine Works v1.7.5 or earlier, which supported many **Custom Measurement Locations**, those **Measurement Devices** will now be mapped into individual **Measurement Points** in the **Custom Location** for that **Component**.

3.2.6 Measurement Point Definition

Every **Measurement Point** is added to a **Measurement Location**, or **Custom Location**, to provide a place to connect a **Device Mapping**.

There are four types of **Measurement Point**:

1. **Network Point** — A single measurement from a device on your network can be mapped to this point.
2. **Network Triax** — A **Network Triax** point contains measurements from an AMS Wireless Vibration Monitor for each orientation (**Horizontal**, **Vertical**, and **Axial**), and a measurement of the surface **Temperature** of the equipment that the AMS Wireless Vibration Monitor is mounted on.
3. **Portable Point** — This is a point for any single measurement provided by a portable AMS 2140 Machinery Health Analyzer.

4. **Portable Triax** — This is a group of three measurement points for the **Horizontal**, **Vertical**, and **Axial** orientations provided by a portable AMS 2140 Machinery Health Analyzer.

3.2.7 Measurement Device Definition

A **Measurement Device** is a device which has one, or more, calibrated sensors and communicates either by a network connection or to an AMS 2140 Machinery Health Analyzer.

AMS Machine Works supports the following types of **Measurement Devices**:

- AMS 9420 Wireless Vibration Transmitter
- AMS Wireless Vibration Monitor
- AMS 2140 Machinery Health Analyzer
- AMS Asset Monitor
- AMS 6500 ATG

3.2.8 Speed Definitions

There are two ways that AMS Machine Works measures speed:

1. **Rotational Speed** — This is used by every regular **Machine Train**, and has a unit of **RPM**.
2. **Linear Speed** — This is used by every **Roll / Pulley Section**, and has a unit of **FPM** (Feet Per Minute) when using **Imperial** units, or **MPM** (Meter Per Minute) when using either **Metric** or **SI** units.

Rotational Speed can be measured with a tachometer on every **Shaft** of every **Component**.

For a **Roll / Pulley Section** the **Linear Speed** is set in the **Build Train** step. The **RPM** is calculated for each **Component** in a **Roll / Pulley Section** according to its **Diameter**. See: Roll / Pulley Section Component Configuration Tasks

3.2.9 Fault Frequencies

AMS Machine Works supports a wide range of fault frequency calculations. Some fault frequencies are only available for specific types of **Components**. It is important to properly configure your **Machine Train** so that it resembles your actual machinery and performs the appropriate fault frequency calculations.

There are five categories of **Fault Frequencies**:

1. **Bearing Fault Frequencies** — Associated with any rolling element with one or more bearings.
2. **Shaft Fault Frequencies** — Associated with the rotational speed of a shaft.

3. **Component Specific Fault Frequencies** — Associated with the mechanical properties and working principles of a specific **Component**.
4. **Coupling Specific Fault Frequencies** — Associated with the mechanical properties and working principles of a specific **Coupling** and the speed of the connected **Shaft** or **Shafts**.
5. **Custom Fault Frequencies** — These are specified by the **User** for situations not covered by any of the other **Fault Frequencies** for a **Component**. The **User** must specify any nonstandard **Critical Frequencies**.

Each **Fault Frequency** has the following definition:

- **Description** — This is either set by the **Component** for every **Standard Fault Frequency**, or given by the **User** for each **Custom Fault Frequency** (Default: Fault Frequency #X where #X = #1 - #10)
- **Type** — This is either **Harmonic** or **Sideband**. Every **Custom Fault Frequency** is **Harmonic**.
- **Unit** — This is either **Order** or **Hz**.
- **Base Frequency**(AKA: Modulation Frequency) — This is a positive real number which defines a **Harmonic Fault Frequency**. (Default: 1)
- **Central Frequency** (AKA: Carrier Frequency) — This is a positive real number which is only used with a **Sideband Fault Frequency**.

3.3 Design Studio Libraries

When you select the **Library Tab**, the **Navigator** displays the **Library List**. These libraries hold definitions for use in configuring, managing, and monitoring **Machine Trains**.

Creating New Library Entries

Each **Library** has one or more buttons for creating a new **Library Entry**.

Editing / Deleting Library Entries

When you edit a **Library Entry**, every **Component**, **Parameter Set**, or **Alert Set** that uses that item is affected.

You cannot **Delete** a **Library Entry** which is currently in use.

List of Libraries

1. **Bearing Library** — AMS Machine Works has an extensive preconfigured library of bearings. You can also create customized bearings from a blank template. See: Bearing Library
2. **Portable Parameter Sets** — See: Portable Parameter Set Library
3. **Portable Parameter Alert Sets** — See: Portable Alert Set Library

3.3.1 Bearing Library

The **Bearings Library** contains a list of predefined **Antifriction Bearings**. You can also Add / Edit / Delete a Bearing Definition for your own **Custom Antifriction Bearings**.

Add / Edit / Delete a Bearing Definition

You can add, edit, or delete any **Custom Bearing Definition**.

Note
Users cannot add, edit or delete **Predefined Bearing Definitions**.

Prerequisites

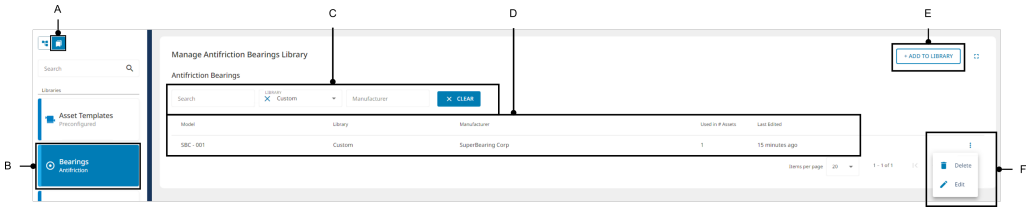
Click the **Library Tab** in the **Design Studio** → **Navigator** → **Tabs Area** to open the list of every **Library** in AMS Machine Works. See: Design Studio Navigator — Landing Page with the Library Tab Selected

Procedure

1. Click the **Bearings Library** tile in **Navigator**.

   The **Bearings Library** opens in the **Train Builder Work Area**.

Figure 3-5: Manage Antifriction Bearings Library Interface



A. ***Library Tab*** *— The* ***Library Tab*** *is selected in the* ***Navigator*** *area.*
B. ***Bearings Library*** *— The* ***Bearings Library*** *is selected in the* ***Navigator****.*
C. ***Search Area*** *— The search area various ways to refine your search.*
   - ***Search*** *— Enter text to search the* ***Antifriction Bearing Library****.*
   - ***Library*** *— You can search in either the* ***Custom Library****, the* ***Predefined Library****, or both (default) at the same time.*
   - ***Manufacturer*** *— Select the producer of an* ***Antifriction Bearing*** *from the dropdown menu.*
   - ***Clear*** *— Click* ***Clear*** *to reset the search filters.*

D. ***Column Headings*** *— The following columns are listed:*
   - ***Model*** *— The name of the* ***Model*** *of the* ***Bearing****. (Max: 50 characters.)*
   - ***Library*** *—* ***Custom Library*** *or* ***Predefined Library***
   - ***Manufacturer*** *— The name of the* ***Manufacturer*** *of the* ***Bearing****. (Max: 50 characters.)*
   - ***# Used in Assets*** *— The number of* ***Components*** *that the* ***Bearing*** *is used in.*
   - ***Last Edited*** *— The amount of time that has passed since the last edit of the definition.*

E. ***+ ADD TO LIBRARY*** *— Click* ***+ ADD TO LIBRARY*** *to create a new* ***Bearing*** *in the* ***Antifriction Bearing Library****.*
F. ***Vertical Ellipsis Menu*** *— These menu items are only available for* ***Custom Library*** *entries.*
   - ***Delete*** *— Click* ***Delete*** *to remove the entry from the* ***Antifriction Bearing Library****.*
   - ***Edit*** *— Click* ***Edit*** *to edit the entry in the* ***Antifriction Bearing Library****.*

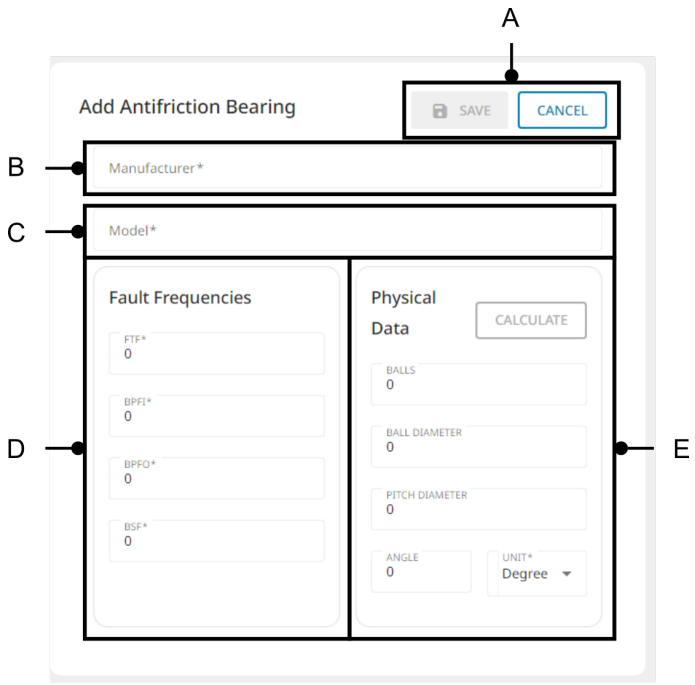
2. (Optional) To **Delete** a **Custom Antifriction Bearing Definition**, click **Vertical Ellipsis Menu** for that library item, and the click **Delete**.
   A confirmation dialog opens for that library item, click **Confirm** to delete the entry, or click **Cancel** to keep the entry.
3. (Optional) To **Edit** a **Custom Antifriction Bearing Definition**, click **Vertical Ellipsis Menu** for that library item, and then click **Edit**.
   The **Edit Antifriction Bearing** interface opens for that library item with the current definition.

Note
The **Edit Antifriction Bearing** interface is configured in the same way as the **Add Antifriction Bearing** interface found in the next step.

4. (Optional) To create a **Custom Antifriction Bearing Definition** click **+ ADD TO LIBRARY**.

   The **Add Antifriction Bearing** interface opens for a new library item without a definition.

Figure 3-6: Add Antifriction Bearing Interface



A. *When you have checked that the **Fault Frequencies** entered are correct, click **SAVE** to record your changes, click **CANCEL** to discard your changes.*
B. *(Required) (Max 50 characters) **MANUFACTURER** — Enter the manufacturer's name.*
C. *(Required) (Max 50 characters) **MODEL** — Enter the model information.*
D. ***Fault Frequencies** — Enter the **Fault Frequencies** if you know them.*

> ***⚠ CAUTION***
>
> *The data in the **Fault Frequencies** section is recorded in the system when you click **SAVE**.*

- *(Required) **FTF** — (Default: 0) Fundamental Train Frequency, enter a number from 0 to 1.*
- *(Required) **BSF** — (Default: 0) Ball Spin Frequency, enter an integer from 0 to 99999.*
- *(Required) **BPFO** — (Default: 0) Ball Pass Frequency Outer, enter a number from 0 to 999.*
- *(Required) **BPFI** — (Default: 0) Ball Pass Frequency Inner, enter a number from 0 to 999.*

E. ***Physical Data** — You can enter the **Physical Data** of the **Antifriction Bearing** and then click **CALCULATE** to automatically fill in the **Fault Frequencies**.*
   - *(Optional) **CALCULATE** — Click **CALCULATE** only when you are sure that the **Physical Data** is correct.*

- *(Optional)* ***BALLS*** *— (Default: 0) Enter an integer from 1 to 999.*
- *(Optional)* ***BALL DIAMETER*** *— (Default: 0) Enter a number from 1 to 9999.*
- *(Optional)* ***PITCH DIAMETER*** *— (Default: 0) Enter a number from 0.01 to 9999.*
- *(Optional)* ***ANGLE*** *— (Default: 0) Enter a number from 0.01 to 90.*
- *(Optional)* ***UNITS*** *— (Default: Degree) Choose between* ***Degree*** *and* ***Radian*** *units for measuring the angle.*

3.3.2 Portable Parameter Set Library

The **Portable Parameter Set Library** has two types of **Portable Parameter Sets**:

1. **Vibration Analysis Parameter Set** — See: Add or Edit a Vibration Analysis Parameter Set
2. **PeakVue Analysis Parameter Set** — See: Add or Edit a PeakVue Analysis Parameter Set

Note

Analysis Parameter Sets configured in versions of AMS Machine Works before v2.3 are duplicated for every **Location** that they were used in when updating to AMS Machine Works v2.3.

Unused **Analysis Parameter Sets** from versions of AMS Machine Works before v2.3 are deleted when updating to AMS Machine Works v2.3.

Figure 3-7: Portable Parameter Set Library Interface



A. ***Site Filter*** *field — Enter text to find the* ***Location*** *where set is used.*
B. ***Add Vibration AP Set*** *button — See: Add or Edit a Vibration Analysis Parameter Set*
C. ***Add PeakVue AP Set*** *button — See: Add or Edit a PeakVue Analysis Parameter Set*
D. ***Clear Filter*** *button — Click the* ***Clear Filter*** *button to see the full list of sets.*
E. ***Name*** *— The name is set when you create or edit the set.*
F. ***Location*** *— The* ***Location*** *is the only* ***Site*** *where each set can be used.*
G. ***Set Type*** *— This is either* ***Vibration*** *or* ***PeakVue****.*
H. ***Sensor Type*** *— Four sensor types can be configured.*
   - ***Acceleration*** *— **PeakVue AP Sets** always use **Acceleration** sensors.*
   - ***Velocity***
   - ***Displacement***
   - ***General Dynamic***

I. ***Used In*** *— If a green tick mark is in this column, the set is* ***In Use*** *and cannot be edited or deleted.*

> ***Note***
> *Only the name of the set can be edited.*

J. ***Last Edited*** *— This is either the creation date, or the date of the last edit.*
K. ***Vertical Ellipsis Menu*** *— This menu contains controls to:*
   - ***Add Alert Set*** *— Add an* ***Alert Set*** *based on this* ***Parameter Set****. See: Add or Edit a Portable Alert Set*
   - ***Edit*** *— Depending on the* ***Set Type*** *this opens the current set for editing.*
     See:
     — *Add or Edit a Vibration Analysis Parameter Set*
     — *Add or Edit a PeakVue Analysis Parameter Set*
   - ***Delete*** *— See: Delete an Analysis Parameter Set*

Add or Edit a Vibration Analysis Parameter Set

Follow these instructions to define a **Vibration Analysis Parameter Set**.

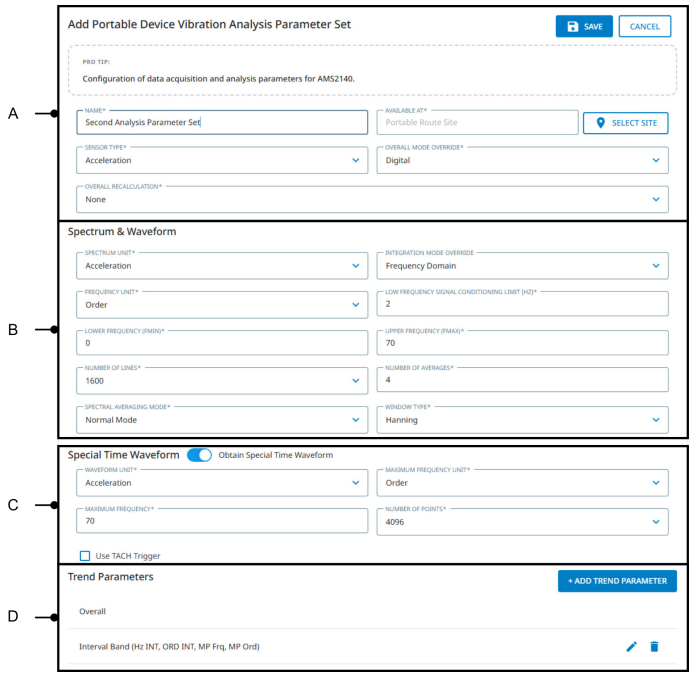
To define a **PeakVue Analysis Parameter Set** see: Add or Edit a PeakVue Analysis Parameter Set

Prerequisites

1. To Add a **Vibration Analysis Parameter Set** select: **Design Studio → Libraries → Portable Parameter Sets → Add Vibration AP Set**
2. To Edit a **Vibration Analysis Parameter Set** select: **Design Studio → Libraries → Portable Parameter Sets → Vertical ellipsis menu of the Set → Edit**

> **Note**
> A **Vibration Analysis Parameter Set** can only be edited if it is not **In Use**. See: Remove Set from Components

Figure 3-8: Add Portable Device Vibration Analysis Parameter Set Interface



A. ***General Information Section*** — *The selection in the **Sensor Type** field in this section controls the availability and values of certain fields in the **Spectrum and Waveform Section** and in the **Special Time Waveform Section**.*
B. ***Spectrum & Waveform Section*** — *The **Integration Mode Override** field in this section is not available when the **Sensor type** is set to **General Dynamic**.*
C. ***Special Time Waveform Section*** — *This section is optional.*
D. ***Trend Parameters Section*** — *This section is optional.*

Procedure

General Information Section

1. (Required) Set the **Name** of the **Vibration Analysis Parameter Set**
2. (Required) Click the **Select Site** button to set the **Site** where this set can be used.

   Note
   Once a **Site** is configured it cannot be edited.

   Note
   Analysis Parameter Sets configured in versions of AMS Machine Works before v2.3 are duplicated for every **Site** that they were used in when updating to AMS Machine Works v2.3.

   Unused **Analysis Parameter Sets** from versions of AMS Machine Works before v2.3 are deleted when updating to AMS Machine Works v2.3.

3. (Required) Select the **Sensor Type** of the **Vibration Analysis Parameter Set**
   - **Acceleration** (Default)
   - **Velocity**
   - **Displacement**
   - **General Dynamic**

   Note
   The selection in the **Sensor Type** field controls the availability and values of certain fields in the **Spectrum and Waveform Section** and in the **Special Time Waveform Section**.

4. (Required) Select the **Overall Mode Override** of the **Vibration Analysis Parameter Set**
   - **Digital** (Default)
   - **Analog**
   - **True Peak**
   - **Average Peak**
5. (Required) Select the **Overall Mode Recalculation** of the **Vibration Analysis Parameter Set**
   - **None** (Default)
   - **RMS**
   - **Peak**
   - **Peak-Peak**

Spectrum & Waveform Section

6. (Required) Select the **Spectrum Unit** from the dropdown menu.
   - **Acceleration** — This unit is only available when the **Sensor Type** is set to **Acceleration**.

- **Velocity** — This unit is only available when the **Sensor Type** is set to either **Acceleration** or **Velocity**.
- **Displacement** — This unit is only available when the **Sensor Type** is set to **Acceleration**, **Displacement**. or **Velocity**.
- **Arbitrary Unit** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.
- **Strain** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.
- **Pressure** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.
- **Voltage** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.
- **Flux** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.
- **Current** — This unit is only available when the **Sensor Type** is set to **General Dynamic**.

7. (Optional) Choose the **Integration Mode Override** of the **Vibration Analysis Parameter Set** from the dropdown menu:
   - **Frequency Domain** (Default)
   - **Time Domain**

   Note
   This setting is not available when the **Sensor Type** is set to **General Dynamic**.

8. (Required) Choose the **Frequency Unit** of the **Vibration Analysis Parameter Set** from the dropdown menu:
   - **Order** (Default)
   - **Hz**
9. (Required) Set the **Low Frequency Signal Conditioning Limit (Hz)** of the **Vibration Analysis Parameter Set**. From 0 to 1000.
10. (Required) Set the **Lower Frequency (FMIN)** of the **Vibration Analysis Parameter Set**. From 0 to (FMAX - 1).
11. (Required) Set the **Upper Frequency (FMAX)** of the **Vibration Analysis Parameter Set**. From (FMIN + 1) to 80000.
12. (Required) Select the **Number of Lines** from the dropdown menu.
    - 400
    - 800
    - 1600 (Default)
    - 3200
    - 6400

- 12800

13. (Required) (Default: 4) Set the **Number of Averages** of the **Vibration Analysis Parameter Set**. From 1 to 5000.
14. (Required) Choose the **Spectral Averaging Mode** of the **Vibration Analysis Parameter Set** from the dropdown menu:
    - **Normal Mode** (Default)
    - **Peak Hold**
    - **Synchronous Time**
    - **Order Tracking**
    - **Tach Trigger**
15. (Required) Choose the **Window Type** of the **Vibration Analysis Parameter Set** from the dropdown menu:
    - **Hanning** (Default)
    - **Uniform**

Special Time Waveform Section

16. (Required)(Default: **Off**) Set the **Obtain Special Time Waveform** toggle to the **On** position to show the fields and controls of the **Special Time Waveform Section**.

    Attention
    Changing the **Obtain Special Time Waveform** toggle in either direction removes every **Trend Parameter** definition.

17. (Required) Select the **Waveform Unit** from the dropdown menu.
    - **Acceleration** — Only available when the **Sensor Type** is set to **Acceleration**.
    - **Velocity** — Only available when the **Sensor Type** is set to either **Acceleration** or **Velocity**.
    - **Displacement** — Only available when the **Sensor Type** is set to **Acceleration**, **Displacement**. or **Velocity**.
18. (Required) Select the **Maximum Frequency Unit** from the dropdown menu.
    - **Order**
    - **Hz**
19. (Required) Set the **Maximum Frequency**. (Default: The initial value of **FMAX**.) From 1 to 80000.
20. (Required) Select the **Number of Points** from the dropdown menu.
    - 1024
    - 2048
    - 4096 (Default)
    - 8192

- 16384
- 32768

21. (Optional) (Default: **Unchecked**) Check the **Use TACH Trigger** checkbox.

Trend Parameters Section

22. (Optional) Choose which action to perform:
    - (Option 1) Click the **Add Trend Parameter** button to create a new **Trend Parameter**. See: Add or Edit a Trend Parameter
    - (Option 2) Click the **Edit Trend Parameter** pen icon to edit an existing **Trend Parameter**. See: Add or Edit a Trend Parameter
    - (Option 3) Click the **Delete Trend Parameter** trash icon to remove an existing **Trend Parameter**.
23. Click **Save** to record your changes.

Postrequisites

Now that you have a **Vibration Analysis Parameter Set** defined, you can define a related **Portable Alert Set**. See: Add or Edit a Portable Alert Set

Add or Edit a PeakVue Analysis Parameter Set

Follow these instructions to define a **PeakVue Analysis Parameter Set**.

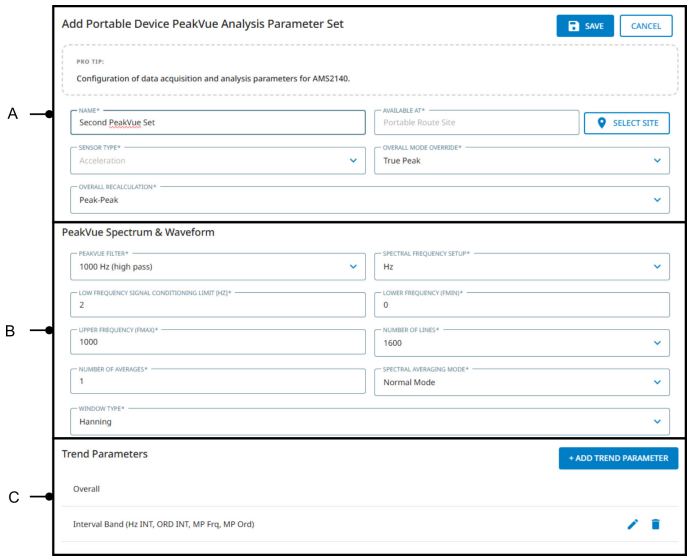
To define a **Vibration Analysis Parameter Set** see: Add or Edit a Vibration Analysis Parameter Set

Prerequisites

1. To Add a **PeakVue Analysis Parameter Set** select: **Design Studio** → **Libraries** → **Portable Parameter Sets** → **Add PeakVue AP Set**
2. To Edit a **PeakVue Analysis Parameter Set** select: **Design Studio** → **Libraries** → **Portable Parameter Sets** → **Vertical ellipsis menu of the Set** → **Edit**

> **Note**
> A **PeakVue Analysis Parameter Set** can only be edited if it is not **In Use**. See: Remove Set from Components

Figure 3-9: Add Portable Device PeakVue Analysis Parameter Set Interface



A. ***General Information Section*** — *The selection in the* ***Sensor Type*** *field in this section controls the availability and values of certain fields in the* ***Spectrum and Waveform Section*** *and in the* ***Special Time Waveform Section****.*
B. ***Spectrum & Waveform Section***
C. ***Trend Parameters Section*** — *This section is optional.*

Procedure

General Information Section

1. (Required) Set the **Name** of the **PeakVue Analysis Parameter Set**
2. (Required) Click the **Select Site** button to set the **Site** where this set can be used.

   Note
   Once a **Site** is configured it cannot be edited.

   Note
   Analysis Parameter Sets configured in versions of AMS Machine Works before v2.3 are duplicated for every **Site** that they were used in when updating to AMS Machine Works v2.3.

   Unused **Analysis Parameter Sets** from versions of AMS Machine Works before v2.3 are deleted when updating to AMS Machine Works v2.3.

3. (Required)(Unconfigurable) the **Sensor Type** of the **PeakVue Analysis Parameter Set** is always **Acceleration**.
4. (Required) Select the **Overall Mode Override** of the **PeakVue Analysis Parameter Set**:
   - **Digital**
   - **Analog**

- **True Peak** (Default)
- **Average Peak**

Note
The selection of the **Overall Mode Override** changes the default behavior of the **Overall Recalculation** when the **Overall Recalculation** is set to **None.**

5. (Required) Select the **Overall Recalculation** to set a preferred display mode for the **PeakVue Analysis Parameter Set**regardless of how the overall measurement is acquired.
   - **None** — No recalculation, the amplitude mode is derived from the **Overall Mode Override** type.

     Note
     — **RMS** is the default for **Digital** and **Analog** measurements.
     — **Peak** is the default for **True Peak** and **Average Peak** measurements.

   - **RMS** — The overall measurement is always converted to the RMS amplitude mode.
   - **Peak** — The overall measurement is always converted to the Peak amplitude mode.
   - **Peak-Peak** (Default) — The overall measurement is always converted to the Peak-Peak amplitude mode.

Spectrum & Waveform Section

6. (Required) Choose the **PeakVue Filter** of the **PeakVue Analysis Parameter Set** from the dropdown menu:
   - **500 Hz (high pass)**
   - **1000 Hz (high pass)** (Default)
   - **2000 Hz (high pass)**
   - **5000 Hz (high pass)**
   - **10000 Hz (high pass)**
   - **20000 Hz (high pass)**
   - **20-150 Hz (band-pass)**
   - **50-300 Hz (band-pass)**
   - **100-600 Hz (band-pass)**
   - **500-1000 Hz (band-pass)**
   - **5000-6500 Hz (band-pass)**
7. (Required) Choose the **Spectral Frequency Setup** of the **PeakVue Analysis Parameter Set** from the dropdown menu:
   - (default) **Hz**

- **Order**

8. (Required) Set the **Low Frequency Signal Conditioning Limit (Hz)** of the **PeakVue Analysis Parameter Set**. From 0 to 1000.
9. (Required) Set the **Lower Frequency (FMIN)** of the **PeakVue Analysis Parameter Set**. From 0 to (FMAX - 1).
10. (Required) Set the **Upper Frequency (FMAX)** of the **PeakVue Analysis Parameter Set**. From (FMIN + 1) to 80000.
11. (Required) Select the **Number of Lines** from the dropdown menu.
    - 400
    - 800
    - 1600 (Default)
    - 3200
    - 6400
    - 12800
12. (Required) (Default: 1) Set the **Number of Averages** of the **PeakVue Analysis Parameter Set**. From 1 to 5000.
13. (Required) Choose the **Spectral Averaging Mode** of the **PeakVue Analysis Parameter Set** from the dropdown menu:
    - **Normal Mode** (Default)
    - **Peak Hold**
    - **Synchronous Time**
    - **Order Tracking**
    - **Tach Trigger**
14. (Required) Choose the **Window Type** of the **PeakVue Analysis Parameter Set** from the dropdown menu:
    - **Hanning** (Default)
    - **Uniform**

Trend Parameters Section

15. (Optional) Choose which action to perform:
    - (Option 1) Click the **Add Trend Parameter** button to create a new **Trend Parameter**. See: Add or Edit a Trend Parameter
    - (Option 2) Click the **Edit Trend Parameter** pen icon to edit an existing **Trend Parameter**. See: Add or Edit a Trend Parameter
    - (Option 3) Click the **Delete Trend Parameter** trash icon to remove an existing **Trend Parameter**.
16. Click **Save** to record your changes.

Postrequisites

Now that you have a **PeakVue Analysis Parameter Set** defined, you can define a related **Portable Alert Set**. See: Add or Edit a Portable Alert Set

Add or Edit a Trend Parameter

The **Trend Parameter** side panel enables you to set a **Parameter**, and then configure the fields associated with that **Trend Parameter**.

The **Parameters** are:

1. **Interval Band (Hz INT, ORD INT, MP Frq, MP Ord)**
2. **Synchronous Peak (NxRPM-A)** — Not available for **PeakVue Trend Parameters**.
3. **Synchronous Phase (NxRPM-P)** — Not available for **PeakVue Trend Parameters**.
4. **DC Measurement (DC-MEAS))** — Not available for **PeakVue Trend Parameters**.
5. **DC Voltage (DC-GAP))** — Not available for **PeakVue Trend Parameters**.
6. **Waveform 0-Pk (MP Wave)**
7. **Waveform Pk-Pk (P-P Wave)**
8. **Waveform Crest Factor**
9. **HFD** — Not available for **PeakVue Trend Parameters**, or for **Vibration Analysis Parameter Sets** when the **Sensor Type** is set to either **Velocity** or **Displacement**.
10. **Variable HFD (Hz vHFD)** — Not available for **PeakVue Trend Parameters**, or for **Vibration Analysis Parameter Sets** when the **Sensor Type** is set to either **Velocity** or **Displacement**.

Note
Only one **Trend Parameter** can exist for each **Parameter**.

Prerequisites

In AMS Machine Works select: **Design Studio → Navigator → Library Tab → Portable Parameter Sets → (Either an Add or Edit Parameter Set Task) → (Any Add or Edit a Trend Parameter)**

See either:

1. Add or Edit a Vibration Analysis Parameter Set
2. Add or Edit a PeakVue Analysis Parameter Set

Procedure

Choose the **Parameter**:

- **Interval Band (Hz INT, ORD INT, MP Frq, MP Ord)**
    a. Choose the **Type**:
        1. **Energy** (Default)
        2. **Max Peak**

b. Choose the **Amplitude Unit**:
   1. **Acceleration**
   2. **Velocity**
   3. **Displacement**

c. Choose the **Amplitude Mode**:
   1. **RMS**
   2. **Peak**
   3. **Peak-Peak**

d. Set the **Frequency Unit**: (Default: **Order**) Either **Order** or **Hz**.

e. Set the **Lower Frequency (FMIN)**: (Default: 0) From 0 to <**FMAX**.

f. Set the **Upper Frequency (FMIN)**: (Default: 1) From >**FMIN** to 80 000.

- **Synchronous Peak (NxRPM-A)**
  a. Choose the **Amplitude Unit**:
     1. **Acceleration**
     2. **Velocity**
     3. **Displacement**

  b. Choose the **Amplitude Mode**:
     1. **RMS**
     2. **Peak**
     3. **Peak-Peak**

  c. Set the **Order**: (Default: 1) From 1 to 9.

  d. Set the **Number of Revolutions**: (Default:10) From 2 to 50.

- **Synchronous Phase (NxRPM-P)**
  a. Choose the **Amplitude Unit**:
     1. **Acceleration**
     2. **Velocity**
     3. **Displacement**

  b. Set the **Order**: (Default: 1) From 1 to 9.

  c. Set the **Number of Revolutions**: (Default:10) From 2 to 50.

- **DC Measurement (DC-MEAS))**
  a. Nothing to configure.

- **DC Voltage (DC-GAP))**
  a. Nothing to configure.

- **Waveform 0-Pk (MP Wave)**
  a. Nothing to configure.
- **Waveform Pk-Pk (P-P Wave)**
  a. Nothing to configure.
- **Waveform Crest Factor**
  a. Nothing to configure.
- **HFD**
  a. Choose the **Amplitude Mode**:
     1. **RMS**
     2. **Peak**
     3. **Peak-Peak**
- **Variable HFD (Hz vHFD)**
  a. Choose the **Amplitude Mode**:
     1. **RMS**
     2. **Peak**
     3. **Peak-Peak**
  b. Set the **Lower Frequency (FMIN)**: (Default: 0) From 0 to (**FMAX** - 1)
  c. Set the **Upper Frequency (FMAX)**: (Default: (**FMIN** + 1) From (**FMIN** + 1) to 800000.

Remove Set from Components

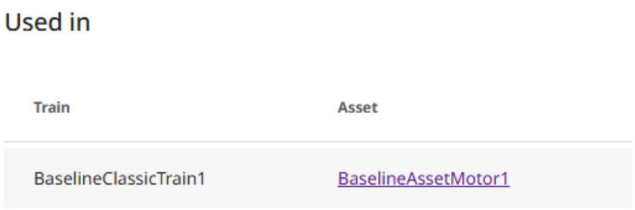
When either **Portable Parameter Set** or **Portable Alert Set** is **In Use** by any **Component**, it cannot be edited or deleted.

To **Edit** or **Delete** either **Portable Parameter Set** or **Portable Alert Set** you must first remove it from use in every **Component**.

Prerequisites

1. The **Used In** flag must be present for a set in either the **Portable Parameter Set Library** or the **Portable Alert Set Library**.
2. Click on the set to open it.
3. The **Used In List** opens.

Figure 3-10: Used In List



A. ***Machine Train*** *— The name of* ***Machine Train*** *which contains the* ***Component****.*
B. ***Component*** *— The* ***Component*** *which uses the set.*

Procedure

1. Click on a link in the list to open the **Portable Device Configuration** step, and then complete the Remove Portable Parameters and Alerts task.
2. Repeat Step 1 for each link in the list.

Delete an Analysis Parameter Set

To delete a **Vibration Analysis Parameter Set**, or an **PeakVue Analysis Parameter Set**, it cannot be **In Use**. See: Portable Parameter Set Library

Prerequisites

1. The **Analysis Parameter Set** must not be **In Use**. See: Remove Set from Components

Procedure

1. For the set you want to delete select: **Ellipsis Menu** → **Delete**
2. In the dialog popup:
   - Click **Confirm** to delete.
   - Click **Cancel** to exit without making any changes.

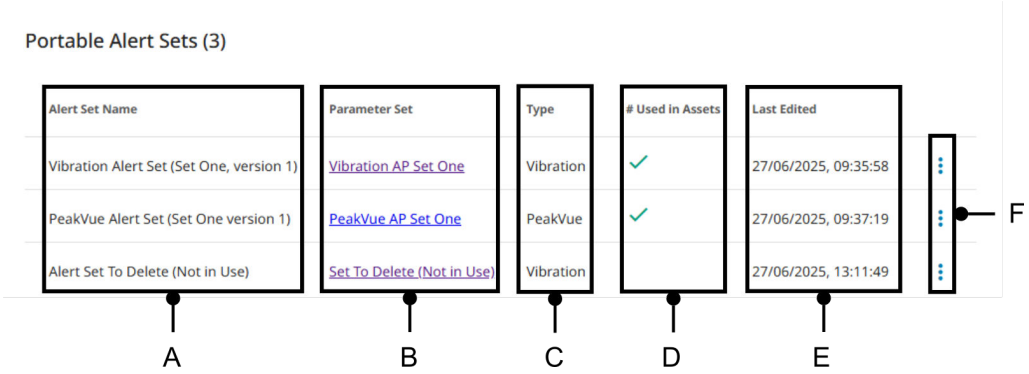
3.3.3 Portable Alert Set Library

Every **Portable Alert Set** is defined on the basis of a **Portable Parameter Set**. See: Portable Parameter Set Library

The **Portable Alert Set Library** has two types of **Portable Alert Sets**:

1. **Vibration Alert Set**
2. **PeakVue Alert Set**

Figure 3-11: Portable Alert Set Library Interface



A. ***Alert Set Name*** *— The default name is the Parameter Set Type and the time it was created. The user can choose a different name.*
B. ***Parameter Set*** *— A link to the* ***Parameter Set*** *that this* ***Alert Set*** *is based on. Click the link to open the* ***Parameter Set*** *for viewing or editing.*
C. ***Set Type*** *— This is either* ***Vibration*** *or* ***PeakVue****.*
D. ***Used In*** *— If a green tick mark is in this column, the set is* ***In Use*** *and cannot be edited or deleted.*
E. ***Last Edited*** *— This is either the creation date, or the date of the last edit.*
F. ***Vertical Ellipsis Menu*** *— This menu contains controls to:*
   - ***Edit*** *— This opens the current set for editing. See: Add or Edit a Portable Alert Set*
   - ***Delete*** *— Click* ***Delete*** *to delete the set. See: Delete a Portable Alert Set*

Add or Edit a Portable Alert Set

There are two types of **Portable Alert Sets**:

1. **Portable Vibration Alert Sets**
2. **Portable PeakVue Alert Sets**

Every **Portable Alert Set** is defined on the basis of a **Portable Parameter Set**. See: Portable Parameter Set Library

The steps for creating or editing both types of **Portable Alert Set** are the same. The interface elements for beginning each process are in different places.

Prerequisites

To **create** a **Portable Alert Set**:

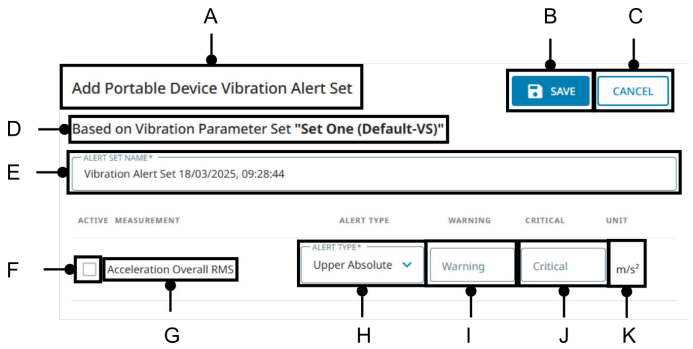
1. Select: **Design Studio** → **Libraries** → **Portable Parameter Sets**
2. Choose a **Portable Parameter Set**
3. Select: **Vertical ellipsis menu of the Portable Parameter Set** → **Add Alert Set**

To **edit** a **Portable Alert Set**:

Note
A **Portable Alert Set** can only be edited if it is not **In Use**. See: Remove Set from Components

1. Select: **Design Studio** → **Libraries** → **Portable Alert Sets**
2. Choose a **Portable Alert Set**
3. Select: **Vertical ellipsis menu of the Portable Alert Set** → **Edit**

Figure 3-12: Add Portable Alert Set Dialog



A. ***Dialog Title:***
   A. *For a **Portable Vibration Alert Set**, it is Add Portable Device Vibration Alert Set. (Shown here.)Portable Vibration Alert Set*
   B. *For a **Portable PeakVue Alert Set**, it is Add Portable Device PeakVue Alert Set.*

B. ***Save***

C. ***Cancel***

D. ***Associated Parameter Set*** *— The name of the **Associated Parameter Set** is given inside quotation marks, for example, **"Set One (Default-VS)"***

E. ***Alert Set Name*** *— The default name is the **Portable Alert Set** type, followed by the date and time that the **Alert Set** was created.*

F. ***Active*** *— The checkbox has three states:*
   A. *Grey — Unconfigured*
   B. *Blue — Configured*
   C. *Blue and checked — Active*

G. ***Measurement*** *— Different **Measurement Types** are available for each type of **Portable Alert Set**.*

   *There is one required default **Measurement**, and some optional **Measurements** for each type of **Portable Alert Set**.*

   *The optional **Measurements** are available when you add a **Trend Parameter** for the **Associated Parameter Set**. Add or Edit a Trend Parameter*
   A. *The associated **Vibration Parameter Set** has from 1 to 13 scalar parameters which can be used to define a **Portable Vibration Alert Set**.*
   B. *The associated **PeakVue Parameter Set** has from 1 to 13 scalar parameters which can be used to define a **Portable PeakVue Alert Set**.*

H. ***Alert Type*** *— There are two types of **Alert:***
   A. ***Upper Absolute*** *— An **Alert** where higher values are worse.*
   B. ***Lower Absolute*** *— An **Alert** where lower values are worse.*

   *For more info on **Alerts** see: AMS Machine Works Glossary*

I. ***Warning*** *— The least severe level of **Alert** in a **Portable Alert Set**.*

> ***Note***
> *The **Advice** level is not defined for a **Portable Alert Set**.*

J. ***Critical*** *— The most severe level of **Alert** in a **Portable Alert Set**.*

K. ***Unit*** *— The unit can be:* ***unitless***, ***degree***, ***V***, *or* ***m/s²***

Procedure

1. Set the **Alert Set Name**. — (Required)(Default: The **Portable Alert Set** type, followed by the date and time that the **Alert Set** was created.)
2. Choose the **Alert Type**:
   - **Upper Absolute**
   - **Lower Absolute**
3. (Optional) Set the **Warning** level:
   - With an **Upper Absolute** alert the **Warning** level must be lower than the **Critical** level.
   - With a **Lower Absolute** alert the **Warning** level must be higher than the **Critical** level.

   Note
   It is recommended best practice to set both the **Warning** level and the **Critical** level.
4. (Optional) Set the **Critical** level:
   - With an **Upper Absolute** alert the **Critical** level must be higher than the **Warning** level.
   - With a **Lower Absolute** alert the **Critical** level must be lower than the **Warning** level.

   Note
   It is recommended best practice to set both the **Warning** level and the **Critical** level.
5. Check the **Active** checkbox to mark this **Alert** for use.

   Need help?
   If the checkbox is grey, this **Alert** is not properly configured for use.
6. (Optional) Repeat Steps 2 to 5 for every available **Measurement** that you want to configure.
7. Click **Save** to record your changes.

Remove Set from Components

When either **Portable Parameter Set** or **Portable Alert Set** is **In Use** by any **Component**, it cannot be edited or deleted.

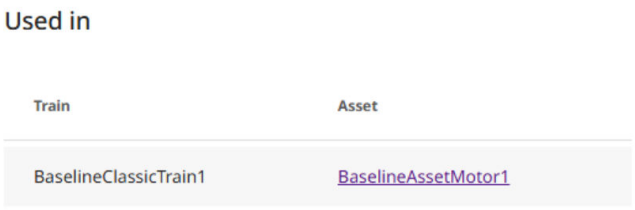
To **Edit** or **Delete** either **Portable Parameter Set** or **Portable Alert Set** you must first remove it from use in every **Component**.

Prerequisites

1. The **Used In** flag must be present for a set in either the **Portable Parameter Set Library** or the **Portable Alert Set Library**.
2. Click on the set to open it.

3. The **Used In List** opens.

Figure 3-13: Used In List



*A. **Machine Train** — The name of **Machine Train** which contains the **Component**.*
*B. **Component** — The **Component** which uses the set.*

Procedure

1. Click on a link in the list to open the **Portable Device Configuration** step, and then complete the Remove Portable Parameters and Alerts task.
2. Repeat Step 1 for each link in the list.

Delete a Portable Alert Set

To delete a **Vibration Alert Set**, or a **PeakVue Alert Set**, it cannot be **In Use**. See: Portable Alert Set Library

Prerequisites

1. The **Alert Set** must not be **In Use**. See: Remove Set from Components

Procedure

1. For the set you want to delete select: **Ellipsis Menu** → **Delete**
2. In the dialog popup:
   - Click **Confirm** to delete.
   - Click **Cancel** to exit without making any changes.

3.4 Design Studio Process

The eight step process for building a regular **Machine Train** or specialized **Roll / Pulley Section** in AMS Machine Works is outlined here.

MHM Equipment is migrated from Machinery Health Manager systems and cannot be created directly in AMS Machine Works. **MHM Equipment** is configured in a separate two step process. See: MHM Equipment Configuration Process

Step One: Build Train

This step determines if you build a regular **Machine Train** or a **Roll Section**. This step then takes you through the process of setting parameters, and then adding and configuring **Components**. For regular **Machine Trains** there is an additional task of connecting

Components. Finally, if everything is properly defined, you can proceed to other steps in the **Design Studio Process**.

See: Step One: Build Train

Step Two: Measurement Locations

Every type of **Component** in your **Machine Train** or **Roll Section** has some predefined **Measurement Locations** and one **Custom Location**.

In this step you can define a number of **Portable Point**, **Portable Triax**, **Network Point**, and **Network Triax** points for every **Measurement Location**. The **Custom Location** can only have **Network Point** and **Network Triax** points.

When you have a point defined you can proceed to the next step and map measurement devices.

See: Step Two: Measurement Locations

Step Three: Device Mappings

In the **Network Device Module** of AMS Machine Works you can connect to the **Measurement Devices** available through the **Agents** you have installed. See: Network Device Module

In the **Device Mapping** step you can associate the **Measurement Devices** available on your network to every **Network Point** and **Network Triax** that is defined.

See: Step Three: Device Mappings

Step Four: Device Parameter Alerts

The **Device Parameter Alerts** step is used to set up **Alerts** on every **Measurement** coming from the **Devices**.

See: Step Four: Device Parameter Alerts

Step Five: Transient Waveform Processing

The **Transient Waveform Processing** step is specialized to support **Machine Trains** with **measurements** from AMS 6500 ATG UM (Universal Measurement) cards. Only these cards produce **Transient Waveform** data.

See: Step Five: Transient Waveform Processing

Step Six: Analysis Parameters

In the **Analysis Parameter** step the user configures **Analysis Parameters** on **Spectrum Parameters** and **Waveform Parameters** provided by **Measurement Devices Parameters**.

See: Step Six: Analysis Parameters

Step Seven: Analysis Alerts

In the **Analysis Alerts** step the user configures **Analysis Alerts** on every **Analysis Parameter** that you selected in the **Analysis Parameters** step.

See: Step Seven: Analysis Alerts

Step Eight: Portable Device Configuration

In the **Portable Device Configuration** step the user configures every **Portable Triax Point** and **Portable Point** which was added to the **Machine Train** in the **Measurement Locations** step. Analysis parameters and alerts are configured with the help of the **Portable Parameter Sets** and **Portable Alert Sets** libraries.

See:

1. Step Eight: Portable Device Configuration
2. Portable Parameter Set Library
3. Portable Alert Set Library

3.4.1 Step One: Build Train

AMS Machine Works supports three types of **Machine Trains**.

1. A **Machine Train** model which can be defined for a wide range of purposes.
2. A **Roll / Pulley Section** model which is optimized for a specific purpose.
    a. A **Roll / Pulley Section** is only composed of **Pulley / Roll Components** and **Transfer Gear Components**.
3. **MHM Equipment** — **MHM Equipment** can only be created by a migration from Machinery Health Manager.

Prerequisites

Choose which kind of **Machine Train** you want to build:

1. (Option One) **Machine Train**, click **+ Add Machine Train**.
2. (Option Two) **Roll / Pulley Section**, click **+ Add Roll / Pulley Section**.
3. (Option Three) **MHM Equipment**, migrated the **MHM Equipment** from a Machinery Health Manager installation.

The main **Work Area** of the **Design Studio** will open in the first step of the process that you chose.

Procedure

1. (Option One) To build a **Machine Train** you must complete the following tasks:
    a) The overall parameters for the **Machine Train** must be set. See: Set Machine Train Parameters
    b) You can add up to 72 **Components**. See: Add Component
    c) Every **Component** must be connected into one **Machine Train** structure. See: Connect Components
    d) Configure each **Component**. See: Regular Machine Train Component Configuration Tasks

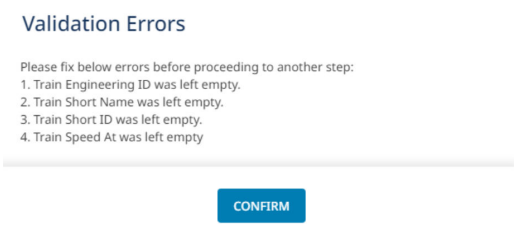
When you have completed all the tasks in this step for the **Machine Train** and every **Component** in it you can proceed to Step Two: Measurement Locations.

2. (Option Two) To build a **Roll / Pulley Section** you must complete the following tasks:
   a) The overall parameters for the **Roll / Pulley Section** must be set. See: Set Roll / Pulley Section Parameters
   b) You can add up to 72 **Components**. See: Add Component
   c) Configure each **Component**. See: Roll / Pulley Section Component Configuration Tasks

   When you have completed all the tasks in this step for the **Roll / Pulley Section** and every **Component** in it you can proceed.
3. Click **Measurement Locations** to proceed to Step Two: Measurement Locations.

Need help?

a. **Figure 3-14: Failure Message: Validation Errors**



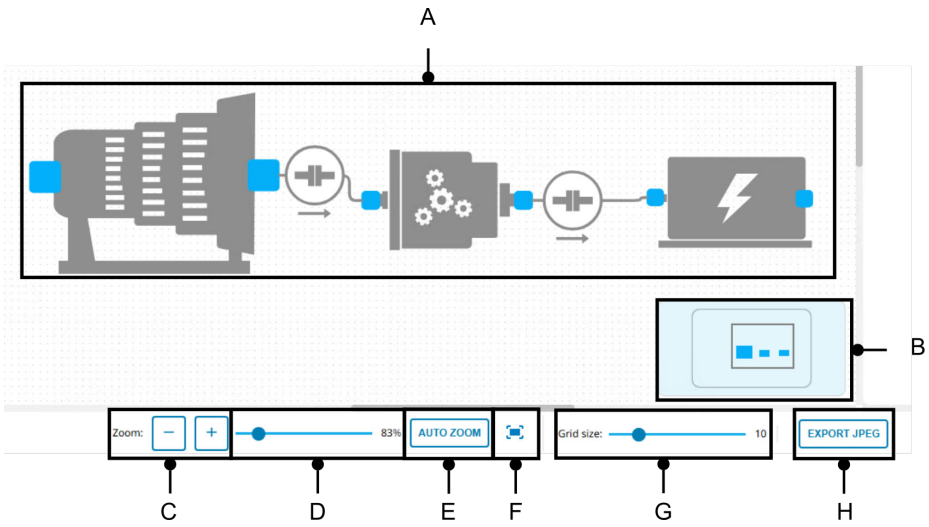
If you see an alert, double-check the configuration and correct the errors.

b. To **delete** a **Machine Train** or **Roll / Pulley Section** see: Editing and Deleting Machine Trains or Roll / Pulley Sections

Step One: Layout Controls and Keyboard Shortcuts

The **Design Studio** interface for **Step One: Build Train** supports controls and keyboard shortcuts for building and laying out **Machine Trains**,

Figure 3-15: Work Area View Controls:



A. ***Main View*** *— A view of the* ***Machine Train*** *at the current* ***Zoom*** *setting.*
B. ***Thumbnail View*** *— This view shows an overview of the entire* ***Machine Train*** *diagram. Click on the portion of the* ***Machine Train*** *you want to view.*
C. ***Zoom: - +*** *— Click* ***-*** *to zoom the view out, and* ***+*** *to zoom the view in.*
D. ***Zoom Slider*** *— Drag this slider to zoom the view in and out. (From 20% to 500%.)*
E. ***Auto Zoom*** *— Click the* ***Auto Zoom*** *button to fit all the* ***Components*** *into the view.*
F. ***Full Screen*** *— Click* ***Full Screen*** *button to maximize the* ***Work Area*** *display.*
G. ***Grid Slider*** *— Drag this slider to set the scale of the layout grid from 1 to 50.*
H. ***EXPORT JPEG*** *— Click* ***EXPORT JPEG*** *to open a view of the entire* ***Machine Train*** *which you can save by clicking* ***Download****, or cancel by clicking* ***X****.*

Figure 3-16: Mouse Controls for the Work Area:

A. ***Mouse scroll wheel*** *— Scrolls your view vertically.*
B. ***Mouse scroll wheel + shift*** *— Scrolls your view horizontally.*
C. ***Mouse scroll wheel + ctrl*** *— Zooms your view in / out.*

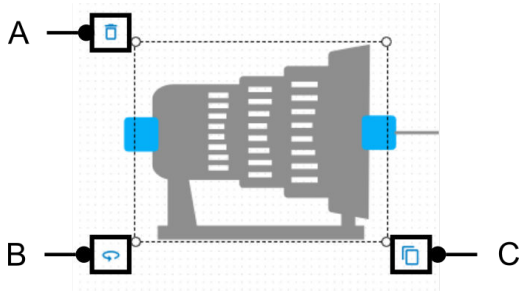
Figure 3-17: Keyboard Commands with a Single Component Selected:

A. ***Ctrl + c*** *— Copy the currently selected* ***Component****.*
B. ***Delete*** *— Delete the currently selected* ***Component****.*
C. ***Ctrl + Click*** *— Click a* ***Component*** *to add it the group of selected* ***Components****.*
D. ***Shift + Click*** *— Has two uses:*
    A. *Use to select a range of items in a list of a field from one cursor position to another.*
    B. *Functions the same as* ***Ctrl + Click*** *with* ***Components****.*

Figure 3-18: Keyboard Commands for Fields:

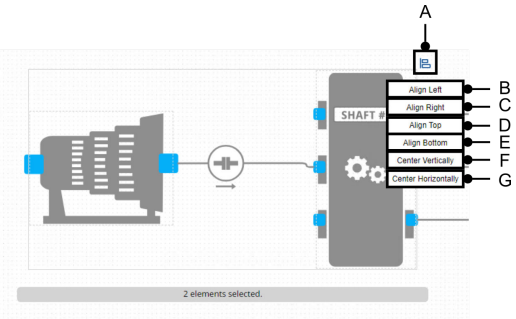
A. ***Ctrl + c*** — *Copy*
B. ***Ctrl + x*** — *Cut*
C. ***Ctrl + v*** — *Paste*
D. ***Ctrl + a*** — *Select All*
E. ***Ctrl + z*** — *Undo*
F. ***Ctrl + y*** — *Redo*
G. ***Tab*** — *Select the contents of the next field, or place cursor in the next field.*
H. ***Shift + Tab*** — *Select the contents of the previous field, or place cursor in the previous field.*

Figure 3-19: Layout Controls with a Single Item Selected:



A. ***Trash Icon*** — *Click the **Trash Icon** to delete the currently selected **Component**.*
B. ***Copy Icon*** — *Click the **Copy Icon** to create a copy of the currently selected **Component**.*
C. ***Rotate Icon*** — *Click and drag the **Rotate Icon** to rotate the component.*

Figure 3-20: Layout Controls with Multiple Items Selected:



A. ***Alignment Menu Icon*** — *Click the icon to display the alignment options.*
B. ***Align Left*** — *Aligns every* ***Component*** *with the one furthest left.*
C. ***Align Right*** — *Aligns every* ***Component*** *with the one furthest right.*
D. ***Align Top*** — *Aligns every* ***Component*** *with the one at the top.*
E. ***Align Bottom*** — *Aligns every* ***Component*** *with the one at the bottom.*
F. ***Center Vertically*** — *Aligns every* ***Component*** *with a vertical line between the right and left* ***Components****.*
G. ***Center Horizontally*** — *Aligns every* ***Component*** *with a horizontal line between the top and bottom* ***Components****.*

Common Building Process Tasks

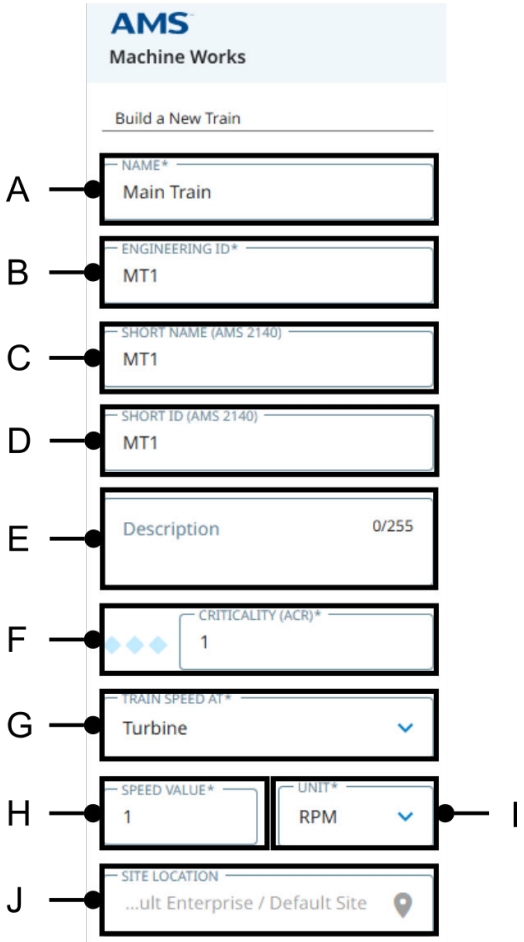
During the **Build Train** step of the **Design Studio Process**, you need to:

1. Set the overall parameters.
    a. Set Machine Train Parameters
    b. Set Roll / Pulley Section Parameters
    c. Set MHM Equipment Parameters
2. Layout, configure, and connect every **Component**.
    a. Layout every **Component**. See: Add Component
    b. Configure every **Component**.
        1. See: Regular Machine Train Component Configuration Tasks
        2. See: Roll / Pulley Section Component Configuration Tasks
    c. With a regular **Machine Train** you must connect every **Component**. See: Connect Components
    d. With a regular **Machine Train** you must configure every **Coupling** which is different than an **In-Line Direct Coupling** with a 1:1 ratio.
    See: Configure a Coupling

Set Machine Train Parameters

In **Step One** of the **Design Studio Process**, the **Navigator** has fields and settings which affect the whole **Machine Train**.

Figure 3-21: Machine Train Parameters



A. ***Name*** *— (Required) The initial value is the date and time when the* ***Machine Train*** *was created or copied.*
B. ***Engineering ID*** *— (Required)*
C. ***Short Name (AMS 2140)*** *— (Optional)*
D. ***Short ID (AMS 2140)*** *— (Optional)*
E. ***Description*** *— (Optional)*
F. ***Criticality*** *— (Required)*
G. ***Train speed at*** *— (Required) Sets the source of the measured* ***running speed*** *to be used with SpeedAI functionality.*
H. ***Speed Value*** *— (Required) Sets the* ***nominal speed*** *for the* ***Machine Train****.*
I. ***Unit*** *— (Required)*
J. ***Site Location*** *— You can edit the* ***Site Location*** *in the hierarchy. See: Sort Elements in the Hierarchy*

Prerequisites

Procedure

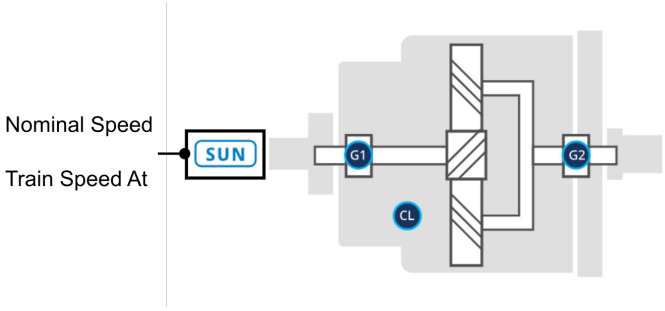
1. (Required) Enter a **Name**. The initial value is the date and time when the **Machine Train** was created. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)
2. (Required) Enter a unique ID for the **Engineering ID**. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)

   Attention
   Ensure that you set a unique Engineering ID. A repeated Engineering ID can cause measurement points from different machine trains on an AMS 2140 route to be grouped together.

3. (Optional) Enter a **Short Name (AMS 2140)**. (From 1 to 28 characters, this field accepts alphabetical, numerical, and special characters.)
4. (Optional) Enter an ID for the **Short ID (AMS 2140)**. (From 1 to 10 characters, this field accepts alphabetical, numerical, and special characters.)
5. (Optional) Enter a **Description**. (From 1 to 255 characters, this field accepts alphabetical, numerical, and special characters.)
6. (Required) Set the **Criticality** of this **Machine Train**. (Default: **1**) (Lowest criticality = **1**, to the highest criticality = **100**)
7. (Required) **Train speed at** — Choose an **Asset** from this dropdown list to use as the speed reference for the **Machine Train**.

Note
For SpeedAI to function, the **Asset** selected as the **Train speed at** location must have a speed measurement mapped to the shaft indicated on the **Asset** diagram as the **Nominal Speed** source.

Figure 3-22: Nominal Speed / Train Speed At



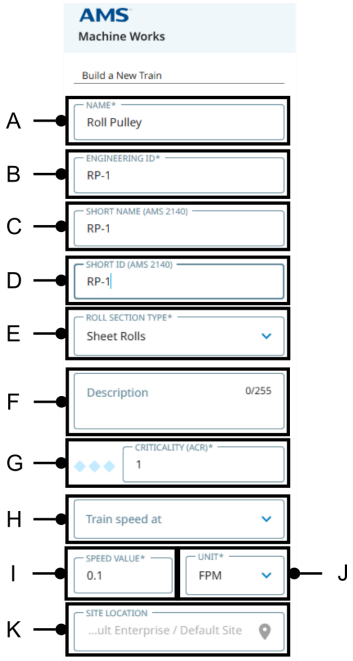
- **Nominal Speed / Train Speed At** — This shaft is used for:
  A. *Determining the **Nominal Speed** of the **Asset**.*
  B. *(Optional) Receiving a **speed measurement** when this **Asset** is configured as the **Train Speed At** source.*

8. (Required) Choose the **Unit** for this **Machine Train**. (Default: **RPM**) There is only one choice in this dropdown menu.
9. Edit the **Site Location** in the hierarchy. See: Sort Elements in the Hierarchy

Set Roll / Pulley Section Parameters

In **Step One** of the **Design Studio Process**, the **Navigator** has fields and settings which affect the whole **Roll / Pulley Section**.

Figure 3-23: Roll / Pulley Section Parameters



A. ***Name*** *— (Required) The initial value is the date and time when the* ***Roll / Pulley Section*** *was created or copied.*
B. ***Engineering ID*** *— (Required)*
C. ***Short Name (AMS 2140)*** *— (Optional)*
D. ***Short ID (AMS 2140)*** *— (Optional)*
E. ***Roll Section Type*** *— (Required)*
F. ***Description*** *— (Optional)*
G. ***Criticality*** *— (Required)*
H. ***Train speed at*** *— (Optional) Sets the source of the measured* ***running speed*** *to be used with SpeedAI functionality.*
I. ***Speed Value*** *— (Required) Sets the* ***nominal speed*** *for the* ***Roll / Pulley Section****.*
J. ***Unit*** *— (Required)* ***FPM*** */* ***MPM***
K. ***Site Location*** *— You can edit the* ***Site Location*** *in the hierarchy. See: Sort Elements in the Hierarchy*

Prerequisites

Procedure

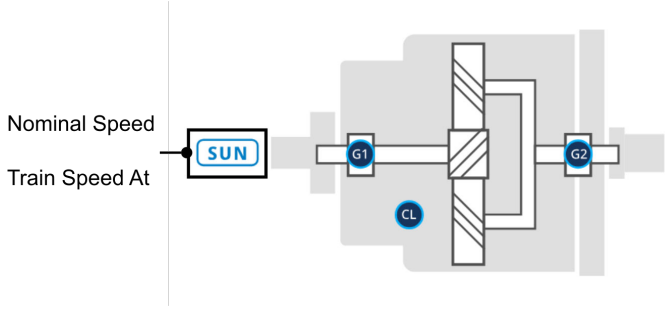
1. (Required) Enter a **Name**. The initial value is the date and time when the **Roll / Pulley Section** was created. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)
2. (Required) Enter a unique ID for the **Engineering ID**. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)

   Attention
   Ensure that you set a unique Engineering ID. A repeated Engineering ID can cause measurement points from different machine trains on an AMS 2140 route to be grouped together.

3. (Optional) Enter a **Short Name (AMS 2140)**. (From 1 to 28 characters, this field accepts alphabetical, numerical, and special characters.)
4. (Optional) Enter an ID for the **Short ID (AMS 2140)**. (From 1 to 10 characters, this field accepts alphabetical, numerical, and special characters.)
5. (Required) Choose the **Roll Section Type**. (Default: **Sheet Rolls**) There are four choices:
   - **Conveyor / Pulleys**
   - **Sheet Rolls**
   - **Milling Rolls**
   - **Other**
6. (Optional) Enter a **Description**. (From 1 to 255 characters, this field accepts alphabetical, numerical, and special characters.)
7. (Required) Set the **Criticality** of this **Roll / Pulley Section**. (Default: **1**) (Lowest criticality = **1**, to the highest criticality = **100**)
8. (Optional) Select an **Asset** from the **Train speed at** dropdown menu to configure the measured **running speed** for the **Roll / Pulley Section**.

   Note
   For SpeedAI to function, the **Asset** selected as the **Train speed at** location must have a speed measurement mapped to the shaft indicated on the **Asset** diagram as the **Nominal Speed** source.

Figure 3-24: Nominal Speed / Train Speed At



- **Nominal Speed / Train Speed At** — This shaft is used for:
  A. *Determining the **Nominal Speed** of the **Asset**.*
  B. *(Optional) Receiving a **speed measurement** when this **Asset** is configured as the **Train Speed At** source.*

9. (Required) Set the **nominal speed** of the **Roll / Pulley Section** in the **Speed Value** field. — (Default: 0.1)
10. (Required) Choose the **Unit** for this **Roll /Pulley Section**:
    - (Default) **FPM**
    - **MPM**
11. Edit the **Site Location** in the hierarchy. See: Sort Elements in the Hierarchy

Add Component

In **Step One** of the **Design Studio Process** in the **Design Studio** module you can add a **Component** to a **Machine Train** by dragging it from the **Components Selection** and dropping it into the main **Work Area**.

Prerequisites

Open a **Machine Train** in the **Design Studio**:

1. Create a new **Machine Train**. See: Step One: Build Train
2. Select a **Machine Train** for editing. See: Figure 3-2

Procedure

1. Find the **Component** you want to add in the **Component Selector**.
2. Drag the **Component** from the **Component Selector** and drop it into the **Layout** area.
   The **Component** has been created, and you can now configure it. Every **Component** has additional information which can be configured. See:
   - Regular Machine Train Component Configuration Tasks
   - Roll / Pulley Section Component Configuration Tasks

Postrequisites

See:

- Remove Component
- Connect Components

Remove Component

Removing a **Component** also removes all of the configuration associated with that **Component**, and can cause your **Machine Train** to have an invalid configuration.

The following types of configuration information are lost:

1. Alarms
2. Cases
3. Connections
4. Device Mappings
5. Measurement Points
6. Parameters
7. Train speed at (Only one **Component** per **Machine Train** can have this configuration.)

Prerequisites

In the **Design Studio**, have a **Machine Train** open in the **Build Train** step.

Procedure

1. Select the **Component** to remove.
2. Click the **Trash** icon.
3. Confirmation dialog:
   - **Confirm** — (Default) Every type of configuration associated with the **Component** is lost when you remove it.
   - **Cancel** — Exit without making any changes.

Connect Components

A regular **Machine Train** must have all of its **Components** connected to define the relationships between all the **Components**.

Note
A **Roll / Pulley Section** is a specialized **Machine Train** which does not need to have the connections between **Components** defined. See: Roll / Pulley Section Component Configuration Tasks

Note
Any **Machine Train** with just a single **Component** does not need any **Coupling**.

Prerequisites

You must have at least two **Components** added to your **Machine Train**. See: Add Component

Procedure

1. In the **Machine Train** diagram, click on the blue dot on a **Component** which is the source of power, and drag it towards a green dot on another **Component**.

   The two **Components** are connected with a default **In-Line Coupling** that has a 1:1 ratio. The arrow above the **Coupling Icon** indicates the direction that power is traveling through the **Coupling**, from source to load.

   Need help?
   To delete a **Coupling**, select the **Coupling** → **Trash** → **Confirm**.

2. Continue connecting **Components** until they are all connected in the same way as in your actual physical installation.
3. Configure each **Coupling** that is different than the standard **In-Line Coupling** with a 1:1 ratio. See: Configure a Coupling
4. Once every **Component** has been added and connected, and every **Coupling** has been configured, you can proceed to Step Two: Measurement Locations.

Component Configuration Tasks

Every type of **Component** in AMS Machine Works has an individualized **General** information section, and may have other information sections. See: Regular Machine Train Component Configuration Tasks

Each **Component** has specific instructions for filling in its **General** information section, and references to the other Common Configuration Tasks that can be used with that type of **Component**.

Regular Machine Train Component Configuration Tasks

The types of **Components** available for building a **Regular Machine Train** are:

1. Coupling Components
   a. Configure a Coupling
2. Driver Components
   a. Motor Configuration
   b. Turbine Configuration
   c. Engine Configuration
3. Intermediate Component
   a. Configure a Gearbox
4. Driven Components
   a. Fans

1. Fan Configuration

b. Pumps
    1. Pump Configuration

c. Compressors

d. Other Driven Components
    1. Configure Other Driven Components

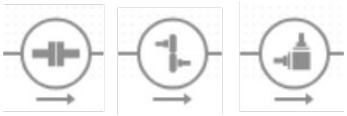
Coupling Components

Coupling Components are added automatically whenever you connect two **Components**. See: Connect Components

Configure a Coupling

Every **Coupling** is initially created as an **In-Line** coupling with a **Direct** connection, and a **Speed Ratio** of 1:1.

Figure 3-25: Coupling Types



There are three kinds of **Coupling** to choose from:

A. ***In-Line*** *— By default this has a* ***Connection Types*** *of:* ***Direct****.*
B. ***Parallel*** *— By default this has a* ***Connection Types*** *of:* ***Belt****.*
C. ***Angular*** *— By default this has a* ***Connection Types*** *of:* ***Gear****.*

Any kind of **Coupling** can use any of the nine **Connection Types**:

- **Belt** — Supports the definition of a **Speed Ratio**, or **Sheave** definitions.
- **Chain** — Supports the definition of a **Speed Ratio**, or **Sprocket** definitions.
- **Direct** — A **Direct** connection is always defined as 1:1.
- **Flexible** — Supports the definition of a **Flexible Type**.
- **Fluid/Magnetic** — Supports the definition of a **Speed Ratio**.
- **Gear** — Supports the definition of a **Speed Ratio**, or **Gear** definitions.
- **Integral** — Has no special features.
- **Sheet/Web Drive** — Has no special features.
- **Spline** — Has no special features.

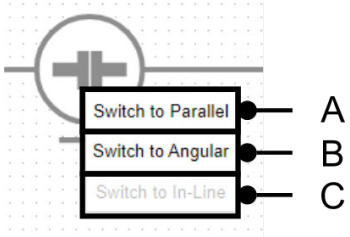
Prerequisites

To create a **Coupling**, you must Connect Components.

Procedure

1. Right click on the **Coupling** to choose the kind of **Coupling**:

Figure 3-26: Choosing the Kind of Coupling

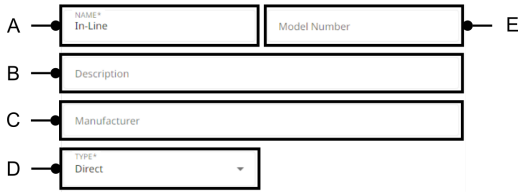


- Switch to **Parallel** — Selecting a **Parallel Coupling** changes the **Coupling Type** to **Belt**.
- Switch to **Angular** — Selecting an **Angular Coupling** changes the **Coupling Type** to **Gear**.
- Switch to **In-Line** (Default) — Currently selected. Selecting an **In-Line Coupling** changes the **Coupling Type** to **Direct**.

2. Double-click on the **Coupling** to open the **Coupling Configuration Side Panel**.

   The **Coupling Configuration Side Panel** opens with the five standard fields for every **Type** of **Coupling**, and additional fields for some **Types** of **Coupling**.

Figure 3-27: Common Coupling Fields

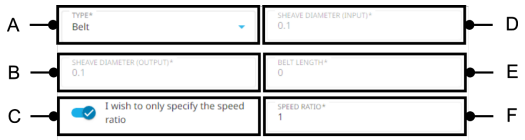


*A. **Name** — The default value is the kind of **Coupling**. (**In-Line**/**Parallel**/**Angular**)*
*B. **Description** — The user can enter some characters here.*
*C. **Manufacturer** — The user can enter some characters here.*
*D. **Type** — Select the **Type** of **Coupling** from the dropdown menu.*
*E. **Model Number** — The user can enter some characters here.*

3. (Required) Fill in the **Name** field. The default value is the kind of **Coupling**. (**In-Line** / **Parallel** / **Angular**)
4. (Optional) Fill in the **Model Number** field.
5. (Optional) Fill in the **Description** field.
6. (Optional) Fill in the **Manufacturer** field.
7. (Required) Chose the **Type** of **Coupling** from the dropdown menu.
   - If the **Type** is **Direct**, **Integral**, **Sheet / Web Drive**, or **Spline**, then the **Coupling** is now fully configured.

- (Optional) If you chose **Belt**, fill in the following fields:

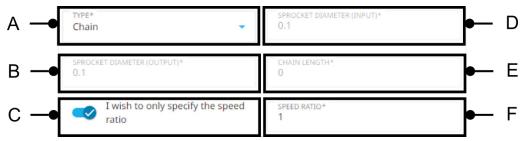
Figure 3-28: Belt Coupling



A. *When the **Type** is set to **Belt**:*
B. *(Optional) Fill in the **SHEAVE DIAMETER (OUTPUT)** field. (Default value: 0.1)*
C. *(Required) Toggle the **I wish to only specify the speed ratio.** toggle. (Default: On)*
D. *(Optional) Fill in the **SHEAVE DIAMETER (INPUT)** field. (Default: value: 0.1)*
E. *(Optional) Fill in the **BELT LENGTH** field. (Default value: 0)*
F. *(Required) Fill in the **SPEED RATIO** field. (Default value: 1)*

- (Optional) If you chose **Chain**, fill in the following fields:

Figure 3-29: Chain Coupling



A. *When the **Type** is set to **Chain**:*
B. *(Optional) Fill in the **SPROCKET DIAMETER (OUTPUT)** field. (Default value: 0.1)*
C. *(Required) Toggle the **I wish to only specify the speed ratio.** toggle. (Default: On)*
D. *(Optional) Fill in the **SPROCKET DIAMETER (INPUT)** field. (Default: value: 0.1)*
E. *(Optional) Fill in the **CHAIN LENGTH** field. (Default value: 0)*
F. *(Required) Fill in the **SPEED RATIO** field. (Default value: 1)*

- (Optional) If you chose **Flexible**, fill in the following fields:

Figure 3-30: Flexible Coupling



A. *When the **Type** is set to **Flexible**:*
B. *(Required) Fill in the **Flexible Type** field. (Default value: **Not Specified**) Choose from:*
   - ***Bun Double Split***
   - ***Bun Single Split***
   - ***Chain Link***
   - ***Disk / Shim Pack***
   - ***Four Jaw***
   - ***Gear***
   - ***Grid***
   - ***Shear Insert***
   - ***Three Jaw***
   - ***Not Specified***

- (Optional) If you chose **Fluid / Magnetic**, fill in the following fields:

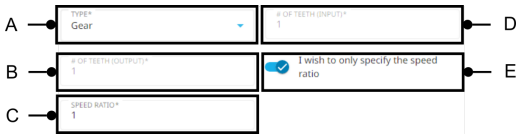
Figure 3-31: Fluid / Magnetic Coupling



A. *When the **Type** is set to **Fluid / Magnetic**:*
B. *(Required) Fill in the **SPEED RATIO** field. (Default value: 1)*
C. *(Required) Toggle the **I wish to only specify the speed ratio.** toggle. (Default value: On)*

- (Optional) If you chose **Gear**, fill in the following fields:

Figure 3-32: Gear Coupling



A. *When the **Type** is set to **Gear**:*
B. *(Optional) Fill in the **# OF TEETH (OUTPUT)** field. (Default value: 1)*
C. *(Required) Fill in the **SPEED RATIO** field. (Default value: 1)*
D. *(Optional) Fill in the **# OF TEETH (INPUT)** field. (Default: value: 1)*
E. *(Required) Toggle the **I wish to only specify the speed ratio.** toggle. (Default: On)*

8. Click **Apply** to save your changes.

Driver Components

AMS Machine Works has three **Driver Components** which each have different configuration options:

1. Motor Configuration
2. Turbine Configuration
3. Engine Configuration

Motor Configuration

To configure a **Motor Component** you need to fill in the information for three steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Set Fault Frequencies configuration step.

There are six **MOTOR TYPES** to choose from:

- **Not Specified** — This is the default **MOTOR TYPE**. This **MOTOR TYPE** has some additional fields associated with it.
- **AC Induction** — This **MOTOR TYPE** has some additional fields associated with it.
- **AC Synchronous** — This **MOTOR TYPE** has some additional fields associated with it.
- **DC Motor** — This **MOTOR TYPE** has some additional fields associated with it..
- **Hydraulic** — This **MOTOR TYPE** has some additional fields associated with it.
- **Other** — This **MOTOR TYPE** does not have any additional fields associated with it.

Prerequisites

1. Create a **Motor** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Motor** to open the **Motor Configuration Side Panel**.

Figure 3-33: Motor Configuration Side Panel

A. ***Name*** *— (Required)(Default: Motor) Fill in the* ***Name*** *field.*
B. ***Component ID*** *— (Optional) Fill in the* ***Component ID*** *field.*
C. ***Description*** *— (Optional) Fill in the* ***Description*** *field.*
D. ***Manufacturer*** *— (Optional) Fill in the* ***Manufacturer*** *field.*
E. ***Model Number*** *— (Optional) Fill in the* ***Model Number*** *field.*
F. ***Support Position*** *— (Optional)(Default:* ***Unknown****) choose the* ***Support Position*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
G. ***MOTOR TYPE*** *— (Optional)(Default:* ***Not Specified****) choose the* ***MOTOR TYPE*** *from the dropdown menu. (Choose from:* ***Not Specified****/****AC Induction****/****AC Synchronous****/****DC Motor****/****Hydraulic****/****Other****)*
H. ***Frame Size*** *— (Optional) Fill in the* ***Frame Size*** *field.*
I. ***ENCLOSURE*** *— (Optional)(Default:* ***Not Specified****) choose the* ***ENCLOSURE*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
J. ***POWER*** *— (Required)(Default: 0) Fill in the* ***POWER*** *field. From: 0.01 to 1000000*
K. ***POWER UNIT*** *— (Required)(Default:* ***HP****) Choose the* ***POWER UNIT*** *from the dropdown menu. (Choose from:* ***HP****/****kW****)*
L. ***Various Fields*** *— These fields are different for each* ***MOTOR TYPE****.*
M. ***Variable Frequency*** *— (Optional)(Default:* ***Off****) Set the* ***Variable Frequency*** *toggle either* ***On*** *or* ***Off****.*

Procedure

1. **Name** — (Required)(Default: Motor) Fill in the **Name** field.
2. **Component ID** — (Optional) Fill in the **Component ID** field.
3. **Description** — (Optional) Fill in the **Description** field.
4. **Manufacturer** — (Optional) Fill in the **Manufacturer** field.
5. **Model Number** — (Optional) Fill in the **Model Number** field.
6. **Support Position** — (Optional)(Default: **Unknown**) Choose the **Support Position** from the dropdown menu.
   - **Unknown**
   - **Bottom**
   - **Side**
   - **Top**
   - **End**
7. (Optional)(Default: **Not Specified**) Choose the **MOTOR TYPE** from the dropdown menu. (Choose from: **Not Specified**/**AC Induction**/**AC Synchronous**/**DC Motor**/**Hydraulic**/**Other**)
   - (Optional) If you choose a **MOTOR TYPE** of **Not Specified**, fill in the following fields:

Figure 3-34: Additional fields for a MOTOR TYPE of: Not Specified

A. *When the **MOTOR TYPE** is set to **Not Specified**:*
B. *(Optional) Fill in the **RATED VOLTAGE** field. (Default value: 0) (From 0 to 100000)*
C. *(Optional) Fill in the **FULL LOAD CURRENT (AMPS)** field. (Default value: 0) (From 0.1 to 10000)*
D. *(Optional) Fill in the **# OF PHASES** field. (Default value: 3) (From 1 to 3)*

- (Optional) If you choose a **MOTOR TYPE** of **AC Induction** or **AC Synchronous**, fill in the following fields:

Figure 3-35: Additional fields for a MOTOR TYPE of: AC Induction or AC Synchronous

A. *When the **MOTOR TYPE** is set to **AC Induction** or **AC Synchronous**:*
B. *(Optional) Fill in the **RATED VOLTAGE** field. (Default value: 0) (From 0 to 100000)*
C. *(Optional) Fill in the **FULL LOAD CURRENT (AMPS)** field. (Default value: 0) (From 0.1 to 10000)*
D. *(Optional) Fill in the **# OF PHASES** field. (Default value: 3) (From 1 to 3)*
E. *(Optional) Fill in the **# OF POLES** field. (Default value: 0) (From 0 to 1000)*

⚠ CAUTION

*The default value for the **# OF POLES**, (0), is incorrect. Users must manually configure this field.*

*The **# OF POLES** must be a non-zero even number.*

F. *(Optional) Fill in the **# OF ROTOR BARS** field. (Default value: 0) (From 0 to 1000)*
G. *(Optional) Fill in the **# OF STATOR SLOTS** field. (Default value: 0) (From 0 to 1000)*

- (Optional) If you choose a **MOTOR TYPE** of **DC Motor**, fill in the following fields:

Figure 3-36: Additional fields for a MOTOR TYPE of: DC Motor

A. *When the **MOTOR TYPE** is set to **Not Specified**:*
B. *(Optional) Fill in the **RATED VOLTAGE** field. (Default value: 0) (From 0 to 100000)*
C. *(Optional) Fill in the **FULL LOAD CURRENT (AMPS)** field. (Default value: 0) (From 0.1 to 10000)*
D. *(Optional) Fill in the **# OF PHASES** field. (Default value: 3) (From 1 to 3)*
E. *(Required) Choose from the **DC MOTOR TYPE** dropdown menu. (Default value: **Not Specified**) (Choose from: **Not Specified**/**Compound**/**Series**/**Shunt**/**Other**)*

- (Optional) If you choose a **MOTOR TYPE** of **Hydraulic**, fill in the following fields:

Figure 3-37: Additional fields for a MOTOR TYPE of: Hydraulic

A. *When the **MOTOR TYPE** is set to **Hydraulic**:*
B. *(Optional) Fill in the # **OF GEAR TEETH** field. (Default value: 3) (From 1 to 3)*
C. *(Optional) Fill in the # **OF PISTONS** field. (Default value: 3) (From 1 to 3)*
D. *(Optional) Fill in the # **OF VANES** field. (Default value: 3) (From 1 to 3)*
E. *(Required) Choose from the **HYDRAULIC MOTOR TYPE** dropdown menu. (Default value: **Not Specified**) (Choose from: **Not Specified**/**Gear**/**Piston**/**Vane**/**Other**)*

- (Optional) If you choose a **MOTOR TYPE** of **Other** there are no additional fields to fill in.

8. **Frame Size** — (Optional) Fill in the **Frame Size** field.
9. **ENCLOSURE** — (Optional)(Default: **Not Specified**) choose the **ENCLOSURE** from the dropdown menu. (Choose from: **Unknown**/**Bottom**/**Side**/**Top**/**End**)
10. **POWER** — (Required)(Default: 0) Fill in the **POWER** field. From: 0.01 to 1000000
11. **POWER UNIT** — (Required)(Default: **HP**) Choose the **POWER UNIT** from the dropdown menu. (Choose from: **HP**/**kW**)
12. **Various Fields** — Between the **POWER UNIT** and **Variable Frequency** fields there are **Various Fields** for each choice of **MOTOR TYPE**. (Detailed in Step 7 above.)
13. **Variable Frequency** — (Optional)(Default: **Off**) Set the **Variable Frequency** toggle either **On** or **Off**.
14. You have four options once you have configured all the required fields shown above, and as many of the optional fields as you need:
    - (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
    - (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
      — Complete the Add / Edit / Delete Bearings step.
      — Complete the Set Fault Frequencies step.
    - (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
    - (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.

Turbine Configuration

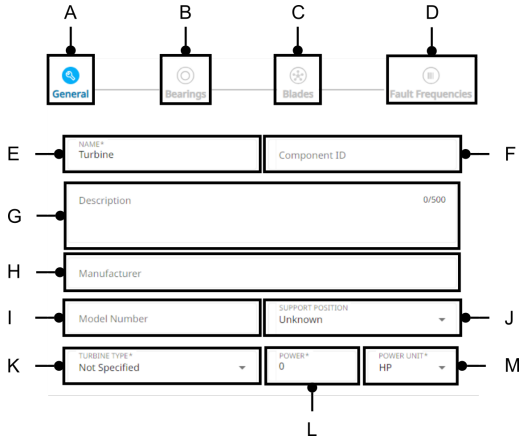
To configure a **Turbine Component** you need to fill in the information for four steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Add Blades configuration step.
4. The Set Fault Frequencies configuration step.

Prerequisites

1. Create a **Turbine** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Turbine** to open the **Turbine Configuration Side Panel**.

Figure 3-38: Turbine Configuration Side Panel



A. ***General Configuration*** *step — Highlighted as the current step.*
B. *Add / Edit / Delete Bearings step — Click here to switch to this step.*
C. *Add Blades step — Click here to switch to this step.*
D. *Set Fault Frequencies step — Click here to switch to this step.*
E. ***Name*** *— (Required)(Default: Turbine) Fill in the* ***Name*** *field. (1 to 128 characters)*
F. ***Component ID*** *— (Optional) Fill in the* ***Component ID*** *field. (0 to 128 characters)*
G. ***Description*** *— (Optional) Fill in the* ***Description*** *field. (0 to 500 characters)*
H. ***Manufacturer*** *— (Optional) Fill in the* ***Manufacturer*** *field. (0 to 128 characters)*
I. ***Model Number*** *— (Optional) Fill in the* ***Model Number*** *field. (0 to 128 characters)*
J. ***Support Position*** *— (Optional)(Default:* ***Unknown****) Choose the* ***Support Position*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
K. ***TURBINE TYPE*** *— (Optional)(Default:* ***Not Specified****) Choose the* ***TURBINE TYPE*** *from the dropdown menu. (Choose from:* ***Not Specified****/****Gas****/****Hydraulic****/****Other****/****Steam****)*
L. ***Frame Size*** *— (Optional) Fill in the* ***Frame Size*** *field.*
M. ***ENCLOSURE*** *— (Optional)(Default:* ***Not Specified****) Choose the* ***ENCLOSURE*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
N. ***POWER*** *— (Required)(Default: 0) Fill in the* ***POWER*** *field. From: 0.01 to 1000000*
O. ***POWER UNIT*** *— (Required)(Default:* ***HP****) Choose the* ***POWER UNIT*** *from the dropdown menu. (Choose from:* ***HP****/****kW****)*

Procedure

Fill in all the required fields shown above, and as many of the optional field as you need.

- (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.

- (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
  - Complete the Add / Edit / Delete Bearings step.
  - Complete the Add Blades step.
  - Complete the Set Fault Frequencies step.
- (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
- (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.

Engine Configuration

To configure an **Engine Component** you need to fill in the information for three steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Set Fault Frequencies configuration step.

There are four **ENGINE TYPES** to choose from:

- **Not Specified** — This is the default **Engine TYPE**. This **ENGINE TYPE** does not have any additional fields associated with it.
- **Reciprocating** — This **ENGINE TYPE** has some additional fields associated with it.
- **Rotary** — This **ENGINE TYPE** does not have any additional fields associated with it.
- **Other** — This **ENGINE TYPE** does not have any additional fields associated with it.

Prerequisites

1. Create an **Engine** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Engine** to open the **Engine Configuration Side Panel**.

Figure 3-39: Engine Configuration Side Panel

A. ***General Configuration*** *step — Highlighted as the current step.*
B. *Add / Edit / Delete Bearings step — Click here to switch to this step.*
C. *Set Fault Frequencies step — Click here to switch to this step.*
D. ***Name*** *— (Required)(Default: Engine) Fill in the* ***Name*** *field.*
E. ***Component ID*** *— (Optional) Fill in the* ***Component ID*** *field.*
F. ***Description*** *— (Optional) Fill in the* ***Description*** *field.*
G. ***Manufacturer*** *— (Optional) Fill in the* ***Manufacturer*** *field.*
H. ***Model Number*** *— (Optional) Fill in the* ***Model Number*** *field.*
I. ***Support Position*** *— (Optional)(Default:* ***Unknown****) Choose the* ***Support Position*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
J. ***ENGINE TYPE*** *— (Optional)(Default:* ***Not Specified****) Choose the* ***ENGINE TYPE*** *from the dropdown menu. (Choose from:* ***Not Specified****/****Reciprocating****/****Rotary****/****Other****)*
K. ***POWER*** *— (Required)(Default: 0) Fill in the* ***POWER*** *field. From: 0.01 to 1000000*
L. ***POWER UNIT*** *— (Required)(Default:* ***HP****) Choose the* ***POWER UNIT*** *from the dropdown menu. (Choose from:* ***HP****/****kW****)*
M. ***IGNITION TYPE*** *— (Optional)(Default:* ***Not Specified****) Choose the* ***IGNITION TYPE*** *from the dropdown menu. (Choose from:* ***Not Specified****/****Compression****/****Spark****)*

Procedure

1. **Name** — (Required)(Default: Engine) Fill in the **Name** field.
2. **Component ID** — (Optional) Fill in the **Component ID** field.
3. **Description** — (Optional) Fill in the **Description** field.
4. **Manufacturer** — (Optional) Fill in the **Manufacturer** field.
5. **Model Number** — (Optional) Fill in the **Model Number** field.
6. **Support Position** — (Optional)(Default: **Unknown**) Choose the **Support Position** from the dropdown menu.
   - **Unknown**
   - **Bottom**
   - **Side**
   - **Top**
   - **End**
7. **ENGINE TYPE** — (Optional)(Default: **Not Specified**) Choose the **ENGINE TYPE** from the dropdown menu.
   - **Not Specified** — No additional fields.
   - **Reciprocating** — Additional fields will be displayed for configuration.
   - **Rotary** — No additional fields.
   - **Other** — No additional fields.
8. **POWER** — (Required)(Default: 0) Fill in the **POWER** field. From: 0.01 to 1000000

9. **POWER UNIT** — (Required)(Default: **HP**) Choose the **POWER UNIT** from the dropdown menu.
   - **HP**
   - **kW**
10. **IGNITION TYPE** — (Optional)(Default: **Not Specified**) Choose the **IGNITION TYPE** from the dropdown menu.
   - **Not Specified**
   - **Compression**
   - **Spark**
11. Fill in any conditional fields connected with your choice of **ENGINE TYPE** in Step 7.
   - (Optional) If you did not choose an **ENGINE TYPE** of **Reciprocating** in Step 7, there are no additional fields to fill in.
   - (Optional) If you choose an **ENGINE TYPE** of **Reciprocating** in Step 7, fill in the following fields:

     Figure 3-40: Additional fields associated for an ENGINE TYPE of: Reciprocating

     *A. When the **ENGINE TYPE** is set to **Reciprocating**:*
     *B. (Optional) Fill in the **# OF CYLINDERS** field. (Default value: 0) (From 0 to 20)*
     *C. (Required) Choose from the **# OF CYCLES** dropdown menu. (Default value: **Two Cycles**) (Choose from: **Two Cycles**/**Four Cycles**)*
12. Choose the next step in your workflow.
   - (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
   - (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
     — Complete the Add / Edit / Delete Bearings step.
     — Complete the Set Fault Frequencies step.
   - (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
   - (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.

Intermediate Component

The **Intermediate Components** in AMS Machine Works are a range of **Gearbox** types.

Configure a Gearbox

To configure a **Gearbox Component** you need to fill in the information for four steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.

3. The Define the Number of Teeth per Gear configuration step.
4. The Set Fault Frequencies configuration step.

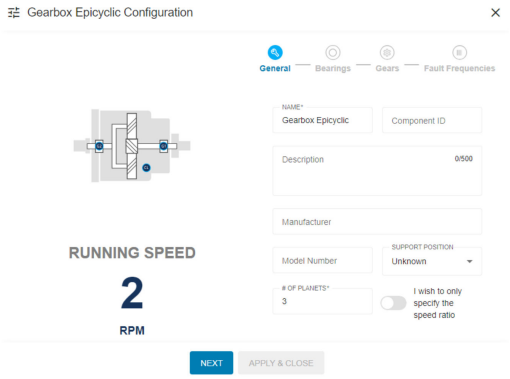
There are seven types of **Gearbox** to choose from:

1. **2 Shaft Gearbox** — This **Gearbox** has two additional fields associated with it.
    a. **I wish to only specify the speed ratio** — Toggle **On** / **Off**.
    b. **Speed Ratio** — (Default value: 1) (From 0.001 to 1000)
2. **3 Shaft Gearbox** — This **Gearbox** does not have any additional fields associated with it.
3. **4 Shaft Gearbox** — This **Gearbox** does not have any additional fields associated with it.
4. **5 Shaft Gearbox** — This **Gearbox** does not have any additional fields associated with it.
5. **6 Shaft Gearbox** — This **Gearbox** does not have any additional fields associated with it.
6. **7 Shaft Gearbox** — This **Gearbox** does not have any additional fields associated with it.
7. **Epicyclic Gearbox** — This **Gearbox** has three additional fields associated with it.
    a. **# OF PLANETS** — (Default: **3**) From: 1 to 10.
    b. **I wish to only specify the speed ratio** — Toggle **On** / **Off**.
    c. **Speed Ratio** — (Default value: 1) (From 0.001 to 1000)

Prerequisites

1. Create a **Gearbox** by adding it from the **Intermediate Components** section. See: Add Component
2. Double-click on the **Gearbox** to open the **Gearbox Configuration Side Panel**.

Figure 3-41: Gearbox Configuration Side Panel



A. ***Name*** *— (Required)(Default: Engine) Fill in the* ***Name*** *field.*
B. ***Component ID*** *— (Optional) Fill in the* ***Component ID*** *field.*
C. ***Description*** *— (Optional) Fill in the* ***Description*** *field.*
D. ***Manufacturer*** *— (Optional) Fill in the* ***Manufacturer*** *field.*
E. ***Model Number*** *— (Optional) Fill in the* ***Model Number*** *field.*
F. ***Support Position*** *— (Optional)(Default:* ***Unknown****) Chose the* ***Support Position*** *from the dropdown menu. (Choose from:* ***Unknown****/****Bottom****/****Side****/****Top****/****End****)*
G. ***# OF PLANETS*** *— (Only for* ***Epicyclic Gearbox****)(Optional)(Default:* ***3****) From: 1 to 10.*
H. ***I wish to only specify the speed ratio*** *— (Only for the* ***Epicyclic Gearbox*** *and the* ***2-Shaft Gearbox****)(Optional)(Default:* ***Off****) (****On*** */* ***Off****)*

Procedure

1. Fill in all the required fields shown above, and as many of the optional field as you need.
2. (Optional)(Only for the **Epicyclic Gearbox**) Set the **# OF PLANETS**. (Default: **3**) From: 1 to 10.
3. (Optional)(Only for the **2 Shaft Gearbox** and the **Epicyclic Gearbox**) If you set the **I wish to only specify the speed ratio** toggle into the **On** position, fill in the **Speed Ratio** field:

   Note
   Optionally you can Define the Number of Teeth per Gear for a **2 Shaft Gearbox** or **Epicyclic Gearbox**.

   a. (Required) Fill in the **Speed Ratio** field. (Default value: 1) (From 0.001 to 1000)

4. Fill in all the required fields shown above, and as many of the optional field as you need.
   a) (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
   b) (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.

c) (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.

d) (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.

5. Complete the Add / Edit / Delete Bearings step.
6. Complete the Define the Number of Teeth per Gear step.
7. Complete the Set Fault Frequencies step.

Driven Components

The **Driven Components** in a **Machine Train** perform some work. There are four general types of **Driven Component**:

1. Fans
2. Pumps
3. Compressors
4. Other Driven Components — Each of these has a specific purpose, except for the **User Defined Component**, which is a generic single shaft component that you can name.

Fans

There are two types of mountings for a **Fan** in AMS Machine Works:

1. **Center Hung** — This type has its **Blade** elements located **between** the **Bearing** elements.
2. **Overhung** — This type has its **Blade** elements located **after** the **Bearing** elements.

⚠ CAUTION

The type of mounting affects the vibration analysis of a **Fan**, you must select the correct mounting.

The other steps for configuring a **Fan** are identical. See: Fan Configuration

Fan Configuration

There are two types of **Fan** to choose from:

1. **Overhung Fan**
2. **Center Hung Fan**

To configure both types of **Fan Component** you need to fill in the information for four steps:

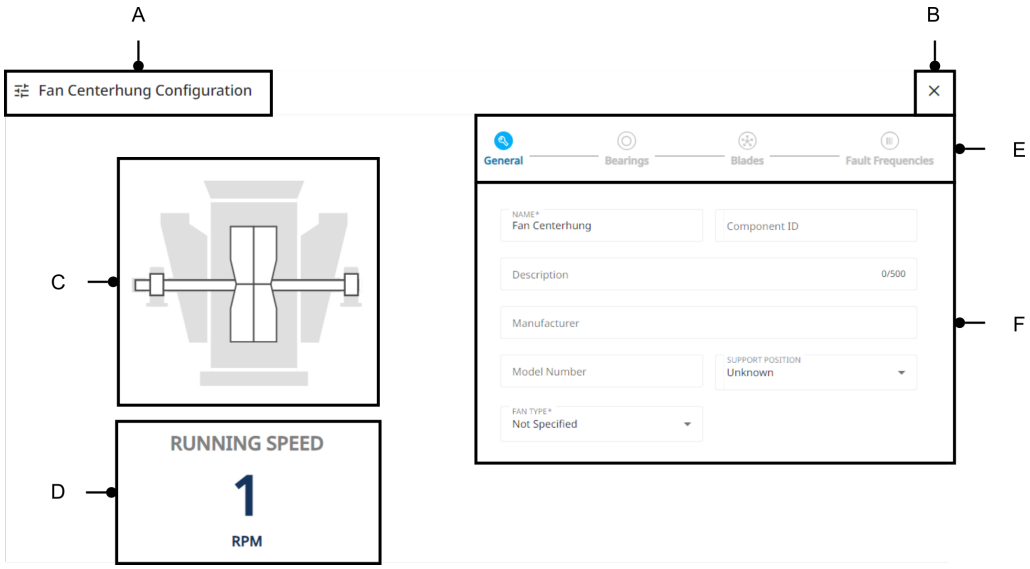
1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Add Blades configuration step.
4. The Set Fault Frequencies configuration step.

Prerequisites

1. Create a **Fan** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Fan** to open the **Fan Configuration Side Panel**.

The **Center Hung / Overhung Fan Configuration Side Panel** will open.

Figure 3-42: Fan Configuration Side Panel



*A. **Side Panel Title** — Either **Center Hung Fan Configuration** or **Overhung Fan Configuration**, depending on the type of **Fan**.*
*B. **Close Panel Control** — Click **X** to close this panel.*
*C. **Component Diagram** — A representation of the type of fan is displayed here.*
*D. **Running Speed** — A calculation of the running speed is pictured here.*
*E. **Configuration Steps** — If all the required fields have been filled in, you can switch to any step by clicking on it.*
*F. **General Configuration Fields** — These fields are detailed in the steps below.*

Procedure

1. **Name** — (Required) The default value is either **Center Hung Fan** or **Overhung Fan**, depending on the type of **Fan**.
2. **Component ID** — (Optional)
3. **Description** — (Optional)
4. **Manufacturer** — (Optional)
5. **Model Number** — (Optional)
6. **Support Position** — (Optional) Choose a **Support Position** from this dropdown menu.
   - (Default) **Unknown**

- **Bottom**
- **Side**
- **Top**
- **End**

⚠ CAUTION

The type of **Support Position** affects the vibration analysis of a **Fan**, you must select the correct mounting.

7. **Fan Type** — (Required) Choose which type of **Fan** this is.
   - (Default) **Not Specified**
   - **Axial Flow**
   - **Centrifugal**
   - **Other**
   - **Lobed Blower**
   - **Propeller Fan**
8. Fill in all the required fields shown above, and as many of the optional field as you need.
   a) (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
   b) (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
   c) (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
   d) (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.
9. Complete the Add / Edit / Delete Bearings step.
10. Complete the Add Blades step.
11. Complete the Set Fault Frequencies step.

Pumps

AMS Machine Works has a variety of **Pump Component** templates to choose from.

Pump Configuration

There are two types of **Pump** to choose from:

1. **Overhung Pump**
2. **Center Hung Pump**

To configure both types of **Pump Component** you need to fill in the information for four steps:

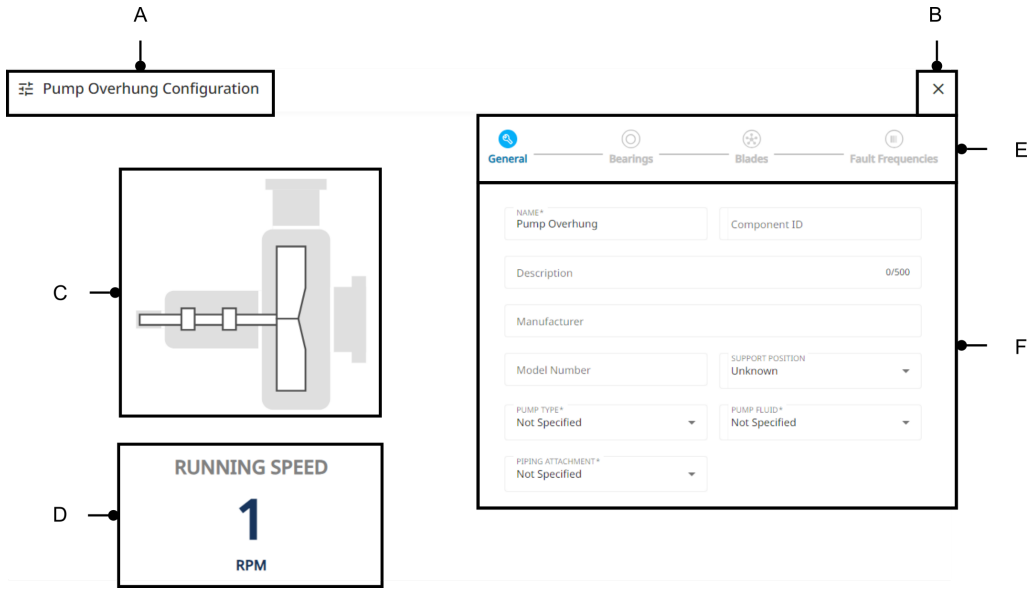
1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Add Blades configuration step.
4. The Set Fault Frequencies configuration step.

Prerequisites

1. Create a **Pump** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Pump** to open the **Fan Configuration Side Panel**.

The **Center Hung / Overhung Pump Configuration Side Panel** will open.

Figure 3-43: Pump Configuration Side Panel



A. ***Side Panel Title*** — *Either **Center Hung Pump Configuration** or **Overhung Pump Configuration**, depending on the type of **Pump**.*
B. ***Close Panel Control*** — *Click **X** to close this panel.*
C. ***Component Diagram*** — *A representation of the type of fan is displayed here.*
D. ***Running Speed*** — *A calculation of the running speed is pictured here.*
E. ***Configuration Steps*** — *If all the required fields have been filled in, you can switch to any step by clicking on it.*
F. ***General Configuration Fields*** — *These fields are detailed in the steps below.*

Procedure

1. **Name** — (Required) The default value is either **Center Hung Fan** or **Overhung Fan**, depending on the type of **Fan**.
2. **Component ID** — (Optional)
3. **Description** — (Optional)

4. **Manufacturer** — (Optional)
5. **Model Number** — (Optional)
6. **Support Position** — (Optional) Choose a **Support Position** from this dropdown menu.
   - (Default) **Unknown**
   - **Bottom**
   - **Side**
   - **Top**
   - **End**

⚠ CAUTION

The type of **Support Position** affects the vibration analysis of a **Pump**, you must select the correct mounting.

7. **PUMP TYPE** — (Required) Choose which type of **Pump** this is.
   - (Default) **Not Specified**
   - **Axial Flow**
   - **Centrifugal**
   - **Other**
   - **Positive Displacement**
   - **Reciprocating**
   - **Rotary**
   - **Screw**
   - **Vertical**
8. **PUMP FLUID** — (Required) Choose which type of **Fluid** is used.
   - (Default) **Not Specified**
   - **Butane**
   - **Ethane**
   - **Hydraulic**
   - **Oil**
   - **Propane**
   - **Other**
   - **Water**
9. **PIPING ATTACHMENT** — (Required) Choose which type of **Attachment** is used.
   - (Default) **Not Specified**

- **Flex Joint**
- **Solid**

10. Fill in all the required fields shown above, and as many of the optional field as you need.
    a) (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
    b) (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
    c) (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
    d) (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.
11. Complete the Add / Edit / Delete Bearings step.
12. Complete the Add Blades step.
13. Complete the Set Fault Frequencies step.

Compressors

AMS Machine Works has a variety of **Compressor Component** templates to choose from.

Compressor Configuration

There are seven types of **Compressor** to choose from:

1. **Centrifugal Compressor**
2. **Centrifugal Bull Gear Compressor**
3. **Horizontal Reciprocating Compressor**
4. **Vertical Reciprocating Compressor**
5. **Single Stage Dry Screw Rotary Compressor**
6. **Two Stage Dry Screw Rotary Compressor**
7. **Flooded Screw Rotary Compressor**

To configure every type of **Compressor Component** you need to fill in the information for some sub-steps:

1. Every type of **Compressor** has the **General** configuration step.
2. Every type of **Compressor** has the Add / Edit / Delete Bearings configuration step.
3. The following types of **Compressor** have the Define the Number of Teeth per Gear configuration step.
    - **Centrifugal Bull Gear Compressor**
    - **Single Stage Dry Screw Rotary Compressor**
    - **Two Stage Dry Screw Rotary Compressor**

4. The following types of **Compressor** have the Add Blades configuration step.
   - **Centrifugal Compressor**
   - **Centrifugal Bull Gear Compressor**
5. The following types of **Compressor** have the Define the Number of Lobes per Rotor configuration step.
   - **Single Stage Dry Screw Rotary Compressor**
   - **Two Stage Dry Screw Rotary Compressor**
   - **Flooded Screw Rotary Compressor**
6. Every type of **Compressor** has the Set Fault Frequencies configuration step.

Prerequisites

1. Create a **Compressor** by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Compressor** to open the **Compressor Configuration Side Panel**.

The **Compressor Configuration Side Panel** will open.

Figure 3-44: Compressor Configuration Side Panel

A. ***Side Panel Title*** *— This is set to "**Compressor Name**" **Configuration**, and is different for each type of **Compressor**.*
B. ***Close Panel Control*** *— Click **X** to close this panel.*
C. ***Component Diagram*** *— A representation of the type of fan is displayed here.*
D. ***Running Speed*** *— A calculation of the running speed is pictured here.*
E. ***Configuration Steps*** *— If all the required fields have been filled in, you can switch to any step by clicking on it.*
F. ***General Configuration Fields*** *— These fields are detailed in the steps below.*

Procedure

1. **Name** — (Required) The default value is the type of **Compressor**.
2. **Component ID** — (Optional)
3. **Description** — (Optional)
4. **Manufacturer** — (Optional)
5. **Model Number** — (Optional)
6. **Support Position** — (Optional) Choose a **Support Position** from this dropdown menu.
   - (Default) **Unknown**
   - **Bottom**
   - **Side**
   - **Top**

- **End**

⚠ CAUTION

The type of **Support Position** affects the vibration analysis of a **Pump**, you must select the correct mounting.

7. (Only for a **Horizontal Reciprocating Compressor** or a **Vertical Reciprocating Compressor**) **# OF CYLINDERS** — (Required)(Default) **0** From 0 to 100. Set how many cylinders the **Compressor** uses.
8. Fill in all the required fields shown above, and as many of the optional field as you need.
   a) (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
   b) (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
   c) (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
   d) (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.
9. Complete the Add / Edit / Delete Bearings step.
10. Complete the Add Blades step.
11. Complete the Set Fault Frequencies step.

Other Driven Components

All other driven **Components** have nearly identical configuration, except for the **Roll / Pulley Component**. **Roll / Pulley Components** have two extra fields.

Note
The **Roll / Pulley Component** in a **Regular Machine Train** is entirely different from the **Pulley / Roll Component** in a **Specialized Machine Train** called a **Roll / Pulley Section**.

For configuration of a **Pulley / Roll Component** in a **Roll / Pulley Section** see: Configure Pulley / Roll

Configure Other Driven Components

The following types of **Driven Components** have nearly identical configuration:

1. **Generator**
2. **Centrifuge**
3. **Spindle**
4. **Grinder**
5. **Chipper / Crusher**
6. **Agitator**

7. **Crane**
8. **Chiller**
9. **Detrasher**
10. **Dynamometer**
11. **Exciter**
12. **Mixer**
13. **Pulverizer**
14. **Radar**
15. **Rotating Kiln**
16. **Bearing Housing**
17. **User Defined**
18. **Roll / Pulley** — This **Component** has two additional fields which are described below.

To configure these types of **Component** you need to fill in the information for three steps:

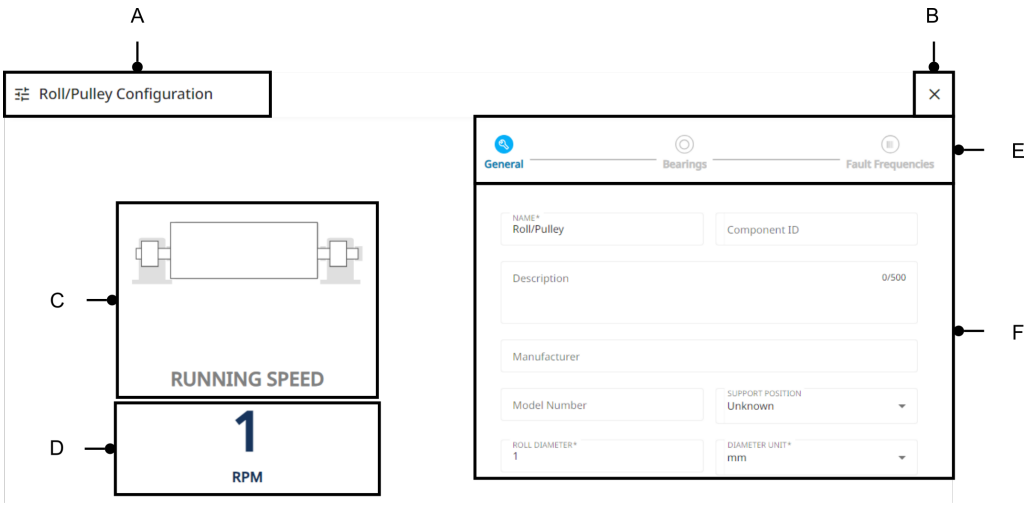
1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Set Fault Frequencies configuration step.

Prerequisites

1. Create one of these **Component** types by adding it from the **Driven Components** section. See: Add Component
2. Double-click on the **Component** to open its **Configuration Side Panel**.

The **Configuration Side Panel** will open.

Figure 3-45: Configuration Side Panel



A. ***Side Panel Title*** — *Default "**Component Name**".*
B. ***Close Panel Control*** — *Click **X** to close this panel.*
C. ***Component Diagram*** — *A representation of the type of **Component** is displayed here.*
D. ***Running Speed*** — *A calculation of the running speed is pictured here.*
E. ***Configuration Steps*** — *If all the required fields have been filled in, you can switch to any step by clicking on it.*
F. ***General Configuration Fields*** — *These fields are detailed in the steps below.*

Procedure

1. **Name** — (Required) The default value is "**Component Name**".
2. **Component ID** — (Optional)
3. **Description** — (Optional)
4. **Manufacturer** — (Optional)
5. **Model Number** — (Optional)
6. **Support Position** — (Optional) Choose a **Support Position** from this dropdown menu.
   - (Default) **Unknown**
   - **Bottom**
   - **Side**
   - **Top**
   - **End**

⚠ CAUTION

The type of **Support Position** affects the vibration analysis of a **Component**, you must select the correct mounting.

7. (Only for a **Roll / Pulley**) **ROLL DIAMETER** — (Required)(Default) **1** From 0.001 to 100 000. Set the size of the **Roll / Pulley**.
8. (Only for a **Roll / Pulley**) **DIAMETER UNIT** — (Required)(Default: **mm**) Set the unit used for measuring the **Roll / Pulley**, choose either **mm** or **inch**.
9. Fill in all the required fields shown above, and as many of the optional field as you need.
    a) (Option 1) Click **NEXT** to save your changes and to proceed to the Add / Edit / Delete Bearings step.
    b) (Option 2) Click on any step icon at the top of the **Configuration Side Panel** to save your changes and to proceed to that step directly.
    c) (Option 3) Click **APPLY & CLOSE** to save your changes and exit this configuration.
    d) (Option 4) Click **X** to close the **Configuration Side Panel** without saving your changes.
10. Complete the Add / Edit / Delete Bearings step.
11. Complete the Add Blades step.
12. Complete the Set Fault Frequencies step.

Roll / Pulley Section Component Configuration Tasks

The types of **Components** available for building a **Roll / Pulley Section** are:

1. Configure Pulley / Roll
2. Configure Transfer Gear

Configure Pulley / Roll

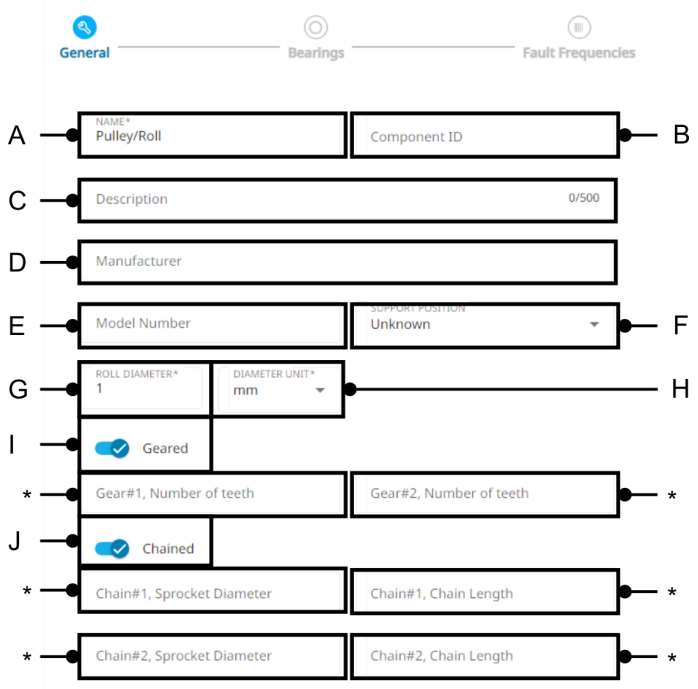
To configure a **Pulley / Roll Component** you need to fill in the information for three steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Set Fault Frequencies configuration step.

Prerequisites

Double-click on the **Component** you want to configure to enter the **General** configuration step.

Figure 3-46: General Configuration



A. ***NAME*** *— (Required) By default the* ***NAME*** *is set to* ***Pulley/ Roll****.*
B. ***Component ID*** *— (Optional) You can enter an optional* ***Component ID****.*
C. ***DESCRIPTION*** *— (Optional) (500 characters) You can enter an optional* ***DESCRIPTION****.*
D. ***MANUFACTURER*** *— (Optional) You can enter an optional* ***MANUFACTURER****.*
E. ***MODEL NUMBER*** *— (Optional) You can enter an optional* ***MODEL NUMBER****.*
F. ***SUPPORT POSITION*** *— (Optional)(Default: Unknown) You can select a* ***SUPPORT POSITION*** *from this dropdown menu. (****Unknown****/****Bottom****/****Side****/****Top****/****End****)*
G. ***ROLL DIAMETER*** *— (Required)(Default: 1) This ratio can be from 0.1 to 100 000.*
H. ***DIAMETER UNIT*** *— (Optional)(Default:* ***mm****) You can select a* ***DIAMETER UNIT*** *from this dropdown menu. (****mm****/****inch****)*
I. ***Geared*** *— (Optional Section)(Default:* ***Off****) Click this toggle into the* ***On*** *position to show two more fields. If you do not need these fields, click the toggle into the* ***Off*** *position. Additional fields:*
    - ***GEAR#1, NUMBER OF TEETH*** *— (Optional)(Default:* ***null****) You can enter a number from 1 to 10000.*
    - ***GEAR#2, NUMBER OF TEETH*** *— (Optional)(Default:* ***null****) You can enter a number from 1 to 10000.*
J. ***Chained*** *— (Optional Section)(Default:* ***Off****) Click this toggle into the* ***On*** *position to show four more fields. If you do not need these fields, click the toggle into the* ***Off*** *position. Additional fields:*
    - ***CHAIN#1, Sprocket Diameter*** *— (Optional)(Default:* ***null****) You can enter a number from 0.01 to 10000.*

- ***CHAIN#1, Chain Length*** — *(Optional)(Default:* ***null****) You can enter a number from 0.01 to 10000.*
- ***CHAIN#2, Sprocket Diameter*** — *(Optional)(Default:* ***null****) You can enter a number from 0.01 to 10000.*
- ***CHAIN#2, Chain Length*** — *(Optional)(Default:* ***null****) You can enter a number from 0.01 to 10000.*

Procedure

1. Fill in all the required fields shown above, and as many of the optional field as you need.
   a) (Option 1) Click **NEXT** to proceed to the Add / Edit / Delete Bearings step.
   b) (Option 2) Click **APPLY & CLOSE** to save your changes and exit this configuration.
   c) (Option 3) Click **X** to close the **Configuration Side Panel** without saving your changes.
2. Add / Edit / Delete Bearings
3. Set Fault Frequencies

Configure Transfer Gear

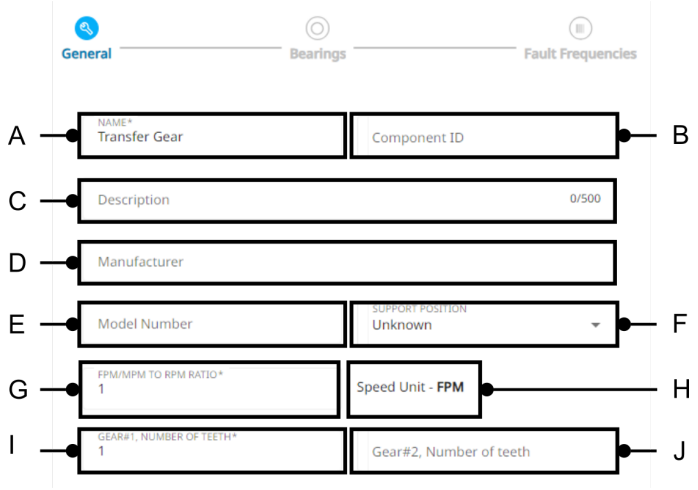
To configure a **Transfer Gear Component** you need to fill in the information for three steps:

1. The **General** configuration step.
2. The Add / Edit / Delete Bearings configuration step.
3. The Set Fault Frequencies configuration step.

Prerequisites

Double-click on the **Component** you want to configure to enter the **General** configuration step.

Figure 3-47: General Configuration



A. ***NAME*** *— (Required) By default the* ***NAME*** *is set to* ***Transfer Gear****.*
B. ***Component ID*** *— (Optional) You can enter an optional* ***Component ID****.*
C. ***DESCRIPTION*** *— (Optional) (500 characters) You can enter an optional* ***DESCRIPTION****.*
D. ***MANUFACTURER*** *— (Optional) You can enter an optional* ***MANUFACTURER****.*
E. ***MODEL NUMBER*** *— (Optional) You can enter an optional* ***MODEL NUMBER****.*
F. ***SUPPORT POSITION*** *— (Optional)(Default: Unknown) You can select a* ***SUPPORT POSITION*** *from this dropdown menu. (****Unknown****/****Bottom****/****Side****/****Top****/****End****)*
G. ***FPM/MPM TO RPM RATIO*** *— (Required)(Default: 1) This ratio can be from 0.1 to 100 000.*
H. ***Speed Unit*** *— (Required) The* ***Speed Unit*** *is set for the whole* ***Roll / Pulley Section****. See: Set Roll / Pulley Section Parameters*
I. ***GEAR#1, NUMBER OF TEETH*** *— (Required) You can enter a number from 1 to 10000.*
J. ***MODEL NUMBER*** *— (Optional) You can enter a number from 1 to 10000.*

Procedure

1. Fill in all the required fields shown above, and as many of the optional field as you need.
   a) (Option 1) Click **NEXT** to proceed to the Add / Edit / Delete Bearings step.
   b) (Option 2) Click **APPLY & CLOSE** to save your changes and exit this configuration.
   c) (Option 3) Click **X** to close the **Configuration Side Panel** without saving your changes.
2. Add / Edit / Delete Bearings
3. Set Fault Frequencies

Common Configuration Tasks

In AMS Machine Works some configuration tasks are used with many types of **Component**.

These tasks are:

- Set Fault Frequencies
- Define the Number of Lobes per Rotor
- Define the Number of Teeth per Gear
- Add Blades
- Add / Edit / Delete Bearings

Set Fault Frequencies

Every **Component** in AMS Machine Works, except for **Coupling Components**, has some standard **Fault Frequencies** associated with it.

The **User** can add up to 10 more **Custom Fault Frequencies**.

A **Fault Frequency** can be measured in either **Hz** or **Order**.

1. If a **Fault Frequency** value is defined in **Hz**, it has constant value independent of the actual rotational running speed of the **Component**.
2. If a **Fault Frequency** value is defined in **Order**, it is a multiplier of the actual rotational running speed of the **Component** so the actual value of the **Fault Frequency** in **Hz** changes as the rotational speed varies.

Prerequisites

Double click on the **Component** you want to configure in **Step One** of the **Design Studio Process**.

Click on the last **Component Configuration** task, **Fault Frequencies**.

Procedure

1. Click **+ ADD FAULT FREQUENCY**.
   A new row is added to the list of fault frequencies. (Max: 10 rows)
2. (Optional) Fill in the **Description** field. (Default: Fault Frequency # X) where X is the number of the row.
3. Fill in the **Value** field to define when the fault occurs. (Default: 1) (Range: 0.0001 to 100 000)
4. (Optional) Choose the **Unit** the **Value** is measured in.
   - **Hz** — Default.
   - **Order** — A multiple of the rotational speed of a **Component** (1xRMP, 2xRPM, 3xRPM, etc.)
5. (Optional) Click the **Trash** icon to delete a **Custom Fault Frequency** that is not needed or inaccurate.

   Note
   Do not leave inaccurate or unnecessary **Custom Fault Frequency** definitions, as these may trigger improper alerts.

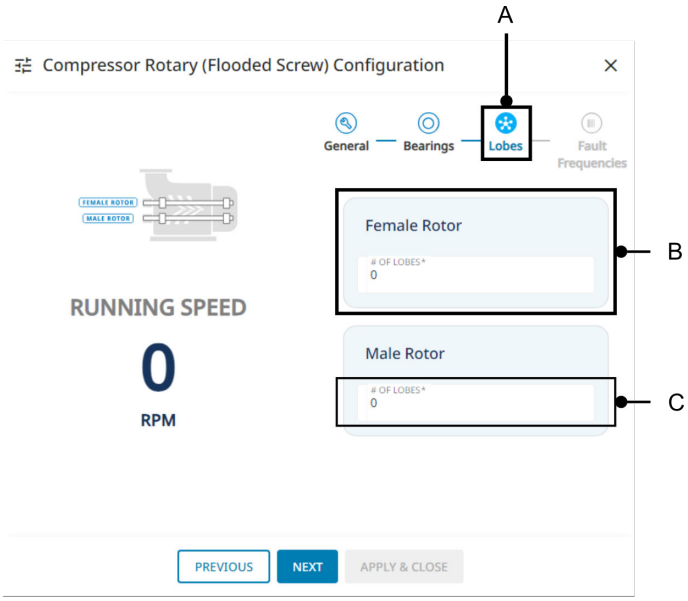
Define the Number of Lobes per Rotor

The number of **Lobes** on a **Rotor** can be defined.

Prerequisites

You must be on the **Lobes** step of the configuration process for a **Component**.

Figure 3-48: Lobes Configuration Step



A. ***Lobes*** *— Shows that the* ***Lobes*** *step is active.*
B. ***Rotor*** *— A* ***Rotor*** *on this* ***Component****.*
C. ***# OF LOBES*** *— (Required) (Default: 0) The number of* ***Lobes*** *on a* ***Rotor****.*

Procedure

1. For each **Rotor** enter an integer from 0 to 1000 into the **# OF LOBES** field.
2. When every **Rotor** is configured properly, click **NEXT** or **APPLY & CLOSE** to save your changes.
3. (Optional) Click **PREVIOUS**, or click **X**, to discard your changes without saving.

Define the Number of Teeth per Gear

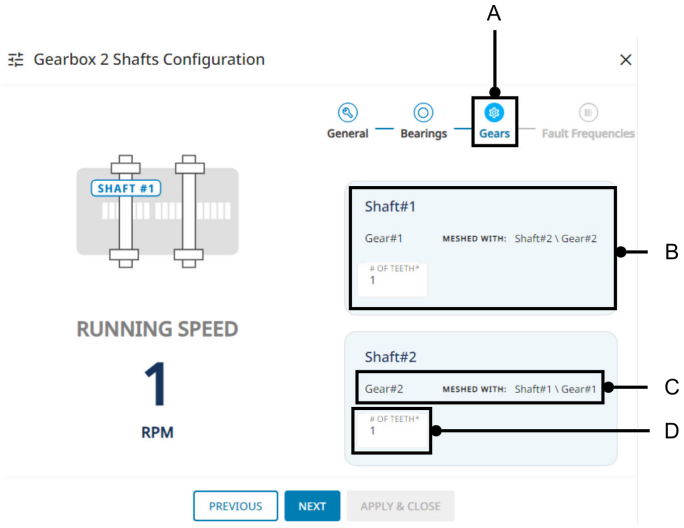
An **Epicyclic Gearbox**, other types of **Gearboxes**, and **Compressors** can have a number of **Gear** elements added.

The **Speed Ratio** between **Shafts** is set by the number of **Teeth** on a **Gear** on a **Shaft**, to the number of **Teeth** on another **Gear** on a different **Shaft**.

Prerequisites

You must be on the **Gears** step of the configuration process for a **Component**.

Figure 3-49: Gears Configuration Step



A. ***Gears*** *— Shows that the* ***Gears*** *step is active.*
B. ***Shaft #*** *— A* ***Shaft*** *on this* ***Component*** *with one or two* ***Gear*** *elements.*
C. ***MESHED WITH:*** *— This defines the relationship between* ***Shafts****.* ***Gear # X*** *on this* ***Shaft*** *is meshed with* ***Gear # Y*** *on* ***Shaft # Z***
D. ***# OF TEETH*** *— (Required) (Default: 1) The number of* ***Teeth*** *on a* ***Gear****.*

Procedure

1. For each **Gear** enter an integer from 0 to 1000 into the **# OF TEETH** field.
2. When every **Gear** on every **Shaft** is configured properly, click **NEXT** or **APPLY & CLOSE** to save your changes.
3. (Optional) Click **PREVIOUS**, or click **X**, to discard your changes without saving.

Add Blades

The number of **Blades** in a **Fan**, **Turbine**, **Pump**, or **Compressor** can be defined.

There are four types of **Blade** configurations:

1. **Fan Blade Rows** — A **Fan** has:
   a. From 0 to 20 **Blade Rows**
   b. From 0 to 1000 **# OF BLADES** per **Blade Row**.
2. **Pump Blade Rows** — A **Pump** has:
   a. From 0 to 20 **Blade Rows**.
   b. From 0 to 1000 **# OF IMPELLER VANES** per **Blade Row**.
   c. From 0 to 1000 **# OF DIFFUSER VANES** per **Blade Row**.
3. **Centrifugal Compressor / Turbine Blade Rows** — A **Centrifugal Compressor / Turbine** has:

a. From 0 to 20 **Blade Rows** for a **Centrifugal Compressor**.

b. From 0 to 100 **Blade Rows** for a **Turbine**.

c. From 0 to 1000 **# OF ROTATING BLADES** per **Blade Row**.

d. From 0 to 1000 **# OF STATIONARY BLADES** per **Blade Row**.

4. **Bull Gear Centrifugal Compressor Blade Rows** — A **Bull Gear Centrifugal Compressor** has:
   a. 4 **Stages**.
   b. From 0 to 1000 **# OF IMPELLER BLADES 1** per **Stage**.
   c. From 0 to 1000 **# OF IMPELLER BLADES 2** per **Stage**.

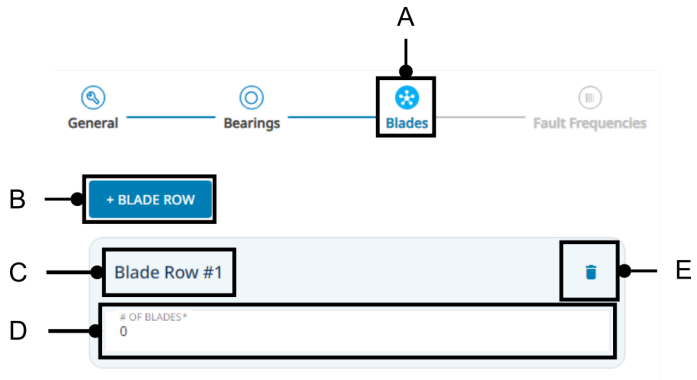
Prerequisites

You must be on the **Blades** step of the configuration process for a **Component**.

Procedure

1. (Option 1) With **Fans** you can add up to 20 **Blade Rows**.

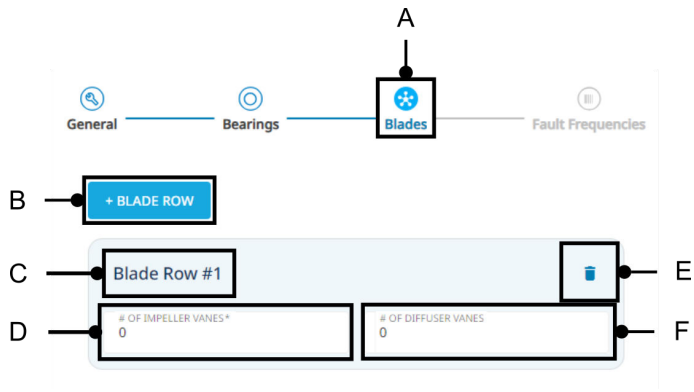
Figure 3-50: Fan Blade Rows



*A. **Blades** — Shows that the **Blades** step is active.*
*B. **+ BLADE ROW** — Click **+ BLADE ROW** to add a **Blade Row** to the **Fan**. (From 0 to 20 **Blade Rows**.)*
*C. **BLADE ROW #** — Shows the number of the **Blade Row**.*
*D. **Trash Icon** — Click the **Trash Icon** to delete a **Blade Row**.*
*E. **# OF BLADES** — Enter a number of **Blades** from 0 to 1000.*

2. (Option 2) With **Pumps** you can add up to 20 **Blade Rows**.

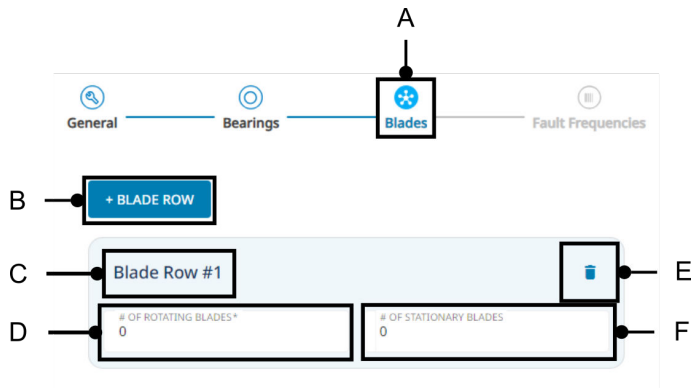
Figure 3-51: Pump Blade Rows



A. ***Blades*** *— Shows that the* ***Blades*** *step is active.*
B. ***+ BLADE ROW*** *— Click* ***+ BLADE ROW*** *to add a* ***Blade Row*** *to the* ***Pump****. (From 0 to 20* ***Blade Rows****.)*
C. ***BLADE ROW #*** *— Shows the number of the* ***Blade Row****.*
D. ***Trash Icon*** *— Click the* ***Trash Icon*** *to delete a* ***Blade Row****.*
E. ***# OF IMPELLER VANES*** *— Enter a number of* ***Impeller Vanes*** *from 0 to 1000.*
F. ***# OF DIFFUSER VANES*** *— Enter a number of* ***Diffuser Vanes*** *from 0 to 1000.*

3. (Option 3) With **Centrifugal Compressors / Turbines** you can add **Blade Rows**.

Figure 3-52: Centrifugal Compressor / Turbine Blade Rows

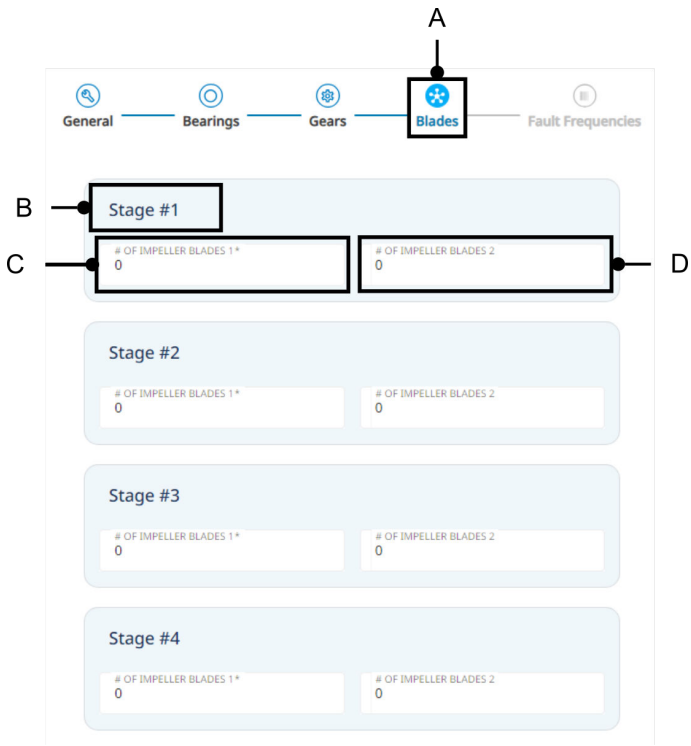


A. ***Blades*** *— Shows that the* ***Blades*** *step is active.*
B. ***+ BLADE ROW*** *— Click* ***+ BLADE ROW*** *to add a* ***Blade Row*** *to a* ***Centrifugal Compressor / Turbine****.*
   - *From 0 to 20* ***Blade Rows*** *for a* ***Centrifugal Compressor****.*
   - *From 0 to 100* ***Blade Rows*** *for a* ***Turbine****.*

C. ***BLADE ROW #*** *— Shows the number of the* ***Blade Row****.*
D. ***Trash Icon*** *— Click the* ***Trash Icon*** *to delete a* ***Blade Row****.*
E. ***# OF ROTATING BLADES*** *— Enter a number of* ***Rotating Vanes*** *from 0 to 1000.*
F. ***# OF STATIONARY BLADES*** *— Enter a number of* ***Stationary Vanes*** *from 0 to 1000.*

4. (Option 4) With **Bull Gear Centrifugal Compressors** you can add **Blades** to each of the four **Stages**.

Figure 3-53: Centrifugal Compressor / Turbine Blade Rows



A. ***Blades*** *— Shows that the* ***Blades*** *step is active.*
B. ***Stage #*** *— Shows the number of the* ***Stage****, (1 to 4).*
C. ***# OF IMPELLER BLADES 1*** *— Enter a number of* ***Impeller Blades*** *from 0 to 1000 for each* ***Stage****.*
D. ***# OF IMPELLER BLADES 2*** *— Enter a number of* ***Impeller Blades*** *from 0 to 1000 for each* ***Stage****.*

5. Add as many **Blades** (0 to 1000) to the **Blade Rows** or **Stages** that your **Component** has.
6. When every **Blade** in every **Blade Row** or **Stage** is configured properly, click **NEXT** or **APPLY & CLOSE** to save your changes.
7. (Optional) Click **PREVIOUS**, or click **X**, to discard your changes without saving.

Add / Edit / Delete Bearings

Every type of **Component** in a **Machine Train** has a specific number of **Measurement Location** elements. Each **Measurement Location** can have up to 9 **Bearing** elements, each with its own **Bearing Interface**.

Note
You can edit a **Bearing** in its **Bearing Interface** at any time.

Prerequisites

Double click on the **Component** you want to configure, and proceed to the **Bearings** configuration step.

Figure 3-54: Add Bearing Interface



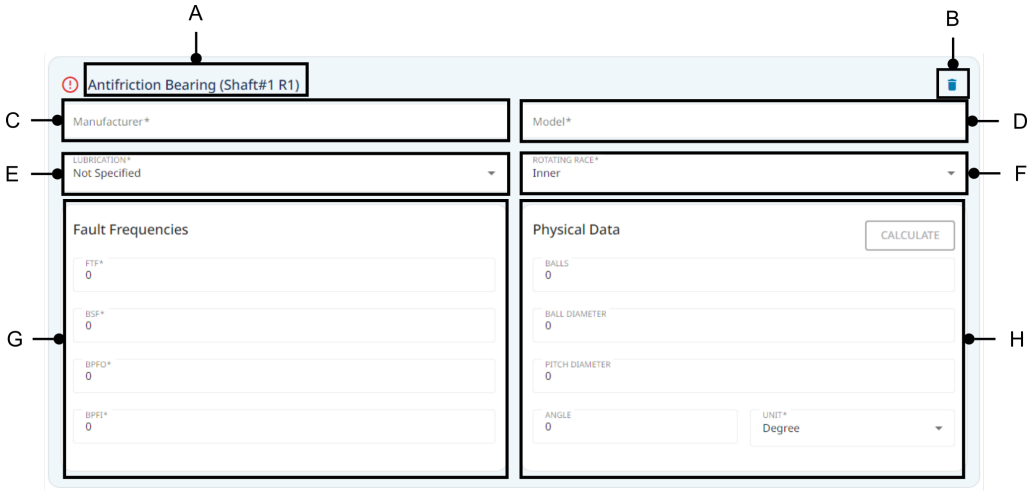
A. ***Bearing Type*** — ***Bearing Type*** *includes:* ***Antifriction*** / ***Sleeve*** / ***Air*** / ***Magnetic*** / ***Not Specified***
B. ***Location*** — *There are two* ***Measurement Locations*** *on each* ***Shaft*** *in a* ***Component****.*
C. ***+ ADD FROM LIBRARY*** — *Add a predefined* ***Bearing*** *from the* ***Bearing Library****. See: Bearing Library*
D. ***+ ADD CUSTOM*** — *Add a custom* ***Bearing*** *for this* ***Location****.*

Procedure

1. Choose a **Location**.
2. To add an **Antifriction** bearing, choose **BEARING TYPE** → **Antifriction** , and then click **+ ADD CUSTOM**.

   An **Antifriction Bearing Configuration Interface** is added at that **Location**.

Figure 3-55: Antifriction Bearing Configuration Interface



A. ***Bearing Type*** *and* ***Bearing Location***
B. *(Optional)* ***Trash Icon*** *— To delete an unnecessary* ***Bearing****, click the* ***Trash Icon****.*
C. *(Required) (Max 50 characters)* ***MANUFACTURER*** *— Enter the name.*
D. *(Required) (Max 50 characters)* ***MODEL*** *— Enter the model.*
E. *(Required)* ***LUBRICATION*** *— Choose from* ***Grease*** */* ***Oil*** */* ***Oil Mist*** */* ***Other*** */* ***Water*** */* ***Not Specified****.*
F. *(Required)* ***ROTATING RACE*** *— Choose between* ***Inner*** */* ***Outer****.*
G. ***Fault Frequencies*** *— Enter the* ***Fault Frequencies*** *if you know them.*

> **⚠ *CAUTION***
>
> *The data in the* ***Fault Frequencies*** *section is recorded in the system when you click* ***APPLY & CLOSE****.*

- *(Required)* ***FTF*** *— (Default: 0) Fundamental Train Frequency, enter a number from 0 to 1.*
- *(Required)* ***BSF*** *— (Default: 0) Ball Spin Frequency, enter an integer from 0 to 99999.*
- *(Required)* ***BPFO*** *— (Default: 0) Ball Pass Frequency Outer, enter a number from 0 to 999.*
- *(Required)* ***BPFI*** *— (Default: 0) Ball Pass Frequency Inner, enter a number from 0 to 999.*

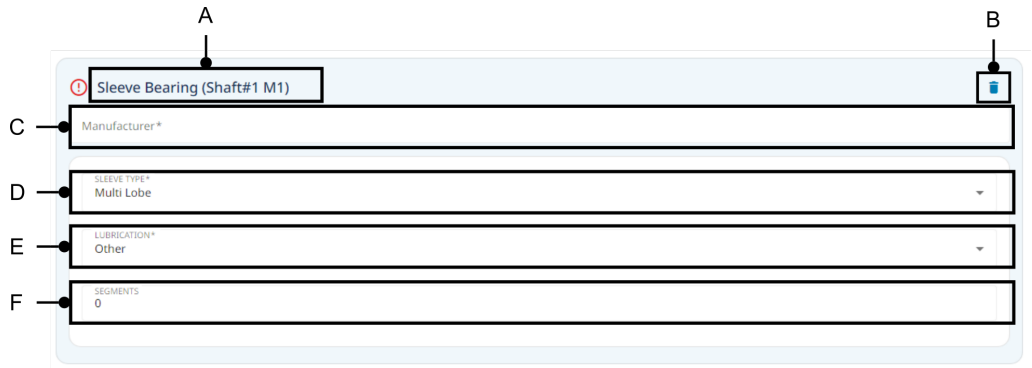
H. ***Physical Data*** *— You can enter the* ***Physical Data*** *of the* ***Antifriction Bearing*** *and then click* ***CALCULATE*** *to automatically fill in the* ***Fault Frequencies****.*
   - *(Optional)* ***CALCULATE*** *— Click* ***CALCULATE*** *only when you are sure that the* ***Physical Data*** *is correct.*
   - *(Optional)* ***BALLS*** *— (Default: 0) Enter an integer from 0 to 999.*
   - *(Optional)* ***BALL DIAMETER*** *— (Default: 0) Enter a number from 0 to 9999.*

- *(Optional)* ***PITCH DIAMETER*** *— (Default: 0) Enter a number from 0 to 9999.*
- *(Optional)* ***ANGLE*** *— (Default: 0) Enter a number from 0 to 90.*
- *(Optional)* ***UNITS*** *— (Default: Degree) Choose between* ***Degree*** *and* ***Radian*** *units for measuring the angle.*

3. To add a **Sleeve** bearing, choose **BEARING TYPE** → **Sleeve** , and then click **+ ADD CUSTOM**.

   A **Sleeve Bearing Configuration Interface** is added at that **Location**.

Figure 3-56: Sleeve Bearing Configuration Interface



A. ***Bearing Type*** *and* ***Bearing Location***

B. (Optional) ***Trash Icon*** *— To delete an unnecessary* ***Bearing****, click the* ***Trash Icon****.*

C. (Required) (Max 50 characters) ***MANUFACTURER*** *— Enter the name.*

D. (Required) ***SLEEVE TYPE*** *— Choose a* ***SLEEVE TYPE****.*

> ***Note***
> *The* ***Segments*** *field is added for the following types of* ***SLEEVE TYPE****: (****Multi-Lobe****,* ***Tilting Pad****,* ***Fixed Pad****,* ***Tilting Pad Thrust****)*

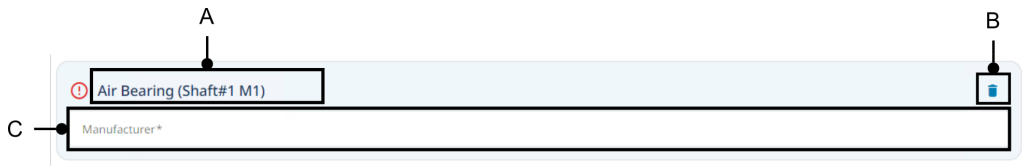
E. (Required) ***LUBRICATION*** *— Choose between* ***Oil Ring*** */* ***Other*** */* ***Pressure Feed*** */* ***Sump****.*

F. (Required) ***Segments*** *— Enter an integer from 1 to 100.*

4. To add an **Air** bearing, choose **BEARING TYPE** → **Air** , and then click **+ ADD CUSTOM**.

   An **Air Bearing Configuration Interface** is added at that **Location**.

Figure 3-57: Air Bearing Configuration Interface



*A. **Bearing Type** and **Bearing Location***
*B. (Optional) **Trash Icon** — To delete an unnecessary **Bearing**, click the **Trash Icon**.*
*C. (Required) (Max 50 characters) **MANUFACTURER** — Enter the name.*

5. To add a **Magnetic** bearing, choose **BEARING TYPE** → **Magnetic** , and then click **+ ADD CUSTOM**.

   A **Magnetic Bearing Configuration Interface** is added at that **Location**.

Figure 3-58: Magnetic Bearing Configuration Interface



*A. **Bearing Type** and **Bearing Location***
*B. (Optional) **Trash Icon** — To delete an unnecessary **Bearing**, click the **Trash Icon**.*
*C. (Required) (Max 50 characters) **MANUFACTURER** — Enter the name.*

6. To add bearing of any other type or an unknown type, choose **BEARING TYPE** → **Not Specified** , and then click **+ ADD CUSTOM**.

   A **Custom Bearing Configuration Interface** is added at that **Location**.

Figure 3-59: Custom Bearing Configuration Interface



*A. **Bearing Type** and **Bearing Location***
*B. (Optional) **Trash Icon** — To delete an unnecessary **Bearing**, click the **Trash Icon**.*
*C. (Required) (Max 50 characters) **MANUFACTURER** — Enter the name.*

7. Continue adding **Bearings** until your **Component** is fully configured. (Maximum 9 per **Location**.)
8. When all the bearings are configured you can either:
   a) Click **NEXT** to proceed to the next step in the **Component** configuration process.

b) Click **APPLY & CLOSE** to save your changes and exit the **Component** configuration process.

Editing and Deleting Machine Trains or Roll / Pulley Sections

If a **Machine Train** or **Roll / Pulley Section** is no longer needed you can delete it.

You can edit a **Machine Train** or **Roll / Pulley Section** whenever you need to.

Prerequisites

Open the **Design Studio** module in a browser tab.

Procedure

1. To **edit** a **Machine Train** or **Roll /Pulley Section**:
   - Select: **Design Studio** → **Design Studio Navigator** → **Hierarchy Tab** → **Click on Item**
   - Select: **Design Studio** → **Design Studio Navigator** → **Hierarchy Tab** → **Right Click on Item** → **Edit**

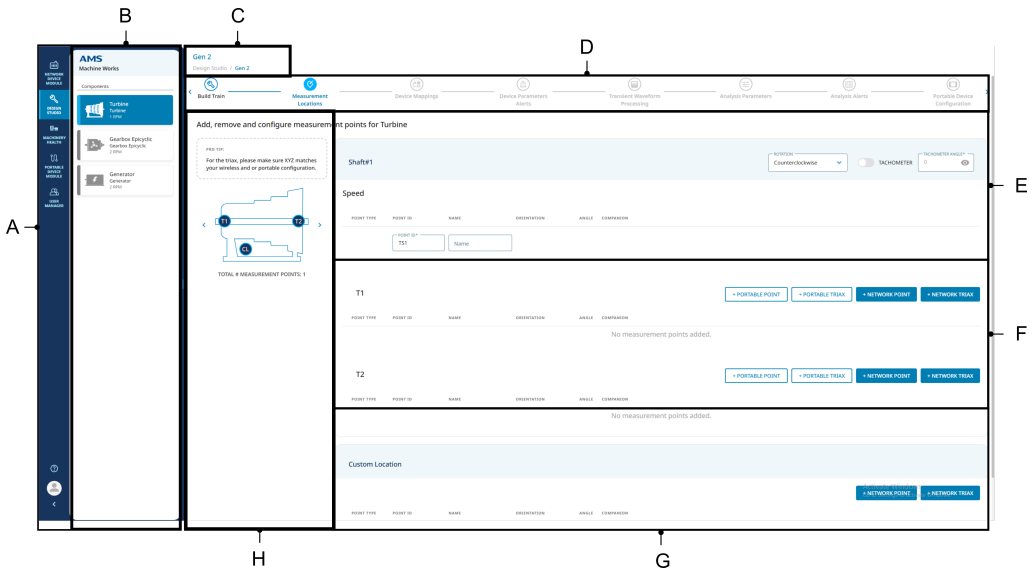
   You can now edit normally. See: Design Studio Process
2. To **delete** a **Machine Train** or **Roll / Pulley Section**, select: **Design Studio** → **Design Studio Navigator** → **Hierarchy Tab** → **Right Click on Item** → **Delete**
   - Click **Confirm** to **delete** the item that you selected.
   - Click **Cancel**

   When you choose **Confirm**, the **Machine Train to exit without making any changes.** or **Roll / Pulley Section** is deleted and all the **Tags** that it used are available to be used again. See: License Functions

3.4.2 Step Two: Measurement Locations

After a **Machine Train** or **Roll / Pulley Section** has every **Component** configured in Step One: Build Train, the next step is to add **Measurement Points** to the **Measurement Locations** and **Custom Locations**. Additionally, every **Shaft** can have its **Rotation** configured and a **Tachometer** added.

Figure 3-60: Step Two: Measurement Locations Interface



A. ***Sidebar*** — *This area contains icons for the other modules and settings available in AMS Machine Works.*
B. ***Component Drawer*** — *Contains a list of every* ***Component*** *in the* ***Machine Train*** *or* ***Roll / Pulley Section****.*
C. ***Breadcrumb Path*** — *Contains links to the higher levels of the* ***Train Builder*** *module.*
D. ***Step Selector*** — *Contains links to all the steps of the* ***Train Builder*** *process.*
E. ***Rotation Direction and Tachometer Configuration*** — *Contains controls for:*
   - *Setting the direction of the shaft's* ***Rotation****.*
   - *Enabling the use of a* ***Tachometer*** *on this* ***Shaft****.*
   - *Setting the* ***Tachometer Angle*** *if a* ***Tachometer*** *is in use.*
F. ***Measurement Locations*** — *Contains the* ***Measurement Locations*** *and the controls for adding both* ***Network Measurement Points*** *and* ***Portable Measurement Points****.*
G. ***Custom Location*** — *Contains the controls for adding* ***Network Measurement Points****.*
H. ***Component Diagram*** — *Contains a diagram of the currently selected* ***Component*** *showing the* ***Measurement Locations*** *and the* ***Custom Location****. Contains* ***Forward Arrow****, and* ***Backward Arrow*** *controls for cycling through the* ***Components****.*

Prerequisites

Complete Step One: Build Train.

Procedure

1. Select each **Component** from the **Component Drawer** in turn, or by using the arrows in the **Component Diagram** section to cycle through each **Component**.
2. For each **Component** configure the following:
   a) (Optional) Configure the **Rotation**. See: Configure Rotation Direction and Tachometer

b) (Optional) Configure every **Network Point** that you need. See: Add and Configure a Network Point

c) (Optional) Configure every **Network Triax** that you need. See: Add and Configure a Network Triax

d) (Optional) Configure every **Portable Point** that you need. See: Add and Configure a Portable Point

e) (Optional) Configure every **Portable Triax** that you need. See: Add and Configure a Portable Triax

3. When you have configured all the **Measurement Points** that you need, click on **Device Mappings** in the **Header Area** to move to Step Three: Device Mappings

Step 2: Common Tasks

Every **Component** has a specific number of **Measurement Locations** and one **Custom Location**, which can hold a total of 62 **Measurement Points**.

On each **Measurement Location** you can define the following types of **Measurement Points**:

1. **NETWORK POINT** — See: Add and Configure a Network Point
2. **NETWORK TRIAX** — See: Add and Configure a Network Triax
3. **PORTABLE POINT** — See: Add and Configure a Portable Point
4. **PORTABLE TRIAX** — See: Add and Configure a Portable Triax

Every **Component** has one **Custom Location** on which you can define the following types of **Measurement Points**:

1. **NETWORK POINT** — See: Add and Configure a Network Point
2. **NETWORK TRIAX** — See: Add and Configure a Network Triax

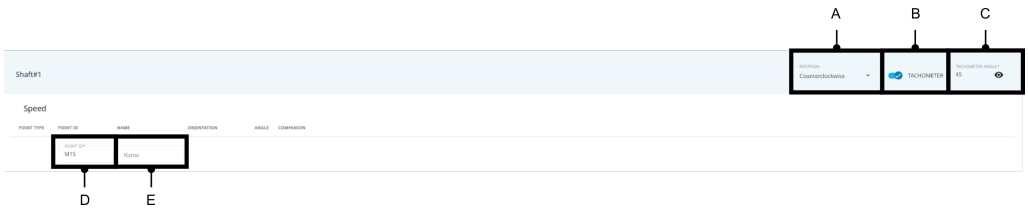
Every **Shaft** in each **Component** has a point for configuring its rotational frequency:

Configure Rotational Frequency — See: Configure Rotation Direction and Tachometer

Configure Rotation Direction and Tachometer

Every **Shaft** on every **Component** has five settings which can be configured:

Figure 3-61: Rotation Direction and Tachometer Configuration



A. ***Rotation*** *—* ***Rotation*** *can be either* ***Clockwise*** *or* ***Counterclockwise*** *The* ***Rotation*** *does not change the data, but does change how it is displayed.*

> ***Note***
> ***Clockwise*** *versus* ***Counterclockwise*** *rotation depends on your perspective. Some companies or organizations use the perspective from source to load, and others use the opposite. In some machines a* ***Shaft*** *can rotate in both directions. Choose the perspective that makes the most sense for your analysis.*

B. ***TACHOMETER*** *—* ***Tachometer*** *toggle.*
C. ***TACHOMETER ANGLE*** *— The* ***Tachometer Angle*** *increases in the direction* ***opposite*** *to the* ***Rotation****. The* ***Tachometer Angle*** *does not change the data, but does change how it is displayed.*
D. ***Point ID*** *— (Required) (Prefilled) (1 to 128 characters) The* ***Point ID*** *of the* ***Measurement Point*** *for the* ***Tachometer*** *must be unique within the context of the* ***Component****.*
E. ***Name*** *— (Optional) (1 to 128 characters) This is a name or short description of this* ***Measurement Point****.*

Prerequisites

Select a **Component**, and determine which **Shaft** to configure.

Note

Every **Component** has at least one **Shaft**, and some **Components** have multiple **Shafts**.

Some **Components** refer to **Male Rotors**, **Female Rotors**, and **Stage #** instead of a **Shaft**, but the configuration process is the same.

Procedure

1. Set the **Rotation** for the **Shaft** according to the perspective used in your company or organization.
   - **Clockwise**
   - (Default) **Counterclockwise**

   ⚠ CAUTION

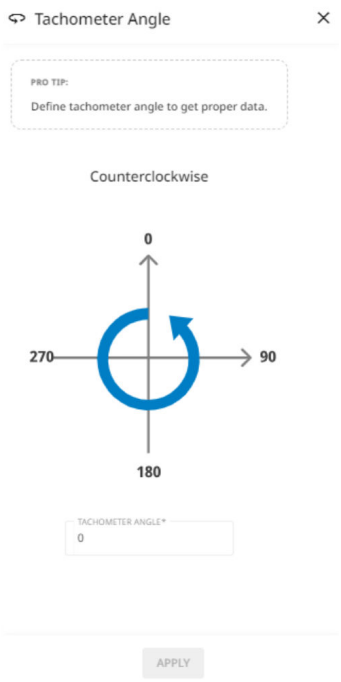
   When you change the **Rotation** direction, the angles for pre-existing **Radial X** and **Radial Y** points are not automatically updated. You must adjust these manually.

2. (Optional) If a **Tachometer** is being used on this **Shaft**, click this toggle into the **On**.
   - (Default) **Off**

- **On**

3. (Optional) Enter an **integer** number from 0 to 359 directly in the **Tachometer Angle** field.
    a) (Alternative Procedure) Click the **Eye Icon** to open the **Tachometer Angle Side Panel**.

Figure 3-62: Tachometer Angle Side Panel



    b) (Alternative Procedure) Observe in which direction the **Tachometer Angle** increases.
    c) (Alternative Procedure) Enter an **integer** number from 0 to 359 in the **Tachometer Angle** field found in the **Tachometer Angle Side Panel**.
    d) (Alternative Procedure) Click **Apply** to record your change, or click **X** to close the side panel without making a change.
4. (Optional) (Prefilled) (1 to 128 characters) Change the unique **Point ID** from its current value. The new value must be unique within the context of the **Component**.
5. Set the name.

Add and Configure a Network Point

A **Network Point** can have a single measurement from a **Measurement Device** mapped to it.

Prerequisites

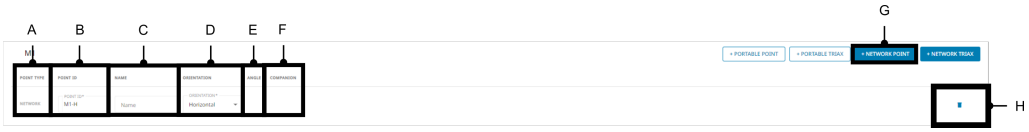
Select a **Component**, and determine which **Location** to add a **Network Point** to.

Note
Every type of **Component** has at least one **Measurement Location**, and one **Custom Location** where you can add a **Network Point**.

Procedure

1. In the area for the **Location** you have selected, click **+ Network Point**.

Figure 3-63: Network Point Configuration

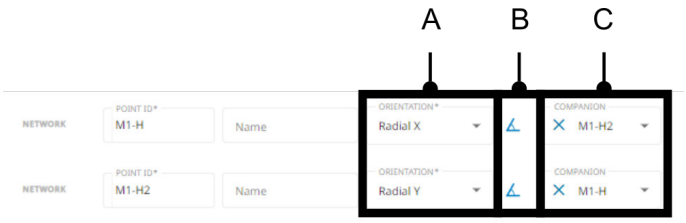


*A. **Point Type** — **NETWORK** is displayed for a **Network Point**.*
*B. **Point ID** — (Required) This field must be unique and can have up to 128 characters. It is filled with a unique value when it is created.*
*C. **Name** — (Optional) This field does not have to be unique and can have up to 128 characters.*
*D. **Orientation** — (Required) The default value of this field is **Horizontal**. (**Horizontal**, **Vertical**, **Axial**, **Radial X**, **Radial Y**, **Radial**, **Other**)*
*E. **Angle** — (Optional) This is the angle between a **Radial X** point and a **Radial Y** point which are **Companions**.*
*F. **Companion** — (Optional) **Radial X** and **Radial Y** points can form **Companion** pairs.*
*G. **+ Network Point** — Click this button to add a **Network Triax** to the **Measurement Location**, or **Custom Location**.*
*H. **Trash Icon** — Click the **Trash Icon** to delete the **Point**.*

A new **Network Point** has been created.

2. (Optional) Enter from 1 to 128 characters to create a **Point ID** for this point.
3. (Optional) Enter from 1 to 128 characters to create a **Name** for this point.
4. (Optional) Choose the **Orientation** of this **Measurement Point**.
   - (Default) **Horizontal**
   - **Vertical**
   - **Axial**
   - **Radial X**
   - **Radial Y**
   - **Radial**
   - **Other**
     a) (Optional) If there is a pair of points, (**Radial X**, **Radial Y**), they can be connected as **Companion Points**. In the **Companion Selection Menu** in the **Companion** column, select a matching **Network Point**.

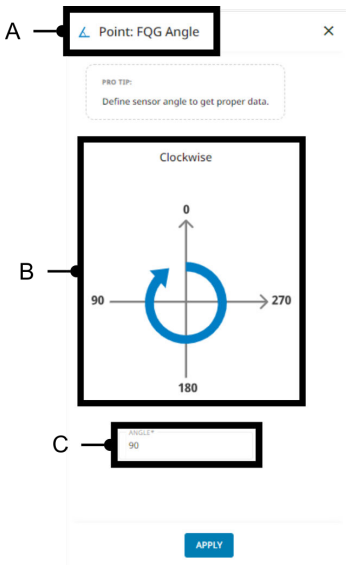
Figure 3-64: Companion Points



A. ***Orientation*** *— Two* ***Network Points****, one with a* ***Radial X Orientation****, and one with a* ***Radial Y Orientation****, can be set as* ***Companion*** *points.*
B. ***Angle Icon*** *— Click this icon to open the* ***Point Angle Side Panel****.*
C. ***Companion*** *— Dropdown menu for selecting a* ***Companion*** *point.*

b) (Optional) View the **Angle** of a point. — In the **Angle Column** click on the **Angle Icon** to open the **Point Angle Side Panel**.

Figure 3-65: Point Angle Side Panel



A. ***Point Name***
B. ***Rotation Direction*** *— (Default:* ***Counterclockwise****) See: Configure Rotation Direction and Tachometer*
C. ***Angle*** *— The default angle between the two points is 90 degrees.*

c) (Optional) Set the **Angle** of a point. — To set a different angle, enter an integer from 0 and 359 in the **Angle** field, and then click **Apply**, or click **X** to close the side panel without making any changes.

Example

1. **Counterclockwise** — (Default) The default rotation is **Counterclockwise**. See: Configure Rotation Direction and Tachometer
   - (Default) **Radial X** = 45 degrees.
   - (Default) **Radial Y** = 315 degrees.
2. **Clockwise** — When you set the rotation to **Clockwise**. See: Configure Rotation Direction and Tachometer
   - (Default) **Radial X** = 315 degrees.
   - (Default) **Radial Y** = 45 degrees.

5. (Optional) To remove a point, click the **Trash** icon in the row for that point.

Add and Configure a Network Triax

A **Network Triax** point contains measurements from an AMS Wireless Vibration Monitor for each orientation (**Horizontal**, **Vertical**, and **Axial**), and a measurement of the surface **Temperature** of the equipment that the AMS Wireless Vibration Monitor is mounted on.

Prerequisites

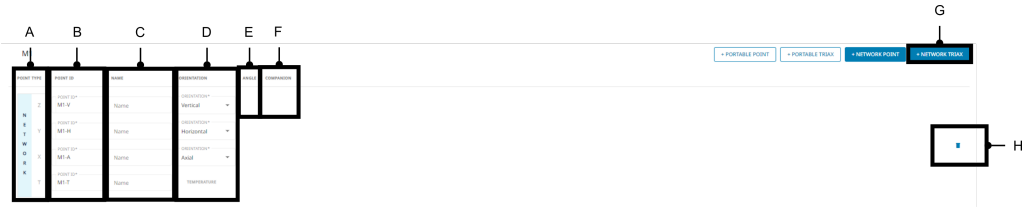
Select a **Component**, and determine which **Location** to add a **Network Triax** to.

Note
Every **Component** has at least two **Measurement Locations**, and one **Custom Location**.

Procedure

1. In the area for the **Location** you have selected, click **+ Network Triax**.

Figure 3-66: Network Point Configuration



A. ***Point Type*** *— **NETWORK** is displayed for a **Network Triax**.*
B. ***Point ID*** *(4) — (Required) This field must be unique and can have up to 128 characters. It is filled with a unique value when it is created.*
C. ***Name*** *(4) — (Optional) This field does not have to be unique and can have up to 128 characters.*
D. ***Orientation*** *(4) — (Required) The default value of these fields are:*
    A. ***Horizontal***
    B. ***Vertical***
    C. ***Axial***
    D. ***Temperature*** *(Not configurable)*
E. ***Angle*** *— (Not Applicable)*
F. ***Companion*** *— (Not Applicable)*
G. ***+ Network Triax*** *— Click this button to add a **Network Triax** to the **Measurement Location**, or **Custom Location**.*
H. ***Trash Icon*** *— Click the **Trash Icon** to delete the **Network Triax**.*

A new **Network Triax** is created.

2. (Optional) For each of the **Point ID** fields, enter from 1 to 128 characters to create a **Point ID** for this point.
3. (Optional) For each of the **Name** fields, enter from 1 to 128 characters to create a **Name** for this point.
4. (Optional) For each of the three **Orientation** fields, choose the **Orientation** of this **Measurement Point**.
    - **Horizontal**
    - **Vertical**
    - **Axial**

Note
The **Orientation** of the fourth field of a **Network Triax** is permanently set to **Temperature**.

5. (Optional) To remove a point, click the **Trash** icon in the row for that point.

Add and Configure a Portable Point

A **Portable Point** can have a single measurement mapped to it. This measurement is gathered by an AMS 2140 Machinery Health Analyzer.

Prerequisites

Select a **Component**, and determine which **Location** to add a **Portable Point** to.

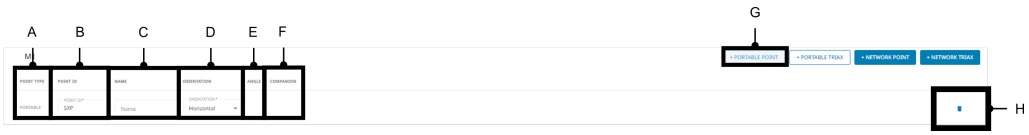
Note

Every **Component** has at least two **Measurement Locations**, and one **Custom Location**.

Procedure

1. In the area for the **Location** you have selected, click **+ Portable Point**.

Figure 3-67: Portable Point Configuration



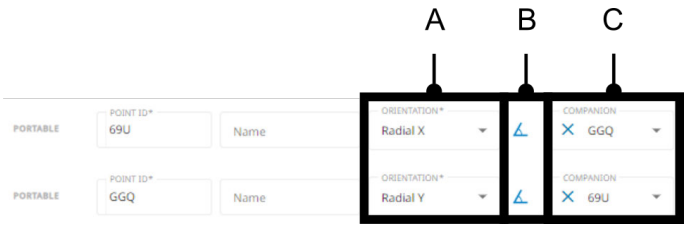
*A. **Point Type** — **PORTABLE** is displayed for a **Portable Point**.*
*B. **Point ID** — (Required) This field must be unique and can have 1 to 3 characters. It is filled with a unique value when it is created.*
*C. **Name** — (Optional) This field does not have to be unique and can have 0 to 32 characters.*
*D. **Orientation** — (Required) The default value of this field is **Horizontal**. (**Horizontal**, **Vertical**, **Axial**, **Radial X**, **Radial Y**, **Radial**, **Other**)*
*E. **Angle** — (Optional) This is the angle between a **Radial X** point and a **Radial Y** point which are **Companions**.*
*F. **Companion** — (Optional) **Radial X** and **Radial Y** points can form **Companion** pairs.*
*G. **+ Portable Point** — Click this button to add a **Portable Point** to the **Measurement Location**.*
*H. **Trash Icon** — Click the **Trash Icon** to delete the **Point**.*

A new **Portable Point** has been created.

2. (Optional) Enter from 1 to 3 characters to create a **Point ID** for this point.
3. (Optional) Enter from 1 to 32 characters to create a **Name** for this point.
4. (Optional) Choose the **Orientation** of this **Measurement Point**.
   - (Default) **Horizontal**
   - **Vertical**
   - **Axial**
   - **Radial X**
   - **Radial Y**
   - **Radial**
   - **Other**

a) (Optional) If there is a pair of points, (**Radial X**, **Radial Y**), they can be connected as **Companion Points**. In the **Companion Selection Menu** in the **Companion** column, select a matching **Portable Point**.

Figure 3-68: Companion Points



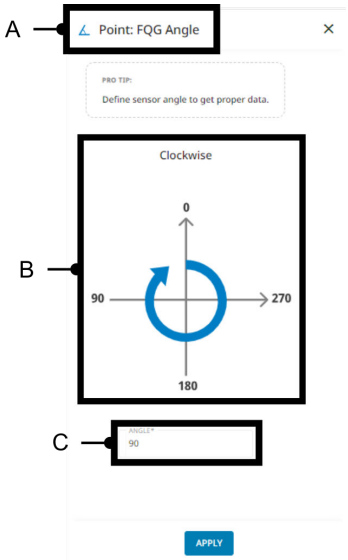
*A. **Orientation** — Two **Portable Points**, one with a **Radial X Orientation**, and one with a **Radial Y Orientation**, can be set as **Companion** points.*

*B. **Angle Icon** — Click this icon to open the **Point Angle Side Panel**.*

*C. **Companion** — Dropdown menu for selecting a **Companion** point.*

b) (Optional) View the **Angle** of a point. — In the **Angle Column** click on the **Angle Icon** to open the **Point Angle Side Panel**.

Figure 3-69: Point Angle Side Panel



*A. **Point Name***

*B. **Rotation Direction** — (Default: **Counterclockwise**) See: Configure Rotation Direction and Tachometer*

*C. **Angle** — The default angle between the two points is 90 degrees.*

c) (Optional) Set the **Angle** of a point. — To set a different angle, enter an integer from 0 and 359 in the **Angle** field, and then click **Apply**, or click **X** to close the side panel without making any changes.

Example

1. **Counterclockwise** — (Default) The default rotation is **Counterclockwise**. See: Configure Rotation Direction and Tachometer
   - (Default) **Radial X** = 45 degrees.
   - (Default) **Radial Y** = 315 degrees.
2. **Clockwise** — When you set the rotation to **Clockwise**. See: Configure Rotation Direction and Tachometer
   - (Default) **Radial X** = 315 degrees.
   - (Default) **Radial Y** = 45 degrees.

5. (Optional) To remove a point, click the **Trash** icon in the row for that point.

Add and Configure a Portable Triax

A **Portable Triax** point contains measurements from an AMS Wireless Vibration Monitor for each orientation, **Horizontal**, **Vertical**, and **Axial**.

Prerequisites

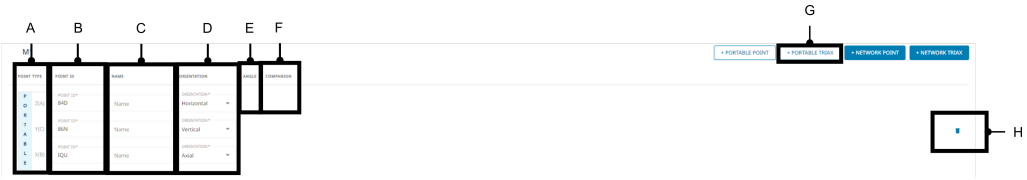
Select a **Component**, and determine which **Location** to add a **Portable Triax** to.

Note
Every **Component** has at least two **Measurement Locations**, and one **Custom Location**.

Procedure

1. In the area for the **Location** you have selected, click **+ Portable Triax**.

Figure 3-70: Portable Point Configuration



A. ***Point Type*** *— **PORTABLE** is displayed for a **Portable Triax**.*
B. ***Point ID*** *(3) — (Required) This field must be unique and can have 1 to 3 characters. It is filled with a unique value when it is created.*
C. ***Name*** *(3) — (Optional) This field does not have to be unique and can have 0 to 32 characters.*
D. ***Orientation*** *(3) — (Required) The default value of these fields are:*
    A. ***Horizontal***
    B. ***Vertical***
    C. ***Axial***
E. ***Angle*** *— (Not Applicable)*
F. ***Companion*** *— (Not Applicable)*
G. ***+ Portable Triax*** *— Click this button to add a **Portable Triax** to the **Measurement Location**.*
H. ***Trash Icon*** *— Click the **Trash Icon** to delete the **Network Triax**.*

A new **Network Triax** is created.

2. (Required)(Prefilled) For each of the **Point ID** fields, enter from 1 to 3 characters to create a **Point ID** for this point. these are filled with unique IDs when the **Portable Triax** point is created.
3. (Optional) For each of the **Name** fields, enter from 0 to 32 characters to create a **Name** for this point.
4. (Optional) For each of the three **Orientation** fields, choose the **Orientation** of this **Measurement Point**.
    - **Horizontal**
    - **Vertical**
    - **Axial**
5. (Optional) To remove a point, click the **Trash** icon in the row for that point.

3.4.3 Step Three: Device Mappings

Every **Measurement Point** that was defined for every **Measurement Location** or **Custom location** can have a **Measurement Device** or an **OPC UA** tag mapped to it.

Every **Network Point**, **Network Triax**, and **OPC UA** tag is mapped in this step.

Note
Portable Point and **Portable Triax** are mapped in a different step. See: Step Eight: Portable Device Configuration.

Shaft Speed Points and SpeedAI

SpeedAI maintains a short term trend of **Machine Trains** and **Roll / Pulley Sections**which have actual speed measurements available. When Wireless Vibration Monitor waveform/ spectrum data arrives, SpeedAI analyzes the timestamps the of data collection, calculates the speed ratio for the measurement location, and then enhances waveform/spectrum with actual speed information.

SpeedAI determines the speed of every element in a **Machine Train** or **Roll / Pulley Section** through calculation and analysis of measurements mapped to the **Speed Point** on the shaft of the **Asset** designated as the source for the reference speed, **Train Speed At**.

⚠ CAUTION

SpeedAI functionality is only enabled when speed measurements are configured for this specific point on a **Machine Train** or **Roll / Pulley Section**.

See:

1. Set Machine Train Parameters
2. Set Roll / Pulley Section Parameters

Prerequisites

For each **Network Point** and **Network Triax**, you must have **Measurement Devices** configured in the Network Device Module before you can add them to the **Components** in your **Machine Train** or **Roll / Pulley Section**.

Procedure

1. Every **Measurement Device** which is connected to the **Machine Train** or **Roll / Pulley Section** must be added to the **Component** it is connected to. See: Add a Device
2. Every **OPC Tag** which is connected to the **Machine Train** or **Roll / Pulley Section** must be added to the **Component** it is connected to. See: Add an OPC UA Tag to an Asset
3. (Optional) If there are any incorrectly assigned **Measurement Devices**, they must be removed. See: Remove a Device
4. Each **Device Source** associated with the **Machine Train** or **Roll / Pulley Section** must be mapped to a **Measurement Point**. See: Add a Mapping

   ⚠ CAUTION

   AMS Asset Monitor and AMS 6500 ATG units can contain **Device Sources** from multiple **Machine Trains** and **Roll / Pulley Sections**. Verify that your mappings are correct.

5. (Optional) If there are any incorrect mappings, they must be removed. See: Remove a Mapping
6. (Optional) If there are any incorrect **OPC Tags**, they must be removed. See: Remove an OPC UA Tag
7. When every **Measurement Device** has been added, and all the **Measurement Points** that you need have a **Device Source** mapped, you may proceed to Step Four: Device Parameter Alerts

Step 3: Common Tasks

The **Device Mapping** step is for selecting which **Measurement Devices** to map to which **Measurement Points**.

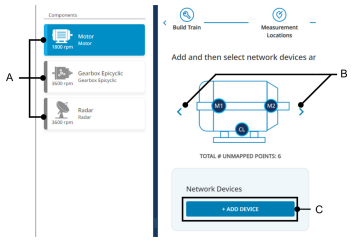
There main actions that you can take in this step are:

1. Add a Device
2. Add a Mapping
3. Remove a Mapping
4. Remove a Device
5. Add an OPC UA Tag to an Asset
6. Remove an OPC UA Tag

Add a Device

The **Measurement Devices** which are monitoring a **Machine Train** or a **Roll / Pulley Section** must be added to a **Component** before specific **Measurements** can be mapped to the **Measurement Points** defined in the previous step, Step Two: Measurement Locations.

Figure 3-71: Add Device



A. ***Components*** *— Select the* ***Component*** *you want to add a* ***Measurement Device*** *to from the* ***Component Drawer****.*
B. ***Previous Component*** *and* ***Next Component*** *selection arrows — Cycle through the* ***Component Drawer*** *to select the* ***Component*** *you want to add a* ***Measurement Device*** *to.*
C. ***Add Device*** *button — Click the* ***Add Device*** *button to open the* ***Select Network Devices Side Panel****.*

Prerequisites

Every **Measurement Device** that is used by this **Machine Train** or **Roll / Pulley Section** must be added to the AMS Machine Works installation in the Network Device Module before it is available for mapping.

Procedure

1. Select the **Component** you need to add a **Measurement Device** to by clicking on its icon in the **Component Drawer** or by cycling through the **Component Drawer** with the arrows beside the **Component Diagram**.
2. Click the **Add Device** button under the **Component Diagram** to open the **Select Network Devices Side Panel**.

Figure 3-72: Select Network Devices Side Panel



A. ***Search and Filtering*** *— Use the* ***Search and Filtering*** *controls to find the correct* ***Measurement Device****.*

B. ***Device Selection Checkboxes*** *— Select* ***Measurement Devices*** *individually, or click the* ***Select All Checkbox*** *at the top of the column to select every available device on this page.*

C. ***Apply (number)*** *button — Click this button to add the currently selected number of* ***Measurement Devices*** *to the* ***Network Device List*** *for this* ***Component****.*

> ***Attention***
> *Ensure that you only add the* ***devices*** *which are actually located on the machine. Incorrectly allocated* ***devices*** *will be unavailable for their proper trains.*

---

3. (Optional) Use the **Searching and Filtering** controls to find the **Measurement Devices** associated with this **Component** quickly.
4. In the **Select Network Devices Side Panel**, select every device that is connected to this **Component**.
5. Click the **Apply (number)** button to add the **Measurement Devices** to the **Component**.

Add a Mapping

There are three types of **Measurement Points** that can have a **Measurement Device** mapped to them.

1. **Shaft Speed Point** — This type of **Measurement Point** should have a **Tachometer** mapped to it.

   ⚠ CAUTION

   The **Shaft Speed Point** on the shaft of the **Asset** designated as the source for **Train Speed At** value must have a **Tachometer** or an **OPC UA** tag configured to accept a **Rotational Speed** value. Without a **Rotational Speed** value, AMS Machine Work's SpeedAI functionality will not work.

   ⚠ CAUTION

   It is not recommend to map a Wireless Vibration Monitor to a **Shaft Speed Point**, only the **Calculated Speed Trend** data will be presented.

2. **Network Point** — This type of **Measurement Point** can have a wide range of **Measurement Devices** mapped to it.
3. **Network Triax** — This type of **Measurement Point** should have an **AMS Wireless Vibration Monitor** mapped to it.

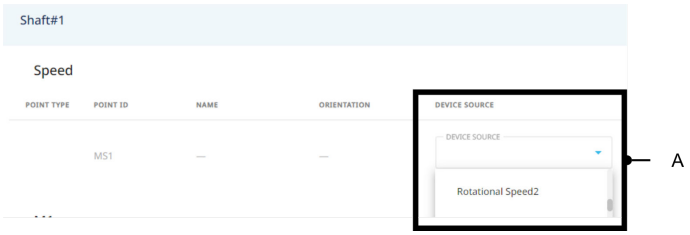
Prerequisites

1. Every **Measurement Point** must have been defined in the **Measurement Locations** step. See: Step Two: Measurement Locations
2. Every **Measurement Device** that needs to be mapped must be added to the **Component**. See: Add a Device

Procedure

1. Locate the **Measurement Point** you want to map.

Figure 3-73: Device Source Dropdown Selector



*A. **Device Source** — This is the list of available **Measurement Devices** for this **Component**.*

2. Choose the correct **Measurement Device** for this **Measurement Point** from the **Device Source** list of available **Measurement Devices**.

Need help?
If the device that you want is not present in the **Device Source List**:

a. Check that it has been added to AMS Machine Works. See: Network Device Module

b. Check that it has been added to a different **Component**. See: Add a Device

3. Repeat Steps 1-2 until all the **Measurement Points** have a **Measurement Device** mapped to them.

Remove a Mapping

To remove a mapping from a **Measurement Point**, click the blue 'X' next to that mapping.

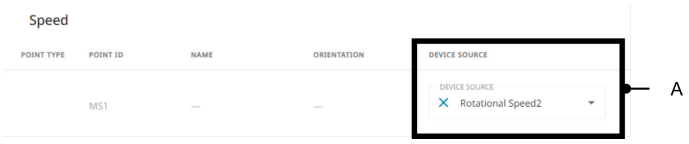
Prerequisites

1. A mapping **Measurement Point** must have been defined in the **Measurement Locations** step. See: Add a Mapping

Procedure

1. Locate the **Measurement Point** you want to remove a mapping from.

Figure 3-74: Device Source Dropdown Selector



*A. **Device Source** — This shows which **Measurement Device** is currently mapped to this **Measurement Point** on this **Component**.*

2. Click the blue 'X' in the **Device Source** field to remove that mapping.
3. Repeat Steps 1-2 until all the unnecessary mappings have been removed.

Remove a Device

When a **Measurement Device** is removed from a **Component** every **Device Mapping** associated with that **Measurement Device** is removed from the **Component** as well. See: Remove a Mapping

AMS 6500 ATG systems and AMS Asset Monitor systems can provide access to many different sensors.

⚠ CAUTION

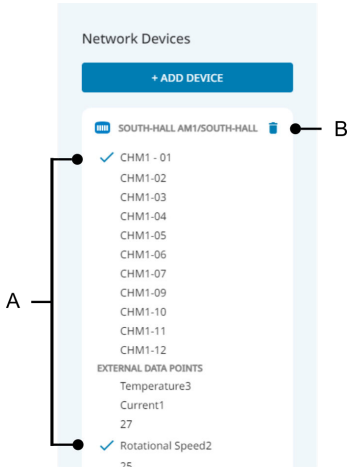
Ensure that no necessary sensors are mapped before removing this kind of device.

Prerequisites

1. Select the **Component** on the **Machine Train** that you need to remove a **Measurement Device** from.

2. Ensure that no necessary **Sensors** are mapped before removing an AMS 6500 ATG or AMS Asset Monitor device.

Figure 3-75: List of Network Devices



A. ***Mapped Sensor Icon*** — *This* ***Checkmark*** *indicated that the* ***Sensor*** *is mapped to a* ***Measurement Point****.*
B. ***Trash Icon*** — *Click the* ***Trash Icon*** *to remove this* ***Measurement Device****.*

Procedure

1. Ensure that no necessary **Sensors** are mapped before removing a **Measurement Device**.
2. In the list of **Network Devices** connected to the component, click the **Trash Icon** next to the **Measurement Device** you need to remove.
   The **Measurement Device** is removed, and a message is displayed in the bottom right corner of the screen.

Add an OPC UA Tag to an Asset

OPC UA connectivity enables AMS Machine Works to use measurements from devices on your other **OPC UA** systems.

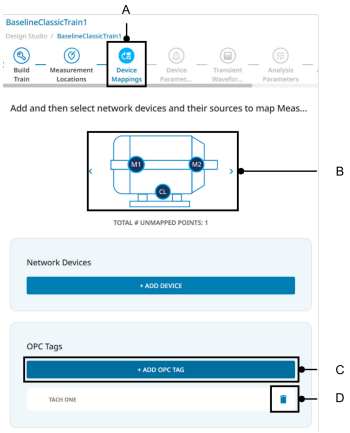
You must first create an **OPC Tag** in the **Network Device Module** before you can use the **Add OPC Tag** function in the **Device Mapping** step of the **Design Studio**.

The mapping between the **OPC UA Tag** defined in AMS Machine Works and the **OPC UA Tags** from your external systems must be performed in your 3rd party **OPC UA** client software. See: OPC UA Tags

Prerequisites

1. An unused **OPC UA Tag** must be available.
2. For measurements to enter AMS Machine Works, the **OPC UA Tag** must be mapped to an external data source in your 3rd party **OPC UA** client software.
3. The **Machine Train** or **Roll / Pulley Section** must be selected in the **Design Studio**, and the **Asset** must be selected in the **Device Mapping** step.

Figure 3-76: Add / Remove OPC Tag

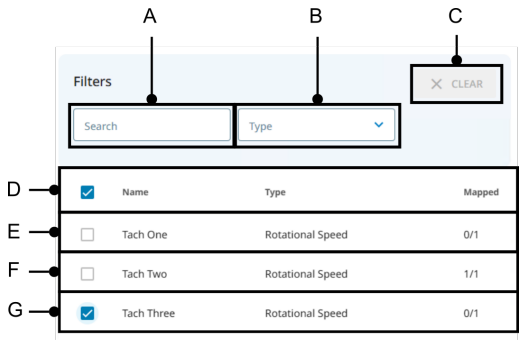


A. ***Device Mapping*** *step.*
B. *Currently selected* ***Asset****.*
C. ***Add OPC Tag*** *button.*
D. ***Remove OPC Tag*** *trash icon. — All the* ***OPC Tags*** *in this list are assigned to this* ***Asset****.*

Procedure

1. Click **Add OPC Tag** to open the **Select OPC Tags Sidepanel**.

Figure 3-77: Select OPC Tags Sidepanel



A. ***Search*** *— Search for an* ***OPC Tag*** *by* ***Name****.*
B. ***Type*** *— Search for an* ***OPC Tag*** *by* ***Type****.*
C. ***Clear*** *button — Clear the search filters.*
D. ***Header*** *row —*
    A. ***Select all*** *checkbox.*
    B. ***Name*** *column.*
    C. ***Type*** *column.*
    D. ***Mapped*** *column — 0/1 indicates that the* ***OPC Tag*** *has not been mapped to a* ***Measurement Point****, 1/1 indicates that the* ***OPC Tag*** *is mapped to a* ***Measurement Point****.*
E. *Row indicating an unavailable* ***OPC Tag*** *that was added to an* ***Asset****, but not mapped to a* ***Measurement Point****.*
F. *Row indicating an unavailable* ***OPC Tag*** *that was added to an* ***Asset****, and mapped to a* ***Measurement Point****.*
G. *Row indicating an available* ***OPC Tag*** *that is currently selected to be added to an* ***Asset****.*

Note

If the **OPC Tag** that you want to use is either unavailable, or unavailable and mapped, you must first remove it from the **Asset** currently added to.

See:

a. OPC UA Tags — To find which **Machine Train** or **Roll / Pulley Section** it is associated with.
b. Remove an OPC UA Tag — To remove the **OPC Tag** from the **Asset**.

2. (Optional) Use the **Search** and **Type** filters to find the **OPC Tag** that you need.
3. (Optional) Use the **Select all** checkbox to select every available **OPC Tag**.
4. Click the checkbox next to the **OPC Tag** that you want to add.
5. Click **Apply** to add every **OPC Tag** that you selected to the **Asset**.
6. (Optional) Click the **X** to close the sidepanel without making any changes.

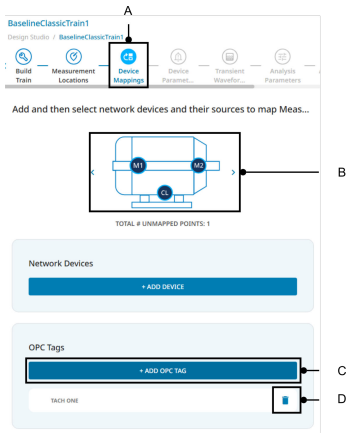
Remove an OPC UA Tag

When you need to remove an **OPC Tag** click the trash icon next to the **OPC Tag**.

Prerequisites

1. The **Machine Train** or **Roll / Pulley Section** must be selected in the **Design Studio**, and the **Asset** must be selected in the **Device Mapping** step.
2. An **OPC UA Tag** must be assigned to the **Asset**.

Figure 3-78: Add / Remove OPC Tag



*A. **Device Mapping** step.*
*B. Currently selected **Asset**.*
*C. **Add OPC Tag** button.*
*D. **Remove OPC Tag** trash icon. — All the **OPC Tags** in this list are assigned to this **Asset**.*

Procedure

1. Click the trash icon next to the **OPC Tag** that you want to remove.
2. In the confirmation dialog:
   - Click **Confirm** to remove the **OPC Tag**.

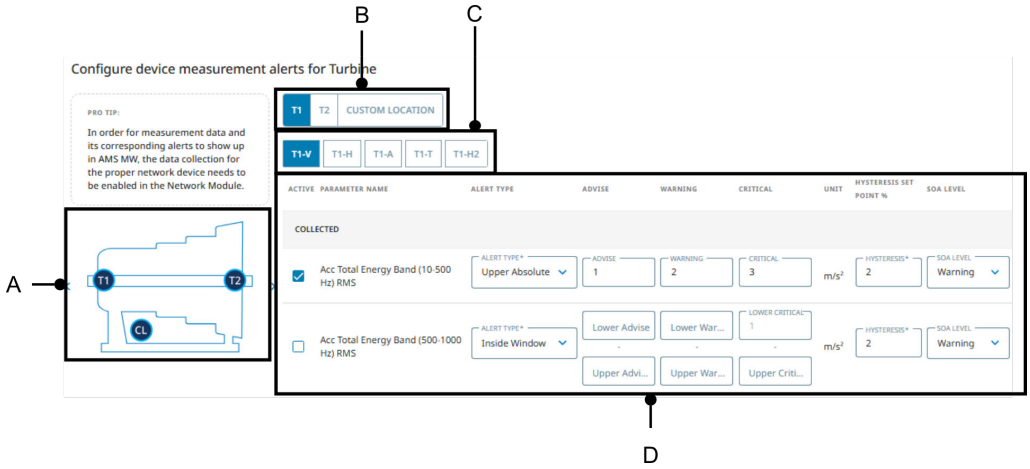
     Note
     This action removes the **OPC Tag** from the **Asset** even if it was in use.

   - Click **Cancel** to take no action.

3.4.4 Step Four: Device Parameter Alerts

After a **Device** is mapped to a **Measurement Point** you can set up **Alerts** on every **Measurement** coming from the **Device**. To set an **Analysis Alert**, see: (Step Six: Analysis Parameters, Step Seven: Analysis Alerts)

Figure 3-79: Device Parameter Alert Configuration Overview



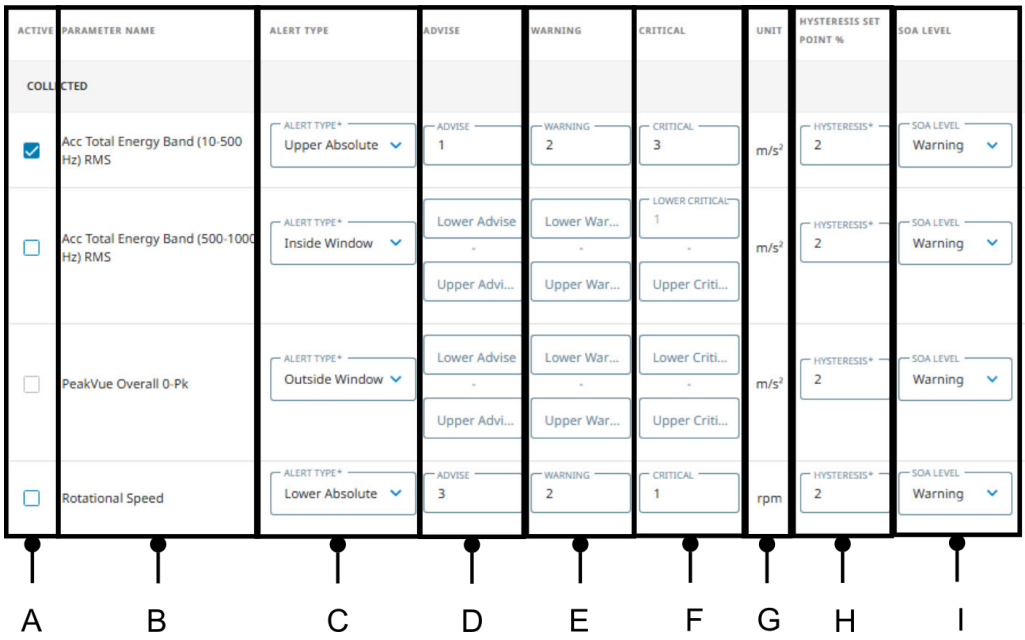
A. ***Component Diagram*** — *The* ***Component Diagram*** *pictures every* ***Measurement Location****.*
B. ***Measurement Location List*** — *The* ***Measurement Location*** *highlighted in this list determines the content of the* ***Measurement Point List****.*
C. ***Measurement Point List*** — *This list contains every* ***Measurement Point*** *associated with the* ***Measurement Location****.*
D. ***Measurement List*** — *This is the list of every* ***Measurement*** *available from the* ***Device*** *that is mapped to that* ***Measurement Point****.*

> **⚠ *CAUTION***
>
> *With* ***AMS Wireless Vibration Monitor*** *devices, when* ***Noise Threshold Toggle*** *is in the* ***Off*** *position this device will not display measurements of the following types:*
>
> - *PeakVue Plus Mechanical Severity*
> - *PeakVue Plus Lubrication Severity*

Prerequisites

Every **Measurement** coming from every **Device** mapped to the selected **Measurement Point** for the selected **Measurement Location** on this **Component** is listed in this section.

Figure 3-80: Measurement Point Alert Configuration



A. ***Active*** *— There are three statuses for* ***Active:***
   - ***Unconfigured*** *— A grey / unselectable check box means that the* ***parameter*** *has not been configured properly.*
   - ***Configured*** *— A blue / selectable check box means that the* ***parameter*** *has been configured properly.*
   - ***Active*** *— A blue / selected check box means that the* ***parameter*** *has been configured properly and the* ***Alert*** *is* ***Active****.*

B. ***Parameter Name*** *— The automatically generated descriptive name of a parameter. For more information see: AMS Machine Works Glossary*

⚠ *CAUTION*

Any ***Parameter Name*** *ending in an asterisk * is not valid. (For example: Strange Name*) Contact Customer Support for more information.*

C. ***Alert Type*** *— There are four* ***Alert Types: Upper Absolute, Lower Absolute, Inside Window****, and* ***Outside Window****.*
D. ***Advise*** *— This is the lowest level of* ***Alert****.*
E. ***Warning*** *— This is the middle level of* ***Alert****.*
F. ***Critical*** *— This is the highest level of* ***Alert****.*
G. ***Unit*** *— The type of unit which matches the* ***parameter name****.*
H. ***HYSTERESIS Set Point %*** *— The amount below a* ***health status*** *that a* ***measurement*** *has to fall before the* ***alert*** *can be triggered again.*
I. ***SOA Level*** *— The Store On Alert level triggers extra data storage from the* ***device*** *that provided the* ***measurement****.*

Note
*Triggering a SOA level on any **measurement** provided by a **device** triggers extra storage for every **waveform collection** provided by that **device**, even for **measurement points** defined on other **Machine Trains**.*

Procedure

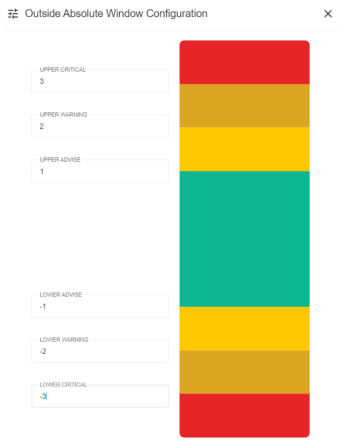
1. Configure an **Alert** for every **parameter** which is necessary for a **measurement point**. For more info on **Alerts** see: AMS Machine Works Glossary
   - **Upper Absolute**
   - **Lower Absolute**
   - **Inside Window**
   - **Outside Window**
2. Set the **Advise**, **Warning**, and **Critical** levels for the **Alert Type** that you selected.
   - **Upper Absolute** — Configure 1 to 3 values where: **Advise < Warning < Critical**
   - **Lower Absolute** — Configure 1 to 3 values where: **Advise > Warning > Critical**
   - **Inside Window** — Configure 1 to 6 values where:
     a. **Upper Advise > Upper Warning > Upper Critical**
     b. **Lower Advise < Lower Warning < Lower Critical**

Figure 3-81: Inside Absolute Window Configuration



   - **Outside Window** — Configure 1 to 6 values where:
     a. **Upper Advise < Upper Warning < Upper Critical**
     b. **Lower Advise > Lower Warning > Lower Critical**

Figure 3-82: Outside Absolute Window Configuration



3. Set the **HYSTERESIS Set Point %** — (Required) (Default: 2%) Set an integer value from 0 to 50.
4. Set the **SOA Levels** for this **measurement**.
   - **---** — Undefined.
   - **Advise**
   - **Warning**
   - **Critical**

   Note
   Triggering a SOA level on any **measurement** provided by a **device** triggers extra storage for every **waveform collection** provided by that **device**, even for **measurement points** defined on other **Machine Trains**.
5. Select the **Active** check box to begin monitoring with the **Alert**.
6. Repeat the previous steps for each **Measurement Point** defined for this **Measurement Location**.
7. Repeat the previous steps for each **Measurement Location** defined for this **Component**.
8. Repeat the previous steps for each **Component** defined for this **Machine Train**.

3.4.5 Step Five: Transient Waveform Processing

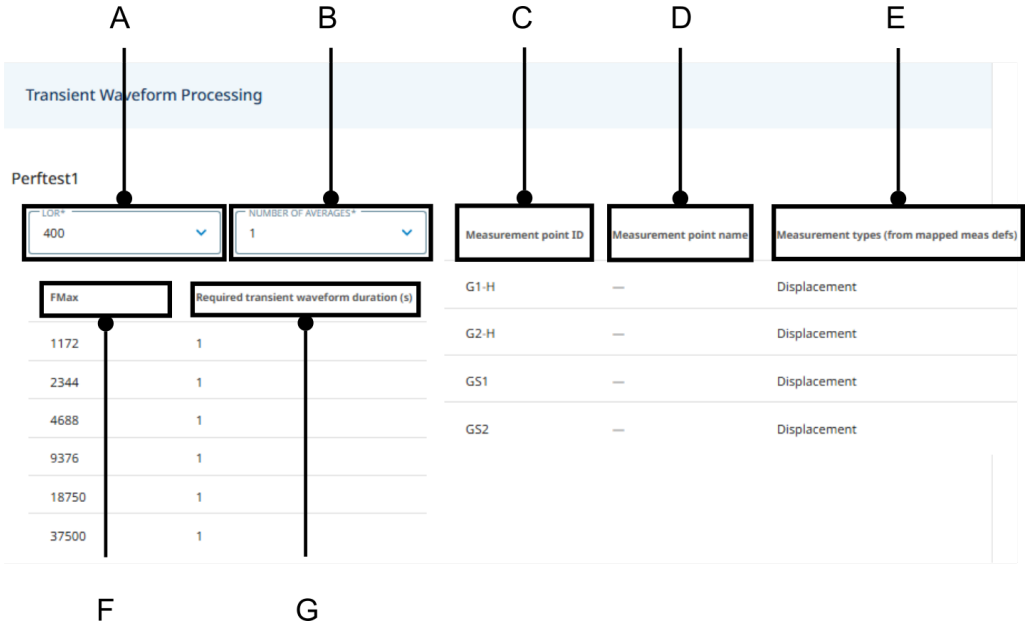
Only **Machine Trains** with a **measurement** from an AMS 6500 ATG UM (Universal Measurement) card have **Transient Waveform** data.

The **duration** of the **Collection Task** for an **AMS 6500 ATG** unit is configured in **Machine Studio**.

When you set the number of **LOR** (Lines Of Resolution) and the **Number of Averages**, the length of the **Transient Waveform** required for each particular **FMax** value changes.

You must ensure the **duration** defined for the **Collection Task** in the **AMS 6500 ATG** unit is equal to, or longer than, the **Required transient waveform duration** listed for the **FMax** value you are using.

Figure 3-83: Transient Waveform Processing



A. ***LOR*** *(Lines Of Resolution) — The number of data points used to define a spectrum.*
B. ***Number of Averages*** *— The number of times to perform the averaging operation.*
C. ***Measurement point ID*** *— The* ***Point ID*** *set during the* ***Measurement Locations*** *step.*
D. ***Measurement point name*** *— (Optional) The* ***Name*** *set during the* ***Measurement Locations*** *step.*
E. ***Measurement types (from mapped meas defs)*** *— The* ***Measurement Type*** *is set when you select a* ***Device Source*** *during the* ***Device Mappings*** *step.*
F. ***FMax*** *— The* ***FMax*** *is set in the* ***Collection Task*** *for the* ***AMS 6500 ATG*** *unit.*
G. ***Required transient waveform duration (s)*** *— The* ***Duration*** *is set in the* ***Collection Task*** *for the* ***AMS 6500 ATG*** *unit.*

Prerequisites

1. Use **Machine Studio** to connect to the **AMS 6500 ATG** unit.
2. Check the **FMax** value for the **Collection**.
3. Check the **Duration** value for the **Collection**.

Procedure

1. Set the **LOR** (Lines Of Resolution):
   - 400
   - 800
   - 1600

- 3200
- 6400
- 12800
- 25600

2. Set the **Number of Averages**:
   - 1
   - 4
   - 7
   - 10

   As a result the **Required transient waveform duration** is listed for each value of **FMax**.
3. Ensure that the **Duration** listed in **Design Studio** is greater than, or equal to, the **Required transient waveform duration (s)** for the same **FMax**.

Need help?
Adjust the **Duration** listed in **Design Studio** to a value equal to or higher than the **Required transient waveform duration (s)** shown in **AMS Machine Works**.

3.4.6 Step Six: Analysis Parameters

Every **Measurement Device** mapped to any **Component** in the **Machine Train** provides **Analysis Parameters** which can be configured in this step.

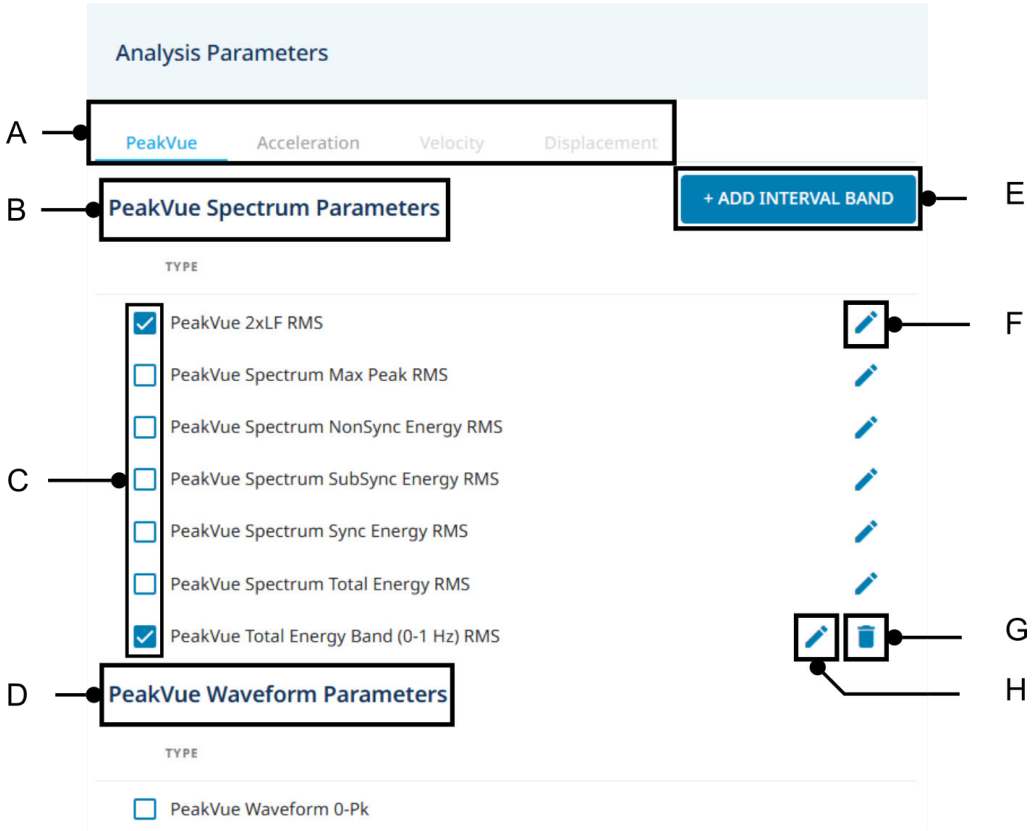
There are four types of **Analysis Parameters**, each divided into **Spectrum Parameters** and **Waveform Parameters**:

1. **PeakVue**
2. **Acceleration**
3. **Velocity**
4. **Displacement**

Choose and configure every **Analysis Parameter** that you will need to use for an **Analysis Alert** in the next step, Step Seven: Analysis Alerts

Prerequisites

Figure 3-84: Analysis Parameters Interface



A. ***Analysis Parameter Types***
   - ***PeakVue Tab*** — *(Active) Blue underlined text.*
   - ***Acceleration Tab*** — *(Inactive) Plain grey text.*
   - ***Velocity Tab*** — *(Inactive) Plain grey text.*
   - ***Displacement Tab*** — *(Inactive) Plain grey text.*

B. ***Spectrum Parameter List***

C. ***Selection Checkboxes*** — *Select which **Analysis Parameters** from the **Spectrum Parameter List** and the **Waveform Parameter List** to use for **Analysis Alerts**. See: Step Seven: Analysis Alerts*

D. ***Waveform Parameter List***

E. ***Add Interval Band*** — *Click the **Add Interval Band** button to add a new **Spectrum Parameter**. See: Add / Edit an Interval Band*

F. ***Edit a Parameter*** — *Click here to edit an **Analysis Parameter**. See: Edit an Analysis Parameter*

G. ***Trash Icon*** — *Click this **Trash Icon** to delete an **Interval Band**.*

H. ***Edit an Interval Band*** — *Click this icon to open the **Edit an Interval Band** dialog. See: Edit an Analysis Parameter*

Procedure

1. For every **Component** in the **Machine Train** you must select every relevant **Analysis Parameter**.
2. Configure every **Analysis Parameter** that you have selected with the following functions:
   - Add / Edit an Interval Band
   - Edit an Analysis Parameter
3. When every necessary **Analysis Parameter** is configured, you may proceed to the next step. See: Step Seven: Analysis Alerts

Add / Edit an Interval Band

You can create a new **Analysis Parameter**; a spectrum parameter called an **Interval Band**.

You can also edit an existing **Interval Band**.

Prerequisites

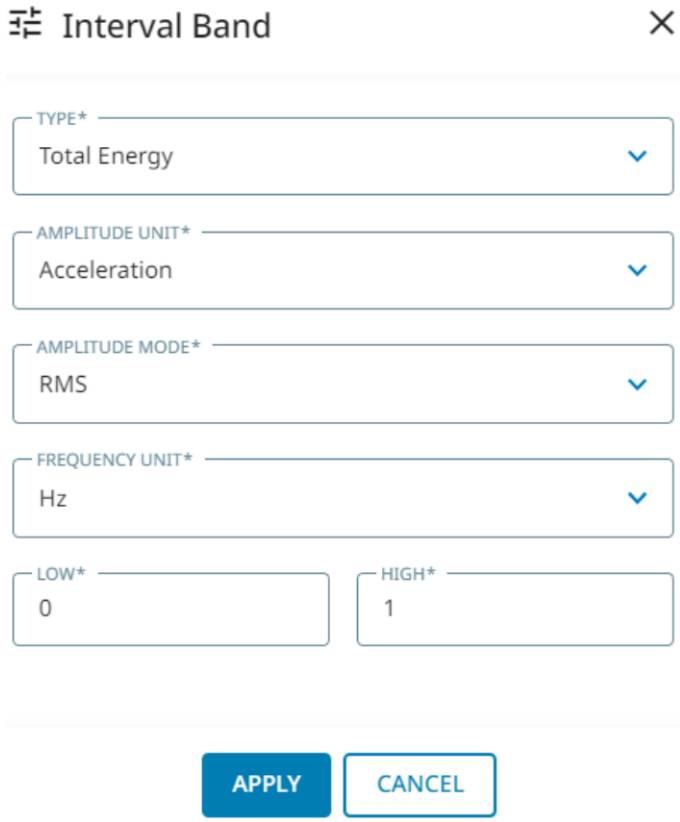
To create an **Interval Band**:

In the **Design Studio**, select the **Analysis Parameters Step** → **Analysis Parameter Tab** → **Add Interval Band**.

To edit an **Interval Band**:

In the **Design Studio**, select the **Analysis Parameters Step** → **Analysis Parameter Tab** → **Pen Icon**.

Figure 3-85: Interval Band Dialog



A. ***Type*** — *(Required) There are four types of* ***Interval Band****:*
   A. ***Total Energy***
   B. ***Max Peak***
   C. ***Synchronous***
   D. ***Non Synchronous***
B. ***Amplitude Unit*** — *(Required) There are three* ***Amplitude Units****:*
   A. ***Acceleration***
   B. ***Velocity***
   C. ***Displacement***

> ***Note***
> *This setting is not available for* ***PeakVue Analysis Parameters****.*

C. ***Amplitude Mode*** — *(Required) There are three* ***Amplitude Modes****:*
   A. ***RMS***
   B. ***Peak***
   C. ***Peak-Peak***
D. ***Frequency Unit*** — *(Required) Choose between* ***Hz*** *or* ***Order***
E. ***Low*** — *(Required) Set the lower end of the* ***Interval Band****.*
F. ***High*** — *(Required) Set the upper end of the* ***Interval Band****.*

Procedure

1. If necessary, change the **Type**.
2. If necessary, change the **Amplitude Units**.

   Note
   This setting is not available for **PeakVue Analysis Parameters**.

3. If necessary, change the **Amplitude Mode**.
4. If necessary, change the **Frequency Unit**.
5. If necessary, change the **Low** value.
6. If necessary, change the **High** value.
7. Click the **Apply** button.
   The **Interval Band** is now configured.

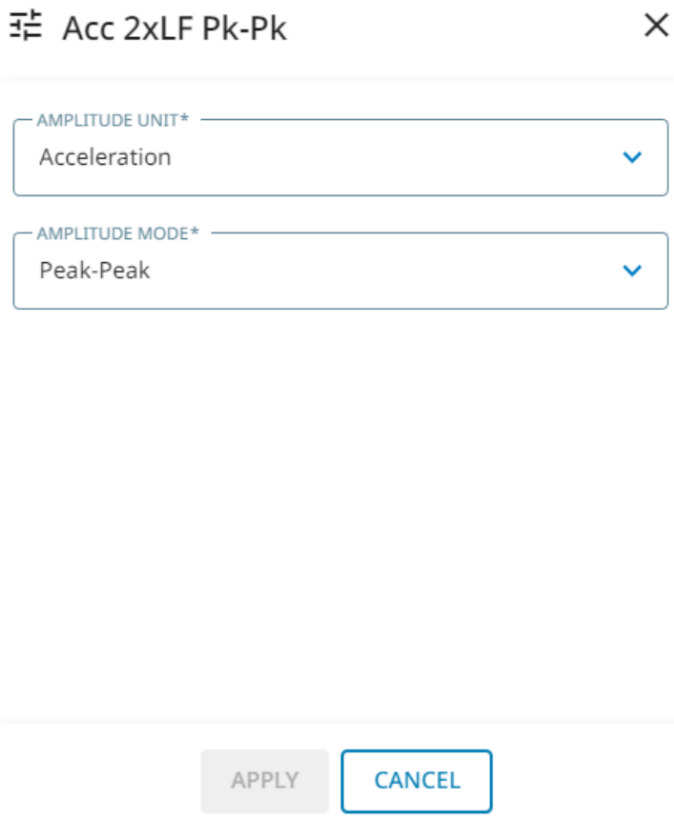
Edit an Analysis Parameter

You can edit an **Analysis Parameter**; a spectrum parameter called an **Interval Band**.

Prerequisites

In the **Design Studio**, select the **Analysis Parameters** → **Add Interval Band**.

Figure 3-86: Analysis Parameter Dialog



A. ***Amplitude Unit*** — *(Required) There are three* ***Amplitude Units****:*
   A. ***Acceleration***
   B. ***Velocity***
   C. ***Displacement***

   Note
   This setting is not available for ***PeakVue Analysis Parameters****.*

B. ***Amplitude Mode*** — *(Required) There are three* ***Amplitude Modes****:*
   A. ***RMS***
   B. ***Peak***
   C. ***Peak-Peak***

Procedure

1. If necessary, change the **Amplitude Units**.

   Note
   This setting is not available for **PeakVue Analysis Parameters**.

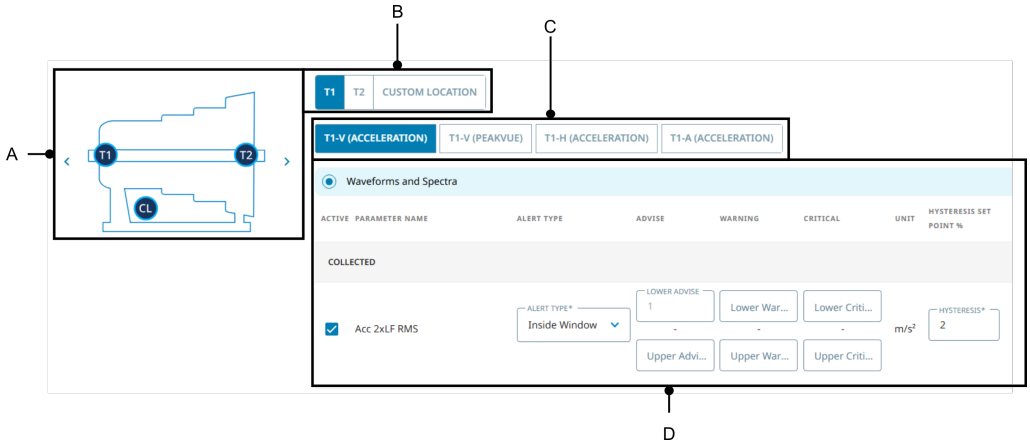
2. If necessary, change the **Amplitude Mode**.
3. Click the **Apply** button.

The **Analysis Parameter** is now configured.

3.4.7 Step Seven: Analysis Alerts

After a device is mapped to a Measurement Point, you can set up Analysis Alerts on every Analysis Parameter that you selected in the **Analysis Parameters** step. See: Step Six: Analysis Parameters

Figure 3-87: Analysis Alert Configuration Overview

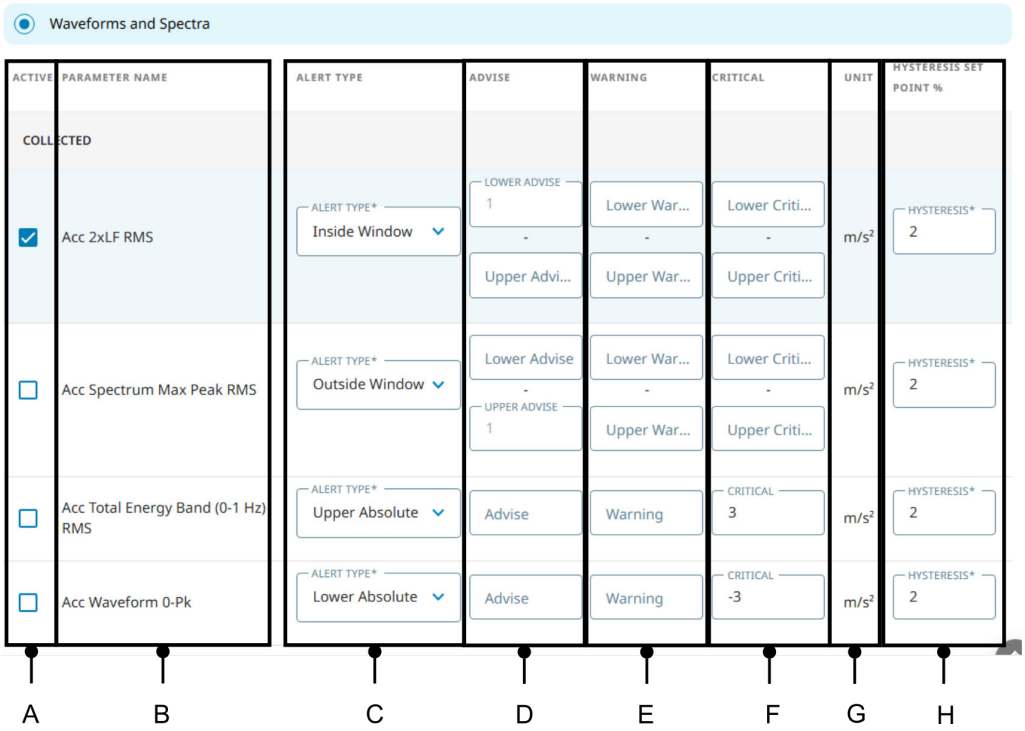


A. ***Component Diagram*** *— The* ***Component Diagram*** *pictures every Measurement Location.*
B. ***Measurement Location List*** *— The Measurement Location highlighted in this list determines the content of the Measurement Point List.*
C. ***Measurement Point List*** *— This list contains every Measurement Point associated with the Measurement Location.*
D. ***Analysis Parameter List*** *— This is the list of every Analysis Parameter available that is defined for the selected Measurement Point.*

Prerequisites

Select: **Design Studio → Analysis Alerts → Component → Measurement Location → Measurement Point**

Figure 3-88: Measurement Point Alert Configuration



A. ***Active*** — *There are three statuses for* ***Active:***
   A. ***Unconfigured*** — *A gray / unselectable check box means that the Analysis Alert has not been configured properly.*
   B. ***Configured*** — *A blue / selectable check box means that the Analysis Alert has been configured properly.*
   C. ***Active*** — *A blue / selected check box means that the Analysis Alert has been configured properly and the Alert is Active.*

B. ***Parameter Name*** — *The automatically generated descriptive name of a parameter. For more information see: AMS Machine Works Glossary*

> **⚠ *CAUTION***
>
> *Any Parameter Name ending in an asterisk (*) is* ***not*** *valid. (For example: Strange Name*) Contact Customer Support for more information.*

C. ***Alert Type*** — *There are four Alert Types:* ***Upper Absolute***, ***Lower Absolute***, ***Inside Window***, *and* ***Outside Window***.
D. ***Advise*** — *This is the lowest level of Alert.*
E. ***Warning*** — *This is the middle level of Alert.*
F. ***Critical*** — *This is the highest level of Alert.*
G. ***Unit*** — *The type of unit which matches the parameter name.*
H. ***HYSTERESIS Set Point %*** — *The amount below a health status that a measurement has to fall before the Alert can be triggered again.*

Procedure

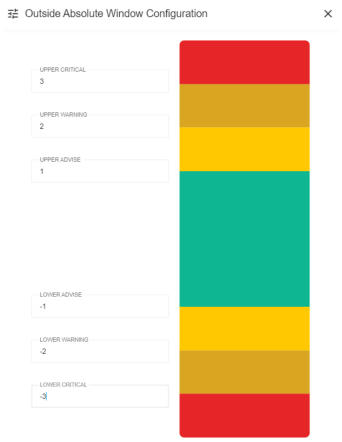
1. Configure an Alert for every analysis parameter which is necessary for a Measurement Point. For more info on **Alerts** see: AMS Machine Works Glossary
   - **Upper Absolute**
   - **Lower Absolute**
   - **Inside Window**
   - **Outside Window**
2. Set the **Advise**, **Warning**, and **Critical** levels for the Alert Type that you selected.
   - **Upper Absolute** — Configure 1 to 3 values where: Advise < Warning < Critical
   - **Lower Absolute** — Configure 1 to 3 values where: Advise > Warning > Critical
   - **Inside Window** — Configure 1 to 6 values where:
     a. Upper Advise > Upper Warning > Upper Critical
     b. Lower Advise < Lower Warning < Lower Critical

Figure 3-89: Inside Absolute Window Configuration



   - **Outside Window** — Configure 1 to 6 values where:
     a. Upper Advise < Upper Warning < Upper Critical
     b. Lower Advise > Lower Warning > Lower Critical

Figure 3-90: Outside Absolute Window Configuration



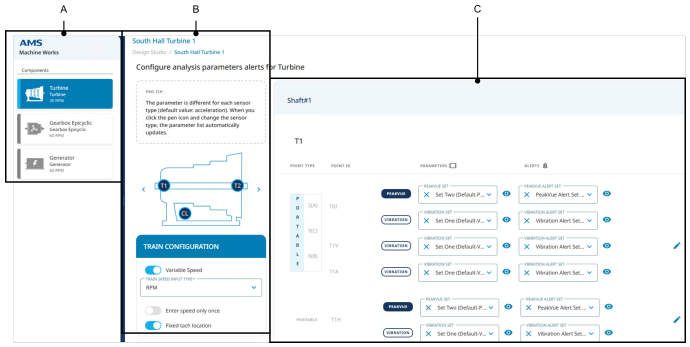
3. Set the **HYSTERESIS Set Point %** — (Required) (Default: 2%) Set an integer value from 0 to 50.
4. Click the **Active** check box to begin monitoring with the **Analysis Alert**.
5. Repeat the previous steps for each Measurement Point defined for this Measurement Location.
6. Repeat the previous steps for each Measurement Location defined for this Component.
7. Repeat the previous steps for each Component defined for this Machine Train.

3.4.8 Step Eight: Portable Device Configuration

In the **Portable Device Configuration** step you must configure every **Measurement Point** on every **Component** which is either a **Portable Triax** or a **Portable Point**.

The process used with **MHM Equipment** is similar, but it has significant differences. See: Portable Device Configuration for MHM Equipment

Figure 3-91: Portable Device Configuration — Interface



A. ***Component Navigator***
B. ***Component Diagram*** *and* ***Train Configuration***
C. ***Portable Point Configuration***

Prerequisites

Ensure that you have defined points to be monitored by a **Portable Device**:

See:

1. Add and Configure a Portable Point
2. Add and Configure a Portable Triax

Procedure

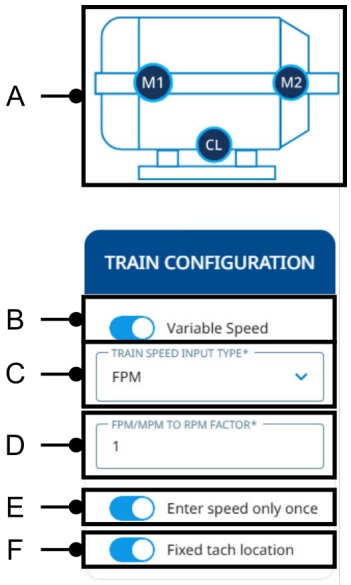
1. Configure your **Machine Train** settings. See: Configure Train Speed
2. Configure every **Portable Point** on every **Component** in the **Machine Train**. See: Portable Device Configuration for MHM Equipment

Configure Train Speed

The **Train Speed** for **Portable Devices** can be set in a variety of ways:

1. (Default) **Fixed Speed**
2. **Variable Speed**
    a. Only **Entered Once**
    b. From a **Tachometer**
        1. From an **Unconstrained Tach Location**
        2. From a **Fixed Tach Location**

Figure 3-92: Train Configuration



A. ***Component Diagram*** *— The* ***Component Diagram*** *shows every* ***Measurement Location*** *on the* ***Component****, and has* ***Forward/Back*** *controls to cycle through every* ***Component*** *in the* ***Machine Train****.*
B. ***Variable Speed*** *toggle — (Default: Off) When the* ***Variable Speed*** *toggle is in the* ***Off*** *position, the other controls are not displayed.*
C. ***Train Speed Input Type*** *— Choose from* ***RPM*** *(Default),* ***FPM****, or* ***MPM****.*
D. ***FPM / MPM to RPM Factor*** *— (Required) (Range: 0.0001 to 1000.) This setting is only available when the* ***Variable Speed*** *toggle is in the* ***On*** *position and the* ***Train Speed Input Type*** *is set to either* ***FPM*** *or* ***MPM****. A value of 1 indicates that 1* ***FPM*** */* ***MPM*** *equals 1* ***RPM****.*
E. ***Enter Speed Only Once*** *toggle — (Default: On) When the* ***Enter Speed Only Once*** *toggle is in the* ***On*** *position*
F. ***Fixed Tach Location*** *toggle — (Default: Off) Set the* ***Fixed Tach Location*** *toggle to the* ***On*** *position when there is a specific location where tachometer readings must be done.*

Prerequisites

Determine which kind of speed configuration that you will be using for this **Machine Train**.

Procedure

1. Choose between **Fixed Speed** and **Variable Speed**.
   - Set **Variable Speed** toggle to **Off**. (Default) No further configuration is possible.
   - Set **Variable Speed** toggle to **On**. Proceed to the next step.
2. Choose the **Train Speed Input Type**.
   - **RPM** (Default)
   - **FPM** — When **FPM** is selected and the **Variable Speed** is in the **On** position, you can enter a **FPM / MPM to RPM Factor**.

- **MPM** — When **MPM** is selected and the **Variable Speed** toggle is in the **On** position, you can enter a **FPM / MPM to RPM Factor**.

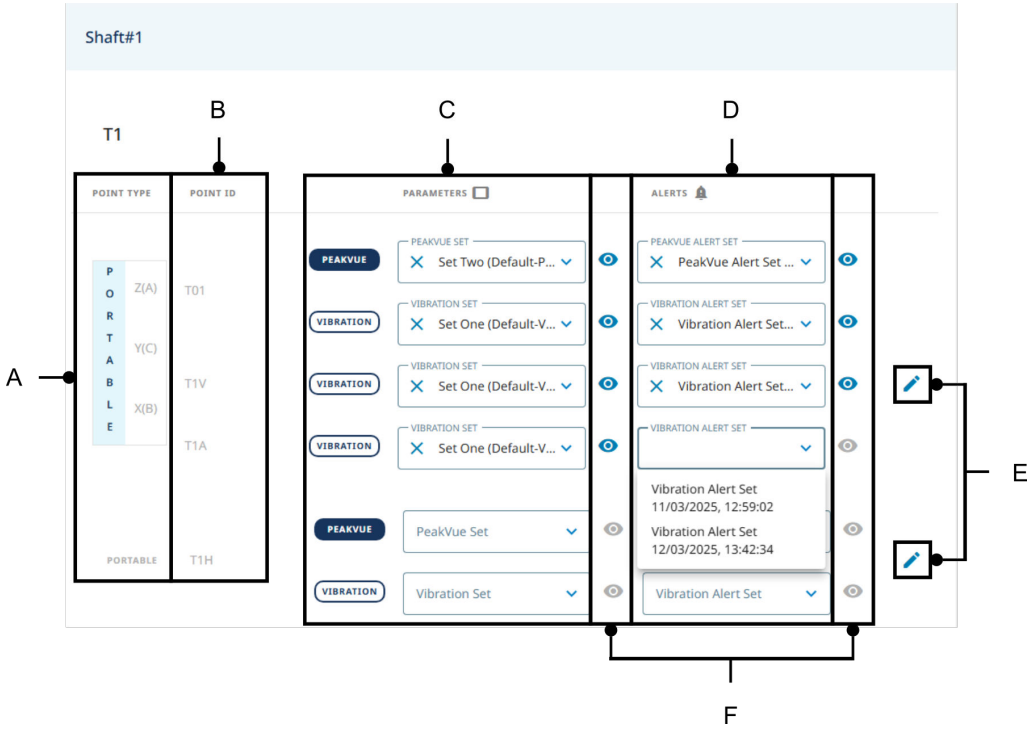
3. (Optional) (Range: 0.0001 to 1000.) When the **Train Speed Input Type** is set to either **FPM** or **MPM**, you can enter a **FPM / MPM to RPM Factor**. A value of 1 indicates that 1 **FPM** / **MPM** equals 1 **RPM**.
4. Choose between entering the speed only once or each time you gather measurements.
   - Set the **Enter Speed Only Once** toggle to **Off**. — (Default) A speed measurement is needed each time you gather measurements.
   - Set the **Enter Speed Only Once** toggle to **On**. — A speed measurement is only needed once to calibrate.
5. Choose between having a fixed tachometer location or using an unconstrained tachometer location.
   - Set the **Fixed Tachometer Location** toggle to **Off**. (Default) — You can place the tachometer anywhere that you want on the shaft.
   - Set the **Fixed Tachometer Location** toggle to **On**. — You must place the tachometer in a specific place on the shaft.

Configure Portable Parameters and Alerts

In this step you can configure a **Portable Parameter Set** and an associated **Portable Alert Set** for a list of **Portable Points** which is displayed for each **Asset**.

Note
With **MHM Equipment** there is only one **Asset**, and there are no **Portable Triax Points**.

Figure 3-93: List of Portable Points for an Asset



A. ***Point Type*** — *This is either a* ***Portable Triax Point*** *or a* ***Portable Point****.*
B. ***Point ID*** — *Each* ***Point ID*** *on an* ***Asset*** *is unique within the context of that* ***Asset****.*
C. ***Parameter Set*** — *Choose a* ***Portable Parameter Set*** *for each* ***Point****. See: Portable Parameter Set Library*
D. ***Alert Set*** — *Choose a* ***Portable Alert Set*** *for each* ***Point****. See: Portable Alert Set Library*
E. ***Configure Sensor*** — *Click this to open a configuration dialog. See: Configure Portable Sensor*
F. ***Preview*** — *Clicking a* ***Preview*** *icon opens a side panel which shows:*
   - *The* ***Trend Parameters*** *associated with the* ***Parameter****.*
   - *The* ***Alert Types*** *associated with an* ***Alert****.*

Prerequisites

1. Select any **Asset** from the **Asset List** to display list of points configured for the **Asset**.
2. Every **Portable Parameter Set** that you intend to use for this **Machine Train** must be defined. See: Portable Parameter Set Library
3. Every **Portable Alert Set** that you intend to use for this **Machine Train** must be defined. See: Portable Alert Set Library

Procedure

1. For each **Portable Point** you have the option to select a **PeakVue Set** and/or a **Vibration Set**.
   - — For a **Portable Point** — You have the option to choose one **PeakVue Set**.
     - — When a **PeakVue Set** is configured you have the option to choose a **PeakVue Alert Set**
   - — For a **Portable Point** — You have the option to choose one **Vibration Set**.
     - — When a **Vibration Set** is configured you have the option to choose a **Vibration Alert Set**.
2. For each **Portable Triax Point** you have the option to select a **PeakVue Set** and/or from 0 to 3 **Vibration Sets**.
   - — For a **Portable Triax Point** you have the option to choose one **PeakVue Set**.
     - — When a **PeakVue Set** is configured you have the option to choose a **PeakVue Alert Set**
   - — For each **Portable Triax Point** — You have the option to choose up to three **Vibration Sets**.
     - — For each **Vibration Set** that is configured, you have the option to choose a **Vibration Alert Set**
3. Repeat the previous steps for each **Asset** in your **Machine Train** that is monitored by a portable device.

Configure Portable Sensor

For each **Machine Train Type**, (**Machine Train**, **Roll / Pulley Section**, **MHM Equipment**), you can configure the sensors used in the **Portable Device Configuration** step.

The **Configure Sensor** side panel enables you to set the **Sensor Type**. The choice of **Sensor Type** determines which fields are available to configure.

There are seven **Sensor Types**:

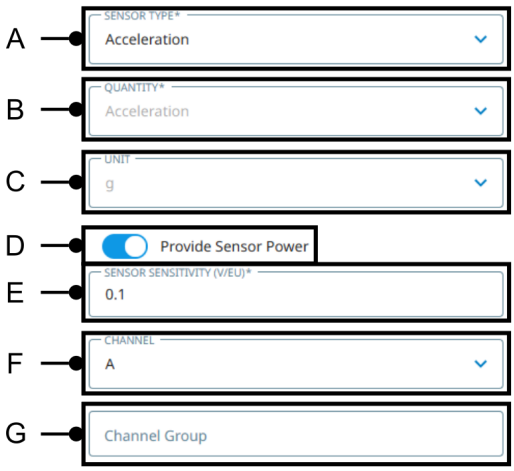
1. **Acceleration**
2. **Velocity**
3. **Displacement**
4. **General Dynamic**
5. **Static/DC Input**
6. **Keypad Input**
7. **Temperature**

Prerequisites

In AMS Machine Works select: **Design Studio** → **Select Machine Train Type** → **Portable Device Configuration** → **Configure Sensor**

Note
The selection, (**Design Studio** → **Select Machine Train Type** → **Portable Device Configuration** → **Configure Triax Sensor**), only displays general information about a **Triax Sensor**, and no configuration is possible.

Figure 3-94: Configure Sensor Sidepanel



A. ***Sensor Type*** *— The choice of* ***Sensor Type*** *determines which other fields are available for configuration.*
B. ***Quantity*** *— The* ***Quantity*** *is usually determined by the* ***Sensor Type****.*
C. ***Unit*** *— The* ***Unit*** *is usually determined by the* ***Sensor Type****.*
D. ***Provide Sensor Power*** *toggle — (Default:* ***On)***
E. ***Sensor Sensitivity (V/EU)*** *— (Default: 0.1) From 0.001 to 100000.*
F. ***Channel*** *— (Required) (Only available with* ***MHM Equipment****) One of four input channels from your* ***Portable Device****. There can be a maximum of 3 points assigned to each* ***Channel*** *in a* ***Channel Group****.*

Note
To define 3 points that are provided from the same measurement device, you must assign each point to the same ***Channel Group****, and then select which points belong to* ***Channel A****,* ***Channel B****, and* ***Channel C****.*

G. ***Channel Group*** *— (Optional) (Only available with* ***MHM Equipment****) Sensors in the same* ***Channel Group*** *can be displayed together in some types of plots. There can be a maximum of 12 points per channel group.*

Note
To define 3 points that are provided from the same measurement device, you must assign each point to the same ***Channel Group****, and then select which points belong to* ***Channel A****,* ***Channel B****, and* ***Channel C****.*

Procedure

1. Choose the **Sensor Type**:
   - **Acceleration**

a. Set the **Provide Sensor Power** toggle — (Default: **On)**

b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.

- **Velocity**
  a. Set the **Provide Sensor Power** toggle — (Default: **On)**
  b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **Displacement**
  a. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **General Dynamic**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**
     2. **Strain**
     3. **Pressure**
     4. **Voltage**
     5. **Flux**
     6. **Current**

  b. Set the **Provide Sensor Power** toggle — (Default: **On)**
  c. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **Static/DC Input**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**
     2. **Strain**
     3. **Pressure**
     4. **Voltage**
     5. **Flux**
     6. **Current**
     7. **Rotational Speed**
     8. **Mass Flow Rate**
     9. **Acoustic Emission**

  b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
  c. Set the **DC Offset (V)** — (Default: 0) From -20 to 20.
- **Keypad Input**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**

2. **Strain**
3. **Pressure**
4. **Voltage**
5. **Flux**
6. **Current**
7. **Rotational Speed**
8. **Mass Flow Rate**
9. **Acoustic Emission**
10. **Temperature**

- **Temperature**
  a. Nothing to configure.

2. (Optional) (Only available with **MHM Equipment**) Select the **Channel** from the dropdown menu.
   - **Default (A)** — **Default (A)** equals **Channel 0**. Every point which was not assigned to a channel prior to migration is assigned to the **Default (A)** channel.
   - **A** — equals **Channel 1**.
   - **B** — equals **Channel 2**.
   - **C** — equals **Channel 3**.
   - **D** — equals **Channel 4**.

   Note
   - To define 3 points that are provided from the same measurement device, you must assign each point to the same **Channel Group**, and then select which points belong to **Channel A**, **Channel B**, and **Channel C**.
   - Points with the same **Channel** must have the same **Sensor Type** and **Sensor Sensitivity**.
   - Every **Measurement Point** that shares a **Channel** must have the same nominal speed, or **RPM**. See: Edit an MHM Equipment Measurement Point

3. (Optional) (Only available with **MHM Equipment**) Set the **Channel Group**. (Range: 0 to 96)

   Note
   - To define 3 points that are provided from the same measurement device, you must assign each point to the same **Channel Group**, and then select which points belong to **Channel A**, **Channel B**, and **Channel C**.
   - Points with the same **Channel** must have the same **Sensor Type** and **Sensor Sensitivity**.

- Every **Measurement Point** that shares a **Channel** must have the same nominal speed, or **RPM**. See: Edit an MHM Equipment Measurement Point

4. **Apply** or **Cancel** your changes.
   - (Optional) When the **Apply** button is available, click it to record your changes and close the configuration panel.
   - (Optional) Click **Cancel** to close the configuration panel without making any changes.

Remove Portable Parameters and Alerts

Use these steps to remove either a **Portable Parameter Set**, or a **Portable Alert Set**, from use in an **Asset**.

Note
Every **Portable Alert Set** is connected with only one **Portable Parameter Set**.

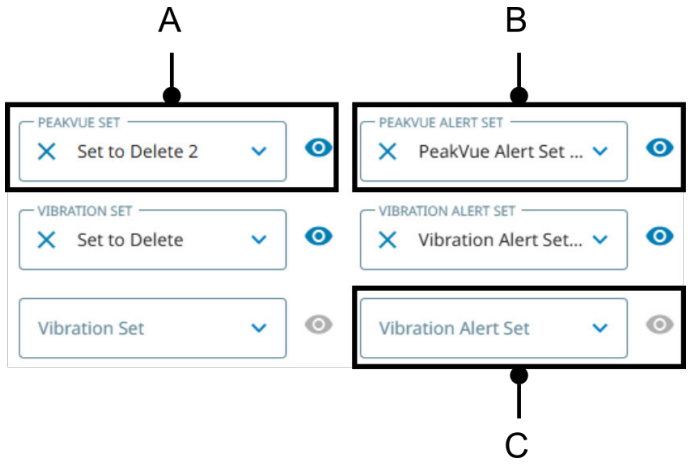
When you remove a **Portable Parameter Set** from an **Asset**, the associated **Portable Alert Set** is also removed.

Prerequisites

In the **Design Studio**, open the **Portable Device Configuration** step, and select the **Asset** of the **Machine Train** where the set is in use.

Note
MHM Equipment only has one **Asset**, so you only have to select the **MHM Equipment**.

Figure 3-95: Remove Parameter and Alert Sets



*A. Configured **Parameter Set***
*B. Configured **Alert Set***
C. Unconfigured

Procedure

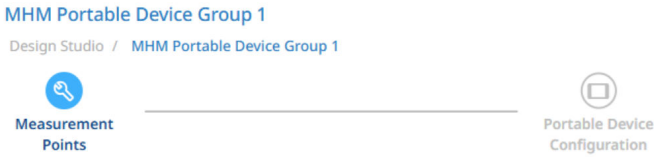
1. (Option One) To remove both the **Parameter Set** and the **Alert Set**, click the **X** next to the **Parameter Set**.
2. (Option Two) To remove just the **Alert Set**, click the **X** next to the **Alert Set**.
3. Repeat Step 1 and Step 2 for every **Measurement Point** on every **Asset** on every **Machine Train** where you want to remove a **Portable Parameter Set** or **Portable Alert Set**.

3.4.9 MHM Equipment Configuration Process

MHM Equipment is migrated from Machinery Health Manager systems and cannot be created directly in AMS Machine Works.

MHM Equipment is configured in a two step process. In both steps you can edit the overall **MHM Equipment** parameters. See: Set MHM Equipment Parameters

Figure 3-96: MHM Equipment Configuration Process



A. ***Measurement Points*** *— This step handles the configuration of every point in the* ***Measurement Point*** *list.*
See: Edit an MHM Equipment Measurement Point

B. ***Portable Device Configuration*** *— This step enables users to manage the* ***Parameter Sets***, ***Alert Sets***, *and sensor configurations of the* ***MHM Equipment***.
See: Portable Device Configuration for MHM Equipment
Specific tasks include:
   - ***Configure Portable Sensors*** *— See: Configure Portable Sensor*
   - *Configure* ***Portable Parameter Sets*** *— See: Configure Portable Parameters and Alerts*
   - *Configure* ***Portable Alert Sets*** *— See: Remove Portable Parameters and Alerts*

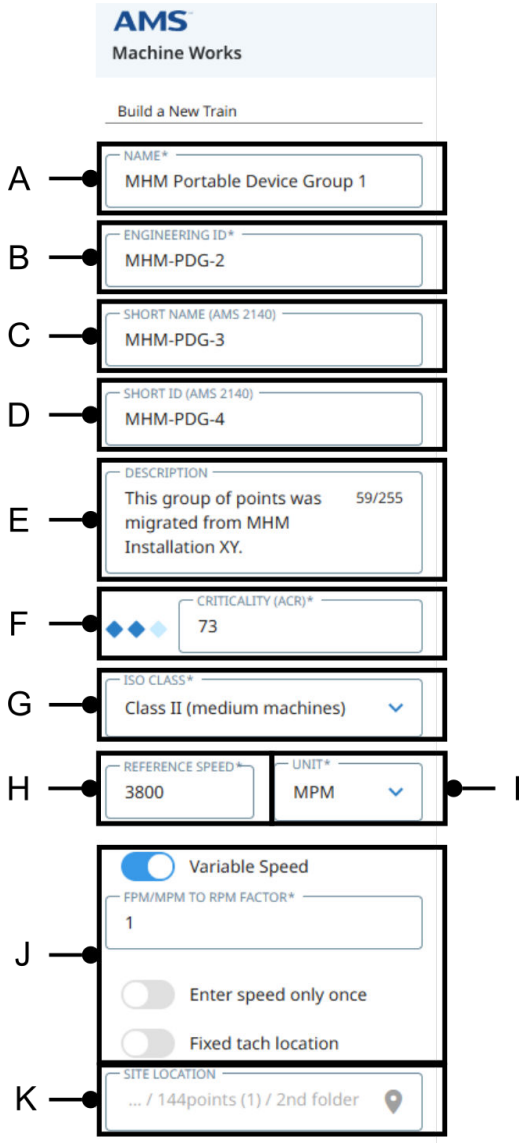
Set MHM Equipment Parameters

With **MHM Equipment** you can set the **MHM Equipment Parameters** in the sidebar of the **Measurement Points** and the **Portable Device Configuration** steps of the **Design Studio Process**.

Prerequisites

1. In the **Design Studio** select a collection of **MHM Equipment**.
2. In both the **Measurement Points** and the **Portable Device Configuration** step the **MHM Equipment Parameters** sidebar is displayed.

Figure 3-97: MHM Equipment Parameters



A. ***Name*** *— (Required) The initial value is set by the migration application.*
B. ***Engineering ID*** *— (Required) The initial value is set by the migration application.*
C. ***Short Name (AMS 2140)*** *— (Optional)*
D. ***Short ID (AMS 2140)*** *— (Optional)*
E. ***Description*** *— (Optional)*
F. ***Criticality*** *— (Required) The initial value is set by the migration application.*
G. ***ISO Class*** *dropdown — (Required) The initial value is set by the migration application.*
H. ***Reference Speed*** *— (Required) The initial value is set by the migration application.*
I. ***Unit*** *dropdown — (Required)* ***RPM*** */* ***FPM*** */* ***MPM*** *The initial value is set by the migration application.*

J. ***Variable Speed Section*** *— The following options are available when the* ***Variable Speed*** *toggle is in the* ***On*** *position.*
   - ***Variable Speed*** *toggle — (Default: On)*
   - ***FPM / MPM to RPM Factor*** *— (Required) This setting is only available when the* ***Variable Speed*** *toggle is in the* ***On*** *position and the* ***Unit*** *is set to either* ***FPM*** *or* ***MPM****. A value of 1 indicates that 1* ***FPM*** */* ***MPM*** *equals 1* ***RPM****.*
   - ***Enter Speed only once*** *toggle — (Default: Off)*
   - ***Fixed tach location*** *toggle — (Default: Off)*

K. ***Site Location*** *— The* ***Site Location*** *is set when the* ***MHM Equipment*** *was migrated and cannot be edited here. See: Sort Elements in the Hierarchy*

Procedure

1. (Required) Enter a **Name**. The initial value is set by the migration application when the **MHM Equipment** was created. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)
2. (Required) Enter a unique ID for the **Engineering ID**. (From 1 to 128 characters, this field accepts alphabetical, numerical, and special characters.)

   ⚠ CAUTION

   Ensure that you set a unique Engineering ID. A repeated Engineering ID can cause measurement points from different machine trains on an AMS 2140 route to be grouped together.

3. (Optional) Enter a **Short Name (AMS 2140)**. (From 1 to 28 characters, this field accepts alphabetical, numerical, and special characters.)
4. (Optional) Enter an ID for the **Short ID (AMS 2140)**. (From 1 to 10 characters, this field accepts alphabetical, numerical, and special characters.)
5. (Optional) Enter a **Description**. (From 1 to 255 characters, this field accepts alphabetical, numerical, and special characters.)
6. (Required) Set the **Criticality** of the **MHM Equipment**. (Default: **1**) (Lowest criticality = **1**, to the highest criticality = **100**)
7. (Required) Set the **ISO Class** for the **MHM Equipment**. (ISO 2372:1974)
   - **Class I (small machines)**
   - **Class II (medium machines)**
   - **Class III (large machines, rigid foundation)**
   - **Class IV (large machines, soft foundation)**
   - **Other**
8. (Required) Set the **Reference Speed** for the **MHM Equipment**. (Range: 1 to 120 000)
9. (Required) Choose the **Unit** for the **MHM Equipment**.
   - **RPM**

- **FPM** — When **FPM** is selected and the **Variable Speed** is in the **On** position, you can enter an **FPM / MPM to RPM Factor**.
- **MPM** — When **MPM** is selected and the **Variable Speed** toggle is in the **On** position, you can enter an **FPM / MPM to RPM Factor**.

10. Set the **Variable Speed** toggle to the **On** position to enable the other **Variable Speed** controls.
    a) (Required when the field is present.) Set an **FPM / MPM to RPM Factor** from 0.0001 to 1000.

    Note
    This field is only available when the **Unit** is set to either **FPM** or **MPM**.

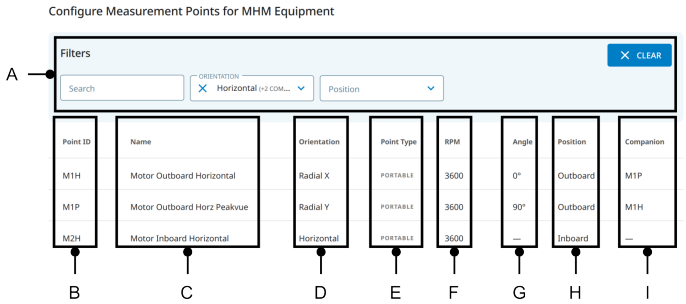
    b) (Optional) Set the **Enter speed only once** toggle to the **On** position to use a one time calibration of the speed. Use the **Off** position to require a speed measurement each time measurements are gathered.
    c) (Optional) Set the **Fixed tach location** toggle to the **On** position to require that tachometer readings to be performed on a specific location. Use the **Off** position to allow tachometer readings to be taken from various locations.
11. (Optional) You can enter an **FPM / MPM to RPM Factor** when the **Variable Speed** toggle is in the **On** position and the **Unit** is set to either **FPM** or **MPM**.
12. **Site Location** — Edit the **Site Location** in the hierarchy. See: Sort Elements in the Hierarchy

Measurement Points for MHM Equipment

The **Measurement Points** step for **MHM Equipment** contains a filterable list of **Measurement Points**.

When you find the **Measurement Point** you want to edit, click on that line in the list to open the **Edit Measurement Point** sidepanel. See: Edit an MHM Equipment Measurement Point

Figure 3-98: Measurement Point List



A. ***Filters*** — *You can search the* ***Measurement Point List****.*
   - ***Text Search*** — *Enter text here to filter the by the* ***Name*** *field.*
   - ***Orientation*** *dropdown menu — Make selections from the dropdown list to filter the list by* ***Orientation****.*
     - ***Horizontal***
     - ***Vertical***
     - ***Axial***
     - ***Radial X***
     - ***Radial Y***
     - ***Radial***
     - ***Other***
   - ***Position*** *dropdown menu — Make selections from the dropdown menu to filter the list by* ***Position****.*
     - ***Foundation***
     - ***Housing***
     - ***Inboard***
     - ***Outboard***
     - ***Pipe / Duct***
     - ***Other***

B. ***Point ID*** — *This field must be unique and can have from 1 to 3 characters. Initially set during the migration process.*
C. ***Name*** — *This field does not have to be unique and can have from 0 to 32 characters.*
D. ***Orientation*** — *(Required) Contains a value from the* ***Orientation*** *dropdown menu shown above. Initially set during the migration process.*
E. ***Point Type*** — *For* ***MHM Equipment*** *the* ***Point Type*** *is always* ***Portable****.*
F. ***RPM*** — *(Optional) (Range: 0 to 1 000 000)*
G. ***Angle*** — *(Optional) (Range: 0 to 359) Only for points with a* ***Companion****.*
H. ***Position*** — *(Required) Contains a value from the* ***Position*** *dropdown menu shown above. Initially set during the migration process.*

I. ***Companion*** *— (Optional) Lists the* ***Point ID*** *of the* ***Radial X*** */* ***Radial Y*** *point matched to this point.*

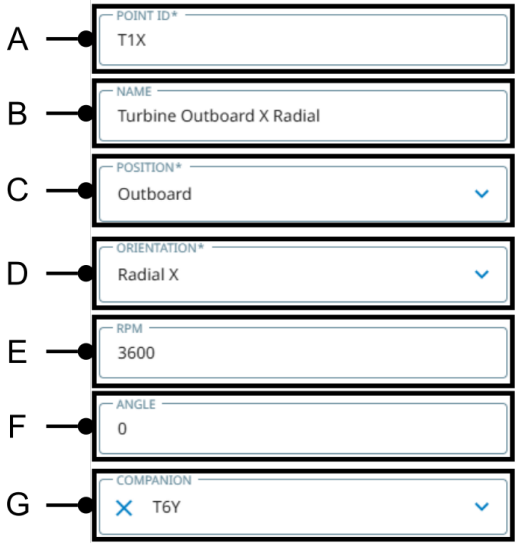
Edit an MHM Equipment Measurement Point

This task is connected with editing **Measurement Points** in **MHM Equipment**, for other types of **Machine Train** see: Step 2: Common Tasks

Prerequisites

1. Select **Design Studio** → **Select MHM Equipment** → **Measurement Point List** → **Measurement Point**
2. The **Edit Measurement Point** sidepanel opens.

Figure 3-99: Edit Measurement Point Sidepanel



A. ***Point ID*** *— This field must be unique and can have from 1 to 3 characters. Initially set during the migration process.*
B. ***Name*** *— This field does not have to be unique and can have from 0 to 32 characters.*
C. ***Position*** *dropdown menu — (Required) You can choose a value from this menu. Initially set during the migration process.*
D. ***Orientation*** *dropdown menu — (Required) You can choose a value from this menu. Initially set during the migration process.*
E. ***RPM*** *— (Optional) (Range: 0 to 1 000 000)*
F. ***Angle*** *— (Optional) (Range: 0 to 359) Only for points with a* ***Companion*** *point defined.*
G. ***Companion****MHM Equipment Configuration — (Optional) Lists the* ***Point ID*** *of the* ***Radial X*** */* ***Radial Y*** *point matched to this point.*

Procedure

1. (Required) Enter from 1 to 3 characters to create a unique **Point ID** for this point.
2. (Optional) Enter from 1 to 32 characters to create a **Name** for this point.
3. (Required) Choose the **Position** of this **Measurement Point**.
   - **Foundation**
   - **Housing**
   - **Inboard**
   - **Outboard**
   - **Pipe / Duct**
   - **Other**
4. (Required) Choose the **Orientation** of this **Measurement Point**.
   - **Horizontal**
   - **Vertical**
   - **Axial**
   - **Radial X**
   - **Radial Y**
   - **Radial**
   - **Other**
5. (Optional) Set the **RPM**. (Range: 0 to 1 000 000)
6. (Optional) When a **Companion** point is defined you can set the **Angle** between the points. (Range: 0 to 359)
7. (Optional) When the point has an **Orientation** defined as either **Radial X** or **Radial Y** you can select a matching **Companion** point from the dropdown menu.

   Note
   A pair of **Companion** points is made of one point with a **Radial X Orientation** and one point with a **Radial Y Orientation**.

8. **Apply** or **Cancel** your changes.
   - (Optional) When the **Apply** button is available, click it to record your changes and close the configuration panel.
   - (Optional) Click **Cancel** to close the configuration panel without making any changes.

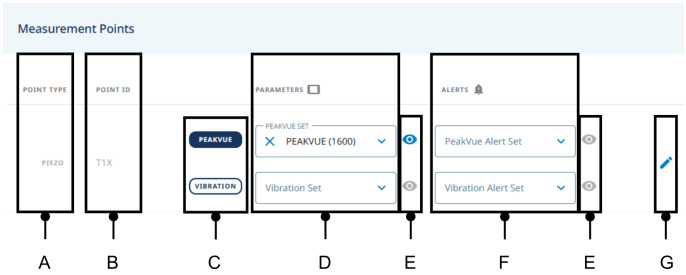
Portable Device Configuration for MHM Equipment

Configuring Portable Devices for MHM Equipment is almost the same as the regular Portable Device Configuration step. The main differences are:

1. **MHM Equipment** only has one **Asset**.

2. **MHM Equipment** only has **Portable Points**.

Figure 3-100: Portable Device Configuration for MHM Equipment



A. ***Point Type*** *— **MHM Equipment** only supports **Portable Points**.*
B. ***Point ID*** *— Each **Point ID** on an **Asset** is unique within the context of that **Asset**.*
C. ***Set Type*** *— This indicated if the set contains **PeakVue** data, or **Vibration** data.*
D. ***Parameter Set*** *— Choose a **Portable Parameter Set** for each **Point**. See: Portable Parameter Set Library*
E. ***Preview*** *— Clicking a **Preview** icon opens a side panel which shows:*
   - *The **Trend Parameters** associated with the **Parameter**.*
   - *The **Alert Types** associated with an **Alert**.*
F. ***Alert Set*** *— Choose a **Portable Alert Set** for each **Point**. See: Portable Alert Set Library*
G. ***Configure Sensor*** *— Click this to open a configuration dialog. See: Configure Portable Sensor*

Configure Portable Sensor

For each **Machine Train Type**, (**Machine Train**, **Roll / Pulley Section**, **MHM Equipment**), you can configure the sensors used in the **Portable Device Configuration** step.

The **Configure Sensor** side panel enables you to set the **Sensor Type**. The choice of **Sensor Type** determines which fields are available to configure.

There are seven **Sensor Types**:

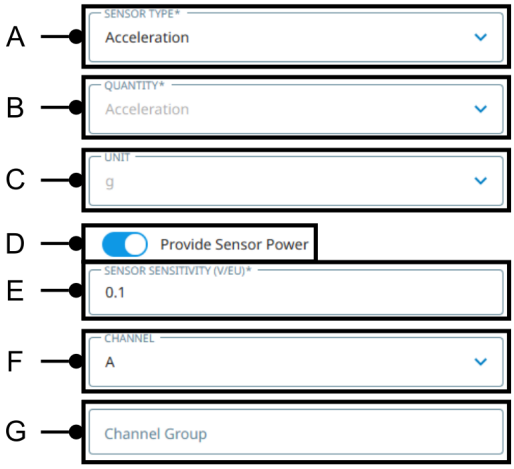
1. **Acceleration**
2. **Velocity**
3. **Displacement**
4. **General Dynamic**
5. **Static/DC Input**
6. **Keypad Input**
7. **Temperature**

Prerequisites

In AMS Machine Works select: **Design Studio** → **Select Machine Train Type** → **Portable Device Configuration** → **Configure Sensor**

Note
The selection, (**Design Studio** → **Select Machine Train Type** → **Portable Device Configuration** → **Configure Triax Sensor**), only displays general information about a **Triax Sensor**, and no configuration is possible.

Figure 3-101: Configure Sensor Sidepanel



A. ***Sensor Type*** *— The choice of* ***Sensor Type*** *determines which other fields are available for configuration.*
B. ***Quantity*** *— The* ***Quantity*** *is usually determined by the* ***Sensor Type****.*
C. ***Unit*** *— The* ***Unit*** *is usually determined by the* ***Sensor Type****.*
D. ***Provide Sensor Power*** *toggle — (Default:* ***On)***
E. ***Sensor Sensitivity (V/EU)*** *— (Default: 0.1) From 0.001 to 100000.*
F. ***Channel*** *— (Required) (Only available with* ***MHM Equipment****) One of four input channels from your* ***Portable Device****. There can be a maximum of 3 points assigned to each* ***Channel*** *in a* ***Channel Group****.*

Note
To define 3 points that are provided from the same measurement device, you must assign each point to the same ***Channel Group****, and then select which points belong to* ***Channel A****,* ***Channel B****, and* ***Channel C****.*

G. ***Channel Group*** *— (Optional) (Only available with* ***MHM Equipment****) Sensors in the same* ***Channel Group*** *can be displayed together in some types of plots. There can be a maximum of 12 points per channel group.*

Note
To define 3 points that are provided from the same measurement device, you must assign each point to the same ***Channel Group****, and then select which points belong to* ***Channel A****,* ***Channel B****, and* ***Channel C****.*

Procedure

1. Choose the **Sensor Type**:
   - **Acceleration**

a. Set the **Provide Sensor Power** toggle — (Default: **On)**

b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.

- **Velocity**
  a. Set the **Provide Sensor Power** toggle — (Default: **On)**
  b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **Displacement**
  a. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **General Dynamic**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**
     2. **Strain**
     3. **Pressure**
     4. **Voltage**
     5. **Flux**
     6. **Current**

  b. Set the **Provide Sensor Power** toggle — (Default: **On)**
  c. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
- **Static/DC Input**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**
     2. **Strain**
     3. **Pressure**
     4. **Voltage**
     5. **Flux**
     6. **Current**
     7. **Rotational Speed**
     8. **Mass Flow Rate**
     9. **Acoustic Emission**

  b. Set the **Sensor Sensitivity (V/EU)** — (Default: 0.1) From 0.001 to 100000.
  c. Set the **DC Offset (V)** — (Default: 0) From -20 to 20.
- **Keypad Input**
  a. Set the **Quantity** — Choose from:
     1. **Arbitrary Unit**

2. **Strain**
3. **Pressure**
4. **Voltage**
5. **Flux**
6. **Current**
7. **Rotational Speed**
8. **Mass Flow Rate**
9. **Acoustic Emission**
10. **Temperature**

- **Temperature**
  a. Nothing to configure.

2. (Optional) (Only available with **MHM Equipment**) Select the **Channel** from the dropdown menu.
   - **Default (A)** — **Default (A)** equals **Channel 0**. Every point which was not assigned to a channel prior to migration is assigned to the **Default (A)** channel.
   - **A** — equals **Channel 1**.
   - **B** — equals **Channel 2**.
   - **C** — equals **Channel 3**.
   - **D** — equals **Channel 4**.

   Note
   - To define 3 points that are provided from the same measurement device, you must assign each point to the same **Channel Group**, and then select which points belong to **Channel A**, **Channel B**, and **Channel C**.
   - Points with the same **Channel** must have the same **Sensor Type** and **Sensor Sensitivity**.
   - Every **Measurement Point** that shares a **Channel** must have the same nominal speed, or **RPM**. See: Edit an MHM Equipment Measurement Point

3. (Optional) (Only available with **MHM Equipment**) Set the **Channel Group**. (Range: 0 to 96)

   Note
   - To define 3 points that are provided from the same measurement device, you must assign each point to the same **Channel Group**, and then select which points belong to **Channel A**, **Channel B**, and **Channel C**.
   - Points with the same **Channel** must have the same **Sensor Type** and **Sensor Sensitivity**.

- Every **Measurement Point** that shares a **Channel** must have the same nominal speed, or **RPM**. See: Edit an MHM Equipment Measurement Point

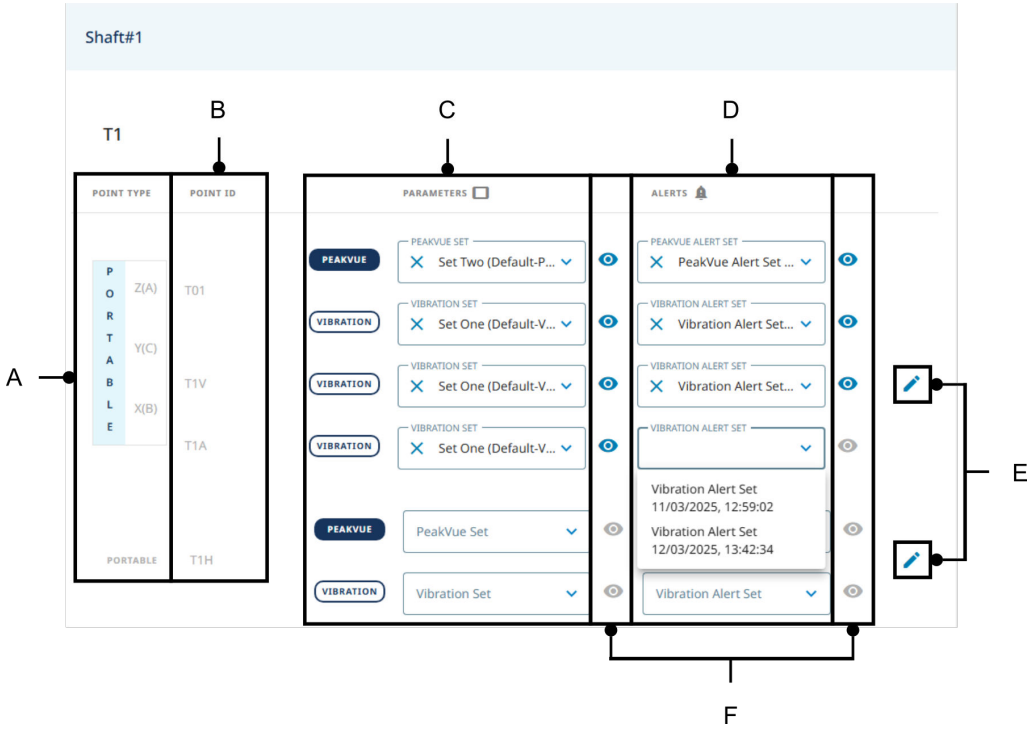
4. **Apply** or **Cancel** your changes.
   - (Optional) When the **Apply** button is available, click it to record your changes and close the configuration panel.
   - (Optional) Click **Cancel** to close the configuration panel without making any changes.

Configure Portable Parameters and Alerts

In this step you can configure a **Portable Parameter Set** and an associated **Portable Alert Set** for a list of **Portable Points** which is displayed for each **Asset**.

Note
With **MHM Equipment** there is only one **Asset**, and there are no **Portable Triax Points**.

Figure 3-102: List of Portable Points for an Asset



A. ***Point Type*** — *This is either a* ***Portable Triax Point*** *or a* ***Portable Point****.*
B. ***Point ID*** — *Each* ***Point ID*** *on an* ***Asset*** *is unique within the context of that* ***Asset****.*
C. ***Parameter Set*** — *Choose a* ***Portable Parameter Set*** *for each* ***Point****. See: Portable Parameter Set Library*
D. ***Alert Set*** — *Choose a* ***Portable Alert Set*** *for each* ***Point****. See: Portable Alert Set Library*
E. ***Configure Sensor*** — *Click this to open a configuration dialog. See: Configure Portable Sensor*
F. ***Preview*** — *Clicking a* ***Preview*** *icon opens a side panel which shows:*
   - *The* ***Trend Parameters*** *associated with the* ***Parameter****.*
   - *The* ***Alert Types*** *associated with an* ***Alert****.*

Prerequisites

1. Select any **Asset** from the **Asset List** to display list of points configured for the **Asset**.
2. Every **Portable Parameter Set** that you intend to use for this **Machine Train** must be defined. See: Portable Parameter Set Library
3. Every **Portable Alert Set** that you intend to use for this **Machine Train** must be defined. See: Portable Alert Set Library

Procedure

1. For each **Portable Point** you have the option to select a **PeakVue Set** and/or a **Vibration Set**.
   - — For a **Portable Point** — You have the option to choose one **PeakVue Set**.
     - — When a **PeakVue Set** is configured you have the option to choose a **PeakVue Alert Set**
   - — For a **Portable Point** — You have the option to choose one **Vibration Set**.
     - — When a **Vibration Set** is configured you have the option to choose a **Vibration Alert Set**.
2. For each **Portable Triax Point** you have the option to select a **PeakVue Set** and/or from 0 to 3 **Vibration Sets**.
   - — For a **Portable Triax Point** you have the option to choose one **PeakVue Set**.
     - — When a **PeakVue Set** is configured you have the option to choose a **PeakVue Alert Set**
   - — For each **Portable Triax Point** — You have the option to choose up to three **Vibration Sets**.
     - — For each **Vibration Set** that is configured, you have the option to choose a **Vibration Alert Set**
3. Repeat the previous steps for each **Asset** in your **Machine Train** that is monitored by a portable device.

Remove Portable Parameters and Alerts

Use these steps to remove either a **Portable Parameter Set**, or a **Portable Alert Set**, from use in an **Asset**.

Note
Every **Portable Alert Set** is connected with only one **Portable Parameter Set**.

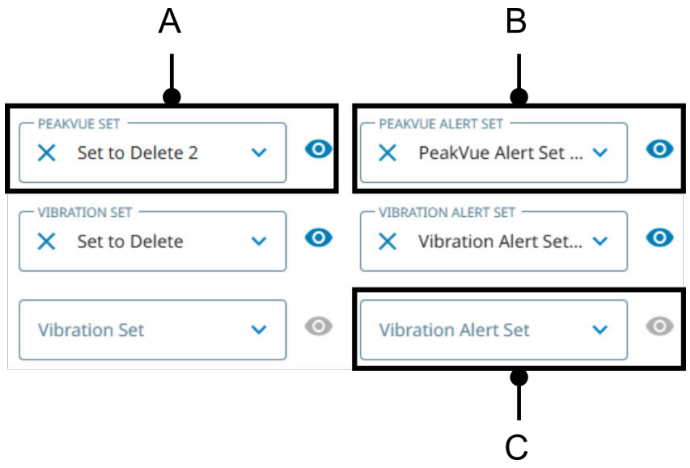
When you remove a **Portable Parameter Set** from an **Asset**, the associated **Portable Alert Set** is also removed.

Prerequisites

In the **Design Studio**, open the **Portable Device Configuration** step, and select the **Asset** of the **Machine Train** where the set is in use.

Note
MHM Equipment only has one **Asset**, so you only have to select the **MHM Equipment**.

Figure 3-103: Remove Parameter and Alert Sets



*A. Configured **Parameter Set***
*B. Configured **Alert Set***
C. Unconfigured

Procedure

1. (Option One) To remove both the **Parameter Set** and the **Alert Set**, click the **X** next to the **Parameter Set**.
2. (Option Two) To remove just the **Alert Set**, click the **X** next to the **Alert Set**.
3. Repeat Step 1 and Step 2 for every **Measurement Point** on every **Asset** on every **Machine Train** where you want to remove a **Portable Parameter Set** or **Portable Alert Set**.

4 Machinery Health

The **Machinery Health** module provides an overview of the health of your **Machine Trains**.

Every **Machine Train** has a **Criticality** assigned to it from 1 to 100:

1. **High Criticality** — Three diamonds, from 76 to 100.
2. **Medium Criticality** — Two diamonds, from 51 to 75.
3. **Low Criticality** — One diamond, from 26 to 50.
4. **Not Critical** — Zero diamonds, from 1 to 25.

Every **Machine Train** has the same **Alert Status** as the worst **Measurement** on one of its **Components**. There are five **Alert Statuses**:

1. **Critical** (9) — The **Measurement** has triggered the highest level of **Alert**.
2. **Warning** (6) — The **Measurement** has triggered the middle level of **Alert**.
3. **Advise** (4) — The **Measurement** has triggered the lowest level of **Alert**.
4. **Good** (0.01) — The **Measurement** has not triggered an **Alert**.
5. **Unknown** (0) — The **Measurement** is not available because the device that supplies it is not responding.

The **Priority** of a **Machine Train** for the **Site** is determined by multiplying **Criticality** by **Alert Status**.

```
Priority = Criticality x Alert Status
```

1. The highest **Priority** is the **Machine Train** with the highest **Criticality** and the worst **Alert Status**.
2. The lowest **Priority** is the **Machine Train** with the lowest **Criticality** and the best **Alert Status**.

Note
Every **Component** not listed in the **Top Priorities** list can be viewed when you select the **Hierarchy Tab** in the **Navigator**.

Note
Every **Machine Train** with an **Unknown** status is listed as the lowest **Priority**.

Table 4-1: Priority Matrix

Alert Status	Machine Train Criticality (100 - 1)			
	High (100 - 76)	Medium (75 - 51)	Low (50 - 26)	Not Critical (25 - 1)
Critical (9)	900 - 684	675 - 459	450 - 234	225 - 9
Warning (6)	600 - 456	450 - 306	300 - 156	150 - 6

Table 4-1: Priority Matrix *(continued)*

Alert Status	Machine Train Criticality (100 - 1)			
Advice (4)	400 - 304	300 - 204	200 - 104	100 - 4
OK (0.01)	1 - 0.76	0.75 - 0.51	0.50 - 0.26	0.25 - 0.01
Unknown (0)[1]	0	0	0	0

1 *If a measurement device is offline it does not contribute to the priority calculation. Use the Network Device Module to check the status of your measurement devices.*

4.1 Measurement Naming

AMS Machine Works has a consistent naming system for measurements. Measurements names are made up of elements. These elements are composed together in specific patterns.

The name patterns create a name space which is broader than the set of measurements currently available in AMS Machine Works. This includes combinations which are not in common usage, or those which are not supported by data from the currently available measurement devices.

4.1.1 Measurement Name Elements

AMS Machine Works combines the following elements according to specific patterns to create a name space for all possible measurement names.

Measurement names are composed of the following elements:

- Measurement Unit — The physical quantity which is measured.
- Data Shape — The type of data which is measured:
  - Peak List
  - Scalar
  - Spectrum
  - Waveform
- Measurement Details — The description of a scalar value.
- Band Info — The frequency range used in the calculation.
  - Hertz (Hz) — From X Hz to Y Hz, where X and Y are positive real numbers.
  - Orders — From X Order to Y Order, where X and Y are positive real numbers.
- RPM Reference — The harmonic of the rotational speed that is being evaluated.
- Measurement Mode — The measurement mode has different meanings depending on the context.
  - Crest Factor
  - Kurtosis
  - 0-Pk
  - 0-Pk(-)

  - 0-Pk(+)
  - Pk-Pk
  - RMS
  - Skewness
  - Variance
- Multiplier Reference Options — Multipliers of the Measurement Unit, usually from 1X to nX.

Note
The multiplier reference does not need to be an integer value, some devices provide decimal values.

4.1.2 Measurement Name Patterns

There are patterns for naming measurements in AMS Machine Works. The naming patterns are made from the elements detailed in: Measurement Name Elements

Overall Measurements

A valid Overall Measurement name is made of one element from each column in the table below.

The naming pattern for Overall Measurements is:

`Measurement Unit + Measurement Details + Measurement Mode`

Example: `Velocity Overall 0-Pk` This is a scalar 0-Peak overall value calculated from either a waveform or spectrum velocity input.

Table 4-2: Overall Measurement Name Elements

Measurement Unit	Measurement Details	Measurement Mode
Acc / Acceleration	Overall	0-Pk
Arbitrary Unit		
Current		
Disp / Displacement		
Flux		Pk-Pk
PeakVue		
Pressure		
Strain		RMS
Vel / Velocity		
Voltage		

Orbit Smax Measurements

A valid Orbit Smax Measurement name is made of one element from each column in the table below.

The naming pattern for Orbit Smax Measurements is:

`Measurement Unit + Measurement Details + Measurement Mode`

Example: `Dis Orbit Smax` This is a Smax parameter calculated from the displacement waveforms of two companion points.

Table 4-3: Orbit Smax Measurement Name Elements

Measurement Unit	Measurement Details	Measurement Mode
Acc / Acceleration	Orbit Smax	(empty)
Arbitrary Unit		
Current		
Disp / Displacement		
Flux		
PeakVue		Pk-Pk
Pressure		
Strain		
Vel / Velocity		
Voltage		

Waveform Total Measurement Names

A valid Waveform Total Measurement name is made of one element from each column in the table below.

The naming pattern for Waveform Total Measurements is:

`Measurement Unit + Measurement Details + Measurement Mode`

Example: `Acc Waveform Crest Factor` is a scalar Crest Factor calculated from an Acceleration Waveform.

Table 4-4: Waveform Total Measurement Name Elements

Measurement Unit	Measurement Details	Measurement Mode
Acc / Acceleration	Waveform	0-Pk
Arbitrary Unit		0-Pk(-)
Current		0-Pk(+)
Disp / Displacement		Crest Factor
PeakVue		Kurtosis
Pressure		Pk-Pk
Strain		RMS
Vel / Velocity		Skewness
Voltage		Variance

Static Measurements

The naming pattern for Static Measurements is:

`Measurement Unit`

- Acc / Acceleration
- Acoustic Emission
- Arbitrary Unit
- Current
- Discrete Value
- Disp / Displacement
- Flux
- Mass Flow
- Oil Moisture Activity
- Oil Moisture Content
- Oil Moisture Saturation
- Oil Quality
- Pressure
- Proportion
- Resistance
- Rotational Speed
- Strain
- Temperature
- Vel / Velocity
- Voltage

Device Specific Parameters

Device Specific Parameters are nonstandard parameters provided directly from various measurement devices.

The naming pattern for Device Specific Parameters is:

`Measurement Unit`

- Compression Ratio Crank Side
- Compression Ratio Head Side
- Degree Of Rod Reversal
- Differential Expansion
- Discharge Pressure Crank Side
- Discharge Pressure Head Side

- Eccentricity
- Maximum Distance
- Maximum Pressure Crank Side
- Maximum Pressure Head Side
- Minimum Distance
- Minimum Pressure Crank Side
- Minimum Pressure Head Side
- Peak Rod Compression
- Peak Rod Tension
- Position
- Position Absolute Difference
- Position Difference
- Position Maximum
- Position Minimum
- Position Sum
- Rod Drop
- Suction Pressure Crank Side
- Suction Pressure Head Side

Peak List, Spectrum and Waveform Measurements

The naming pattern for Peak List and Spectrum Measurements is:

`Measurement Unit + Spectrum / Peak List`

A valid Peak List or Spectrum Measurement name is made of one element from each column in the table below.

Example: `PeakVue Spectrum` is a spectrum calculated from a PeakVue waveform.

Table 4-5: Peak List and Spectrum Measurements

Measurement Unit	Data Shape
Acceleration	Peak List
Arbitrary Unit	
Current	
Displacement	
Flux	
PeakVue	Spectrum
Pressure	
Strain	

Table 4-5: Peak List and Spectrum Measurements *(continued)*

Measurement Unit	Data Shape
Velocity	
Voltage	

The naming pattern for Waveform Measurements is:

A valid Waveform Measurement name is made of one element from each column in the table below.

```
Measurement Unit + Waveform + (Transient)
```

Note
Transient only applies to waveforms from AMS 6500 ATG systems.

Example: `Acceleration Waveform` is obtained from an acceleration sensor.

Table 4-6: Waveform Measurements

Measurement Unit	Data Shape	Measurement Mode (Optional)
Acceleration	Waveform	Transient[1]
Arbitrary Unit		
Current		
Displacement		
Flux		
PeakVue		
Pressure		
Strain		
Velocity		
Voltage		

1 *Transient only applies to waveforms from AMS 6500 ATG systems.*

Spectrum Total Measurements

A valid Spectrum Total Measurement name is made of one element from each column in the table below.

The naming pattern for Spectrum Total Measurements is:

```
Measurement Unit + Measurement Details + Measurement Mode
```

Example: `Velocity Spectrum Total Energy RMS` is a total spectral energy scalar calculated from a velocity spectrum in the RMS amplitude mode.

Table 4-7: Spectrum Total Measurement Name Elements

Measurement Unit	Measurement Details	Measurement Mode
Acc / Acceleration	Spectrum Max Peak	0-Pk
Arbitrary Unit		
Current	Spectrum NonSync Energy	
Disp / Displacement		
Flux	Spectrum SubSync Energy	Pk-Pk
PeakVue		
Pressure	Spectrum Sync Energy	
Strain		RMS
Vel / Velocity	Spectrum Total Energy	
Voltage		

Interval Band Measurements

A valid Interval Band Measurement name is made of one element from each column in the table below.

The naming pattern for Interval Band Measurements is:

`Measurement Unit + Measurement Details + Band Info + Measurement Mode`

Example: `Acc Sync Band (500-1000 Hz) 0-Pk:` is a synchronous energy scalar calculated from the 500 - 1000 Hz band from an acceleration spectrum in the 0-Pk amplitude mode.

Table 4-8: Interval Band Measurement Name Elements

Measurement Unit	Measurement Details	Interval Band	Measurement Mode
Acc / Acceleration	Max Peak Band	(X - Y Hz)	0-Pk
Arbitrary Unit			
Current	NonSync Energy Band		
Disp / Displacement			
Flux		(X - Y Order)	Pk-Pk
Pressure	Sync Energy Band		
Strain			RMS
Vel / Velocity	Total Energy Band		
Voltage			

Peak Measurements

A valid Peak Measurement name is made of one element from each column in the table below.

The naming pattern for Peak Measurements is:

`Measurement Unit + Measurement Details + nX Reference + Measurement Mode`

Table 4-9: Peak Measurement Name Elements

Measurement Unit	Measurement Details	Multiplier Reference	Measurement Mode
Acc / Acceleration	Peak	nX	0-Pk
Arbitrary Unit			
Current			
Disp / Displacement			
Flux			Pk-Pk
Pressure			
Strain			RMS
Vel / Velocity			
Voltage			

Phase Measurements

A valid Phase Measurement name is made of one element from each column in the table below.

The naming pattern for Phase Measurements is:

`Measurement Unit + Measurement Details + nX Reference`

Table 4-10: Phase Measurement Name Elements

Measurement Unit	Measurement Details	Multiplier Reference
Acc / Acceleration	Phase	nX
Arbitrary Unit		
Current		
Disp / Displacement		
Flux		
Pressure		
Strain		
Vel / Velocity		
Voltage		

Line Frequency Measurements

A valid Life Frequency Measurement name is made of one element from each column in the table below.

The naming pattern for Line Frequency Measurements is:

`Measurement Unit + Measurement Details + Measurement Mode`

Table 4-11: Line Frequency Measurement Name Elements

Measurement Unit	Measurement Details	Measurement Mode
Acc / Acceleration	2xLF	0-Pk
Arbitrary Unit		
Current		
Disp / Displacement		
Flux		Pk-Pk
PeakVue		
Pressure		
Strain		RMS
Vel / Velocity		
Voltage		

4.1.3 Measurement Names with an Asterisk

Some measurements can have nonstandard names which are flagged with an asterisk, *, at the end. This indicates an inconsistency when the measurement was registered. This inconsistency does not have any effect on the system's operation, and no action is required by the user.

Note
Measurements with improper names are flagged with as asterisk to aid the customer support department in their analysis.

4.2 Machinery Health Interface

The **Machinery Health** interface is divided into two main sections:

- **Navigator** — By selecting items in the **Navigator** you set the contents of the **Work Area**.
- **Work Area** — The **Work Area** contains most of the informational displays and functions.

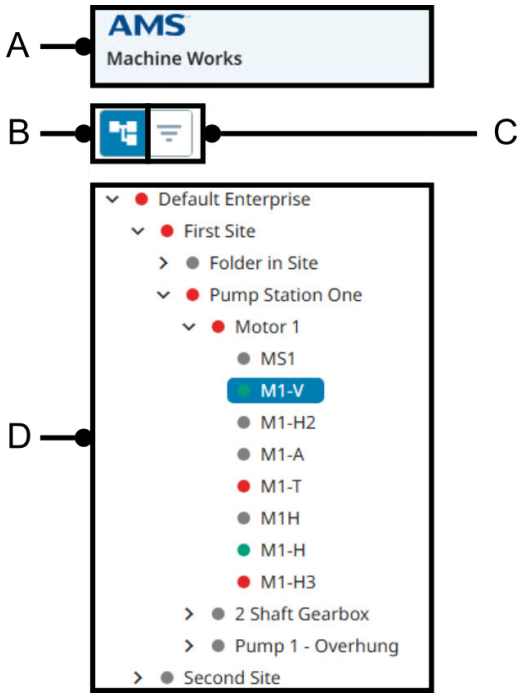
Navigator

Depending on which tab is selected in the **Navigator**, it contains controls for either:

- Navigating the **Hierarchy**. See: Navigate Hierarchy
- Selecting a **Parameter**. See: Select Trend

In the **Navigator** — A hierarchical view of every **Location** that the **User** has access to.

Figure 4-1: Navigator — Hierarchy View



A. ***AMS Machine Works*** *— Click here to reload the* ***Landing Page*** *view.*

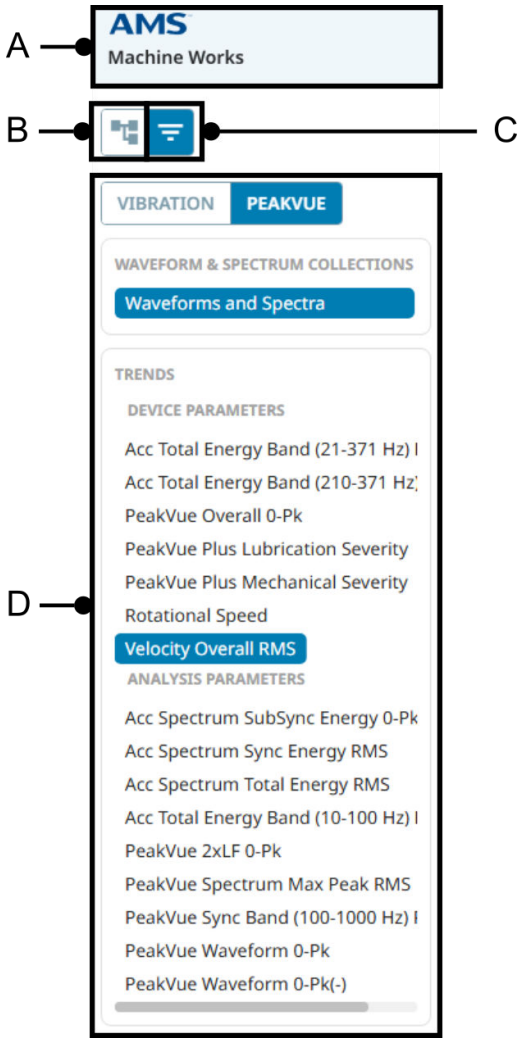
B. ***Hierarchy Tab*** *— For navigating to* ***Sites***, ***Folders***, ***Machine Trains***, ***Components***, *and* ***Measurement Points*** *is always available.*

C. ***Point View Tab*** *— For navigating back to the last* ***Point View*** *that was open.*

> ***Note***
> *This tab isn't visible unless you have a* ***Measurement Point*** *selected.*

D. ***Hierarchy Structure*** *— This contains all the elements defined in the* ***Design Studio***. *See:* Navigate Hierarchy

Figure 4-2: Navigator — Point View



When the **Point Tab** is selected in the **Navigator** it displays controls for selecting the parameters which are defined for a particular **Measurement Point**.

A. ***AMS Machine Works*** — *Click here to reload the* ***Landing Page*** *view.*
B. ***Hierarchy Tab*** — *The* ***Hierarchy Tab*** *is always available for navigating to* ***Sites***, ***Folders***, ***Machine Trains***, ***Components***, *and* ***Measurement Points***.
C. ***Point View Tab*** — *For navigating back to the last* ***Point View*** *that was open.*

> ***Note***
> *This tab isn't visible unless you have a* ***Measurement Point*** *selected.*

D. ***Parameter Lists*** — *This list contains every parameter which was defined in the* ***Design Studio*** *for that point. See:* Navigate Hierarchy

Work Area

The **Work Area** changes its contents depending on what is selected in the **Navigator**.

The **Work Area** has four modes:

1. **Landing View** — The default view showing a list of the **Top Priority Components**. See: Top Priority Tab
2. **Machine Train View** — An overview of a selected **Machine Train**. See: Machine Train View
3. **Component View** — An overview of a selected **Component** in a **Machine Train**. See: Component View
4. **Point View** — A detailed view of the data associated with a **Measurement Point**. See: Point View

4.2.1 Common Tasks

There are several controls that are available from all parts of the interface of the Machinery Health Module.

- Navigate Hierarchy
- Navigate the Breadcrumb Path

Navigate Hierarchy

The hierarchy list is available in all parts of the Machinery Health module by clicking the hierarchy icon.

Figure 4-3: Hierarchy Icon

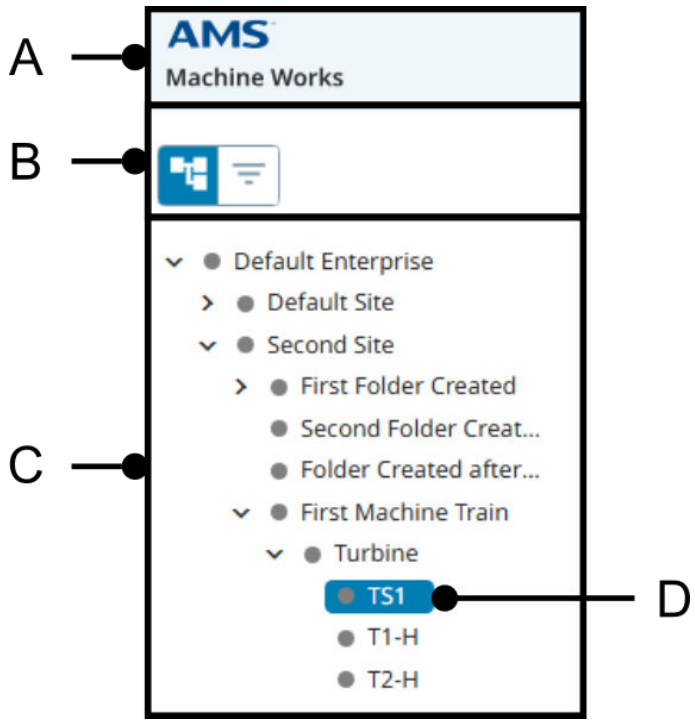


The hierarchy list displays items in the order that they are created with the oldest items at the top. The hierarchy list puts **Folders** items before **Machine Trains** and **Roll/Pulley Sections**.

1. **Hierarchy** — This is a hierarchical list of your entire **Default Enterprise**.
    a. **Default Enterprise** — The root of your **Hierarchy**, it contains **Site** elements.
    b. **Site** — A **Site** can contain a **Folder**, **Machine Train**, or **Roll/Pulley Section**
    c. **Folder** — A **Folder** can be in a **Site**, or inside another **Folder**.
    d. **Machine Train** / **Roll/Pulley Section** — A **Machine Train** / **Roll/Pulley Section** can be in a **Site**, or a **Folder**.
    e. **Asset** — Every **Asset** is part of either a **Machine Train** or a **Roll/Pulley Section**.
    f. **Measurement Point** — Every **Asset** can contain a range of **Measurement Points**.

Every element of the hierarchy can be renamed in the **Design Studio** except for the **Default Enterprise**.

Figure 4-4: Machinery Health Hierarchy



A. ***Header*** *— Click on the* ***Header*** *to reset your view to the* ***Landing View****. See: Top Priority Tab*
B. ***Navigator Controls***
   - ***Hierarchy Icon*** *— (Selected) Always available.*
   - ***Point View Icon*** *— (Unselected) Click here to open the* ***Parameter Selection List*** *in the navigator. Only available when a* ***Measurement Point*** *has been selected.*

C. ***Hierarchy List***
D. ***Measurement Point*** *— The currently selected* ***Measurement Point*** *is highlighted.*

Note
Editing elements of the hierarchy is done in the **Design Studio Module**.

See:

- Create and Edit the Hierarchy
- Step One: Build Train
- Step Two: Measurement Locations.

Procedure

1. (Optional) Click on a **Site** to open that part of the hierarchy.

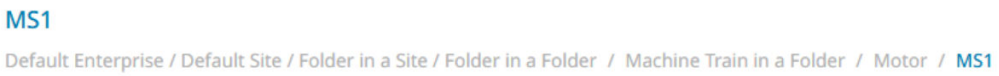
2. (Optional) Click on a **Folder** to open that part of the hierarchy.
3. (Optional) Click on a **Machine Train** to open the **Machine Train View** for that **Machine Train**. See: Machine Train View
4. (Optional) Click on a **Component** to open the **Component View** for that **Component** . See: Component View
5. (Optional) Click on a **Measurement Point** to open the **Point View** for that **Measurement** . See: Point View

Navigate the Breadcrumb Path

The breadcrumb path is available in all parts of the Machinery Health module. The hierarchy is composed of the **Default Enterprise**, **Default Site**, **Folders**, **Machine Trains**, **Components**, and **Measurement Points**.

Every element of the breadcrumb path can be renamed in the **Design Studio** except for the **Default Site**.

Figure 4-5: Machinery Health Breadcrumb Path



A. ***Default Enterprise*** *— The root of the hierarchy.*
B. ***Default Site*** *— (Renamable) Contains* ***Folders*** *and* ***Machine Trains****.*
C. ***Folder in a Site*** *— (Renamable) Contains* ***Folders*** *and* ***Machine Trains****.*
D. ***Folder in a Folder*** *— (Renamable) Contains* ***Folders*** *and* ***Machine Trains****.*
E. ***Machine Train in a Folder*** *— (Renamable) Contains* ***Components****.*
F. ***Motor*** *— (Renamable) A* ***Component*** *which contains* ***Measurement Locations*** *and their associated* ***Measurement Points****.*
G. ***MS1*** *— (Renamable) A* ***Measurement Point*** *which connects to a* ***Sensor*** *and its associated data.*

Note
Editing elements of the hierarchy is done in the **Design Studio Module**.

See:

- Create and Edit the Hierarchy
- Step One: Build Train
- Step Two: Measurement Locations.

Procedure

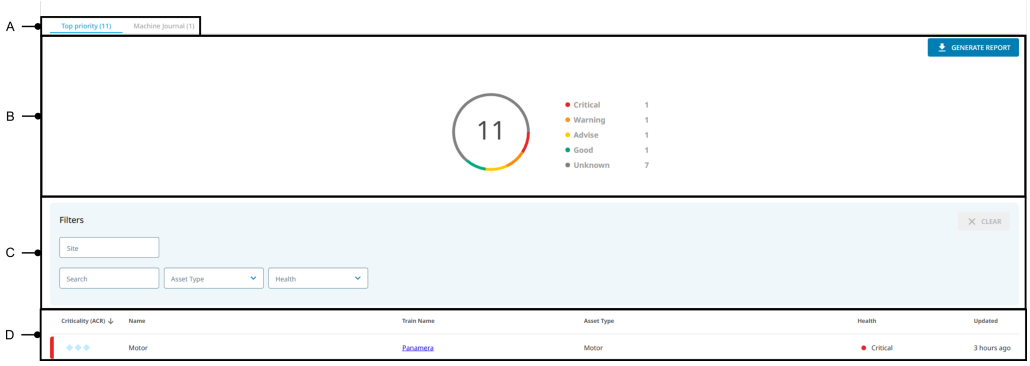
Click on any element in the breadcrumb path to navigate to that level.

4.2.2 Top Priority Tab

The **Top Priority Tab** is the default landing view of the **Machinery Health Module**. This list contains **Components** from **Locations** that the user has access to. By default, the list is displayed by descending priority as defined in Table 4-1.

Clicking on an element in the list will load the **Machine Train View** for the **Machine Train** which contains the high priority **Component**. See: Machine Train View

Figure 4-6: Top Priority Tab



A. ***Machinery Health Tabs*** *—* ***Top Priority Tab*** *is selected.*

B. ***Top Priority KPI*** *display area. — A visual representation of the critical issues monitored by AMS Machine Works.*

- ***Generate Report*** *button — Click the* ***Generate Report*** *button to generate a report for every item in your entire installation which matches your current filter settings. See: Generate a Top Priority Report*
- ***Top Priority KPI*** *display — The* ***Top Priority KPI*** *display shows the filtered results of the* ***Top Priority List****.*

C. ***Top Priority Filters*** *— The* ***Top Priority Filters*** *affect what is displayed in the* ***Top Priority KPI*** *display and in the* ***Top Priority List****.*

> ***Note***
> *The* ***Top Priority Filters*** *also affects the contents of the* ***Top Priority Report****. See: Generate a Top Priority Report*

- ***Site*** *— Click in the* ***Site*** *filter and select from the list of* ***Sites*** *in your hierarchy.*
- ***Search*** *— Enter text to search by the* ***Name*** *of the* ***Asset****.*
- ***Asset Type*** *— Select as many types of* ***Asset*** *from the dropdown list as required.*
- ***Health*** *— Select as many* ***Health*** *statuses from the dropdown list as required.*
- ***Clear*** *button — Click the* ***Clear*** *button to reset the filter.*

D. ***Top Priority List*** *— You can use the information in every column to sort the list in either ascending or descending order.*

- ***Health Status Indicator*** *— The worst* ***Health Status*** *of a* ***Measurement*** *on the* ***Component****.*
- ***Criticality (ACR)*** *— The* ***Criticality (ACR)*** *is defined in Table 4-1*
- ***Name*** *— The* ***Name*** *that was set for the* ***Component*** *in the* ***Design Studio****. Click anywhere in a row, except the* ***Train Name****, to go to the* ***Component View*** *for that* ***Component****. See: Component View*
- ***Train Name*** *— The name of the* ***Machine Train*** *which contains the* ***Component****. Click on the* ***Train Name*** *to see the* ***Machine Train View****. See: Machine Train View*

- ***Asset Type*** *— The type of* ***Asset*** *in the* ***Machine Train****.*
- ***Health*** *— The worst* ***Health Status*** *of a* ***Measurement*** *on the* ***Component****. The color matches the* ***Health Status Indicator*** *for the row.*
- ***Health Change*** *— The amount of time since the* ***Health Status*** *has changed.*

Generate a Top Priority Report

You can create a report detailing all the items in the **Top Priority** list which match your current filters. The report is saved as a `.htm` file.

Prerequisites

1. In the **Machinery Health** module, select the **Top Priority** tab.
2. In the **Filters** area of the **Top Priority** tab, set any necessary filters. See: Top Priority Tab

Procedure

1. Click **Generate Report**.
   A file named `top-priority-<YYYY-MM-DD>T<HH_MM_SS>.htm` is prepared and save file dialog is opened.
2. (Optional) Enter a name for the report file.
3. Choose which directory to save the report in.

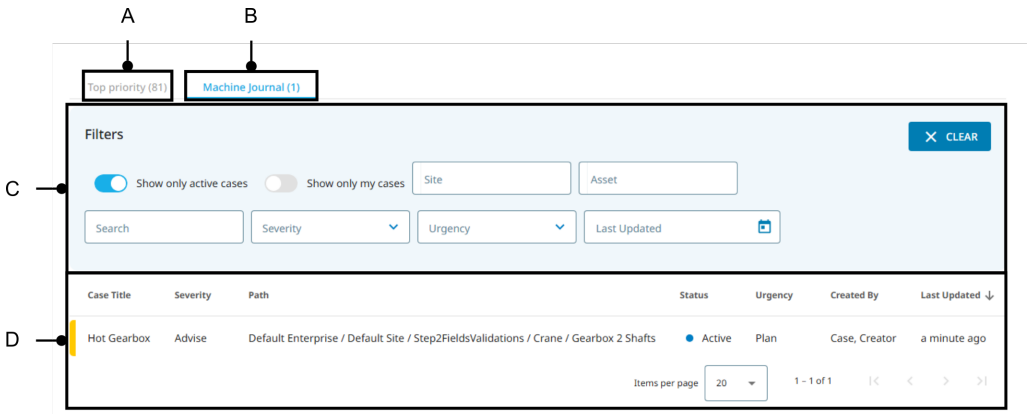
4.2.3 Machine Journal Tab

The **Machine Journal Tab** lists all the **Cases** registered in the system. By default, the **Cases** are sorted by descending **Last Updated** status. Other filtering options are available in the **Filters** area.

Clicking on a **Case** in the list does two things:

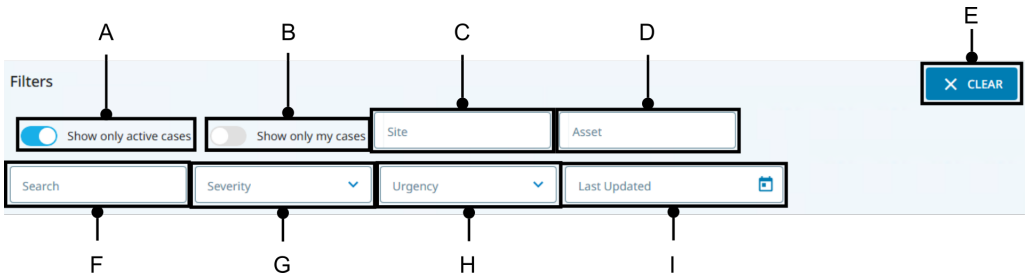
1. Opens the **Edit Case** sidepanel. See: Add / Edit a Case
2. Changes the view to **Component View** for the **Component** involved in the **Case**.

Figure 4-7: Machine Journal Tab



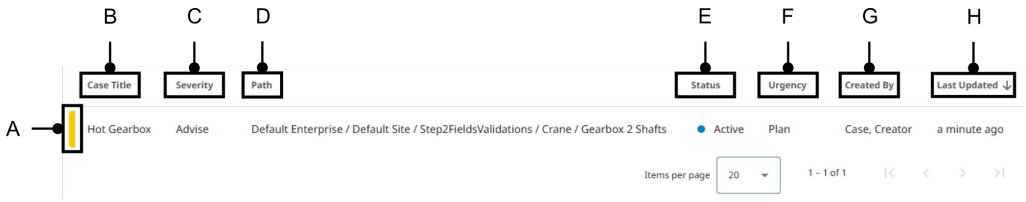
A. *(Unselected)* ***Top Priority Tab*** *— Selected you see a list of* ***Assets*** *sorted by descending* ***Criticality****. See: Top Priority Tab*
B. *(Selected)* ***Machine Journal Tab*** *— With this tab selected you see a filtered list of* ***Cases****.*
C. ***Filters*** *— The* ***Filters*** *enable you to narrow your search for* ***Cases****.*
D. ***Case List*** *— The list contains every* ***Case*** *registered in your system that meets your filtering criteria. Click on a* ***Case*** *to edit it. See: Add / Edit a Case*

Figure 4-8: Filter Area



A. ***Show only active cases*** *toggle — (Default:* ***On****) To see* ***Cases*** *which have the* ***Resolved*** *status, click the toggle into the* ***Off*** *position.*
B. ***Show only my cases*** *toggle — (Default:* ***Off****) To only see the* ***Cases*** *which you created, click the toggle into the* ***On*** *position.*
C. ***Site*** *— Enter some text from the name of the* ***Site*** *you are looking for.*
D. ***Asset*** *— Select a type of* ***Asset*** *from the dropdown menu.*
E. ***Clear*** *— Click* ***Clear*** *to remove all filters.*
F. ***Search by Case Title*** *— Type in characters to limit the list to just those entries with matching text.*
G. ***Search by Severity*** *— Click the drop-down list to select which* ***Case Severity*** *levels to search by. (****Unknown****,* ***Advise****,* ***Warning****,* ***Critical****)*
H. ***Search by Urgency*** *— Click the drop-down list to select which* ***Case Urgency*** *levels to search by. (****Unknown****,* ***Immediate****,* ***Earliest Opportunity****,* ***Plan****)*
I. ***Search by Last Updated*** *— Select a starting date or a range of dates from the calendar.*

Figure 4-9: Case List



A. ***Health Status Indicator*** *— A visual representation of the* ***Case Severity****.*
B. ***Case Title*** *—*
C. ***Severity*** *— The written form of the* ***Case Status****. (****Unknown****,* ***Advise****,* ***Warning****,* ***Critical****)*
D. ***Path*** *— The* ***Path*** *from the* ***Default Enterprise*** *to the* ***Component****.*
E. ***Status*** *— A* ***Case*** *can only be* ***Active*** *or* ***Resolved****.*
F. ***Urgency*** *— The* ***Urgency*** *of the* ***Case****. (****Unknown****,* ***Immediate****,* ***Earliest Opportunity****,* ***Plan****)*
G. ***Created By*** *— The surname and name of the* ***User*** *who added the* ***Case****.*
H. ***Last Updated*** *— The most recent date that the* ***Case*** *was changed. Click on a* ***Case*** *in the list to edit it. See: Add / Edit a Case*

4.2.4 Machine Train View

The **Machine Train View** in the **Machinery Health Module** shows an overview of a **Machine Train**, and highlights the **Health Status** of every **Component**.

Figure 4-10: Machine Train View — Machine Train Info



A. ***Machine Train Information*** *— The name, description, and number of* ***Assets*** *is set in the* ***Design Studio****.*
   - ***Number of Assets*** *— This is set in the* ***Design Studio****.*
   - ***Health Change*** *— The last time the* ***Health*** *was updated.*
   - ***Description*** *— This is set in the* ***Design Studio****.*

B. ***Health Status Indicator*** *— This vertical bar shows the worst* ***Health Status*** *of any* ***Component*** *in the* ***Machine Train****.*

C. ***Nominal Speed*** *— This is defined in the* ***Design Studio*** *for a specific* ***Component*** *in the* ***Machine Train****.*

D. ***Running Speed*** *— This is the measured speed at the* ***Asset*** *designated in the* ***Design Studio*** *with the* ***Train Speed At*** *field.*

E. ***Components in Alert*** *— This number is from 0 to the* ***Number of Components****. This number is the sum of every* ***Component*** *which has any* ***Measurement*** *in either* ***Warning*** *or* ***Critical*** *state.*

> ***Note***
> ***Advice*** *status and* ***Unknown*** *status are not counted.*

F. ***Criticality (ACR)*** *— This is set in the* ***Design Studio*** *from 1 to 100.*

The **Machine Train Diagram** is defined in the **Design Studio**. In the **Machinery Health** module every **Component** is surrounded by a **Health Status Indicator** matching the color of the **Health Status**.

Figure 4-11: Machine Train View — Machine Train Diagram

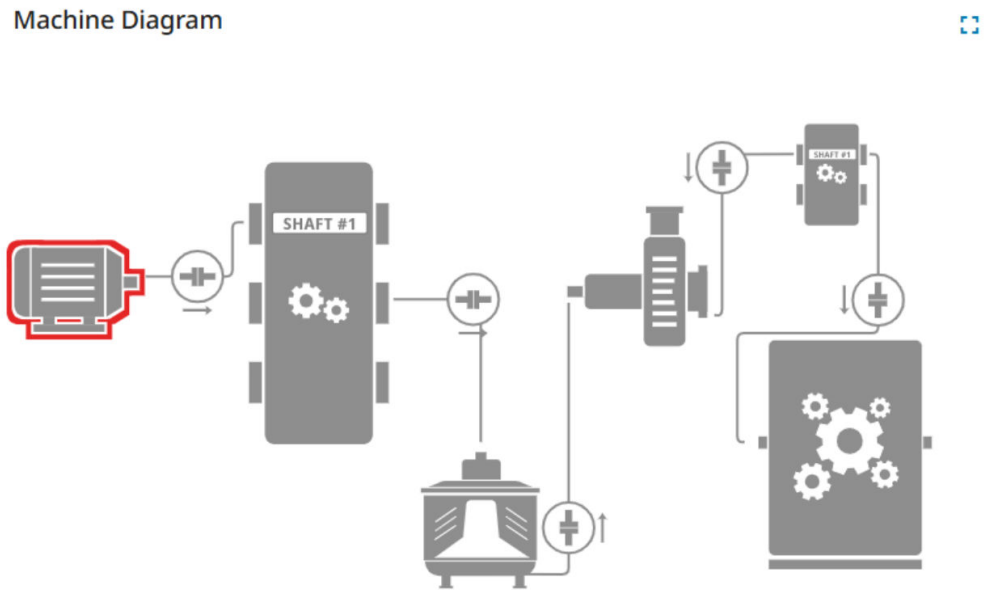


Figure 4-12: Machine Train View — Component List



A. ***Component List Total*** *— The number of* ***Components*** *in this* ***Machine Train****.*
B. ***Health Status Indicator*** *— The* ***Health Status*** *of each* ***Component*** *in the* ***Component List****.*
C. ***Name*** *— The name of the* ***Component****. Set in the* ***Design Studio*** *module.*
D. ***Health*** *— The written form of the* ***Health Status****.*
E. ***Type*** *— The* ***Component*** *type. Set in the* ***Design Studio*** *module. See: Component Definitions and Specialized Component Definitions*
F. ***Has Mapping*** *— There is a checkmark in this column if the* ***Component*** *has a measurement device mapped to it.*
G. ***Nominal Speed*** *— This is defined in the* ***Design Studio*** *for a specific* ***Component*** *in the* ***Machine Train****.*
H. ***Running Speed*** *— This is the measured speed at the* ***Asset*** *designated in the* ***Design Studio*** *with the* ***Train Speed At*** *field.*
I. ***Health Change*** *— The amount of time since the* ***Health Status*** *changed.*

Machine Train View Tasks

The following tasks can be performed in the **Machine Train View**:

- Switch to Component View

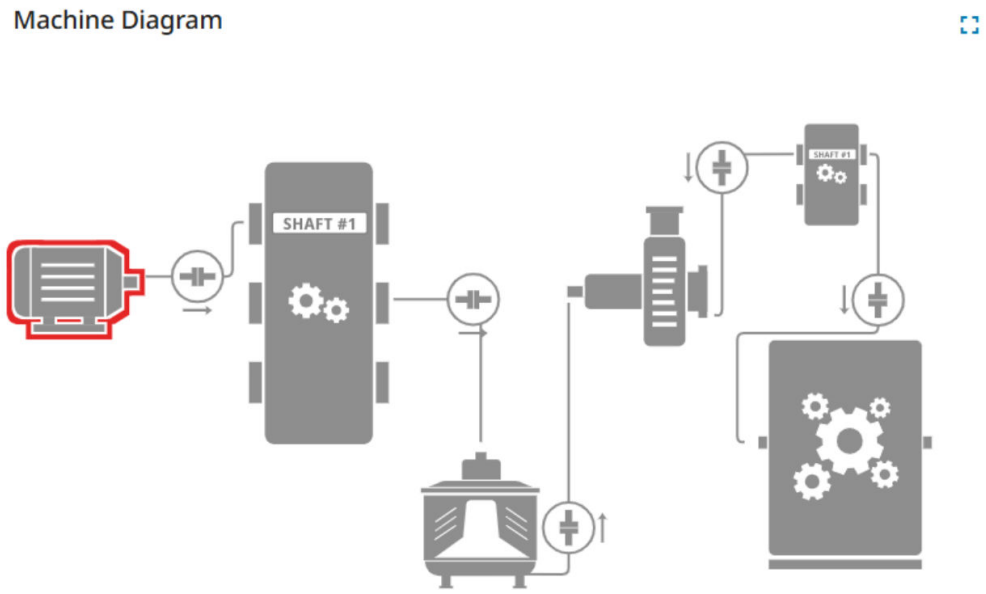
Switch to Component View

From the **Machine Train View** you can navigate to the view for each **Component** in the **Machine Train**.

Prerequisites

Open a **Machine Train View** from the hierarchy or from the **Top Priority View**. See: Navigate Hierarchy

Figure 4-13: Machine Diagram



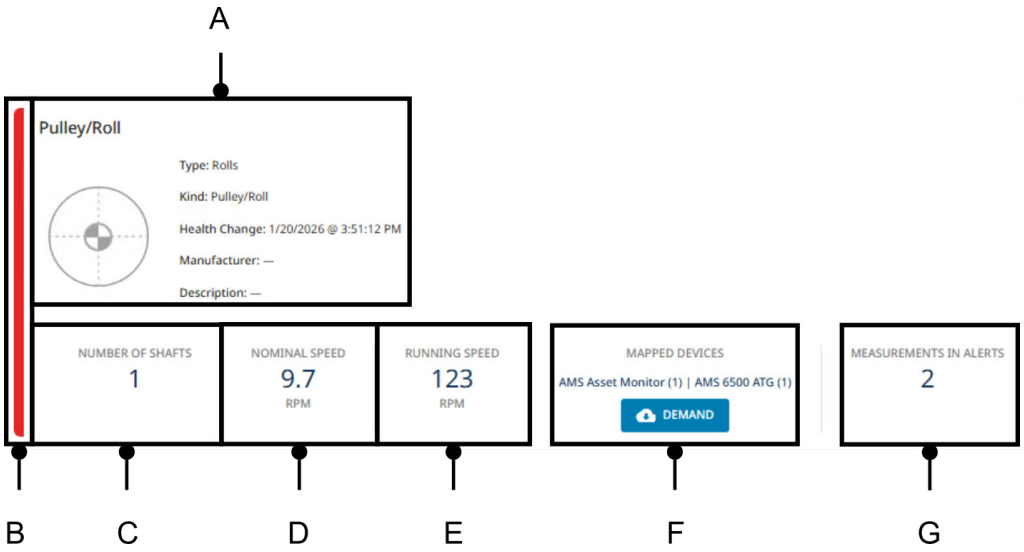
Note
Each **Component** is highlighted by its **Alert Status** when it is above **Advice**.

Procedure

1. Click on any **Component** to switch to the **Component View** for that **Component**. You are now in the **Component View**. See: Component View
2. (Optional) Use the **Breadcrumb Path** to navigate back to the **Machine Train View**, or use the **Hierarchy** to navigate to any other item.

4.2.5 Component View

Figure 4-14: Component View — Component Info



A. ***Health Status Indicator*** *— A visual representation of the* ***Health Status****. In this example, a red* ***Health Status Indicator*** *indicates a critical state.*

B. ***General Component Info*** *— Info set in the* ***Design Studio****.*
   - ***Type*** *— The* ***Type*** *is the category of* ***Component****.*
     - *For standard* ***Machine Trains*** *there are three categories of* ***Component****.*
       - ***Driver***
       - ***Intermediate***
       - ***Driven***
     - *For specialized* ***Roll / Pulley Sections*** *there are two categories of* ***Component****:*
       - ***Rolls***
       - ***Transfer Gears***
   - ***Kind*** *— The specific* ***Component*** *shown.*
   - ***Health Change*** *— The last time the* ***Health*** *was updated.*
   - ***Manufacturer*** *— This is set in the* ***Design Studio****.*
   - ***Description*** *— This is set in the* ***Design Studio****.*

C. ***Number of Shafts*** *— Every* ***Component*** *template has a defined number of* ***Shaft*** *elements.*

D. ***Nominal RPM*** *— This is the* ***RPM*** *calculated for this* ***Component*** *based on the gear ratios and the* ***Machine Train RPM****.*

E. ***Running Speed*** *— This is the measured speed at the* ***Asset*** *designated in the* ***Design Studio*** *with the* ***Train Speed At*** *field.*

F. ***Demand*** — *Click the* ***Demand*** *button to force AMS Machine Works to collect data immediately. See: Demand Collection*

G. ***Measurements in Alert*** — *This number is the sum of every* ***Measurement*** *which is in either* ***Warning*** *or* ***Critical*** *state for this* ***Component.****.*

> ***Note***
> ***Advice*** *status and* ***Unknown*** *status are not counted.*

Figure 4-15: Component View — Measurement Points



A. ***Measurement Point Total*** — *The number of* ***Measurement Points*** *in this* ***Component****.*

B. ***Health Status Indicator*** — *A visual representation of the* ***Health Status****.*

C. ***Point ID*** — *The* ***Point ID*** *is unique per* ***Component****.*

D. ***Name*** — *The* ***Name*** *of a* ***measurement point*** *can be set in: Step Two: Measurement Locations*

E. ***Health*** — *The written form of the* ***Health Status****.*

F. ***Orientation*** — *The* ***Orientation*** *of a* ***measurement point*** *can be set in: Step Two: Measurement Locations*

G. ***Point Type*** — *There are 4 types of point:*

- ***Network Point***
- ***Network Triax***
- ***Portable Point***
- ***Portable Triax***

H. ***Is Mapped*** — *When this column has a checkmark, there is a* ***Measurement Device*** *mapped to the point.*

I. ***Shaft \ Location*** — *The* ***Shaft*** *number and* ***Measurement Location*** *for this* ***Point ID****.*

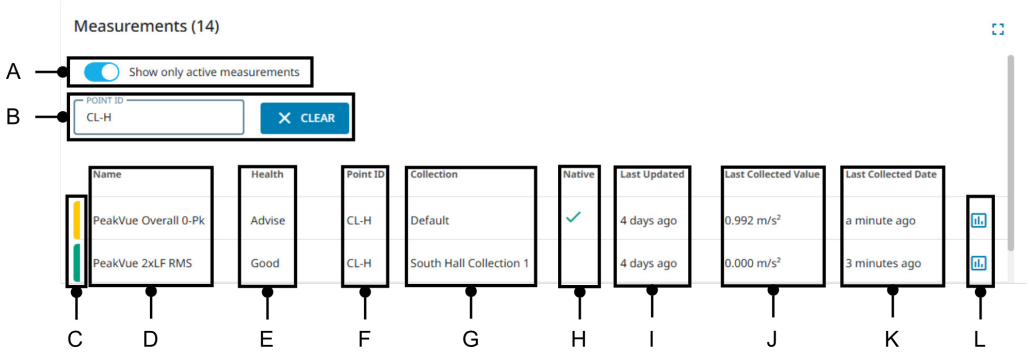
J. ***Nominal Speed*** — *This is the expected* ***RPM*** *on this shaft with the configuration set in: Step One: Build Train*

K. ***Running Speed*** — *This is the measured speed at the* ***Asset*** *designated in the* ***Design Studio*** *with the* ***Train Speed At*** *field.*

L. ***Health Change*** — *The amount of time since the* ***Health*** *was updated.*

M. ***Point View Link*** — *Open the* ***Point View*** *with the first* ***Collection*** *and first* ***Measurement*** *selected. See: Switch to Point View*

Figure 4-16: Component View — Measurements



A. ***Show only active measurements*** *toggle — (Default: On) When this is in the* ***On*** *position, only the* ***measurements*** *which are mapped to a* ***measurement point*** *in the Design Studio are displayed. See: Add a Mapping*

B. ***Search by Point ID*** *— Type in characters to limit the list to just those entries with matching text.*

C. ***Health Status Indicator*** *— A visual representation of the* ***Health Status****.*

D. ***Name*** *— Measurement names follow some naming patterns. See: Measurement Naming*

E. ***Health*** *— The written form of the* ***Health Status****.*

F. ***Point ID*** *— The* ***Point ID*** *is unique per* ***Component****.*

G. ***Collection*** *— The name of the* ***Collection*** *that the* ***measurement*** *is included in. For more information, consult the Network Device Module chapter. See: Collection Details*

H. ***Native*** *— A* ***native measurement*** *is* ***measurement*** *provided directly from the* ***Measurement Device*** *to AMS Machine Works, and which is not processed further.*

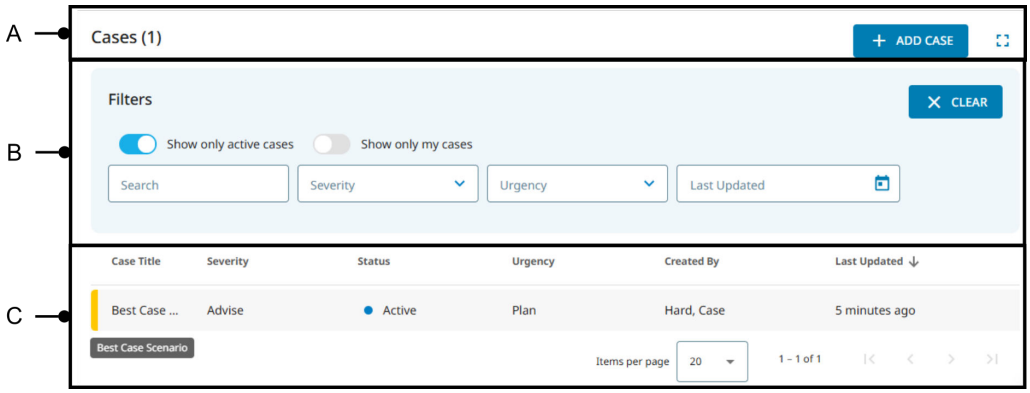
I. ***Health Change*** *— The amount of time since the* ***Health*** *was updated.*

J. ***Last Collected Value*** *— The last value from the most recent* ***Collection****.*

K. ***Last Collected Date*** *— The date of the most recent* ***Collection****.*

L. ***Point View Link*** *— Open the* ***Point View*** *with the* ***Measurement*** *from the row selected. See: Switch to Point View*

Figure 4-17: Component View — Cases

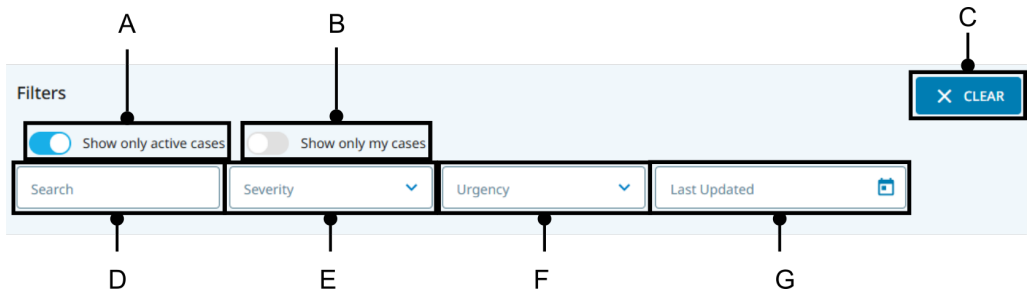


A. ***Add Case*** *button — Click* ***Add Case*** *to create a new case about this* ***Component****. See: Add / Edit a Case*

B. ***Filter Section*** *— Use these filters to refine your search to a specific set of cases.*

C. ***Case List*** *— Click on a* ***Case*** *in the list to edit a* ***Case****. See: Add / Edit a Case*

Figure 4-18: Cases — Filter Section



A. ***Show only active cases*** *toggle — (Default: On) When this is in the* ***On*** *position, only the* ***cases*** *which are still active are displayed.*

B. ***Show only my cases*** *toggle — (Default: Off) When this is in the* ***On*** *position, only the* ***cases*** *created by the current* ***User*** *are displayed.*

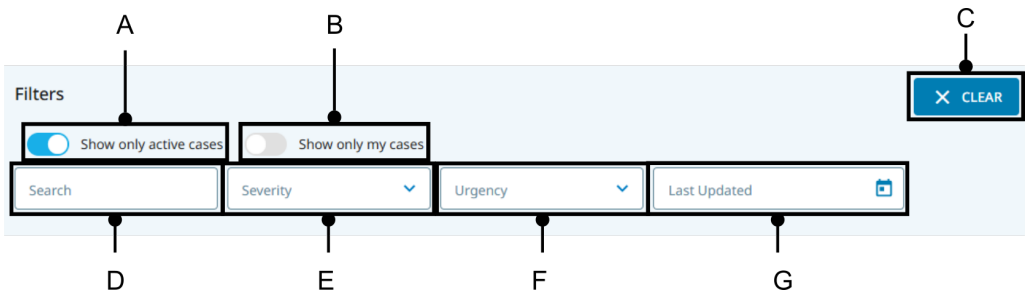
C. ***Search by Case Title*** *— Type in characters to limit the list to just those entries with matching text.*

D. ***Search by Severity*** *— Click on the dropdown list to select which* ***Case Severity*** *levels to search by. (****Unknown****,* ***Advise****,* ***Warning****,* ***Critical****)*

E. ***Search by Urgency*** *— Click on the dropdown list to select which* ***Case Urgency*** *levels to search by. (****Unknown****,* ***Immediate****,* ***Earliest Opportunity****,* ***Plan****)*

F. ***Search by Last Updated*** *— Select a starting date or a range of dates from the calendar.*

Figure 4-19: Cases — Case List



Click on any **Case** in the **Case List** to open it for editing. See: Add / Edit a Case

A. ***Health Status Indicator*** — *A visual representation of the* ***Case Severity****.*
B. ***Case Title*** — *The* ***Case Title*** *is set by the* ***Case Creator****. See: Add / Edit a Case*
C. ***Severity*** — *The written form of the* ***Case Status****.*
D. ***Status*** — *A* ***Case*** *can only be* ***Active*** *or* ***Resolved****.*
E. ***Urgency*** — *The* ***Urgency*** *of the* ***Case****.*
F. ***Created By*** — *The surname and name of the* ***User*** *who added the* ***Case****.*
G. ***Last Updated*** — *The most recent date that the* ***Case*** *was changed.*

Note

- *Changing the* ***Severity****,* ***Urgency****, and* ***Resolved*** *status change this date.*
- *Adding* ***Comments*** *and* ***Attachments*** *do not affect this date.*

Component View Tasks

In the **Component View** you can perform several standard tasks:

1. **Demand Collection** — In the **Component View** you can use the **Demand Collection** button to gather data from every device mapped to that **Component**. See: Demand Collection
2. **Only Show Active Measurements** — An active measurement is one which has an **Alert** configured for it. See: Only Show Active Measurements
3. **Filter Measurements by Point ID** — Each **Measurement Location** can have many **Measurement Points** associated with it. You can filter the list by **Point ID** to find the **Measurement** that interests you.
4. **Switch to Point View** — When you have selected a **Measurement Point** or an individual **Measurement** to analyze you can switch to the **Point View**. See: Switch to Point View

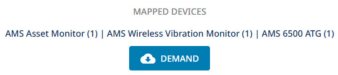
Demand Collection

In the **Component View** you can use the **Demand Collection** button to gather data from every device mapped to that **Component**.

Prerequisites

Open a **Component View** by from the hierarchy. See: Navigate Hierarchy

Figure 4-20: Demand Data Collection Control



- List of **Mapped Devices**.
- **Demand** button.

Procedure

Click **Demand** to collect data from every **Device** that is mapped to this **Component**.

Only Show Active Measurements

In the **Component View** you can use the **Only show active measurements** toggle to exclude every inactive **Measurement** on this **Component** from the **Measurements List**.

Prerequisites

Open a **Component View** by from the hierarchy. See: Navigate Hierarchy

Figure 4-21: Only Show Active Measurements Toggle



Procedure

Click **Only show active measurements** toggle to collect data from every **Device** that is mapped to this **Component**.

Filter Measurements by Point ID

In the **Component View** you can use the **Point ID** field to exclude every **Measurement** on this **Component** from the **Measurements List** which does not have an ID matching your text.

Prerequisites

Open a **Component View** by from the hierarchy. See: Navigate Hierarchy

Figure 4-22: Point ID Filter



Procedure

Enter text into the **Point ID** filter to limit the **Measurement List** to **Measurements** which match your text.

Switch to Point View

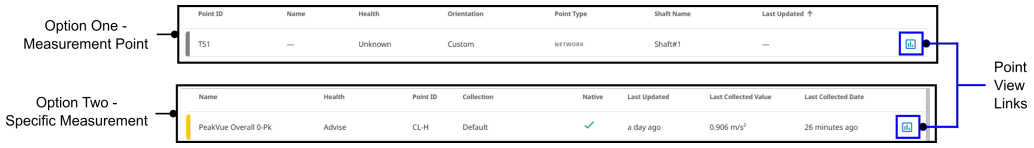
From the **Component View** you can navigate to the view for each **Measurement** connected with a **Component**.

There are two types of links from the **Component View** to the **Point View**.

Prerequisites

Open a **Component View** by from the hierarchy. See: Navigate Hierarchy

Figure 4-23: Point View Links



Procedure

1. (Option 1) From the **Measurement Point List Point View Link** — Open the **Point View** with the first **Collection** and first **Measurement** selected.
2. (Option 2) From the **Measurement List Point View Link** — Open the **Point View** with the **Measurement** from the row selected.

Add / Edit a Case

Every **Component** in your hierarchy can have **Cases** associated with them.

A **Case** can only be modified by the **Case Creator**; other **Users** can only add attachments and comments to a **Case**.

⚠ WARNING

When a **User** is deleted, all of their **Cases** are automatically set to **Resolved**.

A **Case** can be created, edited, or added to in the **Machinery Health** module in the **Cases** section of the **Component View**.

Each **Case** can have up to 50 attachments, with a maximum size per attachment of `50 MB`.

Attachments can be one of the following file types:

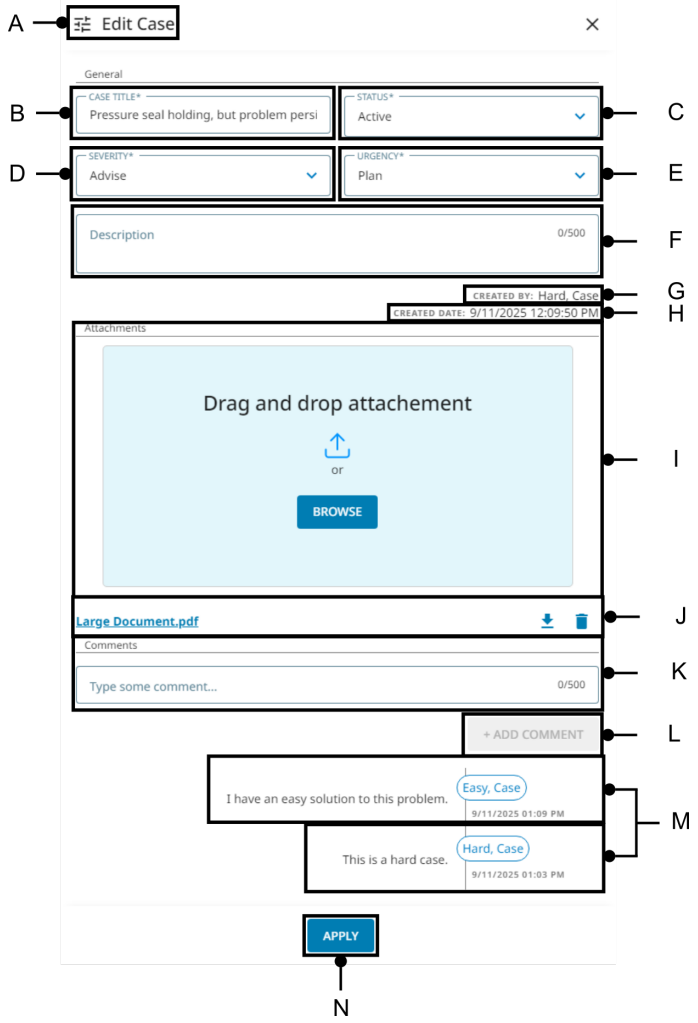
```
.bmp
.csv
.doc
.docx
.jpg / .jpeg
.json
.mp4
.pdf
.png
.ppt
.pptx
.svg
.tiff
.xls
```

```
.xlsx
.xml
.yaml
```

Prerequisites

1. Add a case: **Machinery Health Module → Navigate Hierarchy → Select Component → Cases Section → Add Case**
2. Edit or add to a case: **Machinery Health Module → Navigate Hierarchy → Select Component → Cases Section → Case List → Click on a Case**

Figure 4-24: Add / Edit Case Sidepanel



A. ***Add Case*** *during case creation, or* ***Edit Case*** *afterward.*
B. ***Case Title*** *— (Required) Up to 128 characters. Only editable by the* ***Case Creator****.*
C. ***Status*** *— (Required) (Default:* ***Active****. Only editable by the* ***Case Creator****.*
D. ***Severity*** *— (Required) Only editable by the* ***Case Creator****.*
E. ***Urgency*** *— (Required) Only editable by the* ***Case Creator****.*
F. ***Description*** *— (Optional) Only editable by the* ***Case Creator****.*
G. ***Created by:*** *— (Optional) This* ***User*** *is the* ***Case Creator****.*
H. ***Created Date*** *— (Optional) The time and date when the case was created.*
I. ***Attachments*** *— (Optional) Attachments be one of the file types listed above.*
   - ***Drag and Drop*** *files to add them.*
   - ***Browse*** *for files to add them.*
J. ***Attachment List*** *— (Optional) Every attachment connected with this* ***Case*** *is listed here.*
   - ***File Name***

- ***Download File*** *control. — Click to download an attachment.*
- ***Trash*** *— Click to remove an attachment. Any* ***User*** *can remove an attachment.*

K. ***Comment Text Entry*** *— (Optional) When editing a case you can add comments of up to 3000 characters each.*
L. ***Add Comment*** *button — (Optional) Click* ***Add Comment*** *once you have added some text.*
M. ***Comment Section*** *— (Optional) This area lists all the comments added to this* ***Case*** *with the newest comment at the top.*
N. ***Apply*** *— Click* ***Apply*** *to record your changes and close the sidepanel.*

Procedure

1. (Required during case creation.) Set or edit a **Case Title** of up to 128 characters. Only editable by the **Case Creator**.
2. (Required during case creation.) Set or edit the **Status**. Only editable by the **Case Creator**.
   - (Default) **Active**
   - **Resolved**
3. (Required during case creation.) Set or edit the **Status**. Only editable by the **Case Creator**.
   - (Default) **Advise**
   - **Unknown**
   - **Warning**
   - **Critical**
4. (Required during case creation.) Set the **Urgency**. Only editable by the **Case Creator**.
   - (Default) **Plan**
   - **Unknown**
   - **Immediate**
   - **Earliest Opportunity**
5. (Optional) Set or edit the **Description** of up to 3000 characters.
6. (Optional) Add or delete up to 50 attachments. (Max file size: `50 MB`)
   - Drag and Drop — You can drag files from your file system here and drop them to add them.
   - Browse — You can browse your file system to find images to add.
7. (Optional) Type in a comment of up to 3000 characters, and then click **Add Comment** to publish your comment.

Note
Comments cannot be edited or deleted, and are published immediately.

8. When you have made any changes to a **Case** you have to confirm them.
   - Click **Apply** to save your changes and close the sidepanel.
   - Click **X** to close the sidepanel without recording your changes.

4.2.6 Point View

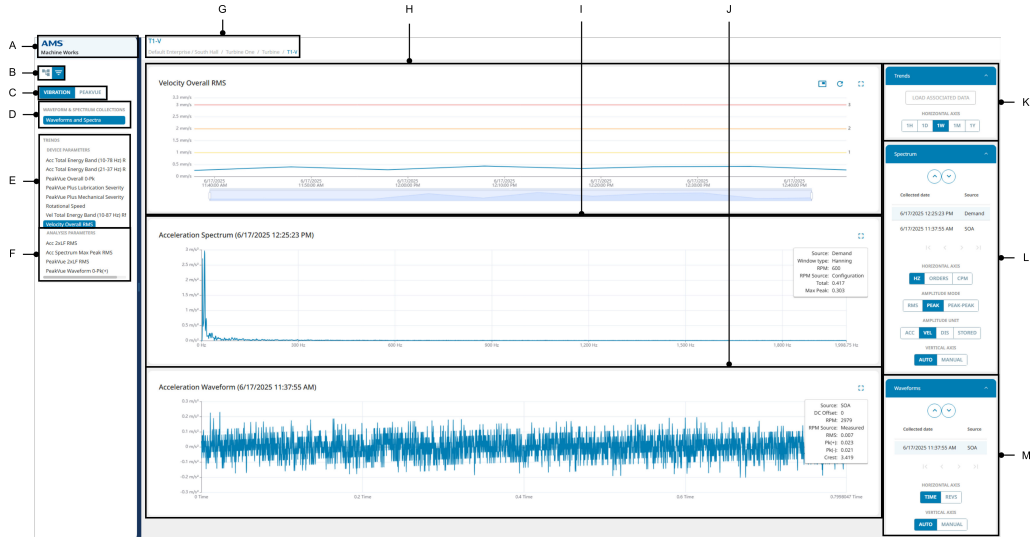
In the **Point View**, the user can interact with the data available for the point that you have selected.

In the **Navigator** the **Point View** tab is selected, and there are controls for selecting which of the measurements associated with the point to observe.

For every measurement there are controls to change the source, scope, and scale of the three graphs.

With each graph, the cursor has a tooltip which highlights the value(s) at its current horizontal position. See: Select Trend Point

Figure 4-25: Point View Interface



A. *AMS Machine Works — Click in this area to go to the Top Priority Tab.*
B. *Navigator Tabs — The **Point View Tab** is visible and selected. Click the **Hierarchy Tab** to load the **Hierarchy** in the **Navigator**. See: Navigate Hierarchy*
C. ***Mode Selector** — Click the **Mode Selector** to switch between **Vibration Mode** and **PeakVue Mode** with the **Spectrum Graph** and **Waveform Graph**. See: Switch Between Vibration and PeakVue Modes*
D. ***Collection List** — Select which **Collection** of data to select a **Trend** from. See: Select Collection*
E. ***Trend Selection** / **Device Parameters** — A list of all parameters supplied directly by the **Devices** connected to this **Measurement** point. See: Select Trend*
F. ***Trend Selection** / **Analysis Parameters** — A list of all the derived analysis parameters defined for this **Measurement** point. See: Select Trend*
G. ***Breadcrumb Path** — Use the **Breadcrumb Path** to navigate within this **Machine Train**. See: Navigate the Breadcrumb Path*
H. ***Trend Graph** — The **Trend Graph** shows the data associated with the **Trend Selection**. See: Trend Graph Controls*
I. ***Spectrum Graph** — The **Spectrum Graph** shows the **Spectrum** associated with **Trend**. Data can be displayed in either **Vibration Mode** or **PeakVue Mode**. See: Spectrum Graph Controls*
J. ***Waveform Graph** — The **Waveform Graph** shows the **Waveform** associated with **Trend**. Data can be displayed in either **Vibration Mode** or **PeakVue Mode**. See: Waveform Graph Controls*
K. ***Trend Graph Controls** — See: Trend Graph Controls*
L. ***Spectrum Graph Controls** — See: Spectrum Graph Controls*
M. ***Waveform Graph Controls** — See: Waveform Graph Controls*

Point View Tasks

The **Point View** has controls selecting types of data, and controls for viewing each kind of graph:

1. Data Type Selection Controls — See: Data Type Selection Controls
2. Trend Graph Controls — See: Trend Graph Controls
3. Spectrum Graph Controls — See: Spectrum Graph Controls
4. Waveform Graph Controls — See: Waveform Graph Controls

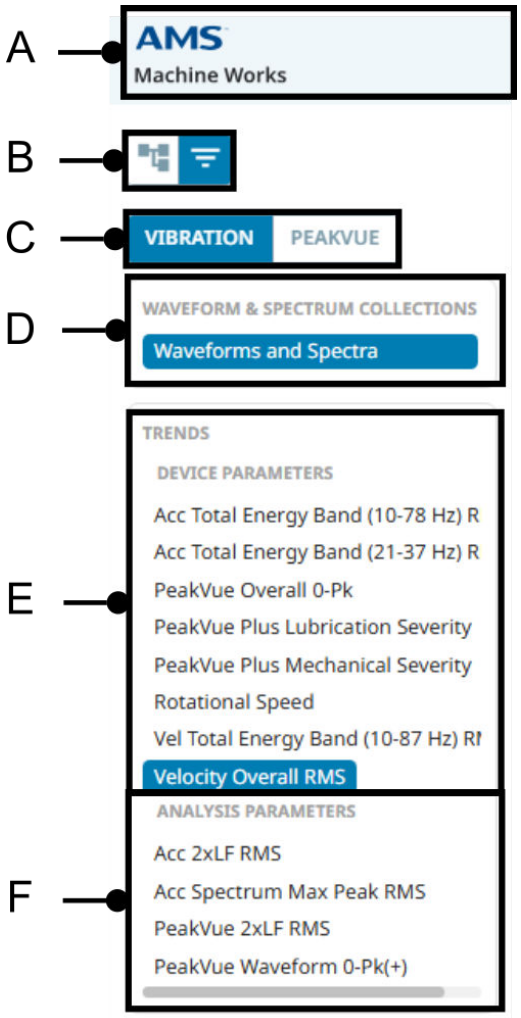
Data Type Selection Controls

The **Navigator** area in the **Point View** contains controls for selecting data for analysis.

The following tasks can be performed in the **Point View Navigator**:

- Switch Between Vibration and PeakVue Modes
- Select Collection
- Select Trend

Figure 4-26: Point View Navigator



A. *AMS Machine Works — Click in this area to go to the Top Priority Tab.*
B. *Navigator Tabs — The **Point View Tab** is visible and selected. Click the **Hierarchy Tab** to load the **Hierarchy** in the **Navigator**. See: Navigate Hierarchy*
C. ***Mode Selector** — Click the **Mode Selector** to switch between **Vibration Mode** and **PeakVue Mode** with the **Spectrum Graph** and **Waveform Graph**. See: Switch Between Vibration and PeakVue Modes*
D. ***Collection List** — Select which **Collection** of data to select a **Trend** from. See: Select Collection*
E. ***Trend Selection** / **Device Parameters** — A list of all parameters supplied directly by the **Devices** connected to this **Measurement** point. See: Select Trend*
F. ***Trend Selection** / **Analysis Parameters** — A list of all the derived analysis parameters defined for this **Measurement** point. See: Select Trend*

Switch Between Vibration and PeakVue Modes

When there is both Vibration and PeakVue data available for a point, you can switch between two analysis modes for Spectrum Graphs and Waveform Graphs: Vibration Mode and PeakVue Mode.

Prerequisites

Both vibration and PeakVue data must be assigned to the **Measurement Point**. See: Step Three: Device Mappings

Figure 4-27: Vibration / PeakVue Toggle



The side that has a blue background is currently selected.

Procedure

1. Click the side that has a white background to toggle to that mode.
2. (Optional) Toggle between Vibration Mode and PeakVue Mode as necessary.

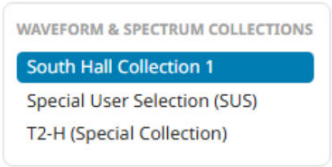
Select Collection

When there is more than one **Collection** defined for a device connected to a **Measurement Point** you can select between these **Collections** to set the source of your data.

Prerequisites

More than one **Collection** must be defined for a device connected to the **Measurement Point**. See:

Figure 4-28: Collection List



The **Collection** that is has a blue background is currently selected.

Procedure

Click on the **Collection** that contains the **Trend** that you want to analyze.
The **Collection** and a **Trend** are selected.

Postrequisites

You can now select the **Trend** that you want to analyze. See: Select Trend

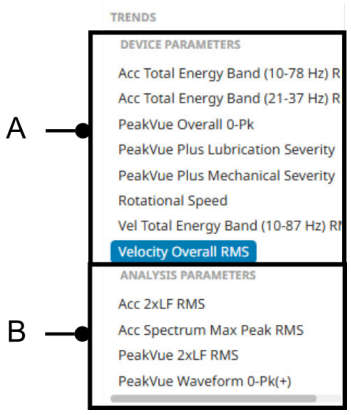
Select Trend

There are two types of **Trends** to select from, **Device Parameters**, and **Analysis Parameters**.

Prerequisites

More than one **Trend** must be available in the currently selected **Collection**. See: Select Collection

Figure 4-29: Trend List



A. ***Device Parameters*** — *These parameters are provided directly by the device.*
B. ***Analysis Parameters*** — *These parameters are calculated by AMS Machine Works.*

The **Trend** that is has a blue background is currently selected.

Procedure

1. Select the **Trend** that you want to analyze.
2. (Optional) If both **Vibration** and **PeakVue** data is available, you can switch between **Vibration Mode** and **PeakVue Mode** for your analysis. See: Switch Between Vibration and PeakVue Modes

Postrequisites

(Optional) You can manipulate each graph with dedicated controls.

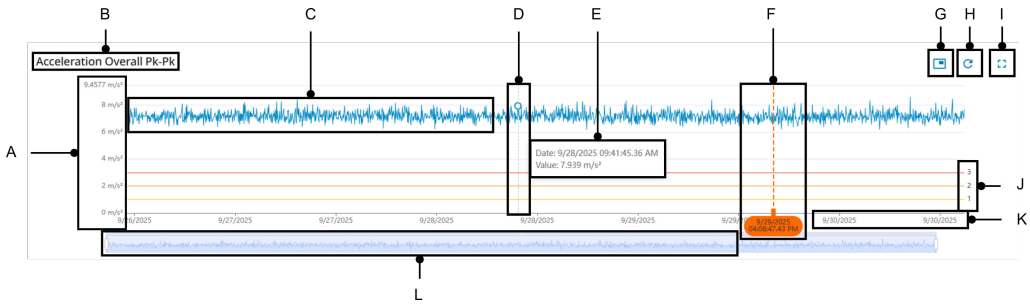
See:

- Trend Graph Controls
- Spectrum Graph Controls
- Waveform Graph Controls

Trend Graph Controls

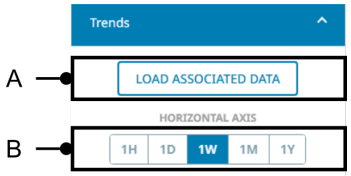
The **Trend Graph** displays the trend data that you selected from the **Trend List** available in the current **Collection**.

Figure 4-30: Trend Graph



A. ***Y-Axis Units*** — *The units and scale for the Y-Axis.*
B. ***Measurement Name*** — *AMS Machine Works descriptive name of the quantity and how it is presented. See: Measurement Naming*
C. ***Graph Data*** — *The range of data selected from the timeline is displayed in blue.*
D. ***Current Cursor Location*** — *The cursor location over the graph is dynamically updated.*
E. ***Current Cursor Value*** — *The values for the graph point at the cursor location.*
F. ***Trend Point*** — *The currently selected **Trend Point**. See: Select Trend Point, Load Associated Data*
G. ***Graph Selection Control*** — *Click this control begin selecting a custom data window. See: Select Custom Data Window*
H. ***Refresh Data Control*** — *Click this to load the most recent data. See: Refresh Data*
I. ***Expand / Collapse Graph Control*** — *Click this control to expand or collapse the graph.*
J. ***Alert Levels*** — *These are the **Alert Levels** set in the **Design Studio**.*
K. ***X-Axis Units*** — *The timeline of this data set.*
L. ***Selected Data*** — *The range of data from the timeline which is currently displayed is highlighted in dark blue.*

Figure 4-31: Trend Graph Controls



A. *Load Associated Data*
B. *Change Data Window*

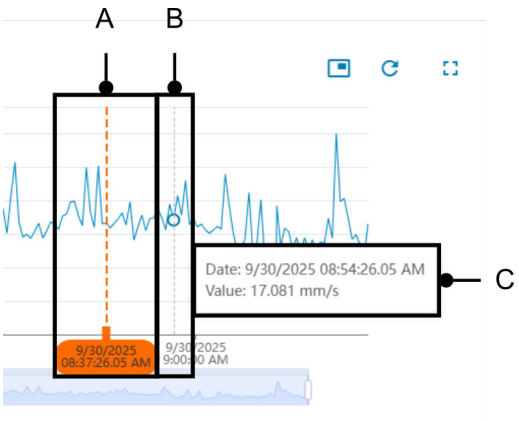
Select Trend Point

When your **Data Window** is set to the most recent period, you can use the **Refresh Data** control to ensure that the most recent trend data is displayed.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend

Figure 4-32: Selected Trend Point



A. ***Selected Point*** *control — Click a point on the* ***Trend Graph*** *select a point.*
B. ***Cursor Location*** *— The line indicates the time on the graph, the circle indicates the current value on the graph.*
C. ***Cursor Location Info*** *— The exact information for the time and value at the current cursor location.*

Procedure

1. Click a point on the **Trend Graph** select a point.
2. (Optional) Load the data associated with that point into the **Spectrum Graph** and the **Waveform Graph**. See: Load Associated Data

Load Associated Data

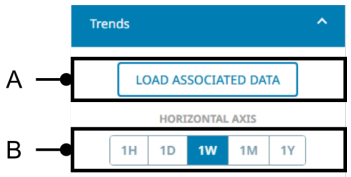
Load the data collection most closely associated with the currently selected point on the **Trend Graph**.

Note
If there isn't a **Collection** from within the current **Data Window**, no data will be loaded into the **Spectrum Graph** and the **Waveform Graph**.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. You must have a **Trend Point** selected in the **Trend Graph**. See: Select Trend Point
3. A **Collection** must exist within the current **Data Window**.

Figure 4-33: Trend Graph Sidebar



A. ***Load Associated Data*** *button — See: Load Associated Data*
B. ***Data Window Selector*** *— Click on the size of the data window to use for your analysis.*

Procedure

1. Click the **Load Associated Data** button.

   Note
   The text "No data to display" is shown when there isn't a **Collection** from within the current **Data Window**.

2. (Optional) When you are analyzing the most recent data, and a new **Collection** has been recorded, you can refresh the data. See: Refresh Data

Change Data Window

In the **Trend Graph** you can the size of the data window to use for your analysis.

You can select between windows of the following sizes:

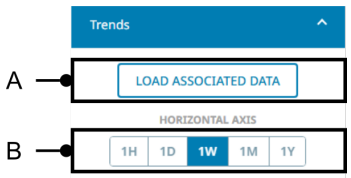
1. **1H** — Data from the last hour.
2. **1D** — Data from the last day.
3. **1W** — (Default) Data from the last week.
4. **1M** — Data from the last month.
5. **1Y** — Data from the last year.

You can also set a custom data window. See: Select Custom Data Window

Prerequisites

The **Point View** must be open in the **Machinery Health Module**.

Figure 4-34: Trend Graph Sidebar



A. ***Load Associated Data Button*** *— See: Load Associated Data*
B. ***Data Window Selector*** *— Click on the size of the data window to use for your analysis.*

Procedure

1. Click on the size of the data window to use for your analysis in the **Data Window Selector**.
   - **1H** — Data from the last hour.
   - **1D** — Data from the last day.
   - **1W** — (Default) Data from the last week.
   - **1M** — Data from the last month.
   - **1Y** — Data from the last year.
2. (Optional) Change your selection as many times as necessary.

Select Custom Data Window

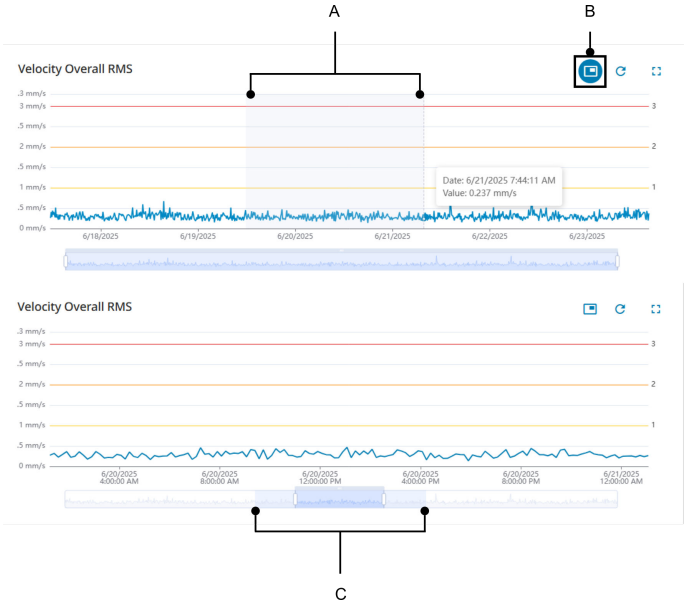
There are two ways to select a **Custom Data Window**:

1. Method One — You can select a subset of the data displayed on the graph for further analysis.
2. Method Two — You can select a subset or a superset of the current **Data Window** from the timeline for further analysis.

Prerequisites

The **Point View** must be open in the **Machinery Health Module**.

Figure 4-35: Trend Graph Sidebar



A. ***Graph Selection Area*** — *After clicking on the* ***Graph Selection Control****, click and drag on the graph to set the size of the data window to use for your analysis.*
B. ***Graph Selection Control*** — *Click this control to enable data window selection from the graph.*
C. ***Timeline Selection Area*** — *Click and drag on the timeline to set the size of the data window to use for your analysis.*

Procedure

1. Method One — From the **Trend Graph**.
    a) Click the **Graph Selection Control**.
    b) Click and drag to select a window from the **Trend Graph**.
2. Method Two — From the **Timeline**.
    a) Click and drag to select a window from the **Timeline**.

Move Data Window

You can click on any point on the **Timeline** to recenter the **Data Window** on that point.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. New **Trend Data** must be available.

Figure 4-36: Data Window

Procedure

1. Click on any point on the **Timeline** to recenter the **Data Window** on that point.
2. (Optional) Select a **Trend Point** and **Load Associated Data**. See: Select Trend Point and Load Associated Data

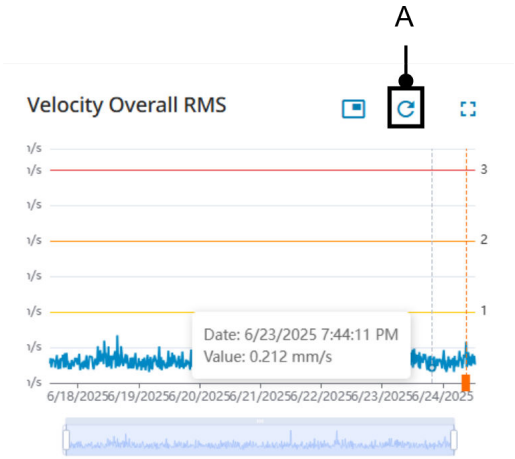
Refresh Data

When your **Data Window** is set to the most recent period, you can use the **Refresh Data** control to ensure that the most recent trend data is displayed.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. New **Trend Data** must be available.

Figure 4-37: Refresh Data Control



*A. **Refresh Data** control — Click the **Refresh Data** to get the most recent data.*

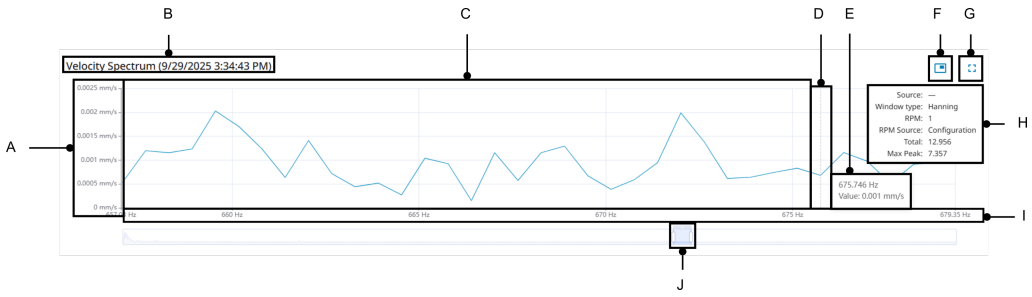
Procedure

1. Click the **Refresh Data** to get the most recent data.
2. (Optional) Gather more data and refresh again. See: Demand Collection

Spectrum Graph Controls

The **Spectrum Graph** displays any spectrum data from a collection that is associated with the measurement shown in the **Trend Graph**.

Figure 4-38: Spectrum Graph



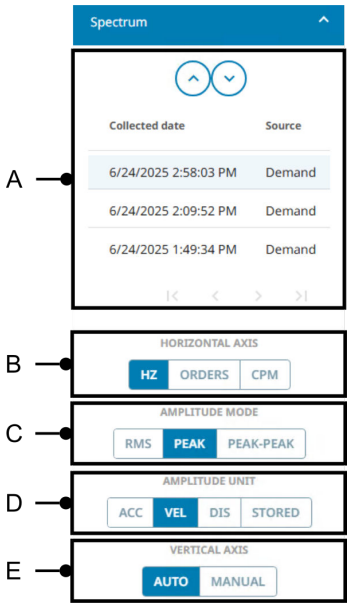
A. ***Y-Axis Units*** *— The units and scale for the Y-Axis.*
B. ***Graph Name*** *— The measurement name and the date it was collected. See:* Measurement Naming
C. ***Graph Data*** *— The range of data selected from the timeline is displayed in blue.*
D. ***Current Cursor Location*** *— The cursor location over the graph is dynamically updated.*
E. ***Current Cursor Value*** *— The values for the graph point at the cursor location.*
F. ***Graph Zoom Control*** *— Click this control and then select a range of data to zoom in on.*
G. ***Expand / Collapse Graph Control*** *— Click this control to expand or collapse the graph.*
H. ***Graph Info***
   - ***Source*** *— The source of the collection. (**Demand** / **SOA**)*

     Note
     *An empty **Source**, "-", indicates a regularly scheduled collection or a device event.*

   - ***Window Type*** *— **Hanning** / **Uniform Window***
   - ***RPM***
   - ***RPM Source*** *— **Configured** / **Measured***
   - ***Total***
   - ***Max Peak***

I. ***X-Axis*** *— The range of frequencies that are displayed.*
J. ***Selected Data*** *— The range of data frequencies which are currently displayed is highlighted in dark blue.*

Figure 4-39: Spectrum Graph Controls



A. ***Collection Dates*** — *Choose what date to view. See: Choose Collection Date*
B. ***Horizontal Axis Controls*** — *Choose between **Hz** / **Order** / **CPM**. See: Change Horizontal Axis*
C. ***Amplitude Mode*** — *See: Change Amplitude Mode*
D. ***Amplitude Unit*** — *Change Amplitude Unit*
E. ***Vertical Axis Controls*** — *Change Vertical Axis Scaling (Auto / Manual)*

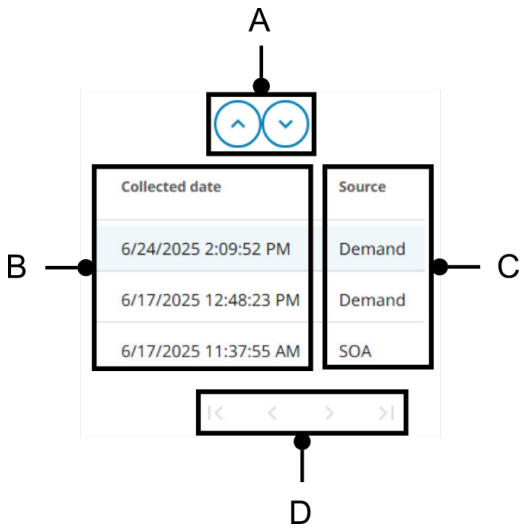
Choose Collection Date

In the **Spectrum Graph Controls** or the **Waveform Graph Controls** you can choose between the available **Collection Dates**. By default, the **Collection Date** within the **Data Window** which is closest to the **Trend Point** is loaded.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-40: Collection Date Controls



A. ***Collection*** *controls — Controls for changing the selection in the current list.*
B. ***Collected date*** *— The date the data was collected.*
C. ***Source*** *— The* ***Source*** *can be:*
   - *- — A dash indicates a regularly scheduled collection. See: Schedule Collection*
   - *- — A dash is displayed for a* ***Route****,* ***Expert****, and* ***Analyze*** *collections from AMS 2140 units.*
   - ***Demand*** *— From a user initiated* ***Demand*** *in the* ***Network Device Module*** *(See: Demand Collection) or in the* ***Machinery Health Module*** *(See: Demand Collection).*
   - ***SOA*** *— The collection was triggered by a Store On Alert Level, or* ***SOA Level****, defined in Step Four: Device Parameter Alerts.*
D. ***Collection List*** *controls — Controls for changing the* ***Collection List****.*

Procedure

1. (Optional) Select the **Collection List** which contains the date you are interested in.
2. Select the **Collection** from the date you are interested in from the **Collection List**.

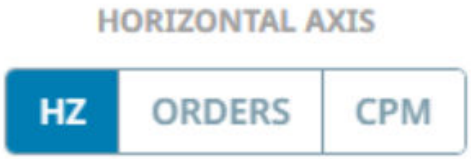
Change Horizontal Axis

In the **Spectrum Graph Controls** you can choose between three **Horizontal Axis** units. The default is **Hz**, with **Orders** and **CPM** options available.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-41: Horizontal Axis Controls



A. ***Hz*** *— (Default) Cycles per second.*
B. ***Orders*** *— A multiple of* ***Hz****.*
C. ***CPM*** *— Cycles Per Minute.*

Procedure

1. Select the **Horizontal Axis** unit which best suits your analysis.
2. (Optional) Switch between **Horizontal Axis** units as many times as necessary.

Change Amplitude Mode

In the **Spectrum Graph Controls** you can choose between three **Amplitude Modes**. The default is **Peak**, with **RMS** and **Peak-Peak** options available.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-42: Horizontal Axis Controls



A. ***RMS*** *— Root Mean Squared*
B. ***Peak*** *— (Default) The maximum positive value.*
C. ***Peak-Peak*** *— The difference between the maximum and minimum values.*

Procedure

1. Select the **Amplitude Mode** which best suits your analysis.
2. (Optional) Switch between **Amplitude Mode** as many times as necessary.

Change Amplitude Unit

In the **Spectrum Graph Controls** you can choose between four **Amplitude Units**. The default unit is set by the source, with the following options available **Acc**, **Vel**, **Dis**, and **Stored**.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-43: Amplitude Unit Controls



A. ***Acc*** *— Acceleration.*
B. ***Vel*** *— Velocity.*
C. ***Dis*** *— Displacement.*
D. ***Stored*** *— The unit depends on the configuration of the measurement device. AMS 6500 ATG, AMS Asset Monitor, and AMS 2140 units can configure* ***Stored*** *unit types.*

Procedure

1. Select the **Amplitude Unit** which best suits your analysis.
2. (Optional) Switch between **Amplitude Unit** as many times as necessary.

Change Vertical Axis Scaling (Auto / Manual)

In the **Spectrum Graph Controls** or the **Waveform Graph Controls** you can choose between **Auto** and **Manual** vertical axis scaling.

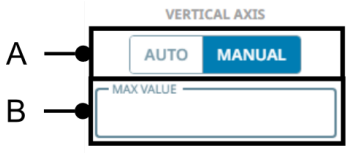
Auto scaling ensures that all the data is shown.

Manual scaling enables the user to set a scale appropriate for the analysis that the user is performing.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A **Collection Date** must be selected. See:

Figure 4-44: Vertical Axis Controls



A. ***Auto*** */* ***Manual*** *selector — (Default:* ***Auto****) Choose* ***Manual*** *to open the* ***Max Value*** *field*
B. ***Max Value*** *field — Enter the maximum value of the vertical axis.*

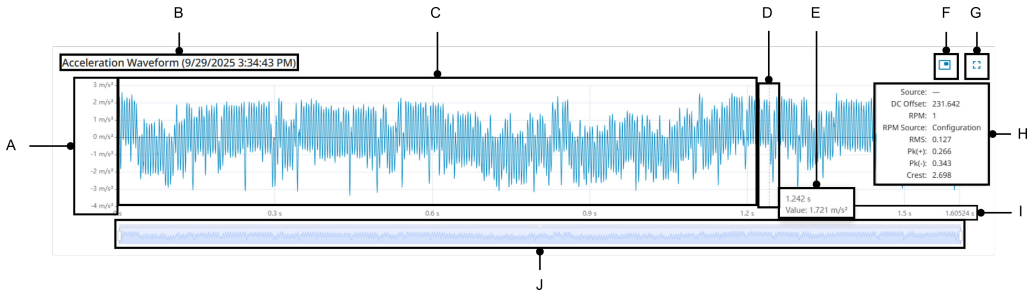
Procedure

1. Click the **Manual** side of the **Auto / Manual** selector.
2. Enter a value appropriate for your analysis into the **Max Value** field.

Waveform Graph Controls

The **Waveform Graph** displays any waveform data from a collection that is associated with the measurement shown in the **Trend Graph**.

Figure 4-45: Waveform Graph



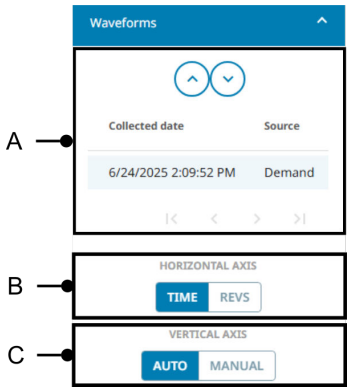
A. ***Y-Axis Units*** *— The units and scale for the Y-Axis.*
B. ***Graph Name*** *— The measurement name and the date it was collected. See:* Measurement Naming
C. ***Graph Data*** *— The range of data selected from the timeline is displayed in blue.*
D. ***Current Cursor Location*** *— The cursor location over the graph is dynamically updated.*
E. ***Current Cursor Value*** *— The values for the graph point at the cursor location.*
F. ***Graph Zoom Control*** *— Click this control and then select a range of data to zoom in on.*
G. ***Expand / Collapse Graph Control*** *— Click this control to expand or collapse the graph.*
H. ***Graph Info***
   - ***Source*** *— The source of the collection. (**Demand** / **SOA**)*

     Note
     *An empty **Source**, "-", indicates a regularly scheduled collection or a device event.*

   - ***DC Offset***
   - ***RPM***
   - ***RPM Source — Configured / Measured***
   - ***Pk(+)***
   - ***Pk(-)***
   - ***Crest***

I. ***X-Axis*** *— The time range of waveform that is displayed.*
J. ***Selected Data*** *— The range of data frequencies which are currently displayed is highlighted in dark blue.*

Figure 4-46: Waveform Graph Controls



A. ***Collection Dates*** — *Choose what date to view. See: Choose Collection Date*
B. ***Horizontal Axis Controls*** — *Choose between **Hz** / **Order** / **CPM**. See: Change Horizontal Axis*
C. ***Vertical Axis Controls*** — *See: Change Vertical Axis Scaling (Auto / Manual)*

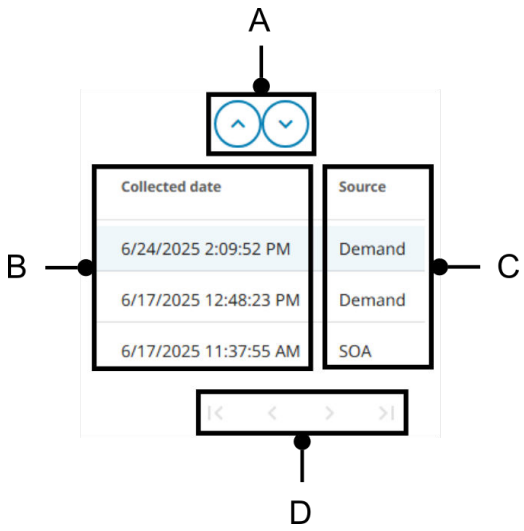
Choose Collection Date

In the **Spectrum Graph Controls** or the **Waveform Graph Controls** you can choose between the available **Collection Dates**. By default, the **Collection Date** within the **Data Window** which is closest to the **Trend Point** is loaded.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-47: Collection Date Controls



A. ***Collection*** *controls — Controls for changing the selection in the current list.*
B. ***Collected date*** *— The date the data was collected.*
C. ***Source*** *— The* ***Source*** *can be:*
   - *- — A dash indicates a regularly scheduled collection. See: Schedule Collection*
   - *- — A dash is displayed for a* ***Route****,* ***Expert****, and* ***Analyze*** *collections from AMS 2140 units.*
   - ***Demand*** *— From a user initiated* ***Demand*** *in the* ***Network Device Module*** *(See: Demand Collection) or in the* ***Machinery Health Module*** *(See: Demand Collection).*
   - ***SOA*** *— The collection was triggered by a Store On Alert Level, or* ***SOA Level****, defined in Step Four: Device Parameter Alerts.*
D. ***Collection List*** *controls — Controls for changing the* ***Collection List****.*

Procedure

1. (Optional) Select the **Collection List** which contains the date you are interested in.
2. Select the **Collection** from the date you are interested in from the **Collection List**.

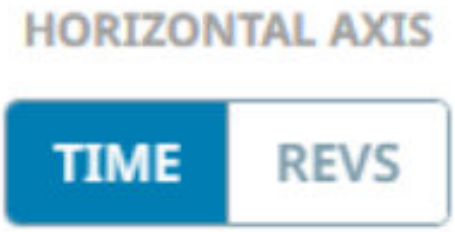
Change Horizontal Axis

In the **Waveform Graph Controls** you can choose between two **Horizontal Axis** units. The default is **Time**, with **Revs** as an available option.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A collection must be available within the current **Data Window**.

Figure 4-48: Horizontal Axis Controls



A. ***Time*** *— (Default)*
B. ***Revs*** *— Revolutions*

Procedure

1. Select the **Horizontal Axis** unit which best suits your analysis.
2. (Optional) Switch between **Horizontal Axis** units as many times as necessary.

Change Vertical Axis Scaling (Auto / Manual)

In the **Spectrum Graph Controls** or the **Waveform Graph Controls** you can choose between **Auto** and **Manual** vertical axis scaling.

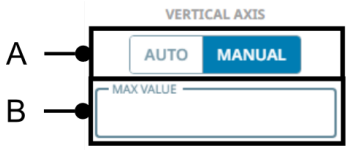
Auto scaling ensures that all the data is shown.

Manual scaling enables the user to set a scale appropriate for the analysis that the user is performing.

Prerequisites

1. The **Point View** must be open in the **Machinery Health Module**.
2. A **Trend** must be selected. See: Select Trend
3. A **Collection Date** must be selected. See:

Figure 4-49: Vertical Axis Controls



A. ***Auto / Manual*** *selector — (Default:* ***Auto****) Choose* ***Manual*** *to open the* ***Max Value*** *field*
B. ***Max Value*** *field — Enter the maximum value of the vertical axis.*

Procedure

1. Click the **Manual** side of the **Auto / Manual** selector.
2. Enter a value appropriate for your analysis into the **Max Value** field.

5 User Manager

The **User Manager** has functionality for managing users' accounts. Some of the functionality is restricted to users which have the **Administrator** or **Co-Administrator** role.

User Roles and Actions

Every level of **User** can perform the actions listed on their level, as well as all the actions of **Users** on levels below them.

1. **Administrator** — There is only one **Administrator** per AMS Machine Works system. An **Administrator** is the only **User** who can create and administrate a **Co-Administrator**. An **Administrator** has complete access to:
   - Every action.
   - Every **Location**.
   - Every **Agent**.

2. **Co-Administrator** — A **Co-Administrator** can do everything that an **Administrator** can except:
   - A **Co-Administrator** cannot create or manage another **Co-Administrator**.
   - A **Co-Administrator** cannot enable **Notifications**.
   - A **Co-Administrator** cannot configure **Custom Units**.
   - A **Co-Administrator** cannot configure the **SMTP** settings.

     Note
     A **Co-Administrator** can only view the **SMTP** settings.

   - A **Co-Administrator** cannot change the **Password Policy**.

     Note
     A **Co-Administrator** can only view the **Password Policy**.

   - A **Co-Administrator** only has access to the **Locations** assigned to them by the **Administrator**.

3. **Operator** — An **Operator** can:
   - Manage **Machine Trains** in the **Locations** they have access to.
   - Manage **Network Devices** connected through the **Agents** they have access to.
   - Access every **Location** and **Agent** the **Administrator** or a **Co-Administrator** has allowed.
   - Modify and trigger **Collections**.
   - Access and configure **Bulk Configuration** functionality.
   - Access and configure **Alert Hysteresis** functionality.

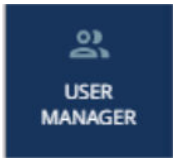
4. **Portable Device User** — A **Portable Device User** can:
   - Do **Route Management** and **Data Transfer** in every **Location** they have access to.
   - Access every **Location** and **Agent** the **Administrator** or a **Co-Administrator** has allowed.
5. **Viewer** — A **Viewer** can:
   - View data in the **Locations** they have access to.
   - Access every **Location** the **Administrator** or a **Co-Administrator** has allowed.

5.1 Log in to the User Manager

Every **User** can log in to the **User Manager**. In the **User Manager** you can change some of your own settings, or administer another **User** if you have **Administrator** or **Co-Administrator** privileges.

Prerequisites

Figure 5-1: User Manager Icon



Click on the **User Manager** icon in the **Sidebar**.

Figure 5-2: User Manager Login Screen



Procedure

1. **E-MAIL** — Enter the email address associated with this account.

   Note
   The **Admin** account is predefined in AMS Machine Works and has the highest level of privileges in the system.

2. **Password** — Enter the **Password** associated with the account.
3. **Remember My Credentials** — Click this box to store your credentials in a cookie in this browser.
4. (Optional) **Forgot Password** — Click **Forgot Password** if you have one of the following situations:
   - You no longer remember your password.
   - Your account is **Blocked**.
5. There are three ways to log in to AMS Machine Works:
   - (Option 1) **LOGIN** — Click **LOGIN** to access the **User Manager**. See: User Manager Interface
   - (Option 2) **LOGIN WITH AZURE - (OpenID_Provider_Name)** — Click **LOGIN WITH AZURE - (OpenID_Provider_Name)** to access the **User Manager**. See: User Manager Interface
   - (Option 3) With your Windows Domain User account. See the AMS Machine Works System Guide for configuration details.

   Note
   A **User** can only have one session open at one time, either a **Normal Session** or a **Private Session**.

6. (Optional) **Forgot Password** — Click this link to be redirected to the Forgot Password dialog. This is an internal site.
   a) Enter the password you use to log in to AMS Machine Works.
   b) Click **Submit** to request a password reset link.
7. (Optional) **Contact Us** — Click this link to be redirected to Emerson's Technical Support contact information in a new tab. This is an external site.
8. (Optional) **Terms of Use** — Click this link to be redirected to Emerson's Software License Agreement document in a new tab. This is an external site.
9. (Optional) **Privacy Policy** — Click this link to be redirected to Emerson's Privacy Notice page in a new tab. This is an external site.
   You are logged in to the **User Manager**.

5.2 User Manager Interface

The **User Manager** has two main areas, the **Navigator** and the **Work Area.**

The contents of the **Navigator** and the **Work Area** change when you select a **Navigator Tab**.

Some **Work Area** functions will open a **Side Panel** with additional configuration items and controls into the **Work Area** from the right side of the screen.

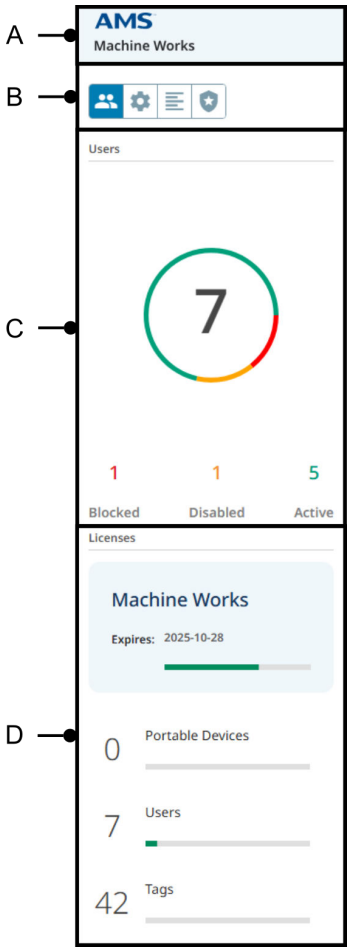
5.2.1 User Manager Navigator and Work Areas

The **Navigator** in the **User Manager** has four tabs. Each **Navigator Tab** has a **Work Area** and group of functions associated with it.

Depending on the which **Navigator Tab** you select, both the contents of the **Navigator** and the **Work Area** change.

User Manager Navigator

Figure 5-3: Navigator Sections



A. ***User Manager Navigator Tabs***

- ***User List*** — *These functions cover tasks such as adding and editing users. See: User Functions*
- ***Password Policy*** — *These functions cover tasks for setting basic password, lockout, credential policies, and provider management. See: Configurations*
- ***Event Log*** — *The* ***Event Log*** *enables* ***Administrator*** *and* ***Co-Administrator*** *users to see a list of actions that they performed on:*
  - ***Users***
  - ***Password Policy***
  - ***Provider Management***
  - ***Licenses***

  See: Event Log Searching and Filtering

- ***Licensing*** *— These functions cover tasks such as registering licenses, viewing information about usage, and requesting license proposals. See: License Functions*

B. *User Overview — This area shows an overview of the* ***Status*** *of every* ***User*** *in the system. See: Activate / Disable User and Unblock User*
C. *License Overview — This area shows an overview of the usage of various types of* ***License****. See: License Functions*

User Management

With the **User Management Tab** selected, you have access to all the information about every **User** in the system, along with the functionality for editing this information.

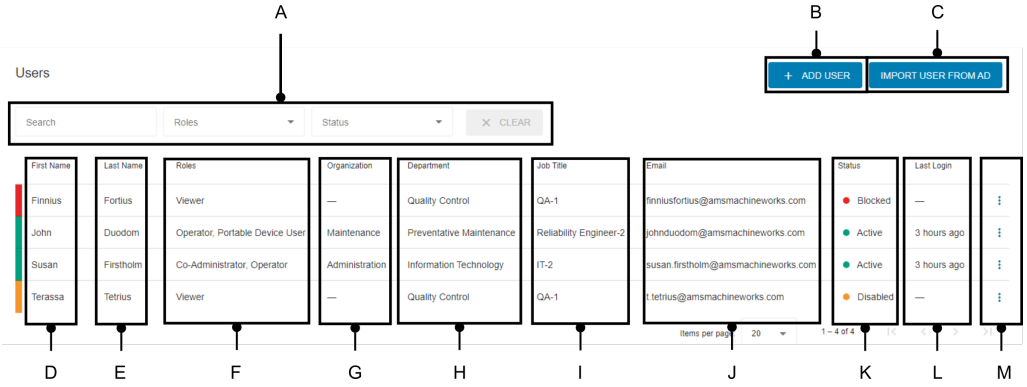
Everything that the **Administrator** and every **Co-Administrator** does is recorded in the **Event Log**. See: Event Log

- **Figure 5-4: User Management Tab**



See: User Functions

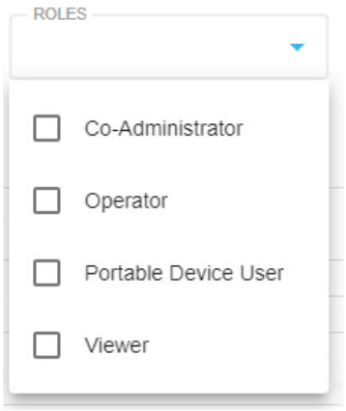
- **Figure 5-5: User Management — Work Area**



A. Search and Filter Area —

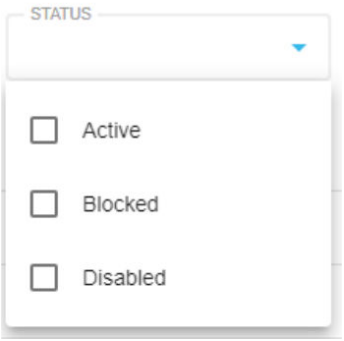
- *— **Search Field** — This field allows you to search for a user by **First Name** or **Last Name**.*
- *— **Role Filter** — This dropdown list enables you to filter for every **Role** except **Administrator**.*

Figure 5-6: Role Filter



- *— **Status Filter** — This dropdown list enables you to filter **Users** by their **Status**. (**Active** / **Blocked** / **Disabled**)*

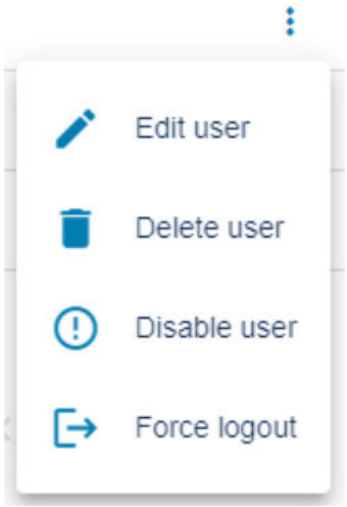
Figure 5-7: Status Filter



- — ***Clear*** *button — When a filter is in place, this button is blue. Click* ***Clear*** *to remove all filters.*

B. ***+ Add User*** *— Click on* ***+ Add User*** *to change the current work area to the* ***New User*** *screen. See: Add User*
C. ***Import User From AD*** *— Click on* ***Import User From AD*** *to open the dialog. See: Import User from Active Directory*
D. ***First Name*** *— (Required) The first name of the user.*
E. ***Last Name*** *— (Required) The last name of the user.*
F. ***Roles*** *— The* ***Primary Role*** *and the* ***Secondary Role*** *assigned to the user.*
G. ***Organization*** *— (Optional) The name of the overall organization.*
H. ***Department*** *— (Optional) The name of the department in the* ***Organization****.*
I. ***Job Title*** *— (Optional) The user's position in the* ***Organization*** *and* ***Department****.*
J. ***Email*** *— (Required) The user's email address.*
K. ***Status*** *— (Required) The status of the user's* ***Account****. (****Active****,* ***Inactive****,* ***Blocked****)*
L. ***Last Login*** *— (System Generated) Recorded in the* ***User Activity Log****.*
M. ***User Management Contextual Menu*** *— Click on the vertical ellipsis to open a contextual menu containing functions that can be performed on that user.*

Figure 5-8: User Management Contextual Menu



A. *Edit User*
B. *Delete User*
C. *Activate / Disable User*
D. *Force Logout*

Password Policy and Provider Management

With the **Password Policy and Provider Management Tab** selected you have access to the three sets of controls for configuring access: **Password Settings**, **Lockout Settings**, and **Provider Management Settings**.

- **Figure 5-9: Configurations Tab**



See: Configurations

The **Configurations** work area has five sections:

1. Password Policy Settings
2. Provider Management Functions
3. Notifications
4. Custom Units
5. SMTP

Event Log

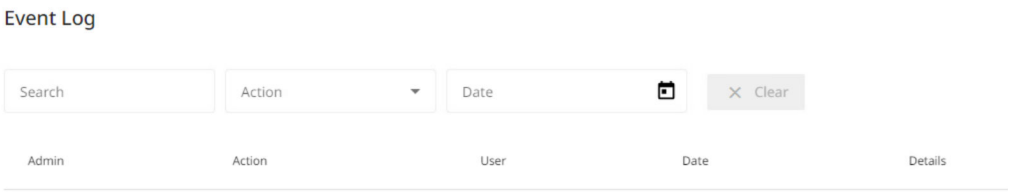
With the **Event Log Tab** selected, you have access to the history of everything done by the **Administrator** and every **Co-Administrator** in the **User Manager** since the system was installed.

- **Figure 5-10: Event Log Tab**



See: Event Log Searching and Filtering

- **Figure 5-11: Event Log — Work Area**



1. Search and Filter Area
    a. **Search Field** — Enter any text to sort for matches in the **First Name** or **Last Name** columns.
    b. **Action Filter** — The **Action Filter** enables you to filter for specific types of **Actions**.
    Event Log Actions
        — Added User
        — Removed User
        — Assigned Role
        — Removed Role
        — Assigned Location
        — Removed Location
        — Assigned Permission
        — Removed Permission
        — Changed user details
        — Changed user password
        — Activated user account
        — Disabled user account
        — Forced user logout
        — Changed password policy
    c. **Date Filter** — Click here to select a date on a calendar. Every **Event** which occurred on that day will be displayed.
    d. **CLEAR** button — When a filter is in place, this button is blue and clickable. Click **CLEAR** to remove all filters.

2. Column Names — The **Date** column name is clickable and sorts every **Action** by ascending or descending date order.
    a. **Admin** — This column lists either **Administrator**, or the **Last Name** and **First Name** of the **Co-Administrator** who performed the **Action**.
    b. **Action** — This column lists which **User Manager** function was performed. See: (User Functions, Configurations, Event Log Searching and Filtering, License Functions)
    c. **User** — This column lists the **Last Name**, **First Name** of the **User** which the **Action** was performed on, or lists '—' if the **Action** affected a **Policy** or a **License**.
    d. **Date** — This column lists the date and time of the **Action**. (DD/MM/YYYY HH:MM:SS)
    e. **Details** — This column contains any notes connected with the **Action**.

Licenses

With the **Licenses Tab** selected, you have access to information about the current usage of the various license components.

There are functions for requesting a license proposal, and registering a license.

- **Figure 5-12: License Tab**



See: License Functions

- **Figure 5-13: Licenses — Actions**



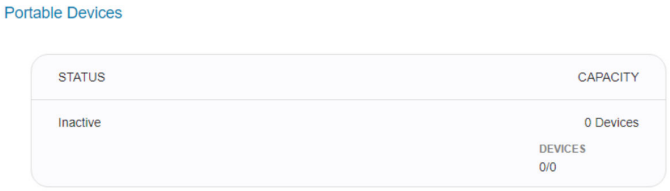
*A. Click **Register License** to open the **Register License Side Panel**. — See: Register License*
*B. Click **Request Proposal** to open the **Request Proposal Side Panel**. — See: Request Proposal*

- **Figure 5-14: Licenses — Work Area Information**

A. ***Figure 5-15: AMS Machine Works License***



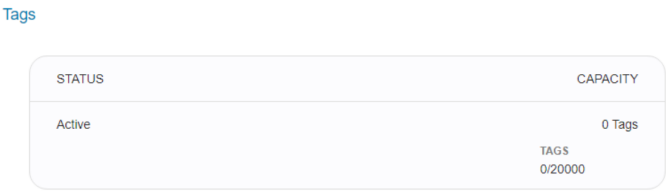
B. ***Figure 5-16: Portable Device Licenses***



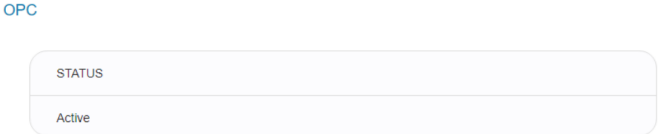
C. ***Figure 5-17: User Licenses***



D. ***Figure 5-18: Tags***



E. ***Figure 5-19: OPC***



5.3 User Functions

Depending on your role you will be able to perform some, or all, of the **User Manager** functions. The list of functions found in the **User Manager** is:

- Activate / Disable User
- Add User
- Edit User
- Change User Password
- Forgot Password
- Delete User
- Grant and Remove Agent Access
- Edit Location Access
- Remove Role
- Force Logout
- Unblock User
- Import User from Active Directory
- User Photo Functions

5.3.1 Activate / Disable User

A user that has their account disabled cannot use the functions associated with their **Roles**.

Note
A **Disabled** account still uses a one space in your **Users Capacity**. See: License Functions

An **Administrator** or **Co-Administrator** activates or disables a user account when they use the:

1. **Add User** function — See: Add User
2. **Edit User** function — See: Edit User
3. **Activate / Disable** functions in the **User Management Contextual Menu** in the **User List**.
4. **Activate / Disable** functions in the **User Management Contextual Menu** in the **User Record**.

Prerequisites

Open either the **Add User** or **Edit User** screen.

Procedure

1. In the **Personal Information** area check the background color of the **Active** toggle.

Figure 5-20: Active Toggle — In Active Position



A blue background indicates that this toggle is in the active position, a grey background indicates that it is disabled.

a) Click the **Active** toggle to change its state.

2. Click **Save** in the top right corner of the **Personal Information** area to record your change, or leave the page to discard your change.

5.3.2 Add User

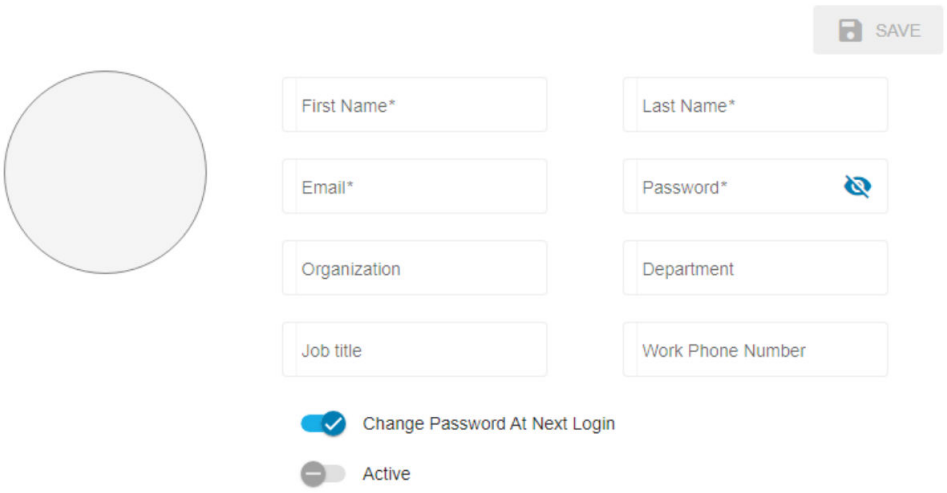
There is only one **Administrator** per system, and only an **Administrator** can add or edit a **Co-Administrator**. An **Administrator** or **Co-Administrator** can add or edit the other types of **User**.

Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, click **+ Add User** in the top right corner of the **Work Area**.

The **+ Add User** screen opens in the **Work Area** and the following field are available for editing.

Figure 5-21: Add User — Work Area



Procedure

1. (Required) **First Name** — This is a required field which accepts up to 50 characters.
2. (Required) **Last Name** — This is a required field which accepts up to 50 characters.

3. (Required) **Email** — A user cannot edit their own account email address. This field accepts 100 characters.
4. (Required) **Password** — A password which meets your system's **Password Policy** is required. See: Password Settings
5. (Optional) **Organization** — This is an optional field which accepts up to 50 characters.
6. (Optional) **Department** — This is an optional field which accepts up to 50 characters.
7. (Optional) **Job Title** — This is an optional field which accepts up to 50 characters.
8. (Optional) **Work Phone Number** — This is an optional field which accepts a valid international phone number. This field accepts a maximum of 50 characters.
9. (Optional) **Change Password At Next Login** — You can toggle this setting if you want the **User** to change their password from its initial setting.
10. (Optional) **Active** — The account is disabled by default. Use the **Active** toggle to change the activity status of an account. See: Activate / Disable User

    Note
    A **User** can be created in either an **Active** or **Disabled** state.

11. Click **Save** in the top right corner of the **Work Area** to record your changes, or leave the page to discard your changes.

Postrequisites

When you click **Save**, your view in the **Work Area** will be changed to the Edit User screen where you can finish configuring the **User**.

5.3.3 Edit User

An **Administrator** or **Co-Administrator** can add or edit a **User**, but only an **Administrator** can add or edit a **Co-Administrator**.

A **User** can exist without a **Role**, but cannot perform any actions in AMS Machine Works other than managing their own account. Every action a **User** performs is in the context of a **Role**, **Location**, and **Agents**.

These instructions outline how to edit the basic personal information, add a **Role**, assign a **Location**, and grant access to every **Agent**.

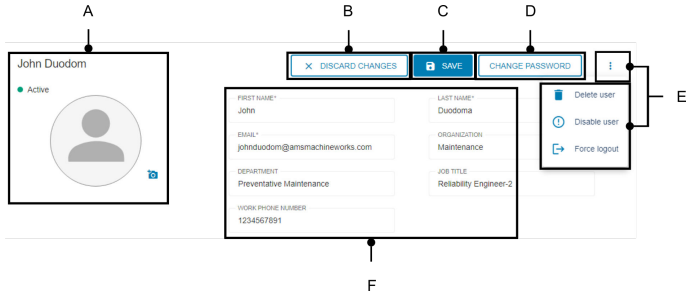
Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, there are four ways to enter the **Edit User** screen:

1. After the **Administrator** or a **Co-Administrator** completes the Add User task they are automatically redirected into the **Edit User** screen.
2. Click on any **User** in the **Work Area**.
3. Click on the **User Management Ellipsis Menu** on the right side of every user entry in the **Work Area**, and select **Edit User**.

The **Edit User** window will open for that **User** in the **Work Area**.

Figure 5-22: Edit User — Personal Information Area



A. ***Name, Image, and Status Display Area*** —
   - ***Full Name*** — *Shows the **FIRST NAME** and **LAST NAME** of the **User**.*
   - ***Status Display*** — *The colored dot and label show the status of the **User**. Green indicates an **Active** account, orange indicates a **Disabled** account, and red indicates a **Blocked** account. See: Activate / Disable User*
   - *(Optional) **Picture** — You can display a photo of the **User** here.*
   - ***Camera** icon — Click the **Camera** icon to select an image to upload from your storage. (File types: JPEG, JPG, and PNG. File size: Up to 0.5 MB.) See: User Photo Functions*

B. ***Discard Changes*** — *This button is not visible if no changes have been made.*

C. ***Save*** — *This button is only visible when valid changes have been made.*

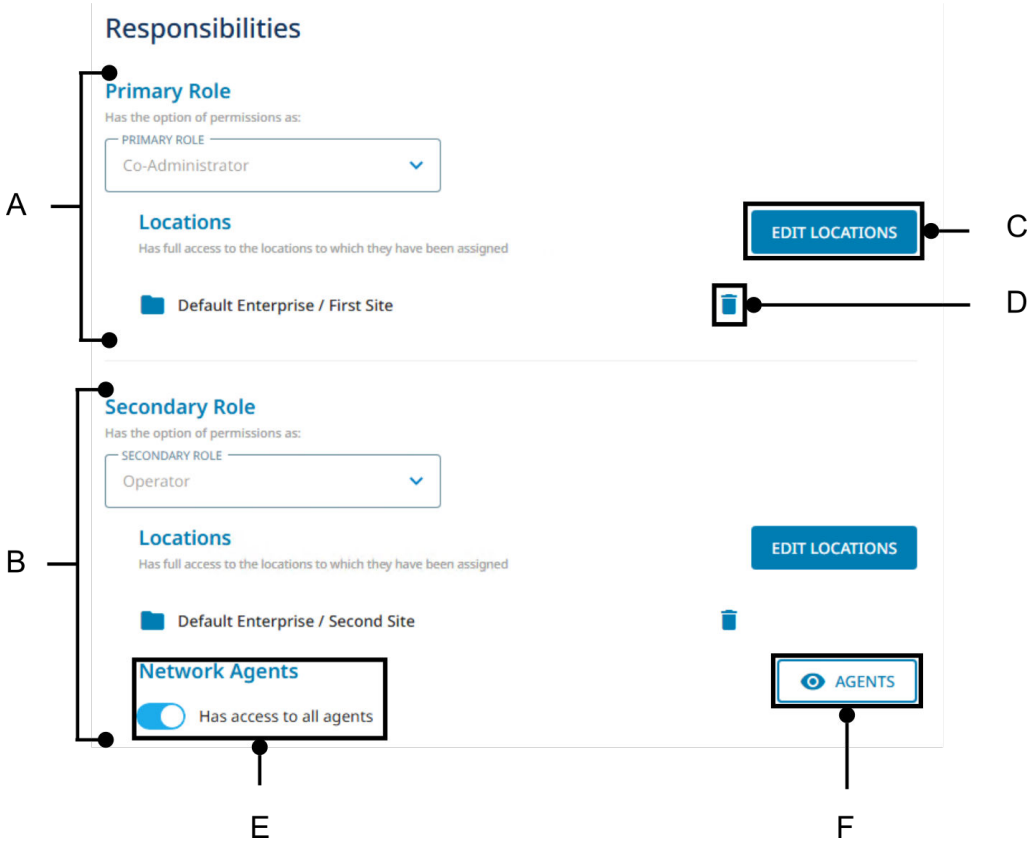
D. ***Change Password*** — *Click **Change Password** button to open the **Change Password** side panel. See: Change User Password*

E. ***User Management Contextual Menu*** — *This dynamic popup menu contains the specific functions which can affect each **User**.*
   - ***Delete user*** — *Click **Delete user** and then **Confirm** or **Cancel***
   - ***Activate user** / **Disable user** — Only displays the option to change the **Status** to the opposite.*
   - ***Force logout*** — *Revokes the validity of any active login tokens that this **User** has.*

F. ***Personal Information Area*** —
   - *(Required) **First Name** — This is a required field which accepts up to 50 characters.*
   - *(Required) **Last Name** — This is a required field which accepts up to 50 characters.*
   - *(Required) **Email** — This is a required field which accepts up to 100 characters.*
   - *(Optional) **Organization** — This is an optional field which accepts up to 50 alphanumeric characters.*
   - *(Optional) **Department** — This is an optional field which accepts up to 50 alphanumeric characters.*
   - *(Optional) **Job Title** — This is an optional field which accepts up to 50 alphanumeric characters.*

- *(Optional)* ***Work Phone Number*** *— This is an optional field which accepts up to 50 characters.*

Figure 5-23: Edit User — Responsibilities Area



A. *(Optional)* ***Primary Role*** *— To be able to do anything in the system more than account maintenance a* ***User*** *must have a* ***Primary Role****. An* ***Administrator*** *or* ***Co-Administrator*** *can select from:*

- ***Co-Administrator*** *(Only available to the Administrator.)*
- ***Operator***
- ***Portable Device User***
- ***Viewer***

B. *(Optional)* ***Secondary Role*** *— A* ***User*** *can have a* ***Secondary Role****, but it must have lower privileges than the* ***Primary Role*** *of this account. You can select from:*

- ***Operator***
- ***Portable Device User***
- ***Viewer***

Note
Depending on the ***Role*** *you have chosen for the* ***User****, you can see controls for* ***Location*** *and* ***Agent*** *access.*

C. *(Optional) Choose* ***Edit Locations*** *for this role. See: Edit Location Access*

D. *(Optional) Click the **Trash** icon to delete access to a **Location**.*
E. *(Optional) A **User** with an **Operator** role has the option to the **Has access to all agents** toggle, which grants or removes access to all **Agents**. Grant and Remove Agent Access*
F. *(Optional) Click the **Agents** button to be redirected to the **Network Device Module**. See: Agents*

Note
*The **Agents** button is only available when the **Has access to all agents** toggle is in the **On** position.*

Procedure

1. Enter the basic required personal information for this **User**:
   a) (Required) **First Name** — This is a required field which accepts up to 50 characters.
   b) (Required) **Last Name** — This is a required field which accepts up to 50 characters.
   c) (Required) **Email** — This is a required field which accepts up to 100 characters.
2. Enter the optional personal information for this **User**:
   a) (Optional) **Picture** — Click the **Camera** icon to select an image to upload from your storage. See: User Photo Functions
   b) (Optional) **Organization** — This is an optional field which accepts up to 50 characters.
   c) (Optional) **Department** — This is an optional field which accepts up to 50 characters.
   d) (Optional) **Job Title** — This is an optional field which accepts up to 50 characters.
   e) (Optional) **Work Phone Number** — This is an optional field which accepts up to 50 characters.
3. (Required) Choose a **Primary Role**:
   a) (Optional) Choose every **Location** where the **User** can act in this **Role**. See: Edit Location Access
   b) (Optional) Choose to grant access to **Agents**. See: Grant and Remove Agent Access

Note
The **Primary Role** can have more privileges and access than the **Secondary Role**.

Note
Not every **Role** requires access to a **Location** or **Agent**.

4. (Optional) Choose a **Secondary Role**:

Note
The **Secondary Role** cannot have more privileges and access than the **Primary Role**.

a) (Optional) Choose every **Location** where the **User** can act in this **Role**. See: Edit Location Access

b) (Optional) Choose to grant access to **Agents**. See: Grant and Remove Agent Access

Note
Not every **Role** requires access to a **Location** or **Agent**.

5. Click **Save** to record your changes. — This button is not displayed if no changes have been made.
6. (Optional) Click **Discard Changes** to reset the changes you made. — This button is not displayed if no changes have been made.

5.3.4 Change User Password

If a password is known to be compromised or forgotten, an **Administrator** can change a **User** password.

Note
A side effect of changing a password is that the **User** is also **Unblocked**.

Prerequisites

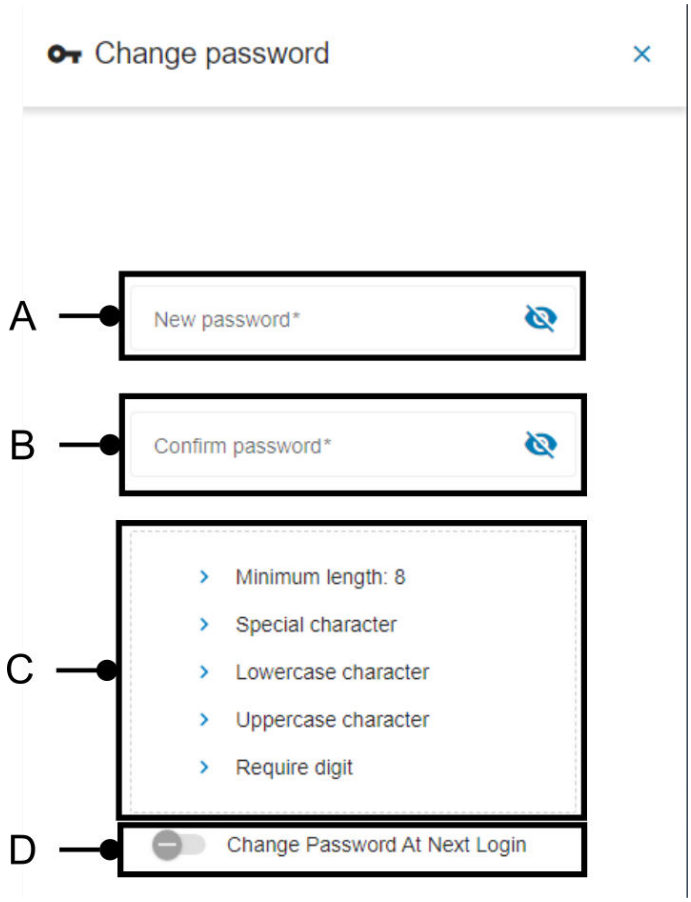
In the **User Manager**, with the **Users Tab** selected in the **Navigator**, click on any **User** in the **Work Area**.

The **Edit User** window will open for that **User** in the **Work Area**.

Procedure

1. Click on the **Change Password** button in the top right corner of the **Work Area**. The **Change Password** panel opens.

Figure 5-24: Change Password Panel



A. ***New Password*** *— The contents of this field must match the* ***Confirm Password*** *field, and meet the* ***Password Policy*** *requirements.*
B. ***Confirm Password*** *— The contents of this field must match the* ***New Password*** *field, and meet the* ***Password Policy*** *requirements.*
C. ***Password Policy*** *— A complete description of the current requirements for passwords. See: Password Settings*
D. ***Change Password At Next Login*** *— (Default)* ***OFF***

2. (Required) Enter the same password in the **New Password** and **Confirm Password** fields. The password must meet the requirements of the system's **Password Policy**.

Note
The system's **Password Policy** is described below the fields.

3. (Optional) By default the **Change Password At Next Login** toggle is in the **OFF** (grey) position.
   a) To require a password change, click the **Change Password At Next Login** toggle into the **ON** (blue) position.

4. Click the **Save** button at the bottom of the panel to confirm your changes.
5. (Optional) Click **Cancel** to reject the changes.

5.3.5 Forgot Password

When a **User** forgets their password, or has entered an incorrect password enough times to **Block** their account, they can click the **FORGOT PASSWORD?** link on the **Login Screen** and reset their password.

Prerequisites

See: Log in to the User Manager

1. The **SMTP** settings must be properly configured for the **Forgot Password** function to operate.
2. Open the AMS Machine Works **User Manager** at the address: `https://<YOUR_SERVER>/user-manager/`
3. Click the **FORGOT PASSWORD?** link.

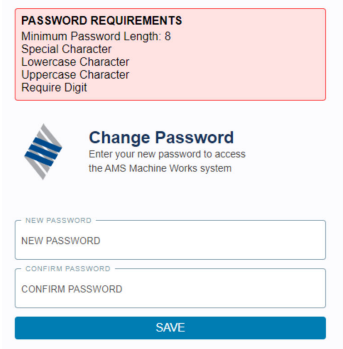
Figure 5-25: Forgot Password Dialog

A. ***E-MAIL*** *— Enter your email address here.*
B. ***SUBMIT*** *— Click* ***SUBMIT*** *to receive a password reset link for the account associated with this email.*

Procedure

1. Enter the **email** associated with your account.
2. Click **SUBMIT**.
3. Check your email account for the reset link.
4. Click the link in the email when you receive it.

Figure 5-26: Password Reset Dialog



5. Enter a password which matches your system's **Password Requirements**.
6. Reenter the password to confirm it.
7. Click **SAVE** to record your change.

5.3.6 Delete User

To permanently delete a **User**, use this function. When a **User** is deleted, one space in the **Users** capacity of your license is made available to be used again. See: License Functions

⚠ WARNING

When you use the **Delete User** function, every **Active Case** that the **User** created is set to **Resolved**.

Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, there are two locations of the vertical ellipsis menu containing the **Delete user** function for a specific **User**:

1. Click on any **User** in the **Work Area** to open the **Edit User** screen. The vertical ellipsis menu is available in the top right corner. See: Edit User
2. The vertical ellipsis menu is available on the right side of every user entry in the **Work Area**. See: User Manager Navigator and Work Areas

Procedure

1. Click the vertical ellipsis menu in any of the locations listed above.
   The **User Management Contextual Menu** opens.
2. Select **User Management Contextual Menu** → **Delete user**
   The **Remove user** confirmation dialog opens.
3. Click **CONFIRM** or **CANCEL**:
   - Click **CONFIRM** to delete the **User** and close the dialog.
   - Click **CANCEL** close the dialog without deleting the **User**.

5.3.7 Grant and Remove Agent Access

Three roles can have access to every **Agent**:

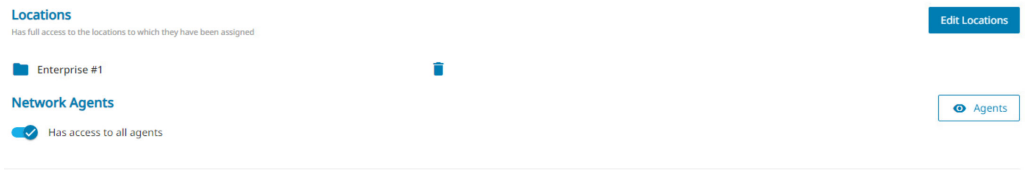
1. **Administrator** — The **Administrator** has access to every **Agent** by default.
2. **Co-Administrator** — The **Co-Administrator** has access to every **Agent** by default.
3. **Operator** — An **Operator** has their access controlled by an **Administrator** or **Co-Administrator**.

Prerequisites

In the **User Manager** module, with the **Users** tab selected in the navigator. In the list of **Users** in the main work area, click on the **User** you want to edit to open the **Edit User** screen in the main work area.

The **User** must have the **Operator** role set for either the **Primary Role** or **Secondary Role**. See: Remove Role

Figure 5-27: Edit User — Locations and Network Agents



- **Has Access To All Agents** — Use this toggle to grant or remove access to all **Agents**.

Procedure

1. In the section for the **Operator** role, there is a sub-section called **Network Agents**, which has a toggle switch next to the text **Has access to all agents**.
   a) (Grant Access) If the toggle switch and text are grey, click the toggle to grant access.
   The switch moves to the on position and turns blue. The **Agents** button appears on the right side of the screen.
   b) (Remove Access) If the toggle switch and text are blue, click the toggle to remove access.
   The switch moves to the off position and turns grey. The **Agents** button is removed from the right side of the screen.
2. **Save** or **Discard** your changes.
   a) (Save change.) Click **Save** in the top right corner of the work area to save your change.
   b) (Discard changes.) Click **Discard changes** in the top right corner of the work area to reset the **Edit User** screen to the previous contents.

5.3.8 Edit Location Access

As an **Administrator** you can give and remove access to a **Location** for the **Primary Role** and **Secondary Role** of a **User**.

Each role area has an **Edit Location** button for the **Location List** associated with that **Role**.

Each **Location** can contain other **Locations**, and this is shown by a **>** symbol when the list is closed, and by a **V** when the list is open. When you grant or remove access to a **Location**, you perform the same action on all the **Locations** it contains.

Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, click on any **User** in the **Work Area**.

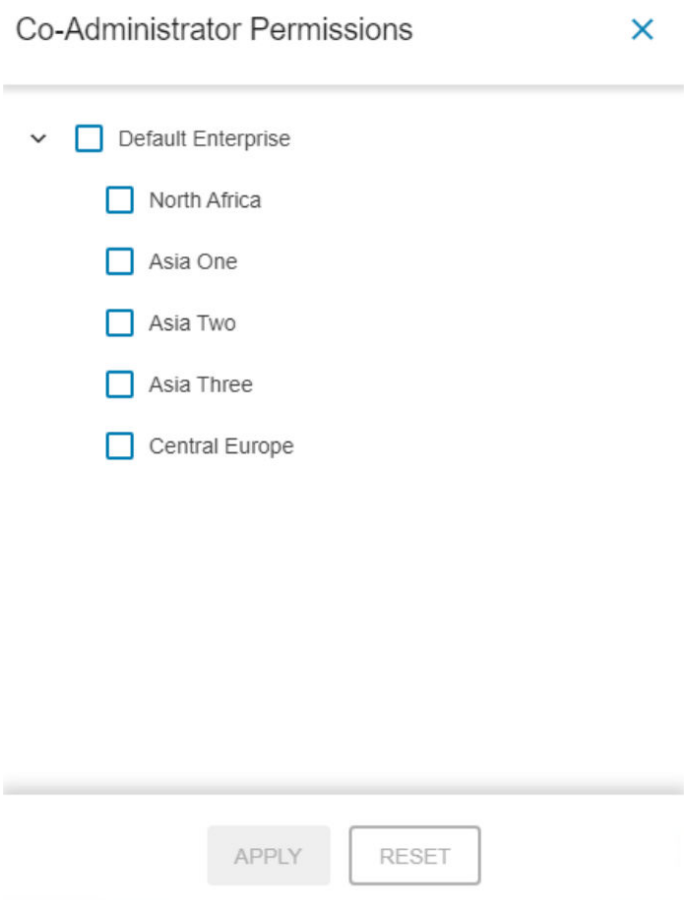
The **Edit User** window will open for that **User** in the **Work Area**.

Procedure

1. In the role area you want to edit **Location** access for, click **Edit Location**.

The **Locations** side panel opens.

Figure 5-28: Locations Side Panel



a. **Apply** — Click **Apply** to save your changes.

b. **Reset** — Click **Reset** to discard your changes.

2. Add or remove access to **Locations** until the **User** only has access to the **Locations** needed to for that **Role**.
   a) (Optional) To add or remove access to all **Locations** at one time, click **Default Enterprise** at the top of the **Location** list.
3. Click **Apply** to save your changes, or click **Reset** to discard your changes.

5.3.9 Remove Role

If a **User** only has a **Primary Role**, you can remove it.

If a **User** has a **Secondary Role**, you can remove it.

But, if a **User** has two **Roles**, you must remove the **Secondary Role** before you can remove the **Primary Role**.

Additionally, every **Location** associated with a **Role** must be removed before the **Role** can be removed.

Note
The configuration of **Role** that has been removed cannot be recreated automatically. You must recreate it manually.

Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, there are three ways to enter the **Edit User** screen:

1. Click on any **User** in the **Work Area**.
2. Click on any **User** in the **Navigator**.
3. Click on the vertical ellipsis menu on the right side of every user entry in the **Work Area**, and select **Edit User**.

The **Edit User** window will open for that **User** in the **Work Area**.

Procedure

1. To remove a **Role** from a **User** you must first:
   a) Remove access to every **Location** associated with that role. See: Edit Location Access
   b) Remove access to every **Agent**. See: Grant and Remove Agent Access

   When every **Location** and **Agent** has been removed from a **Role**, an **X** is available to the left of the **Role**.
2. Click the **X** next to the name of the **Role** to remove the **Role**.
3. (Optional) If the **User** had two **Roles**, and you also want to remove the **Primary Role**, repeat Step 1 and Step 2.
4. Click **Save** in the top right corner to record these changes.
5. (Optional) Click **Discard changes** in the top right corner to reset the information.

5.3.10 Force Logout

The **Force Logout** function invalidates every session token for the **User**.

Prerequisites

In the **User Manager**, with the **Users Tab** selected in the **Navigator**, there are two locations of the vertical ellipsis menu containing the **Force Logout** function for a specific **User**:

1. Click on any **User** in the **Work Area** to open the **Edit User** screen. The **vertical ellipsis** menu is available in the top right corner.

2. The **vertical ellipsis** menu is available on the right side of every user entry in the **Work Area**.

Procedure

1. Click the vertical ellipsis menu in any of the locations listed above. See: Figure 5-8
2. Select **vertical ellipsis menu** → **Force Logout**
   The session token for the **User** is now revoked.

5.3.11 Unblock User

When a user violates the **Lockout Policy** the account will be **Blocked** for as many minutes as you have configured in the **Lockout Time**. (See: Lockout Settings)

If the **User** needs access to their account before the **Lockout Time** ends, you must use the Change User Password function to clear the **Blocked** status of the **User**.

Prerequisites

There are two ways to clear the blocked status of a **User**:

1. By an **Administrator** or **Co-Administrator**.
2. By the **User**.

Procedure

1. As an **Administrator** or **Co-Administrator**, click on any **User** in the **Work Area** to open the **Edit User** screen. The **CHANGE PASSWORD** button is available in the top right corner. See: Change User Password
2. As a **User**, click on the **RESET PASSWORD** button on the **Login Screen**. See: Forgot Password

5.3.12 Import User from Active Directory

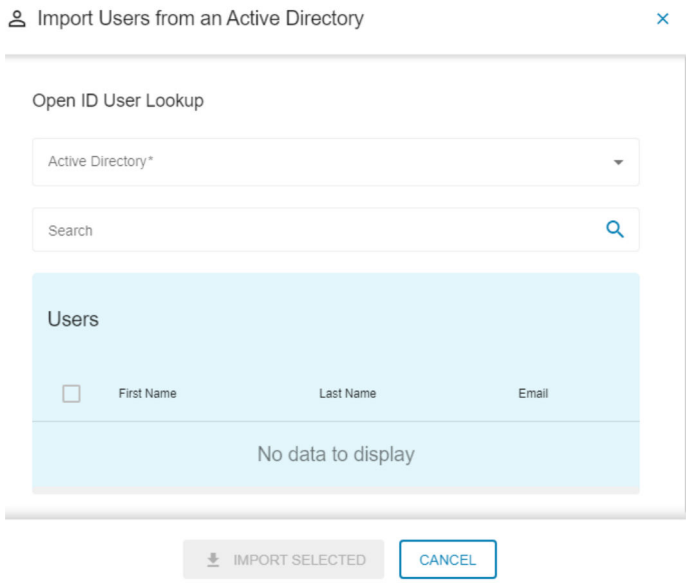
The **IMPORT USER FROM AD** function is used to import a **User** from any **Azure OpenID Providers** that you have configured.

Note
While it is technically possible to import more than one user at a time it is best practice to only import one, or several users (max: 3), at one time.

Prerequisites

1. You must have an Active Directory provider configured. See: Configuring Azure OpenID Providers
2. Open the **Import Users from an Active Directory** side panel. See: User Management

Figure 5-29: Import Users from an Active Directory



Procedure

1. Select the Active Directory that is configured in your system from the **Active Directory** dropdown menu.
2. (Optional) You can enter 3 or more characters of text into the **Search** field to find a **First Name**, **Last Name**, or **Email** in the **User List**.
3. Select from 1 to 3 users to import from the **User List**.
4. Complete or exit the task:
   - (Option 1) Click **IMPORT SELECTED** to import the selected **Users** and exit the task.
   - (Option 2) Click **CANCEL** or the **X** in the top right corner of the side panel to cancel the task without saving any changes.

5.3.13 User Photo Functions

In the **Edit User** section of the **User Manager**, or in the **Your Account** section with your personal information, an image can be associated with the account of a **User**.

Prerequisites

You need to have an image file in JPEG, JPG, or PNG format that is smaller than 0.5 MB.

Procedure

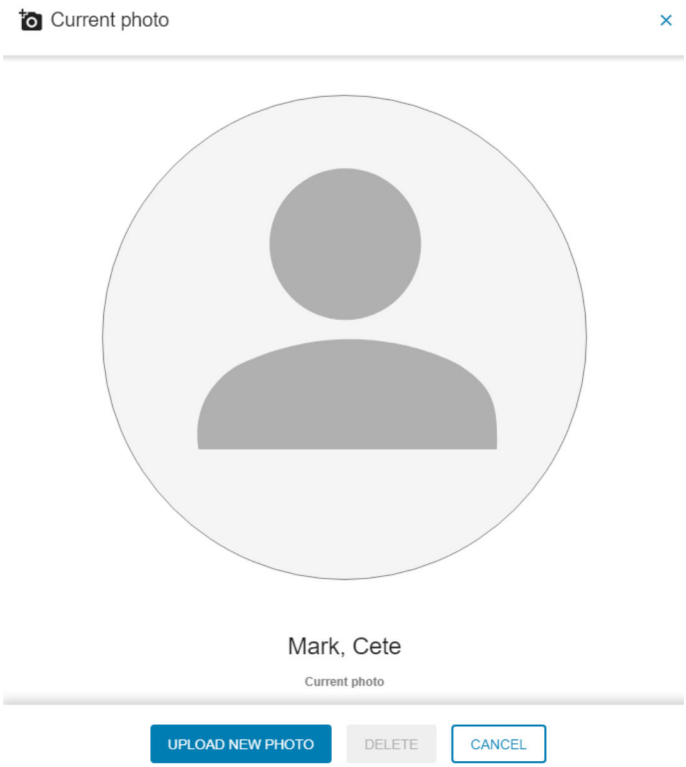
1. Click the **Camera Icon** next to the **User Photo**.

Figure 5-30: User Photo and Camera Icon



The **Photo Side Panel** opens from the right side of the screen..

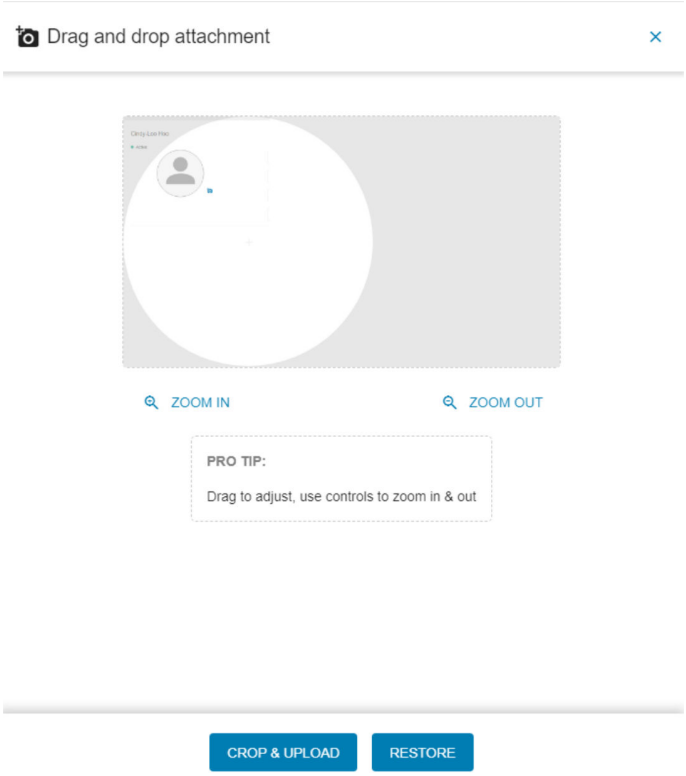
Figure 5-31: Photo Side Panel



2. (Optional) If there is currently a photo that you do not want to use, you can click **DELETE** to remove the picture.
3. (Optional) Click **CANCEL** to leave the side panel without making any changes.
4. (Optional) Click **UPLOAD NEW PHOTO** to open the **Upload Photo Side Panel**

   The **Choose, Crop, and Upload Photo Side Panel** opens.

Figure 5-32: Choose, Crop, and Upload Photo Side Panel



5. Choose your image file.
   a) (Option 1) Drag a file from the file system and drop it onto the blue area.
   b) (Option 2) Click **BROWSE** to navigate the file system and choose a file.
6. Adjust the circular frame over the image to crop the part of the image you are interested in.
7. **ZOOM IN** and **ZOOM OUT** controls to scale the size of the highlighted area appropriately.
8. Click **CROP & UPLOAD** to save your changes, or click **RESTORE** to discard your changes.

5.4 Configurations

In the **User Manager** when the **Configurations Tab** is selected in the **Navigator** section.

Password Policy

1. **Password Settings** — This policy defines what length and combination of special characters is required to create a valid password. See: Password Settings
2. **Lockout Settings** —This policy defines the **Lockout Time** and the maximum number of failed access attempts. See: Lockout Settings

Provider Management

Provider Management — OpenID Configuration. See: Configuring Azure OpenID Providers

Notifications

Notifications — Enable notifications. See: Configure Notifications

Custom Units

Custom Units — The **Administrator** can configure a custom set of units for this installations. See: Configure Custom Units

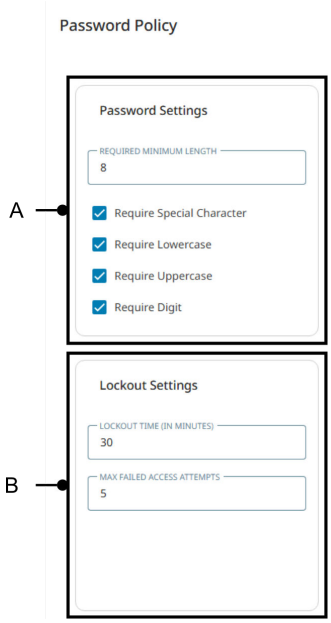
SMTP

SMTP — The **Administrator** must configure a connection to a **SMTP** server for sending notifications. See: Configure SMTP Connection

5.4.1 Password Policy Settings

The **Password Policy** section contains two type of configuration:

Figure 5-33: Password Policy Settings



A. ***Password Settings*** — *See: Password Settings*
B. ***Lockout Settings*** — *See: Lockout Settings*

Password Settings

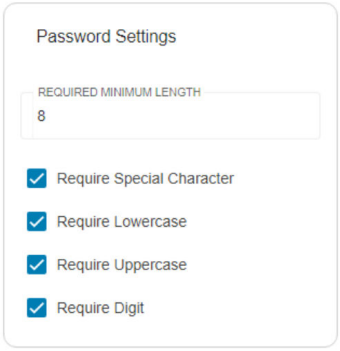
A valid password in AMS Machine Works is from 8 to 100 characters long, and can contain a mix of uppercase letters, lowercase letters, digits, and special characters.

To ensure that every **User** has a stronger password, you can require the use of these different types of characters, and require longer passwords than the minimum of 8 characters.

Prerequisites

In the **User Manager**, with the **Password Policies and Provider Management Tab** selected in the **Navigator**, you will see the **Password Settings** area in the **Work Area**.

Figure 5-34: Password Settings



Procedure

1. Enter a number. **Set Minimum Length** — AMS Machine Works supports passwords from 8 to 100 characters in length.
2. **Require Special Character** — Click this checkbox to toggle between **ON** and **OFF**. When selected, a valid password must have at least one special character.
3. **Require Lowercase** — Click this checkbox to toggle between **ON** and **OFF**. When selected, a valid password must have at least one lowercase letter.
4. **Require Uppercase** — Click this checkbox to toggle between **ON** and **OFF**. When selected, a valid password must have at least one uppercase letter.
5. **Require Digit** — Click this checkbox toggle to between **ON** and **OFF**. When selected, a valid password must have at least one number.
6. Click the **Save** button in the top right corner to confirm your changes.
7. (Optional) Click the **Discard changes** button in the top right corner to discard your changes.

Lockout Settings

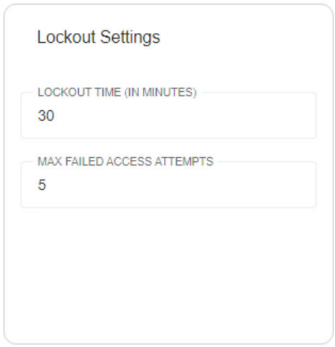
When a **Password** is entered incorrectly more times in a row than the **Max Failed Access Attempts**, the **Account** is **Blocked** for the amount of minutes entered in the **Lockout Time** field. The **Lockout Time** is from 10 to 120 minutes.

To **Unblock** an **Account** sooner follow the Unblock User procedure.

Prerequisites

In the **User Manager**, with the **Account Policies Tab** selected in the **Navigator**, you will see the **Lockout Settings** area in the **Work Area**.

Figure 5-35: Lockout Settings



Procedure

1. Enter a number. **Lockout Time** — AMS Machine Works can have a **Lockout Time** from 10 to 120 minutes in length.
2. Enter a number. **Max Failed Access Attempts** — AMS Machine Works can have a **Max Failed Access Attempts** value from 1 to 1000.
3. Click the **Save** button in the top right corner to confirm your changes.
4. (Optional) Click the **Discard changes** button in the top right corner to discard your changes.

5.4.2 Provider Management Functions

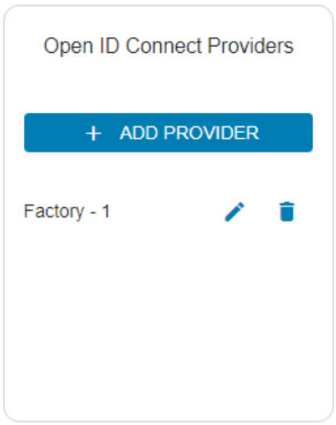
AMS Machine Works supports the use of OpenID for managing **Users**. To begin, you must first add an OpenID provider. See: Configuring Azure OpenID Providers

This requires configuration on the side of the OpenID provider.

1. `User.Read` — Delegated
2. `User.Read.All` — Application

In the **User Manager**, with the **Password Policies and Provider Management Tab** selected in the **Navigator**, you will see the **Provider Management** area in the **Work Area**. See: Password Policy and Provider Management

Figure 5-36: OpenID Provider Functions



A. *Click* ***+ Add Provider*** *to add a new OpenID provider. See: Configuring Azure OpenID Providers*
B. *Click the* ***Pencil*** *icon to edit an existing OpenID provider. See: Configuring Azure OpenID Providers*
C. *Click the* ***Trash*** *icon to delete an existing OpenID provider. See: Delete OpenID Provider*

Configuring Azure OpenID Providers

To use an Azure OpenID provider, gather information from your network administrator about your configuration, and follow these instructions.

Note
Most of the information required to configure an **Azure OpenID Provider** is specific to your organization.

Prerequisites

In the **User Manager** → **User Manager Navigator** → **Configurations Tab** → **Provider Management**

1. Select **+ Add Provider** button — Use this option to add a new OpenID provider record.

   Note
   Only the **Administrator** can add a new Open ID Connect Provider.

2. Select the **Pen** icon next to a configuration. — Use this option to edit an existing OpenID provider record.

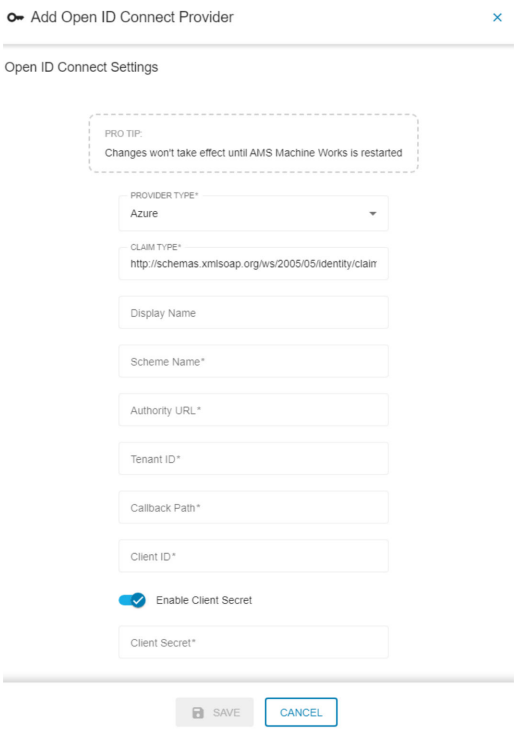
   Note
   Only the **Administrator** and any **Co-Administrator** can edit an existing Open ID Connect Provider configuration.

Procedure

1. Open the **OpenID Connect Settings** by either method mentioned above.

The configuration side panel opens.

Figure 5-37: Configure Open ID Provider



2. (Required) **Provider Type** — In this dropdown menu select **Azure**.
3. (Required) **Claim Type** — Enter a URL for defining the claim type.

   Example Claims

   - To use the principal name: `http://schemas.xmlsoap.org/ws/2005/05/identity/claims/name`
   - To use an email address: `http://schemas.xmlsoap.org/ws/2005/05/identity/claims/emailaddress`
4. (Optional) **Display Name** — Enter a custom label for an OpenID provider. (From 0 to 128 characters. All characters are allowed.)
5. (Required) **Scheme Name** — Enter a descriptive name for the authentication scheme. (From 0 to 128 characters. All characters are allowed.)
6. (Required) **Authority** — The **Authority** is the URL where your Azure Active Directory (Azure AD) resides. The **Authority** URL typically follows the format: `https://login.microsoftonline.com/` (From 0 to 128 characters. All characters are allowed. It must start with: `https://`)
7. (Required) Enter your organization's Azure AD **Tenant ID** or domain name. (From 0 to 128 characters. All characters are allowed.)

8. (Required) **Callback Path** — The **Callback Path** is a URL path beginning with `/` which the **User** is redirected to after a successful authentication. (From 0 to 128 characters. All characters are allowed.)

   Example Callback Paths

   - `/signin-aad`
   - `/signin-oidc`

9. (Required) **Client ID** — Enter the **Client ID** for AMS Machine Works: `60e35fd5-73b9-4136-8803-9e7ef065cecd`. (From 0 to 128 characters. All characters are allowed.)
10. (Required) **Enable Client Secret** — The **Client Secret** is used for secure communication between your application and Azure AD. The default setting of this toggle is in the **Enabled** position.
11. (Optional) **Client Secret** — This field is only editable when the **Enable Client Secret** toggle is in the **Enabled** position. (From 0 to 128 characters. All characters are allowed.)
12. Click **SAVE** to record your changes.
13. Restart AMS Machine Works to begin using the OpenID connection that you configured.

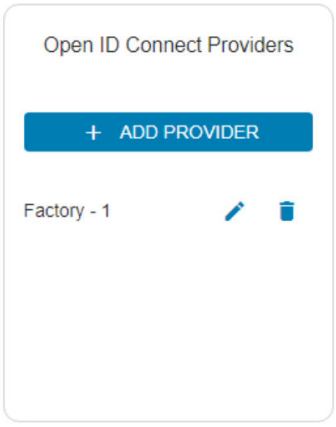
Delete OpenID Provider

There can be a maximum of five OpenID providers defined at one time. To remove an OpenID provider, follow the instructions below.

Prerequisites

In the **User Manager**, with the **Password Policies Tab** selected in the **Navigator**, you will see the **OpenID Providers** area in the **Work Area**. See: Password Policy and Provider Management

Figure 5-38: OpenID Provider Functions



*A. **Trash** icon — Clicking the trash can icon initiates the delete process.*

Procedure

1. Click the **Trash** icon to delete an existing OpenID provider.
2. Click the **Save** button in the top right corner to proceed and delete the OpenID Provider.
3. (Optional) Click the **Discard changes** button in the top right corner to cancel the action.

5.4.3 Notifications

The **Administrator** can determine which notification modules to enable in the system.
See: Configure Notifications

Configure Notifications

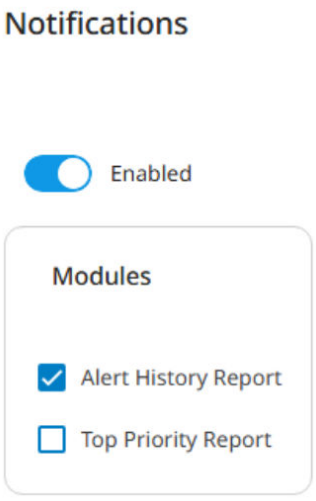
Notifications must be enabled in the **User Manager** module so that your users can receive email reports.

The **Notification** system must be **Enabled** and at least one **Report** must be checked for the system to work.

Prerequisites

1. You must be logged in as the **Administrator**.
2. Open the controls: **User Manager** → **Configurations** → **Notifications**

Figure 5-39: Notifications: Default Configuration



- **Enabled** — By default **Notifications** are **Enabled**.
- **Module Selection** — By default the **Alert History Report** is selected, and the **Top Priority Report** is not selected.

Procedure

1. (Optional) Click this toggle to switch the entire **Notifications** system status between **Enabled** and **Disabled**.
2. (Optional) Check every kind of report to send when **Notifications** are **Enabled**.

5.4.4 Custom Units

By default the **Custom** units are set to the **SI** versions of units.

The **Administrator** can create a mix of **Metric**, **Imperial**, and **SI** units.

Every **User** who is using the **Custom** units is affected by any change that the **Administrator** makes.

To configure **Custom Units** see: Configure Custom Units

Configure Custom Units

There following unit types can have a custom configuration.

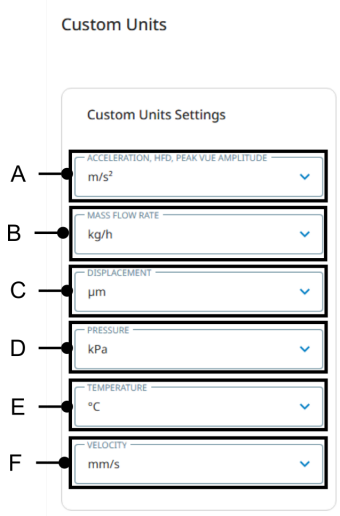
Prerequisites

1. You must be logged in as the **Administrator**.
2. Open the controls: **User Manager** → **Configurations** → **Custom Unit Settings**

In the **Custom Units** section, make your selections.

Note
All changes are immediately recorded.

Figure 5-40: Custom Unit Settings



A. ***Acceleration, HFD, PeakVue Amplitude*** — *(default)* ***m/s², g***
B. ***Mass Flow Rate*** — *(default)* ***kg/h, lb/h***
C. ***Displacement*** — *(default)* ***µm, mil***
D. ***Pressure*** — *(default)* ***kPa, psi***
E. ***Temperature*** — *(default)* ***°C, °F***
F. ***Velocity*** — *(default)* ***mm/s, in/s***

Note
HFD (High Frequency Detection) is a parameter type used with AMS 2140 Machinery Health Analyzer units.

Procedure

1. Choose the unit for: **Acceleration**, **HFD**, **PeakVue Amplitude**
   - (default) **m/s²**
   - **g**
2. Choose the unit for: **Mass Flow Rate**
   - (default) **kg/h**
   - **lb/h**
3. Choose the unit for: **Displacement**
   - (default) **µm**
   - **mil**
4. Choose the unit for: **Pressure**
   - (default) **kPa**
   - **psi**

5. Choose the unit for: **Temperature**
   - (default) **°C**
   - **°F**
6. Choose the unit for: **Velocity**
   - (default) **mm/s**
   - **in/s**

5.4.5 SMTP

AMS Machine Works has email notification functions. See: Notifications

To enable this notification functionality you must configure a connection to a **SMTP** (Simple Mail Transfer Protocol) server. See: Configure SMTP Connection

At any time, you can check if your SMTP connection is working. See: Send a Test Message

Configure SMTP Connection

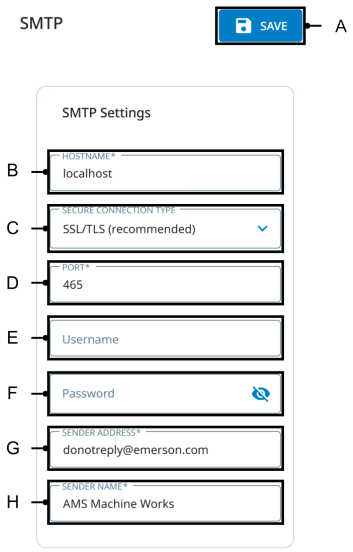
An **SMTP** server connection must be configured for the **Notifications** functions to work. See: Notifications

Prerequisites

1. Your SMTP Server must be configured and running.
2. You must be logged in as the **Administrator**.
3. Open the controls: **User Manager** → **Configurations** → **SMTP Settings**

Configure the items in the **SMTP Settings** section.

Figure 5-41: SMTP Settings



A. ***Save*** / ***SEND A TEST*** — *Initially these button are not visible.* ***Save*** *becomes available after you have made some changes, and* ***SEND A TEST*** *becomes available after you have saved a configuration. See: Send a Test Message*
B. ***Hostname*** — *(Required) Use either localhost / IP Address / Name / FQDN*
C. ***Secure Connection Type*** — *None / (Default: SLS/TLS / StartTLS)*
D. ***Port*** — *(Required) (Default: 465)*
E. ***Username*** — *(Optional)*
F. ***Password*** — *(Optional)*
G. ***Sender Address*** — *(Required) This address is used to receive test messages.*
H. ***Sender Name*** — *(Required) (Default: AMS Machine Works)*

Procedure

1. Enter the **Hostname** — You can use one of these formats:
   - localhost
   - IP Address
   - Name
   - FQDN (Fully Qualified Domain Name)
2. Choose the **Secure Connection Type** :
   - (Default) SLS/TLS (Recommended)
   - None
   - StartTLS
3. Enter a **Port** number for **SMTP** connections. From 1 to 65535. (Default: 465)
4. (Optional) Enter the **Username** for the **SMTP** connection.
5. (Optional) Enter the **Password** for the **SMTP** connection.

6. Enter the **Sender Address** — Enter a valid email address.
7. Enter the **Sender Name** — (Max: 128 characters.) Enter a name to identify emails from this AMS Machine Works installation.
8. When you have made changes to the configuration you can choose to **Save** or discard your changes.
   - Click **Save** to record your changes.
   - Close or reload the browser to discard your changes.
9.

Postrequisites

When there is an SMTP server configuration saved, you can verify the connection. See: Send a Test Message

Send a Test Message

Once you have configured your **SMTP Settings** you can test this functionality at any time by clicking **Send a Test Message**. See: Configure SMTP Connection

Prerequisites

1. You must be logged in as the **Administrator**.
2. Some **SMTP Settings** must be configured.
3. Open the controls: **User Manager** → **Configurations** → **SMTP Settings**

Procedure

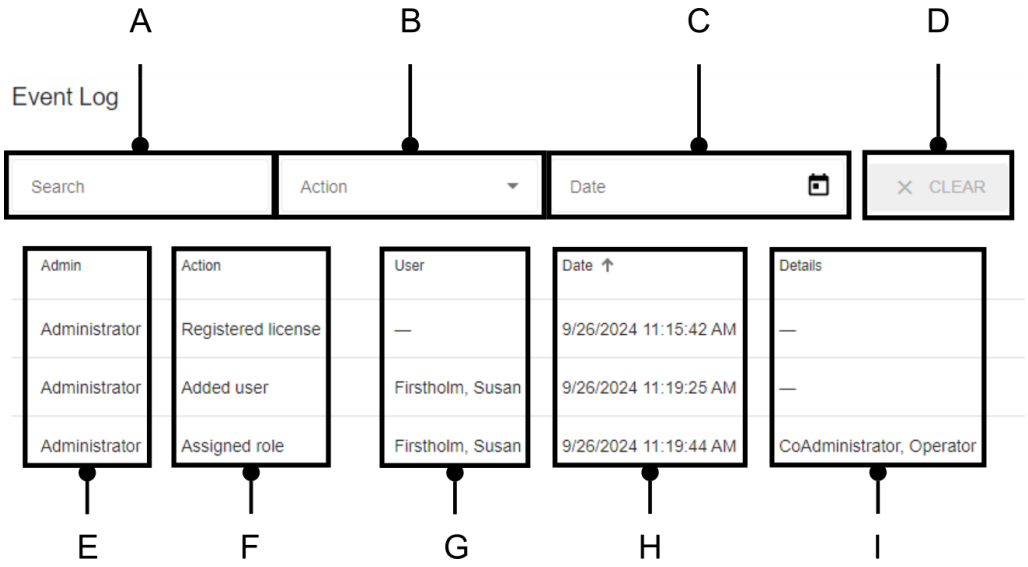
1. Click on: **User Manager** → **Configurations** → **SMTP Settings** → **Send a Test Message**
2. In your preferred email program verify that:
   a. You have access to the account configured for the **Sender Address**.
   b. A **Test Message** arrived from the name configured for **Sender Name**.

Need help?
If the **Test Message** doesn't arrive, check and correct your **SMTP Settings**. If the problem persists, contact your network administrator for assistance.

5.5 Event Log Searching and Filtering

The **Event Log** contains every **Action** performed by the **Administrator** and every **Co-Administrator**.

Figure 5-42: Event Log Display and Filtering Options



A. ***Search Field*** — *Enter text to search in the* ***Admin*** *and* ***User*** *columns.*

B. ***Action Filter*** — *Select as many* ***Actions*** *as you want to filter for. The list of* ***Actions*** *includes:*

- ***Added user***
- ***Removed user***
- ***Assigned role***
- ***Removed role***
- ***Assigned location***
- ***Removed location***
- ***Assigned permission***
- ***Removed permission***
- ***Changed user details***
- ***Changed user password***
- ***Activated user account***
- ***Disabled user account***
- ***Forced user logout***
- ***Changed password policy***
- ***Registered license***

C. ***Date Filter*** — *Click on a specific date to find any* ***Action*** *performed on that date.*

D. ***Clear Filter Button*** — *This button will be blue if there are any* ***Filters*** *in effect.*

E. ***Admin*** — *Lists the* ***Admin*** *who performed the* ***Action****.*

F. ***Action*** — *Lists the* ***Action*** *that was performed.*

G. ***User*** *— Lists the* ***User*** *the* ***Action*** *was performed on, or displays — for* ***Actions*** *without a* ***User****.*
H. ***Date*** *— List the date the* ***Action*** *occurred.*
I. ***Details*** *— Lists any details associated with the* ***Action****.*

5.6 License Functions

In the **User Manager**, when the **License Tab** is selected in the **Navigator Area**, the **Work Area** displays five categories of licensing information and has two controls to access additional functions.

Figure 5-43: Licensing Functions and Information

A. ***Figure 5-44: Licensing Function Controls***



*There are three **Licensing Functions** which you can access:*

A. ***Register License** — As part of the installation process you must register your license. See: Register License*
B. ***Request Proposal** — As your needs grow you can modify these licenses by getting a license proposal. See: Request Proposal*
C. ***Guardian Info** — Click the **Guardian Info** to open a sidepanel with an overview of your system and an expandable view of the complete current configuration of the system. See: Guardian Info*

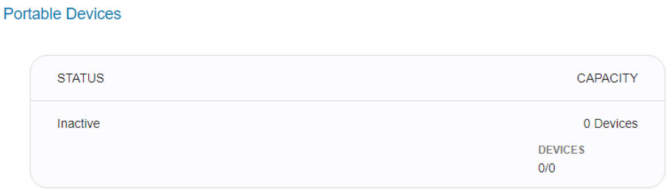
B. ***Figure 5-45: Licensing Information Areas***

A. ***AMS Machine Works License***



***AMS Machine Works License** — This license is for a specific version of AMS Machine Works running on hardware which has a particular **Machine Fingerprint**. This license has a **Start Date** and an **End Date**. The length of the progress bar indicated how much of the time covered by the license has been used so far, and the color turns red as the license is about to end.*

B. ***Portable Device License***



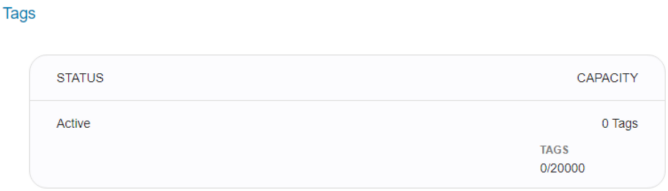
***Portable Device License** — This license sets the limit for the maximum number of AMS 2140 Machinery Health Analyzer units associated with this system. This number increases with each unique AMS 2140 Machinery Health Analyzer that you add to AMS Machine Works. This number does not decrease when you delete a device from the system.*

C. ***User License***



User License *— This license sets the limit for the maximum number of users for this system. All* ***Active***, ***Disabled***, *and* ***Blocked*** *users count. To decrease the count, you must* ***Delete*** *a user. See: Delete User*

D. ***Tag License***



Tag License *— Each type of monitoring equipment uses a different number of* ***Vibration Tags*** *in operation. This is based on the number of* ***Channels*** *that a device has. The* ***Vibration Tags*** *are consumed when you add a* ***Device*** *in the* ***Network Device Module***, *and* ***Vibration Tags*** *are released when you remove a* ***Device*** *in the* ***Network Device Module***. *See: Devices and Remove Device*

- ***AMS Wireless Vibration Monitor*** *— 3* ***Channels*** *= 3* ***Vibration Tags*** *consumed.*
- ***AMS 9420 Wireless Vibration Transmitter*** *— 1 or 2* ***Channels*** *= 1 or 2* ***Vibration Tags*** *consumed.*
- ***AMS Asset Monitor*** *— 0 to 12* ***Channels*** *= 0 to 12* ***Vibration Tags*** *consumed.*
- ***AMS 6500 ATG*** *— 0 to 22* ***Channels*** *= 0 to 22* ***Vibration Tags*** *consumed.*

Note

Temperature Measurements *do not consume* ***Vibration Tags***, *so an* ***AMS Asset Monitor*** *unit or an* ***AMS6500 ATG*** *unit with only* ***Temperature Measurements*** *cards will not consume any* ***Vibration Tags***.

Note

There are hardware and software limits to how many ***Vibration Tags*** *a system can support. See: 'System Scalability' in the AMS Machine Works System Guide.*

E. ***OPC License***



OPC License *— For your installation to work with other OPC UA systems you will need to have an OPC component in your license.*

5.6.1 Register License

One of the final steps of installing AMS Machine Works is registering the license. Without a properly registered license AMS Machine Works will not function. An AMS Machine Works license associates three things:

1. A specific version of the software.
2. A specific **Machine Fingerprint**.
3. A specific mix of license categories:
    a. **AMS Machine Works License** — (Required) This sets the **Start Date** and **End Date** to define the duration of the license connected with the **Machine Fingerprint**.
    b. **Portable Device License** — (Optional) This sets the limit of how many AMS 2140 Machinery Health Analyzer units can be used with your system.
    c. **User License** — (Required) This sets the maximum number of users.
    d. **Vibration Tag License** — (Required) This sets the maximum number of measurements can
    e. **OPC License** — (Optional) This license enables **OPC UA** functionality.

Follow the procedure below to register your license.

Prerequisites

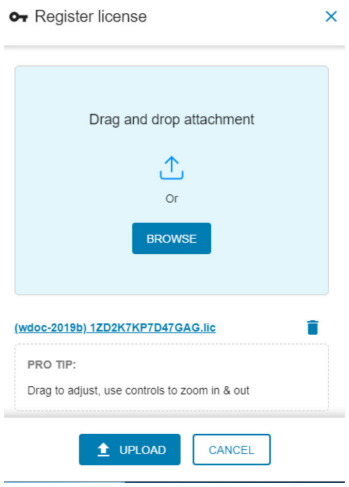
1. You must first get a license file which matches the **Machine Fingerprint** of this machine. See: Request Proposal
2. From the **Sidebar** select the **User Manager** icon.

Procedure

1. Select the **Licensing Functions** tab in the **Navigator**.
   The **Licensing Window** opens in the main work area.
2. Click on the **Register License** button in the top right corner to open the **Register License** side panel.

   The **Register License** side panel opens.

Figure 5-46: Side Panel — Register License



A. ***Drag and Drop Area*** *— For receiving a* `.lic` *file dropped from the file system.*
B. ***Browse*** *button — For navigating to a* `.lic` *file.*
C. ***Upload*** *button — For completing the registration process.*
D. ***Cancel*** *button — For canceling the registration process.*

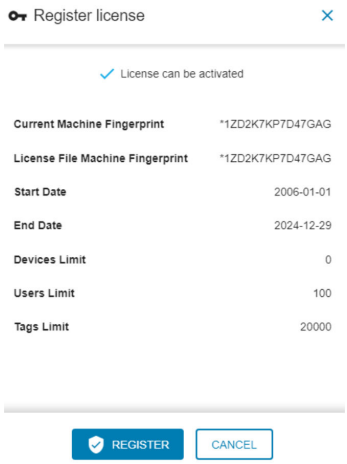
3. Find and select the license file associated with this machine's **Machine Fingerprint**. This is the `.lic` file that you received from Emerson in response to your Request Proposal.
   - (Option 1) Drag the license file from the file system and drop it on the **Drag and Drop Area**.
   - (Option 2) Click **Browse** to navigate to the folder containing the license file.
4. Proceed or Cancel:
   - (Option 1) Click **UPLOAD** at the bottom of the side panel to open the confirmation dialog.
   - (Option 2) Click **CANCEL**, or **X** in the top right corner of the side panel, to exit without registering a license.

   The **Register License** confirmation dialog opens.

⚠ CAUTION

Your license is tightly connected with your **Machine Fingerprint**. Make sure that the hardware configuration has not changed since you generated your **Machine Fingerprint**. Some changes to the hardware configuration will change the **Machine Fingerprint**, which will then require you to get a new license file. See: Request Proposal

Figure 5-47: Register License



5. Check that the parameters of the license match your needs.
6. Register or Cancel:
   - (Option 1) To save your changes and exit, click **REGISTER**.
   - (Option 2) To exit without registering a license, click **CANCEL**, or **X** in the top right corner of the side panel.

   If the license file matches your **Machine Fingerprint** the software will be registered.

5.6.2 Request Proposal

There are three situations where you need to request a license proposal:

1. When you first register AMS Machine Works.
2. When you need to expand the number of licenses.
3. When you perform a hardware upgrade.

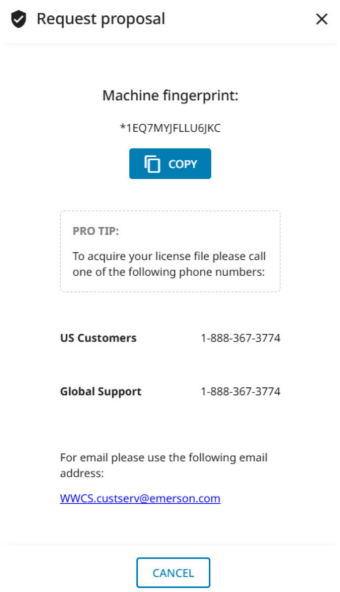
Prerequisites

From the **Sidebar** select the **User Manager** icon.

Procedure

1. Select the **Licenses** tab in the **Navigator**. See: Licenses
   The **Licenses** screen opens in the main work area.
2. Click on the **Request Proposal** button in the top right corner to open the side panel.

Figure 5-48: Side Panel — Request Proposal



3. Click **Copy** to copy the **Machine Fingerprint**.

⚠ CAUTION

Your license is tightly connected with your **Machine Fingerprint**. Make sure the machine meets the hardware and software requirements appropriate for your use case before generating your **Machine Fingerprint**. Any changes to the hardware configuration can change the **Machine Fingerprint**.

4. (Option 1) Contact Emerson by telephone.
   a) **US Customers** should call: `1-888-367-3774`
   b) **Global Customers** should call: `1-888-367-3774`
5. (Option 2) Contact Emerson by email at: `WWCS.custserv@emerson.com`
   a) Click the **Email Link** to launch your email program.
   b) Write your request.
   c) Paste the **Machine Fingerprint** into your email program.

Postrequisites

Once you receive a license file that matches your **Machine Fingerprint**, you can register your license. See: Register License

5.6.3 Guardian Info

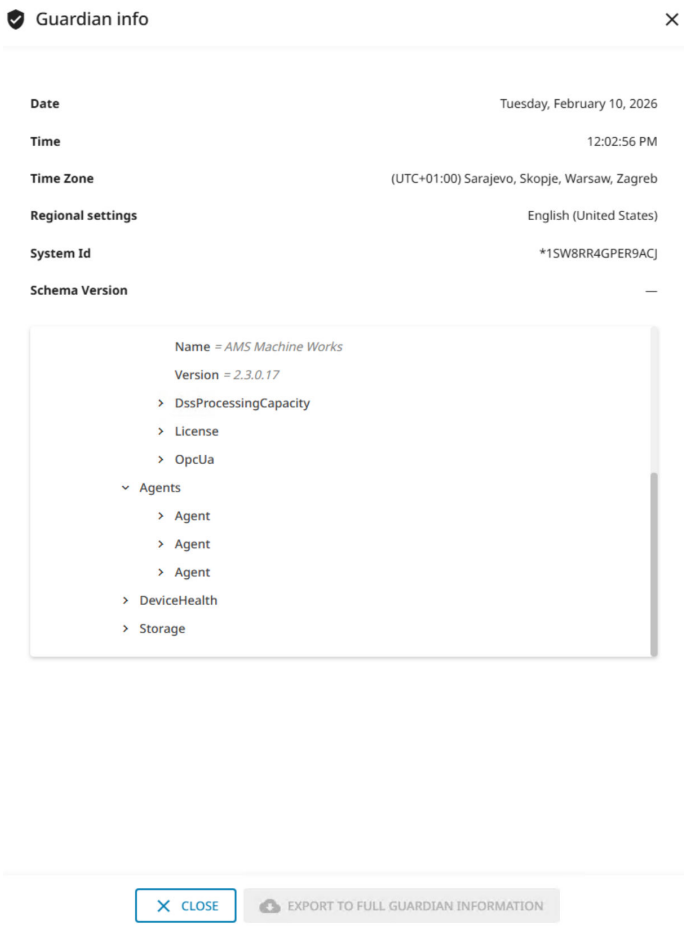
System administrators and co-administrators can view the the **Guardian Info**.

The information is in a hierarchical XML node tree structure, and contains all the information about your system's current configuration.

Prerequisites

1. You must be logged in as an Administrator or Co-Administrator.
2. Click **User Manager** → **License Functions** → **Guardian Info**

Figure 5-49: Guardian Info



Procedure

1. (Disabled) Click **Export Guardian Info** to download the `.xml` file.
2. Click **Close** to exit the sidepanel.

6 Service Status Page

To verify that every element of AMS Machine Works is up and running you can check the **Service Status** page.

The following pages are available:

1. Check Service Status

6.1 Check Service Status

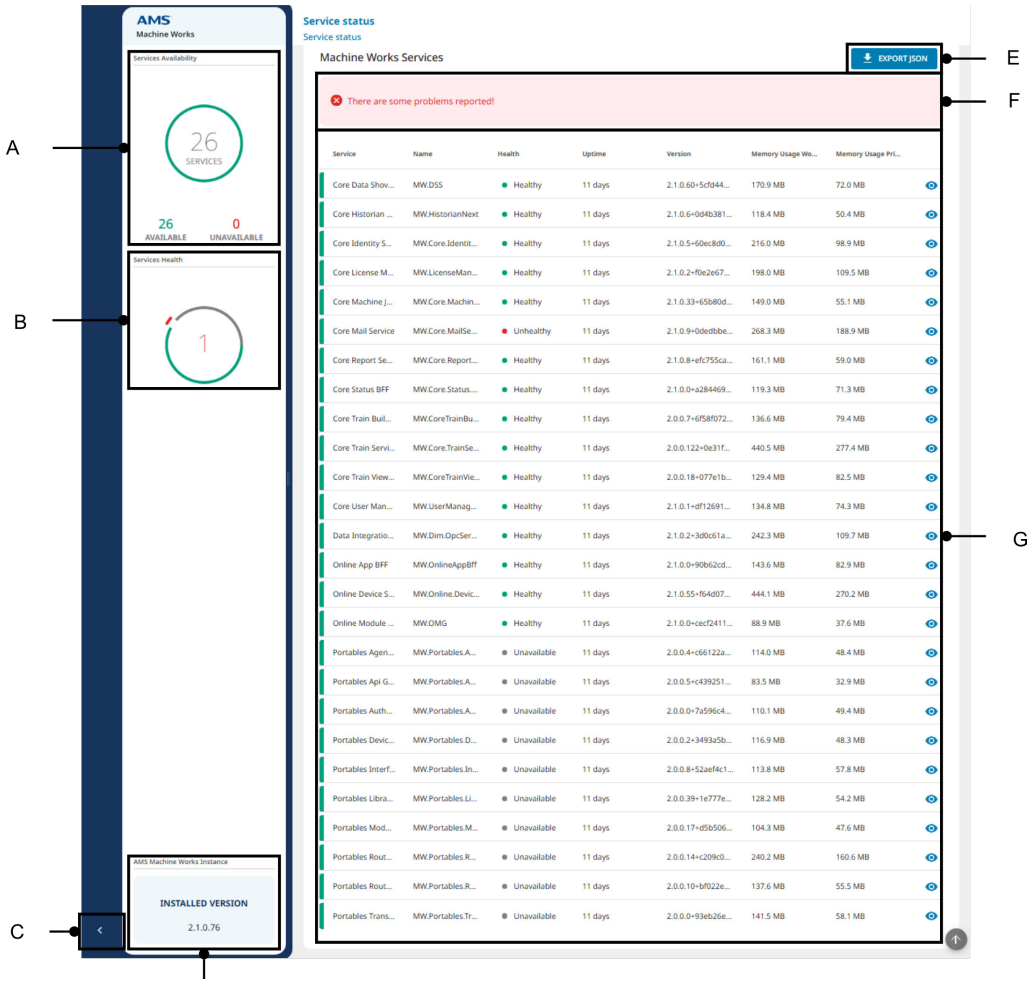
The **Service Status** page shows every **Windows Service** or **IIS Application Pool** that is used in AMS Machine Works.

There are several KPI (Key Performance Indicator) graphical displays which enable users to quickly understand the overall status of the services.

Prerequisites

1. AMS Machine Works must be installed.
2. Allow time for **Services** with a delayed start configured to start.
3. Log in to AMS Machine Works.
4. Open the **Service Status** page by one of the following methods:
   - Click the **Service Status** icon.
   - Enter the URL: `https://<YOUR_AMS_MACHINE_WORKS_SERVER_NAME>/status/`

Figure 6-1: Status Overview



A. ***Service Availability KPI*** *display — The center of the doughnut diagram displays the total number of AMS Machine Works services running on the server. Green represents the available services, and red indicates the unavailable services.*

B. ***Service Health KPI*** *display — The center of the doughnut diagram displays the total number of unhealthy AMS Machine Works services running on the server.*

   A. *Green represents the* ***Healthy*** *services.*

   B. *(Disregard) Grey indicates the incorrectly indicates* ***Unavailable*** *services.*

   C. *Red indicates the* ***Unhealthy*** *services.*

C. ***Open*** */* ***Close*** *control for the tray — (Default:* ***Closed****) Click this control to see the KPIs.*

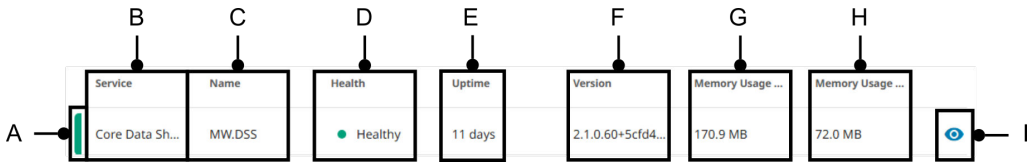
D. ***Installed Version*** *display — The build number of this AMS Machine Works installation.*

E. ***Export JSON*** *button — Click the* ***Export JSON*** *button to save the* `mwstatus.json` *file into the* `Downloads` *director on the system where your browser is running. This file is useful for Emerson Product Support. Consult the AMS Machine Works System Guide topic "Sending Log Files to Emerson Product Support".*

F. ***Status Information*** *— This area contains any warning messages.*

G. ***Service List*** *— Every* ***Windows Service*** *or* ***IIS Application Pool*** *is listed here.*

Figure 6-2: Status List



A. ***Status Indicator*** *— This color indicates the Availability (Green) / Unavailability (Red).*
B. ***Service*** *— The architectural name of the service.*
C. ***Name*** *— The name of the* ***Windows Service*** *or* ***IIS Application Pool****.*
D. ***Health*** *— A service is considered healthy if it is improperly configured.*

> ***Note***
> *Services with names beginning with* `Portables` *incorrectly report that they are* ***Unavailable****. Disregard this information and refer to the color of the* ***Status Indicator*** *for these services.*

E. ***Uptime*** *— The amount of time that the service has been running.*
F. ***Version*** *— The version number for each service. Format:* `x.x.x.<44 character identifier>`*.*
G. ***Memory Usage Working Set*** *— This column indicates how much memory the service will require.*
H. ***Memory Usage Private Set*** *— This column indicates how much memory the service needs exclusive access to.*
I. ***Status Details*** *control — Click the eye icon to open the* ***Status Details*** *sidepanel.*

> ***Note***
> *The* ***Status Details*** *sidepanel has information which is useful for Emerson Product Support. To export this information use the* ***Export JSON*** *button.*
> *Consult the AMS Machine Works System Guide topic "Sending Log Files to Emerson Product Support".*

Procedure

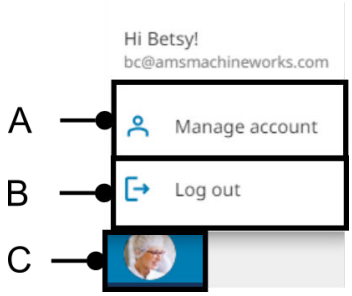
1. Check the **Status Information** area at the top of the window to determine if any problems exist.
2. (Optional) Click the **Open / Close** control for the tray to see the KPI displays and version number.
3. (Optional) When a service is **Unhealthy** and you need to contact Emerson Customer Support:
   a) Click **Export JSON** to download the status information for every service into the `mwstatus.json` file in the **Downloads** folder of the computer where your browser is running.
   b) Contact Emerson Customer Support and send them the `mwstatus.json` file. Consult the AMS Machine Works System Guide topic "Sending Log Files to Emerson Product Support".

7 Your Account

In the **Your Account** settings you can edit your personal photo, change your password, change your unit settings, change your language settings, and view what roles and privileges are assigned to you.

To access the **Your Account** settings, click on the **Your Account** icon in the **Sidebar**. This icon can be your initials, or it can have a customized image. See: User Photo Functions

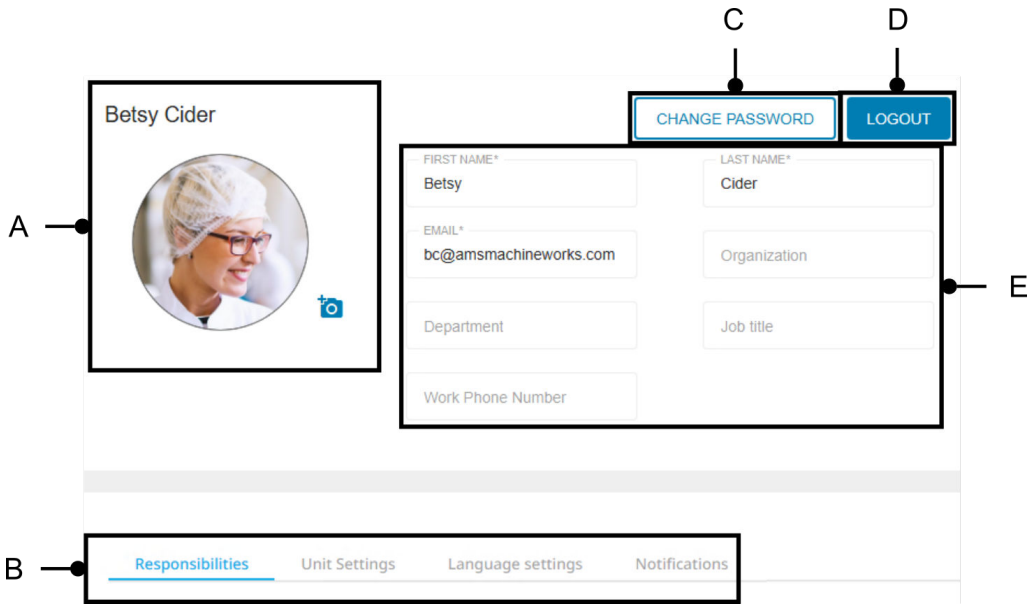
Figure 7-1: Your Account Icon and Menu



A. ***Manage account*** *— Click* ***Manage account*** *to open the* ***Your Account*** *information and controls.*
B. ***Log out*** *— Click* ***Log out*** *to log out of all your browser tabs for this session.*
C. ***Your Account Icon*** *— This user has customized their icon with an image. Click the* ***Your Account Icon*** *to open this menu.*

An AMS Machine Works user can have one or two roles in the system, a **Primary Role**, and a **Secondary Role**. Each role has an independent list of **Locations** and **Agents** for which the role is valid. Users can view these lists in **Your Account**. To get more access, make a request to your **Administrator** or **Co-Administrator**. See: User Manager

Figure 7-2: Your Account Settings — Main Section



A. ***Personal Photo*** *— Click the* ***Camera*** *icon to add a photo. See: User Photo Functions*
B. ***Responsibilities*** */* ***Unit Settings*** */* ***Language Settings*** */* ***Notifications*** *— Each tab has additional settings.*
    A. ***Responsibilities*** *— See: View Responsibilities*
    B. ***Unit Settings*** *— See: Unit Settings*
    C. ***Language Settings*** *— See: Language Settings*
    D. ***Notifications*** *— See: Notifications*
C. ***Change Password*** *— Click* ***Change Password*** *to open the side panel for changing your password. See: Change Password*
D. ***Logout*** *— Click* ***Logout*** *to end your session in all browser tabs.*
E. ***Personal Information*** *— You can view your personal information. If your personal information is incorrect or out of date, contact a co-administrator or the administrator to make changes.*
    A. ***First Name***
    B. ***Last Name***
    C. ***Email***
    D. ***Organization***
    E. ***Department***
    F. ***Job Title***
    G. ***Work Phone Number***

7.1 Change Password

If you are blocked out of your account by having many failed login attempts, contact your **Administrator** and ask them to unblock your account with the Unblock User procedure.

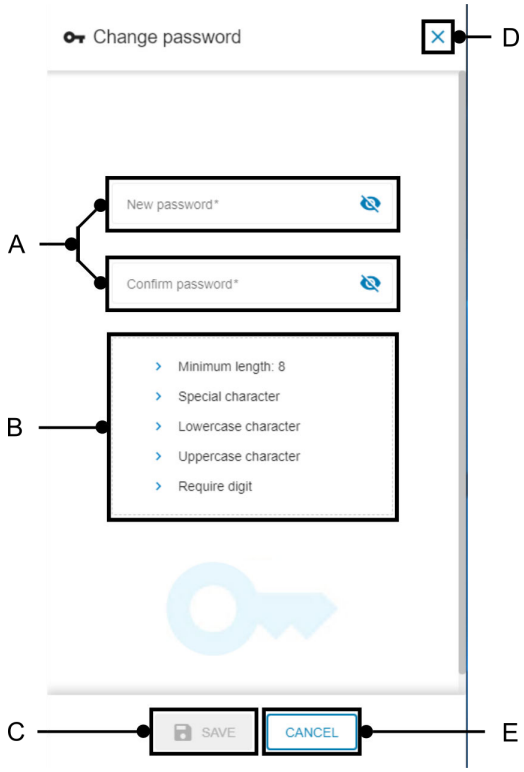
Prerequisites

In the **Sidebar** click **Your Account** → **Manage account** to open **Your Account** information window. See: Sidebar

Click **Change Password** in the top right corner of the area with your personal information.

The **Change Password** side panel opens from the right side of your screen.

Figure 7-3: Change Password



A. *Matching **password** fields.*
B. ***Password Policy** requirements set by your system.*
C. ***Save** your password changes.*
D. *Click **X** to close the side panel without making changes.*
E. ***Cancel** the password change without making changes.*

Procedure

1. Enter a new password into both the **New Password** and **Confirm Password** fields.

   Note
   The passwords must match and meet your company's **Password Policy**.

2. Click **Save** to confirm your change.
   You exit and your password **has changed**.
3. Click **Cancel**, or **X**, to exit without making any change.
   You exit and your password **has not changed**.

7.2 Responsibilities / Unit Settings / Language Settings Notifications

The **Responsibilities** / **Unit Settings** / **Language Settings** area of the **Your Account** window has four tabs, **Responsibilities**, **Unit Settings**, **Language Settings**, and **Notifications**.

Figure 7-4: Your Account — Section Tabs

In the **Your Account** → **Manage account** → **Responsibilities** section you can view the information associated with your **Primary Role** and **Secondary Role**. See: View Responsibilities

In the **Your Account** → **Manage account** → **Unit Settings** section you can set the unit system you view results and analysis in. See: Unit Settings

In the **Your Account** → **Manage account** → **Language Settings** section set the user interface language. See: Language Settings

In the **Your Account** → **Manage account** → **Notifications** section set your notification preferences. See: Notifications

7.2.1 View Responsibilities

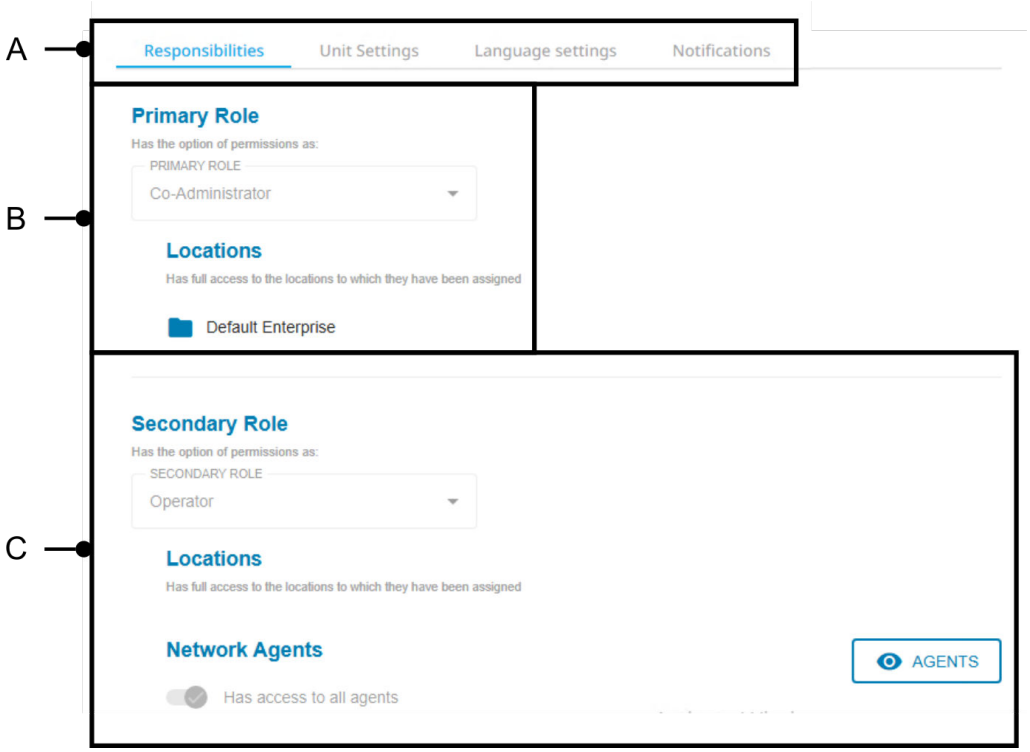
An AMS Machine Works **User** can have two **Roles**; a **Primary Role**, and an optional **Secondary Role**. For more information about **Roles** see: User Roles and Actions

Prerequisites

At the bottom of the Sidebar, click the **Your Account** → **Manage account** → **Responsibilities** to open the **Responsibilities** information and controls for your account.

Example: A **User** with a **Primary Role** of **Co-Administrator**, and a **Secondary Role** of **Operator** could have the following configuration:

Figure 7-5: Your Account — Responsibilities (Example Configuration)



A. ***Responsibilities*** *— This tab details the* ***Roles*** *that a* ***User*** *has in the AMS Machine Works system, and their access to different* ***Locations*** *and* ***Agents****.*

B. ***Primary Role*** *— This is set by a* ***System Administrator*** *in the User Manager.*

   A. ***Locations Section*** *— Lists the* ***Locations*** *where you can act in this role.*

C. ***Secondary Role*** *— This is set by a* ***System Administrator*** *in the User Manager.*

   A. ***Locations Section*** *— Lists the* ***Locations*** *where you can act in this role.*

   B. ***Network Agents Section*** *— The toggle indicates if you have access to all the agents.*

   C. ***Agents*** *— Click* ***Agents*** *to open the* ***Network Device Module****.*

Procedure

1. View the information associated with your **Primary Role**.
   Ask a **Co-Administrator** or the **Administrator** to make any necessary changes to:
   a. **Role**
   b. **Location** access.
   c. **Agent** access.
2. View the information associated with your **Secondary Role**.
   Ask a **Co-Administrator** or the **Administrator** to make any necessary changes to:
   a. **Role**

b. **Location** access

c. **Agent** access

7.2.2 Unit Settings

AMS Machine Works supports a choice between three unit systems, **Imperial**, **Metric**, and **Custom Units** for users to view measurements in.

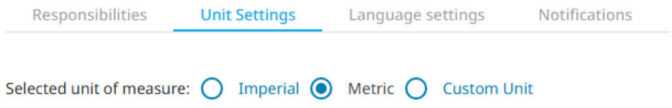
Prerequisites

At the bottom of the Sidebar, click the **Your Account** → **Manage account** → **Unit Settings** to open the **Unit Settings** information and controls for your account.

Procedure

1. Click on the **Unit Settings** tab.
   The **Unit Settings** tab opens.

Figure 7-6: Unit Settings Tab



2. Select the unit system appropriate for your business and region.

   AMS Machine Works supports three measurement systems:

   a. **Imperial** — Mainly used in the United States, Myanmar, and Liberia.

   b. **Metric** — In most cases **Metric** and **SI** are identical, but there are significant differences, e.g., **Acceleration**.

   c. **Custom** — A **Custom** set of units can be defined by the **Administrator**. See: Custom Units

⚠ CAUTION

Displaying measurements in a unit system unfamiliar to your users can lead to user error. Consult your engineering staff to verify which unit system is appropriate for your business and region.

3. Your selection is recorded immediately, reload any open tabs or windows to ensure that the correct units are displayed.

7.2.3 Language Settings

AMS Machine Works can display its interface in a variety of languages. To choose which language you use in AMS Machine Works, use the following procedure.

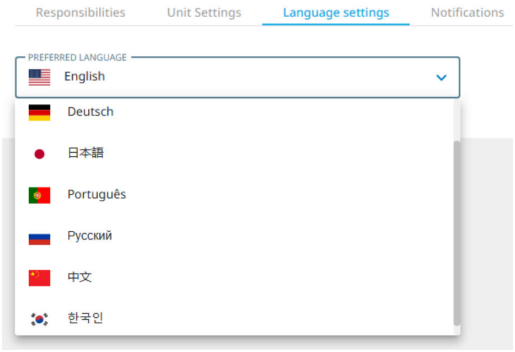
Prerequisites

At the bottom of the Sidebar, click the **Your Account** → **Manage account** → **Language Settings** to open the **Language Settings** information and controls for your account.

Procedure

1. Click on the **Language Settings** tab.
   The **Language Settings** tab opens.

Figure 7-7: Languages Settings Tab



2. Each language option is written in its native character set. Select which language you want to use from the dropdown list.
   - **English (US)**
   - **German**
   - **Japanese**
   - **Portuguese**
   - **Russian**
   - **Chinese**
   - **Korean**
   - **French**

   The interface language immediately changes to the language you selected.

7.2.4 Notifications

Your AMS Machine Works installation sends notification to the email account listed in your user profile once per the **Frequency** you set for each report.

There are two types of reports that users can receive as email notifications:

1. **Alert History Report** — Each user can configure the contents of their own **Alert History Report**.
2. **Top Priority Report** — The **Top Priority Report** for a user is the same as the default view for that user in the **Top Priority Tab**. See: Top Priority Tab

Prerequisites

1. The **SMTP** settings must be configured for your AMS Machine Works installation. See: Configure SMTP Connection
2. The **Administrator** of your AMS Machine Works system must **Enable** notifications, and select some reports for users to configure. See: Configure Notifications
3. At the bottom of the Sidebar, select **Your Account** → **Manage account** → **Notifications** to open the **Notifications** information and controls for your account.

Procedure

1. (Optional) Configure your **Alert History Report** settings. See: Configure the Alert History Report
2. (Optional) Configure your **Top Priority Report** settings. See: Configure the Top Priority Report

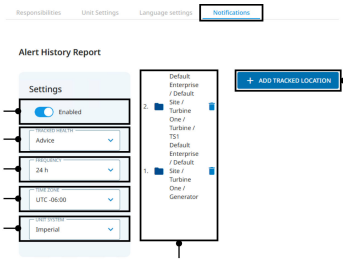
Configure the Alert History Report

Each user can configure their own **Alert History Report**. This report is delivered to you at the **Frequency** that you set, and covers only the **Locations** that you select. The report only contains **Alert** events that meet or exceed the minimum severity level that you set as the **Tracked Health**.

Prerequisites

1. The **Administrator** must enable the **Alert History Report** in the **User Manager** → **Configurations** → **Notifications** section. See: Configure Notifications
2. Open the **Alert History Report** configuration, select **Your Account** → **Manage account** → **Notifications**.

Figure 7-8: Alert History Report Configuration Settings



A. ***Enable / Disable*** *toggle — Click this toggle to enable or disable* ***Alert History Report*** *for your account.*
B. ***Tracked Health*** *dropdown menu — Alerts of the level that you select and higher are included in the* ***Alert History Report****.*
C. ***Frequency*** *dropdown menu — Select how often you want to receive the* ***Alert History Report****.*
D. ***Time Zone*** *dropdown menu — Select the* ***Time Zone*** *you are in.*

> ***Note***
> *The* ***Alert History Report*** *is delivered shortly after each* ***Frequency*** *period ends. Counting begins from* `00:00` *in your* ***Time Zone****.*

E. ***Unit System*** *— Choose the* ***Unit System*** *you want to use in the* ***Alert History Report****.*
F. ***Notifications Tab*** *— Select this tab to see the* ***Alert History Report*** *settings.*
G. ***Add Tracked Location*** *— Click this button to select a* ***Location*** *to track from the hierarchy.*

> ***Note***
> *If you do not see a* ***Location*** *that you want to track, ask your* ***Administrator*** *or* ***Co-Administrator*** *to grant you access.*

H. ***Tracked Location List*** *— A complete list of every* ***Location*** *that you are tracking. Click the* ***Trash*** *icon to remove an item from the list.*

Procedure

1. (Optional) Click the **Enable / Disable** toggle to enable or disable **Alert History Report** for your account.
2. From the **Tracked Health** dropdown list in the **Alert History Report Settings** area, select the minimum alert level to be included in the notifications:
   - **Advice**
   - **Warning**
   - (Default) **Critical**
3. From the **Frequency** dropdown list in the **Alert History Report Settings** area, select how often you want to receive notifications:
   - (Default) **24 h**
   - **12 h**

- **6 h**
- **2 h**
- **1 h**

Note

a. Each report contains all the **Alerts** which occurred within the last reporting period.

b. Each report is sent out a short time after each **Frequency** period ends. (Counting from 00:00 / midnight according to the UTC code the user sets as their **Time Zone**.)

c. When no **Alerts** occur, the report contains the information that, "No Alerts occurred during <Start_Time> and <Stop_Time>."

d. If one or more reports are not sent, the next report that is sent contains all the information from the missing reports.

4. From the **Time Zone** dropdown list in the **Alert History Report Settings** area, select the UTC time zone for your location. (Default **UTC -06:00**)

Note

The **Alert History Report** is delivered shortly after each **Frequency** period ends. Counting begins from `00:00` in your **Time Zone**.

5. From the **Unit System** dropdown list in the **Alert History Report Settings** area, select the unit system to use in the report:
   - (Default) **Imperial**
   - **Metric**
   - **Custom**
6. Click **Add Tracked Location** to select another **Location** to track. Repeat this step as many times as necessary.
   - **Site**
   - **Machine Train** / **Roll** / **Pulley Section** / **MHM Equipment**
   - **Asset**
   - **Measurement Point**

Note

a. **Folder** items cannot be tracked.

b. When you have higher level element in the hierarchy selected, you cannot select any elements that it contains.

c. When you have lower level element in the hierarchy selected, you cannot select any elements that contain it.

d. If you do not see a **Location** that you want to track, ask your **Administrator** or **Co-Administrator** to grant you access.

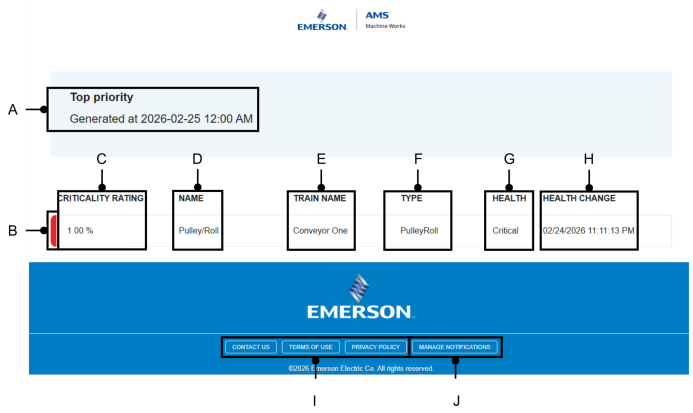
7. In the **Tracked Location List**, ensure that every **Location** that you want to track is present.
   a) (Optional) Delete any unnecessary **Locations** from the **Tracked Location List** by clicking the **Trash** icon next to it.

Configure the Top Priority Report

The **Top Priority Report** is the same as the default view each user would see in the **Top Priority Tab** in the **Machinery Health Module** at the time the report is generated.

This **Top Priority Report** is sent to you once per the **Frequency** period that you select.

Figure 7-9: Top Priority Report Format

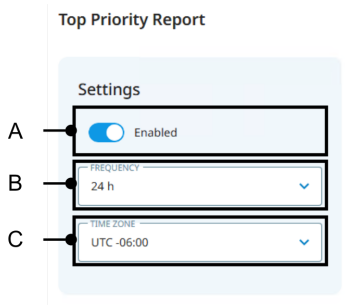


A. ***Top Priority Report*** — *Generated at* `YYYY-MM-DD HH:MM`
B. ***Health Status Indicator*** — *A visual representation of the current* ***Health*** *of the* ***Asset****.*
C. ***Criticality (ACR)*** — *The* ***Criticality (ACR)*** *is defined in Table 4-1*
D. ***Name*** — *The* ***Name*** *that was set for the* ***Asset*** *in the* ***Design Studio****.*
E. ***Train Name*** — *The name of the* ***Machine Train*** *which contains the* ***Asset****.*
F. ***Asset Type*** — *The type of* ***Asset*** *in the* ***Machine Train****.*
G. ***Health*** — *The worst* ***Health Status*** *of a* ***Measurement*** *on the* ***Asset****. The color matches the* ***Health Status Indicator*** *for the row.*
H. ***Health Change*** — *The amount of time since the* ***Health Status*** *has changed.*
I. ***Emerson Informational Links*** — *These are links to:*
   A. ***Contact Us*** — *A link to Emerson Customer Support.*
   B. ***Terms Of Use*** — *A link to the AMS Machine Works terms of use document.*
   C. ***Privacy Policy*** — *A link to the AMS Machine Works privacy policy document.*
J. ***Manage Notifications*** — *Click this link to open the* ***Notifications*** *panel for* ***Your Account****.*

Prerequisites

1. The **Administrator** must enable the **Top Priority Report** in the **User Manager** → **Configurations** → **Notifications** section. See: Configure Notifications
2. Open the **Top Priority Report** configuration, select **Your Account** → **Manage account** → **Notifications**.

Figure 7-10: Top Priority Report Configuration Settings



A. ***Enable / Disable*** *toggle — Click this toggle to enable or disable* ***Alert History Report*** *for your account.*
B. ***Frequency*** *dropdown menu — Select how often you want to receive the* ***Alert History Report****.*
C. ***Time Zone*** *dropdown menu — Select the* ***Time Zone*** *you are in.*

> ***Note***
> *The* ***Top Priority Report*** *is delivered shortly after each* ***Frequency*** *period ends. Counting begins from* `00:00` *in your* ***Time Zone****.*

Procedure

1. (Optional) Click the **Enable / Disable** toggle to enable or disable **Alert History Report** for your account.
2. From the **Tracked Health** dropdown list in the **Alert History Settings** area, select the minimum alert level to be included in the notifications:
   - (Default) **Advice**
   - **Warning**
   - **Critical**
3. From the **Frequency** dropdown list in the **Top Priority Report Settings** area, select how often you want to receive notifications:
   - (Default) **24 h**
   - **12 h**
   - **6 h**
   - **2 h**
   - **1 h**

Note

a. Each report is sent out a short time after each **Frequency** period ends. (Counting from 00:00 / midnight according to the UTC code the user sets as their **Time Zone**.)

b. When no **Alerts** occur, the report contains the information that, "No Alerts occurred during <Start_Time> and <Stop_Time>."

c. If one or more reports are not sent, the next report that is sent contains all the information from the missing reports.

4. From the **Time Zone** dropdown list in the **Alert History Settings** area, select the UTC time zone for your location. (Default **UTC -09:00**)

Note

The **Alert History Report** is delivered shortly after each **Frequency** period ends. Counting begins from `00:00` in your **Time Zone**.

8 Network Device Module

The Network Device Module provides the functionality for discovering and configuring every data source which is available on your network.

Agents

There are four types of **Agent** which enable connections to every kind of **Device**:

1. **AMS Asset Monitor Agent**
2. **Emerson Wireless Gateway Agent**
3. **AMS 6500 ATG Agent**
4. **AMS Portables Agent** See: Portable Device Module

Devices

There are many types of **Device** which you can connect to:

- **AMS Asset Monitor**
  - Each physical **AMS Asset Monitor** device has slots which hold **CHARMs**.
- **Emerson Wireless Gateway**
  - Each physical **Emerson Wireless Gateway** device is able to give network access to **AMS Wireless** devices within its signal range.
  - Each physical **AMS Wireless** device should be appropriately located so that it can return reliable data. There are two types of **AMS Wireless** device:
    - **AMS 9420**
    - **AMS Wireless Vibration Monitor**
- **AMS 6500 ATG** units are located on your network and can contain a wide range of monitoring modules.
- **AMS 2140 Machinery Health Analyzer** units are handheld devices which can connect to your network in three ways, wirelessly, via Ethernet, and by USB.

Licenses

A **Tag** is required for every **measurement source**. Each **measurement source** consumes one **Tag**, even if it generates more than one **measurement**.

Tag evaluation is carried out when measurement data arrives. The evaluation checks if the **measurement source** has a valid **Tag** assigned to it.

If you are an **Administrator** or **Co-Administrator**, you can also access the License Functions available in the User Manager application.

8.1 Network Device Module — Overview and Sidebar

When you start the **Network Device Module** your first view is of the overview. This overview is initially mostly empty until devices are connected to an **Agent** and configured. The overview has a series of links on the left hand side to AMS Machine Works applications, and to the other two main areas of the **Network Device Module**: **Devices**, and **Agents**.

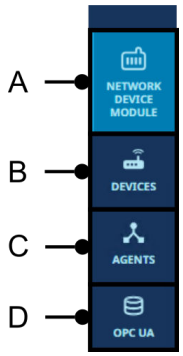
The overview is divided into four informational sections:

1. **Connection Status**
2. **Device Health**
3. **OPC UA Health**
4. **System Stats**

These sections enable you to quickly find information about all the elements of your monitoring infrastructure.

The doughnut charts, and the status lists below them, provide a way for you to quickly find devices which meet your search criteria.

Figure 8-1: Network Device Module - Sidebar



A. ***Network Device Module - Sidebar*** — *This link displays the overview screen. (Shown below.)*
B. ***Network Device Module - Devices*** — *Switches to the Devices view.*
C. ***Network Device Module - Agents*** — *Switches to the Agents view.*
D. ***Network Device Module - OPC UA*** — *Switches to the OPC UA Tag Health view.*

Figure 8-2: Network Device Module - Statistics Overview



A. ***Statistics Overview*** — *Title and breadcrumb path.*
B. ***Connection Status*** — *A doughnut chart with an overview of the connection status of your devices and agents. See: Connection Status*
C. ***Device Health*** — *A doughnut chart with an overview of the health status of your devices. See: Device Health*
D. ***OPC UA Tag Health*** — *A doughnut chart showing the health of **OPC UA Tag** connections. See: OPC UA Tag Health*
E. ***System Stats*** — *A general overview of how many elements are currently configured in the system. See: System Stats*

8.1.1 Header

The header of each window in the **Network Device Module** contains a clickable breadcrumb path which shows the part of the **Network Device Module** that the **User** is in.

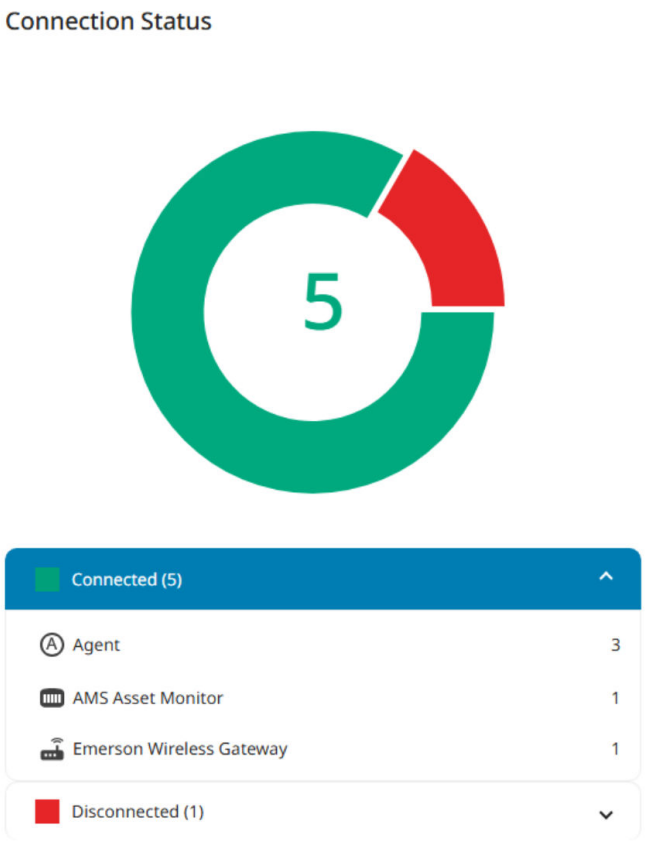
8.1.2 Connection Status

The **Connection Status** panel gives the **User** a quick overview of the current connection status of your monitoring infrastructure, devices, and agents.

There are two **Connection Status** statuses:

- **Disconnected** — Red
- **Connected** — Green

Figure 8-3: Connection Status Panel



The **Connection Status Diagram** shows a proportional representation of the number of devices with each connection status. The number in the center indicates how many devices have the currently selected status.

There are two ways a **user** can select **Connected** or **Disconnected** infrastructure:

1. By clicking a section in the diagram.
2. By clicking a category in the list.

The currently selected category shows an expanded list of **Devices** and **Agents**.

Click on an **Agent** or **Device** in the list to open the **Agents** or **Devices** subsection of the **Network Device Module** with more detailed information. (See: Devices and Agents)

8.1.3 Device Health

The **Device Health** panel gives you a quick overview of the health of the devices in your monitoring infrastructure. A **User** can select devices with a particular status from either the doughnut display or from the list of statuses below.

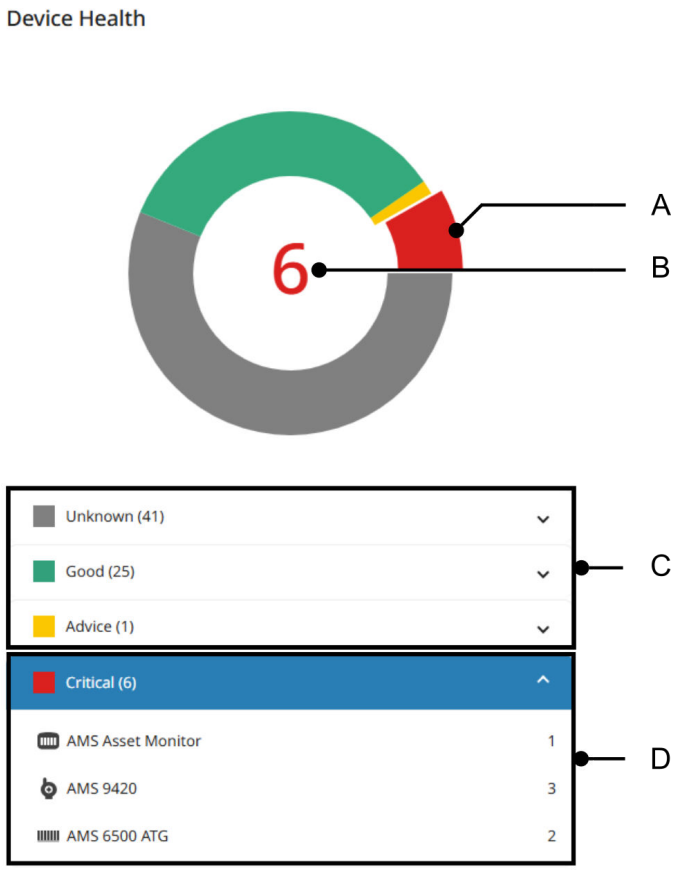
There are five possible **Device Health** statuses:

- **Critical** — **Red**
- **Warning** — **Orange**
- **Advice** — **Yellow**
- **Good** — **Green**
- **Unknown** — **Grey**

Device Health is given by one of two methods:

- **Endpoint Health** — This is the health of an endpoint device.
- **Worst Connected Health** — This is set to the lowest health of a connected endpoint device.
  - With an **Emerson Wireless Gateway**, the worst health of a wireless device connected through that **Emerson Wireless Gateway**.
  - With an **AMS Asset Monitor**, the worst health of a **CHARM** installed in that **AMS Asset Monitor**.
  - With an **AMS 6500 ATG** unit, the worst health of a **Card** in the **AMS 6500 ATG** unit.

Figure 8-4: Device Health Panel



A. *The **Critical** section is selected, so it stands out from the diagram.*
B. *The number of items is the same color as the selected section.*
C. *Other sections are not expanded, and only display the total number of devices with each status.*
   - ***Unknown** — The grey section is not selected, and 41 devices are listed with the **Unknown** status.*
   - ***Good** — The green section is not selected, and 25 devices are listed with the **Good** status.*
   - ***Advice** — The yellow section is not selected, and one device is listed with the **Advice** status.*
D. *The **Critical** section is selected, so the list is expanded to show the details about which **Devices** are **Critical**.*

Note
When no **Devices** have one of the statuses, that status is not displayed. (e.g., There are no **Devices** with the **Warning** status in the diagram above.)

1. **Device Health Diagram** — This doughnut chart shows a proportional representation of the number of devices with each health status. **Critical** is selected, and there are 6 devices with this status.
2. **Critical** — This red section is currently selected and expanded, and there are 6 devices with this status.
3. **Warning** — This orange section is not present because there are no devices with the **Warning** status.

8.1.4 OPC UA Tag Health

OPC UA tag health indicates the status of the information exchange between external OPC UA systems and AMS Machine Works.

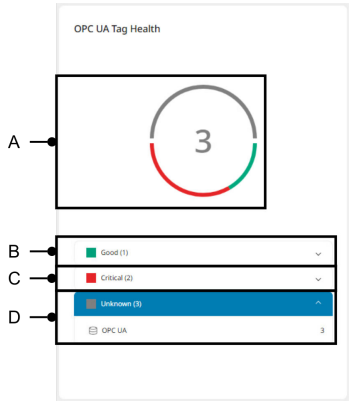
The OPC UA connection in AMS Machine Works has the following default values:

1. **Refresh Rate** — (Default: 5) (Range: 1 to 60 minutes) The system will accept a maximum of one measurement within this period.
2. **Timeout** — (Default: 5) (Range: 1 to 60 minutes) The system will mark an OPC UA tag as **Critical** if a measurement is not provided within the timeout limit.

OPC UA Tag Health Statuses:

1. **Unknown** — No information has ever been received.
2. **Good** — Information has been received within the timeout limit.
3. **Critical** — No information has been received within the timeout limit.

Figure 8-5: OPC UA Tag Health



*A. **Health Overview** — A visual representation of the proportion of tags with different statuses. The number in the center is the number of tags which have the currently selected status.*

*B. **Good** — The number of tags that have received information within the **Timeout** limit.*

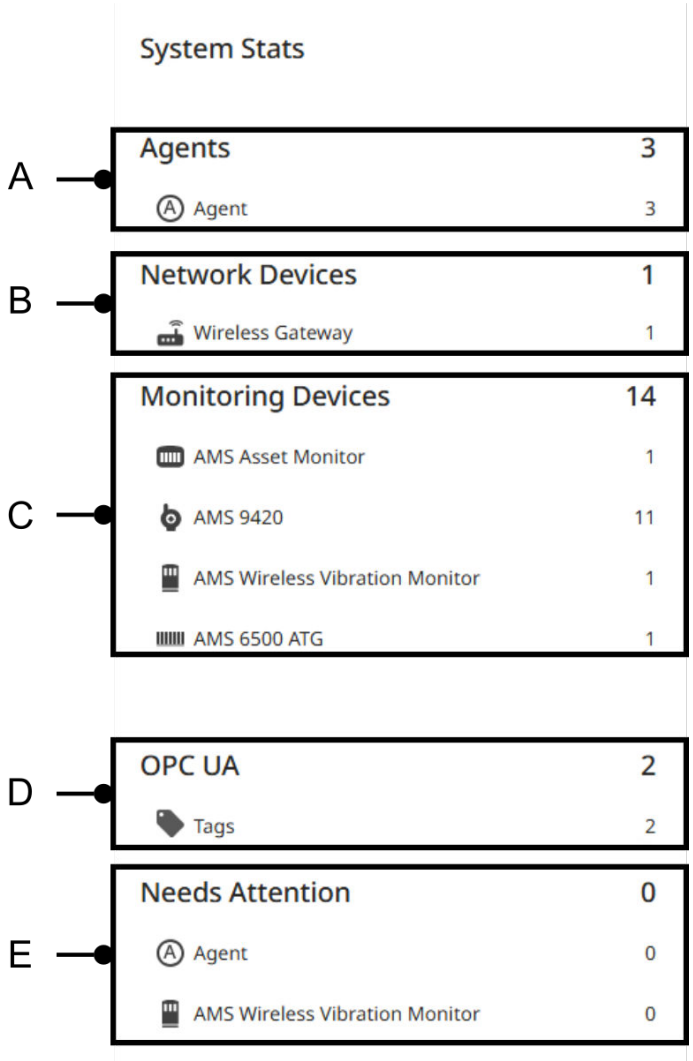
*C. **Critical** — The number of tags that have not received any information within the **Timeout** limit.*

*D. **Unknown** — The number of tags that have never received any information.*

8.1.5 System Stats

The **System Stats** panel has general information about your monitoring infrastructure.

Figure 8-6: System Stats Panel



1. **Agents** — This is the sum of every type of **Internal** and **External Agent**. This includes both currently **Connected** and **Disconnected Agents**.
2. **Network Devices**
   - **Wireless Gateway** — The number **Wireless Gateway** units configured for your AMS Machine Works installation via every **Internal** and **External Wireless Gateway Agent**. This includes both currently **Connected** and **Disconnected** units.
3. **Monitoring Devices**

- **AMS Asset Monitor** — This is the sum of every **AMS Asset Monitor** unit configured for your AMS Machine Works installation via every **Internal** and **External AMS Asset Monitor Agent**. This includes both currently **Connected** and **Disconnected** units.
- **AMS Wireless Vibration Monitor** — This is the sum of every **AMS Wireless Vibration Monitor** unit ever seen by your AMS Machine Works installation via every **Wireless Gateway** that is currently configured in your AMS Machine Works installation. This includes both currently **Connected** and **Disconnected** units.
- **AMS 9420** — This is the sum of every **AMS 9420** unit ever seen by your AMS Machine Works installation via every **Wireless Gateway** that is currently configured in your AMS Machine Works installation. This includes both currently **Connected** and **Disconnected** units.
- **AMS 6500 ATG** — This is the sum of every **AMS 6500 ATG** unit configured for your AMS Machine Works installation via every **Internal** and **External AMS 6500 ATG Agent**. This includes both currently **Connected** and **Disconnected** units.

4. **OPC UA** — An overview how many OPC UA tags are defined in your AMS Machine Works installation.
5. **Needs Attention** — This area lists every device with an incomplete on incompatible configuration. These devices must be reconfigured.

Clicking on a specific row in the **System Stats Panel** redirects the **User** to the **Devices** subsection of the **Network Device Module** with the appropriate **device tab** selected. This tab lists all of those devices and the information for each device.

8.2 Devices

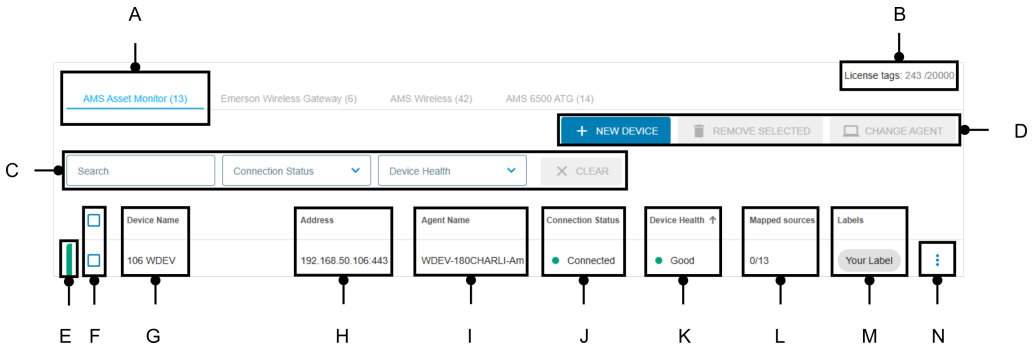
The **Network Device Module** handles the configuration, management, and monitoring of four categories of devices:

- **AMS Asset Monitor** See: AMS Asset Monitor Tab
- **Wireless Gateway** See: Wireless Gateway Tab
- **AMS Wireless** See: AMS Wireless Tab
  - **AMS 9420**
  - **AMS Wireless Vibration Monitor**
- **AMS 6500 ATG** See: AMS 6500 ATG Tab

Each kind of device has different measurement, self-monitoring, and data collection capabilities that are explained in the following sections.

8.2.1 AMS Asset Monitor Tab

Figure 8-7: AMS Asset Monitor Tab



A. ***AMS Asset Monitor Tab*** — *When this tab is underlined with a blue line the **AMS Asset Monitor Tab** is selected.*

B. ***License tags*** — *Shows the number of license tags used over the total number of license tabs.*

C. ***Search Area*** — *Search field, filters, and **Clear**.*
   - ***Search*** — *Use this field to search for devices by:*
   - ***Connection Status Filter*** — *Filter by **Connected** / **Disconnected**.*
   - ***Device Health Filter*** — *Filter by **Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*
   - ***Clear*** — *Click **Clear** to reset all the filters.*

D. ***Functional Buttons*** —
   - ***New Device*** — *Add a new device. See: Add an AMS Asset Monitor*
   - ***Remove Selected*** — *Use this to remove a **device** from the list. See: Remove Device*
   - ***Change Agent*** — *Change the agent responsible for handling this **device**. See: Change Agent*

E. ***Health Bar*** — *The color of the vertical **Health Bar** matches the color and description of the **Device Health**. See: Device Health*

F. ***Checkboxes*** — *Two **Functional Buttons** are enabled for items which have a **checkbox** checked. To select all **devices** you can check the **checkbox** at the top of the column.*
   - *The **Remove Selected** function will affect each **Device** which has a checkbox selected.*
   - *The **Change Agent** function will affect each **Device** which has a checkbox selected.*

G. ***Device Name*** — *Name of the **device**.*

H. ***Address*** — *The IP address and port number for accessing this **device**.*

I. ***Agent Name*** — *The name of the **Agent** used to communicate with the **device**.*

J. ***Connection Status*** — *This field displays **Connected** or **Disconnected**.*

K. ***Device Health*** — *This displays the health of the monitoring **device: Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*

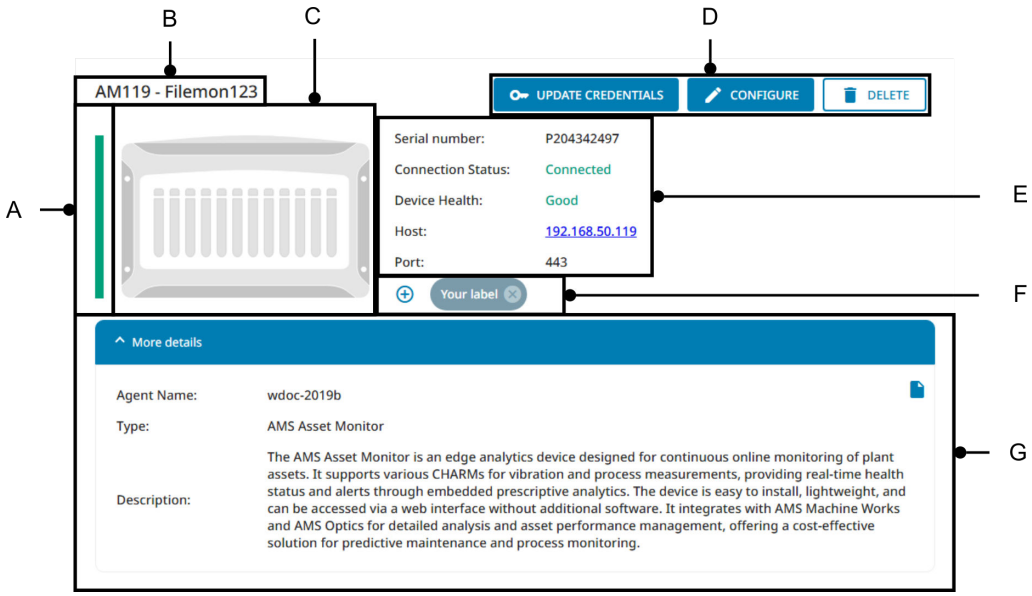
L. ***Mapped Sources*** *— Shows the proportion of* ***mapped sources*** *to the* ***total sources*** *from this* ***device****.*
M. ***Labels*** *— This column displays the user defined labels for each* ***device****. See: Add Label*
N. ***Vertical Ellipsis Menu*** *— The vertical ellipsis menu has the following options:*
   - ***Update Credentials*** *— See: Update credentials*
   - ***Configure*** *— See: Reconfigure an Asset Monitor Connection*
   - ***Delete*** *— See: Remove Device*

AMS Asset Monitor Details

When you view the details of any device, the header of the window displays a breadcrumb path to the device. You can click on any item in the path to navigate between views.

Asset Monitor Details — Main Section

Figure 8-8: Main



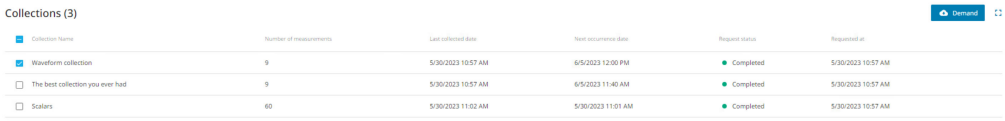
A. ***Device Health Bar*** — *Health is shown by a colored bar. See: Device Health*
B. ***Device Name***
C. ***Breadcrumb Path***
D. ***Asset Monitor Icon***
E. ***Configuration Controls*** — *Controls for changing or deleting the configuration:*
   - ***Update Credentials*** — *To change the access credentials of a **device**. See: Update credentials*
   - ***Configure*** — *To change the configuration of a **device**. See: Reconfigure an Asset Monitor Connection*
   - ***Delete*** — *To delete a **device**. See: Remove Device*
F. ***Information Section*** — *This section contains information about the device configuration and status.*
   - ***Serial Number*** — *The serial number is set by Emerson during production.*
   - ***Connection Status*** — *See: Connection Status*
   - ***Device Health*** — *This health is the same as the health of the **Charm** with the worst health inside this Asset Monitor. The health information is written and color coded to match. See: Device Health*
   - ***Host*** — *The IP Address of the Asset Monitor.*
   - ***Port*** — *The port used to access the Asset Monitor.*
G. ***Add Label*** — *Add a custom label for this Asset Monitor. See: Add Label*
H. ***More Details*** — *This expandable section contains some contextual information about the device.*

- ***Agent Name*** *— This is the name of which agent is being used to access this device. See: Agents*
- ***Type*** *— The type of device.*
- ***Description*** *— Description of what the device is and what it does.*
- ***Advanced Details*** *— Click this file icon, , to display a .json file with technical details about your device such as the firmware version, serial number, or other technical details.*

Collections

For more information about what is included in a **Collection** see: Collection Details

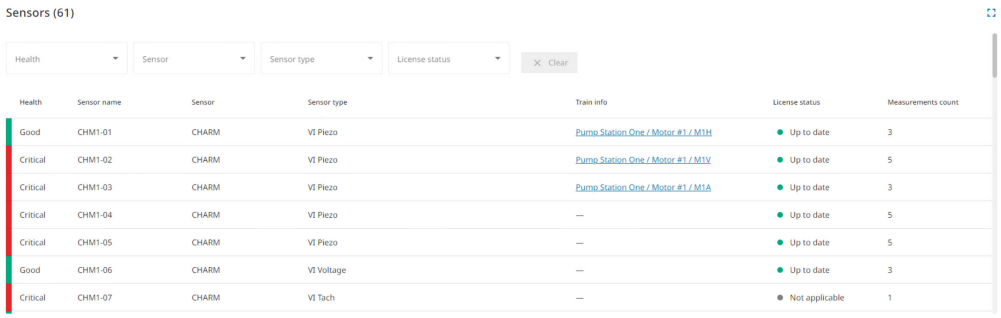
Figure 8-9: Collections



A. ***Demand*** *— When you have one or more* ***Collection*** *boxes marked you can use the* ***Demand*** *button to refresh the data. See: Demand Collection*
B. ***Multiple Demand*** *— When you have one or more* ***Collection*** *boxes marked you can use the* ***Multiple Demand*** *button to refresh the data. See: Multiple Demand Collection*
C. ***Selection boxes*** *— Mark the* ***Collections*** *you want to* ***Demand*** *here.*
D. ***Collection Name*** *— The name of the* ***Collection*** *is displayed here. The name is defined in the* ***AMS Asset Monitor*** *interface, and the instructions for this are described in that product's documentation.*
E. ***Number of measurements*** *— This is the number of measurements defined in this* ***AMS Asset Monitor Collection****.*
F. ***Last collected date*** *— The date and time of when data was last gathered.*
G. ***Next occurrence date*** *— The date and time of when data will be gathered next.*
H. ***Demand status*** *—* ***Requested*** */* ***Completed*** */* ***Outdated*** */* ***Not requested*** */* ***Failed****. Also shows the progress of the request in percentage.*
I. ***Demanded at*** *— This is the date (MM/DD/YYYY) and time (HH:MM AM/PM) the request was made.*

Sensors

Figure 8-10: Sensors

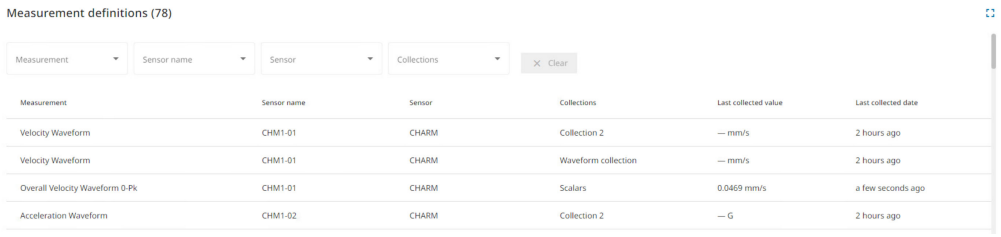


A. ***Sensor Filters*** *— The* ***Sensors*** *can be filtered by four characteristics. Only the* ***Sensors*** *which meet all of the conditions you apply will be displayed. Click* ***Clear*** *to reset the filter.*
   - ***Health*** *— You can select the* ***Sensors*** *which have a particular* ***Health****.*
   - ***Sensor*** *— Choose to filter by either* ***CHARM****, or* ***External Data Point****.*
   - ***Sensor type*** *— There is a wide range of* ***Sensor type*** *available for AMS Asset Monitor.*
   - ***License status*** *— "Not applicable" / "Out of date" / "Up to date"*
   - ***Clear*** *— Click* ***Clear*** *to reset the filters.*

B. ***Device Health Bar*** *— Health is shown by a colored bar. See: Device Health*
C. ***Sensor name*** *— This name is set in the* ***AMS Asset Monitor*** *interfaces and is documented in the* ***AMS Asset Monitor*** *documentation.*
D. ***Device path*** *— This is either the location of the* ***CHARM****, or* ***-*** *for an* ***External Data Point****.*
E. ***Sensor*** *— This can be either* ***CHARM*** *or* ***External Data Point****.*
F. ***Sensor type*** *—* ***CHARM*** *sensors have a specific type, and* ***External Data Point*** *sensors have no entry here.*
G. ***Train info*** *— Includes a link from the sensor to the measurement view for that sensor in the Machinery Health Module. See: Point View*
H. ***License status*** *— The three possible statuses are: "Not applicable", "Out of date", and "Up to date".*
I. ***Defined measurements*** *— This column displays how many measurements this* ***Sensor type*** *is capable of delivering.*

Measurement Definitions

Figure 8-11: Measurement Definitions



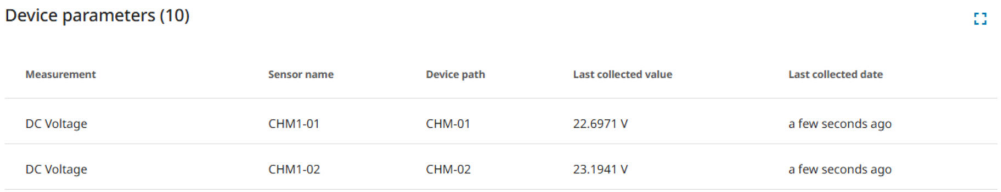
A. ***Measurement Definition Filters*** *— The* ***Measurement Definitions*** *can be filtered by four characteristics. Only the* ***Measurement Definitions*** *which meet all of the conditions you apply will be displayed. Click* ***Clear*** *to reset the filter.*
   - ***Measurement*** *— You can filter for* ***Measurement Definitions*** *which have a particular type. (Waveform, Spectrum, Scalar, Interval Band, Thumbnail, Peak List)*
   - ***Collections*** *— For an AMS Asset Monitor you can filter by the following types of* ***Collection: Scalars***, ***Waveforms***, *or by a custom* ***Collection*** *defined on the AMS Asset Monitor.*
   - ***Sensor name*** *— You can filter by* ***Sensor name****. For an AMS Asset Monitor there can be custom names which are defined in the AMS Asset Monitor interface.*
   - ***Sensor*** *— For an AMS Asset Monitor you can filter by* ***CHARM*** *or by* ***External Data Point****.*
   - ***Clear*** *— Click* ***Clear*** *to reset the filters.*

B. ***Measurement*** *— A short description of the type of measurement.*
C. ***Collections*** *— The name of the* ***Collection*** *where this data is gathered.*
D. ***Sensor name*** *— This name is set in the* ***AMS Asset Monitor*** *interfaces and is documented in the* ***AMS Asset Monitor*** *documentation.*
E. ***Device path*** *— This is either the location of the* ***CHARM****, or* ***-*** *for an* ***External Data Point****.*
F. ***Sensor*** *— This can be either* ***CHARM*** *or* ***External Data Point****.*
G. ***Last collected value*** *— The latest value along with the associated unit for that type of* ***Measurement****.*
H. ***Last collected date*** *— A value along with a unit of time to indicate how long ago the measurement was taken.*

Device Parameters

These are measurements of the measuring device itself.

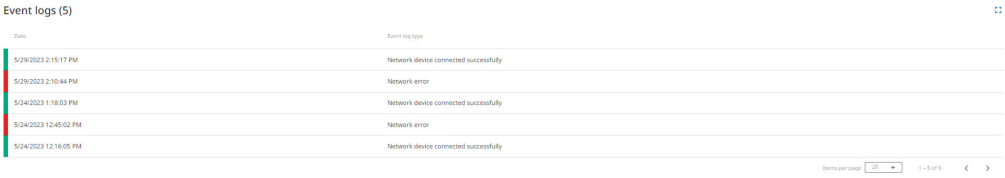
Figure 8-12: Device Parameters



A. ***Measurement*** *— This column lists the type of* ***Measurement****, e.g., Temperature or Voltage.*
B. ***Sensor name*** *— This name is set in the* ***AMS Asset Monitor*** *interfaces and is documented in the* ***AMS Asset Monitor*** *documentation.*
C. ***Device path*** *— This is either the location of the* ***CHARM****, or* ***-*** *for an* ***External Data Point****.*
D. ***Last collected value*** *— The latest value along with the associated unit for that type of* ***Measurement****.*
E. ***Last collected date*** *— A value along with a unit of time to indicate how long ago the measurement was taken.*

Event Logs

Figure 8-13: Event Logs



A. ***Event Log Filters*** *— The* ***Measurement Definitions*** *can be filtered by four characteristics. Only the* ***Measurement Definitions*** *which meet all of the conditions you apply will be displayed. Click* ***Clear*** *to reset the filter.*
   - ***Severity*** *— You can filter for the* ***severity*** *of the* ***Event Log Entry****. Choose from: (Critical, Major, Moderate, Low)*
   - ***Clear*** *— Click* ***Clear*** *to reset the filters.*
B. ***Event Severity Indicator*** *— This indicator gives a visual representation of the severity of the* ***Event****. These match in color and severity to the Device Health scale. For example,* ***Red*** *indicates a* ***Critical Event****, and* ***Green*** *indicates a* ***Good Event****.*
C. ***Date*** *— The date of the* ***Event****.*
D. ***Severity*** *— The* ***Event Severity*** *in text form.*
E. ***Event log type*** *— The type of event, e.g.,* ***Network error*** *or* ***Network device connected successfully****.*

Event Types

Table 8-1: Event Types

Event Message	Severity	Recommended Action
Agent closing	Warning	
Network device connected successfully	Good	None.
Connection broken	Critical	Check your network connection to this device.
Network error	Critical	Check your network connection to this device.
Unknown event log	Unknown	

Add an AMS Asset Monitor

To add an **AMS Asset Monitor** unit to your system, follow these steps.

An **AMS Asset Monitor** uses from 0 to 12 **Channels**, so it consumes between 0 to 12 **Vibration Tags**. The **Vibration Tags** are consumed when you complete this task.

Note
Temperature Measurements do not consume **Vibration Tags**, so an **AMS Asset Monitor** unit with only **Temperature Measurement** cards will not consume any **Vibration Tags**.

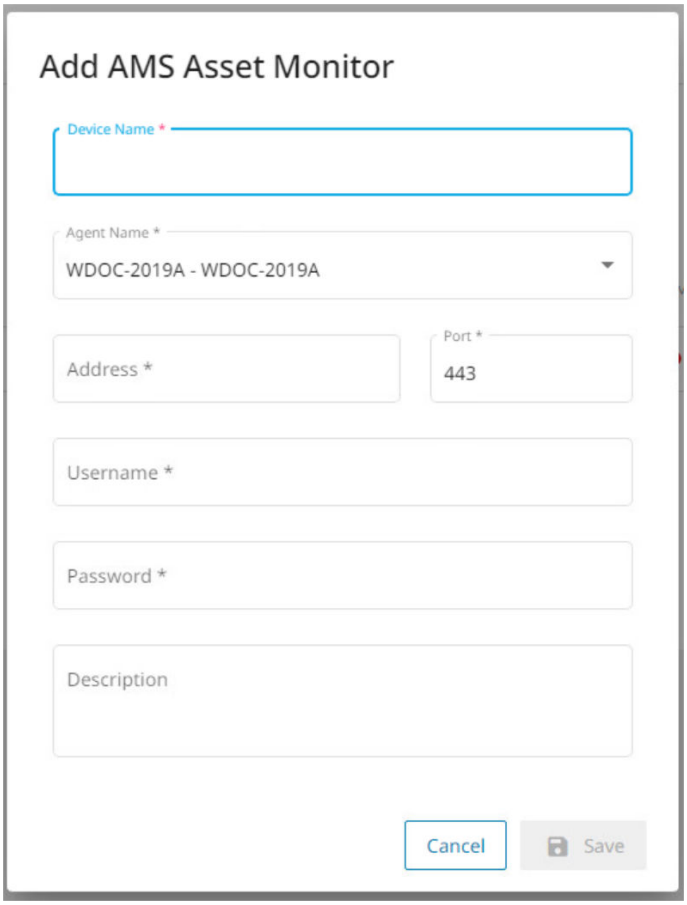
To release the **Vibration Tags**, remove the **Device**. See: Remove Device

Prerequisites

To open the configuration dialog select:

Network Device Module → Devices → AMS Asset Monitor Tab

Figure 8-14: Add an AMS Asset Monitor



Procedure

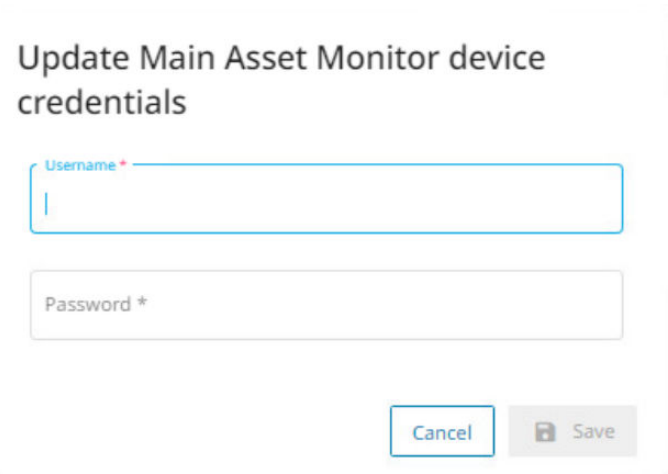
1. **Device Name** — (Required) Enter a name for this device within AMS Machine Works. The maximum length is 100 characters.
2. **Agent Name** — (Required) Select the **Agent** to use for this connection from this dropdown list. See: Agents
3. **Address** — (Required) Enter the IP address of the **AMS Asset Monitor**. The maximum length is 250 characters.
4. **Port** — (Required) The default port, **443**, is prefilled. In some installations this port could be different. The valid range is from 1 to 65535.
5. **Username** — (Required) Enter the **Username** for the **AMS Asset Monitor** account you want to connect to.
6. **Password** — (Required) Enter the **Password** associated with the **Username** for the **AMS Asset Monitor** you want to connect to.
7. **Description** — (Optional) You can enter any useful description information or notes here. The maximum length is 500 characters.
8. **Confirm** or **Cancel**:
   - Click **Cancel** to exit without making changes.

- Click **Save** to save your changes and exit.

Update credentials

If the **AMS Asset Monitor** has had its authentication settings changed you can update them.

Figure 8-15: Update AMS Asset Monitor Credentials



Prerequisites

Verify the **Username** and **Password** needed for the **AMS Asset Monitor**.

Procedure

1. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Asset Monitor Tab → AMS Asset Monitor Device List → Vertical Ellipsis Menu of the affected device → Update Credentials**
   - **Network Device Module → Devices → AMS Asset Monitor Tab → AMS Asset Monitor Device List → Select a device → Update Credentials**
2. **Username** — (Required) Enter the **Username** for the **AMS Asset Monitor** account you want to connect to.
3. **Password** — (Required) Enter the **Password** associated with the **Username** for the **AMS Asset Monitor** you want to connect to.
4. **Confirm** or **Cancel**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

Reconfigure an Asset Monitor Connection

You can modify a previously configured **AMS Asset Monitor** connection. All of the fields except for the **Description** are required.

Prerequisites

Verify the **Address** and **Port** needed for the **AMS Asset Monitor**.

⚠ CAUTION

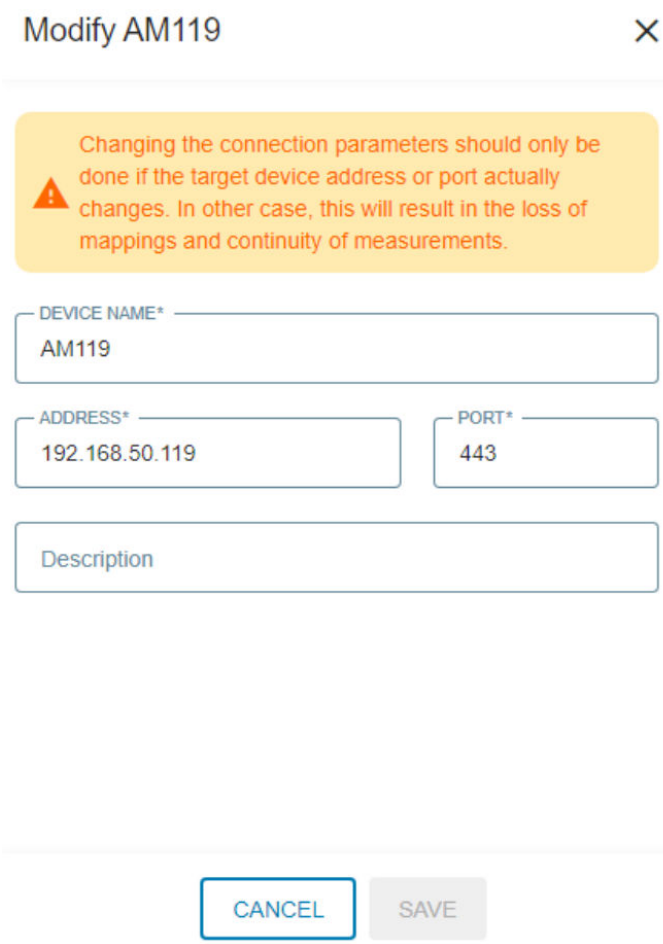
Ensure that the change is actually necessary. An unnecessary change can result in:

- Loss of **measurement device** mappings.
- Breaking the continuity of **measurements**.

Procedure

1. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Asset Monitor Tab → AMS Asset Monitor Device List → Vertical Ellipsis Menu of the affected device → Configure**
   - **Network Device Module → Devices → AMS Asset Monitor Tab → AMS Asset Monitor Device List → Select a device → Configure**

Figure 8-16: Modify an AMS Asset Monitor



2. **Device Name** — (Required) Enter the name that you choose for this device within AMS Machine Works.
3. **Address** — (Required) Enter the IP address of the **AMS Asset Monitor**.
4. **Port** — (Required) The standard port is **443**, and this value is filled in by default. In some installations this port could be different.
5. **Description** — (Optional) You can enter any useful description information or notes here.
6. **Cancel** or **Save**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

8.2.2 Wireless Gateway Tab

A **Wireless Gateway** is a device which enables communication with Emerson wireless sensors, such as the **AMS 9420**, and the **AMS Wireless Vibration Monitor**.

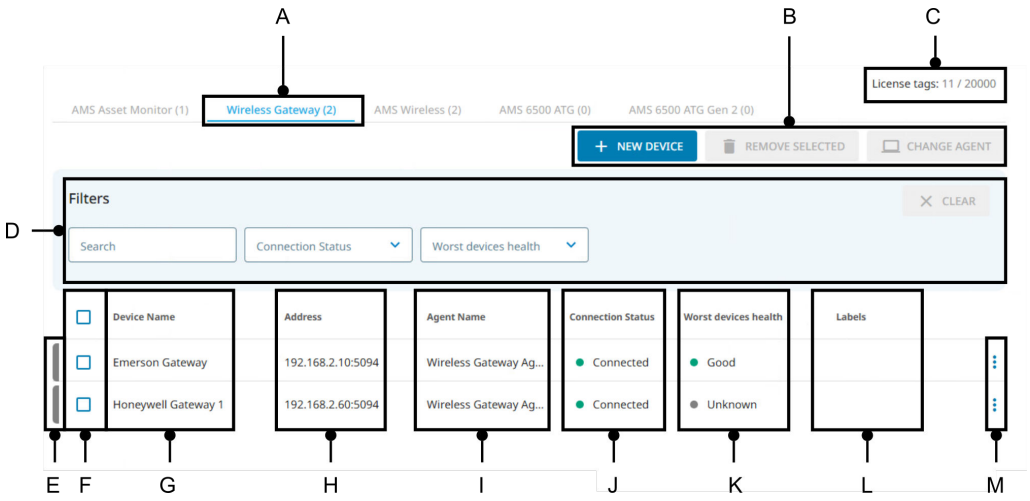
There following types of **Wireless Gateways** are supported:

1. **Emerson Wireless Gateway** — Rosemount 1410 and 1420 Smart Wireless Gateways hardware version 4.0 with the following firmware versions:
    a. Rosemount 1420 Smart Wireless Gateway firmware versions 4.x.xx, or later, are supported.
    b. Rosemount 1410 Smart Wireless Gateway firmware versions 4.6.64, or later, are supported.
2. **Honeywell OneWireless Gateway** — Firmware versions 330.3.08.0 or later are supported.
3. **Centero Intrepid WirelessHART Gateway** — Firmware versions 3.4.10 or later are supported.

The gateway can connect to all the AMS Wireless devices within range of its signal. The signal strength is dependent on the operating environment and interference factors.

When this tab is selected in the **Devices** area of the **Network Device Module** the following screen is displayed.

Figure 8-17: Wireless Gateway Tab



A. ***Wireless Gateway Tab*** — *When this tab is underlined with a blue line the **Wireless Gateway Tab** is selected.*

B. ***Functional Buttons*** —
   - ***New Device*** — *Add a new device. See: Add a Wireless Gateway*
   - ***Remove Selected*** — *Use this to remove a **device** from the list. See: Remove Device*
   - ***Change Agent*** — *Change the agent responsible for handling this **device**. See: Change Agent*

C. ***License tags*** — *Shows the number of license tags used over the total number of license tabs.*

D. ***Search Area*** — *Search field, filters, and **Clear**.*
   - ***Search*** — *Use this field to search for devices by:*
   - ***Connection Status Filter*** — *Filter by **Connected** / **Disconnected**.*
   - ***Device Health Filter*** — *Filter by **Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*
   - ***Clear*** — *Click **Clear** to reset all the filters.*

E. ***Health Bar*** — *The color of the vertical **Health Bar** matches the color and description of the **Device Health**. See: Device Health*

F. ***Check boxes*** — *Two **Functional Buttons** are enabled for items which have a **check box** checked. To select all **devices** you can check the **check box** at the top of the column.*
   - *The **Remove Selected** function will affect each **Device** which has a check box selected.*
   - *The **Change Agent** function will affect each **Device** which has a check box selected.*

G. ***Device Name*** — *Name of the **device**.*

H. ***Address*** — *The IP address and port number for accessing this **device**.*

I. ***Agent Name*** — *The name of the **Agent** used to communicate with the **device**.*

J. ***Connection Status*** — *This field displays **Connected** or **Disconnected**.*

K. ***Worst Device's Health*** — *This displays the health of the monitoring* ***device: Critical*** / ***Warning*** / ***Advice*** / ***Good*** / ***Unknown***. *See: Device Health*

L. ***Labels*** — *This column displays the user defined labels for each* ***device***. *See: Add Label*

M. ***Vertical Ellipsis Menu*** — *The vertical ellipsis menu has the following options:*

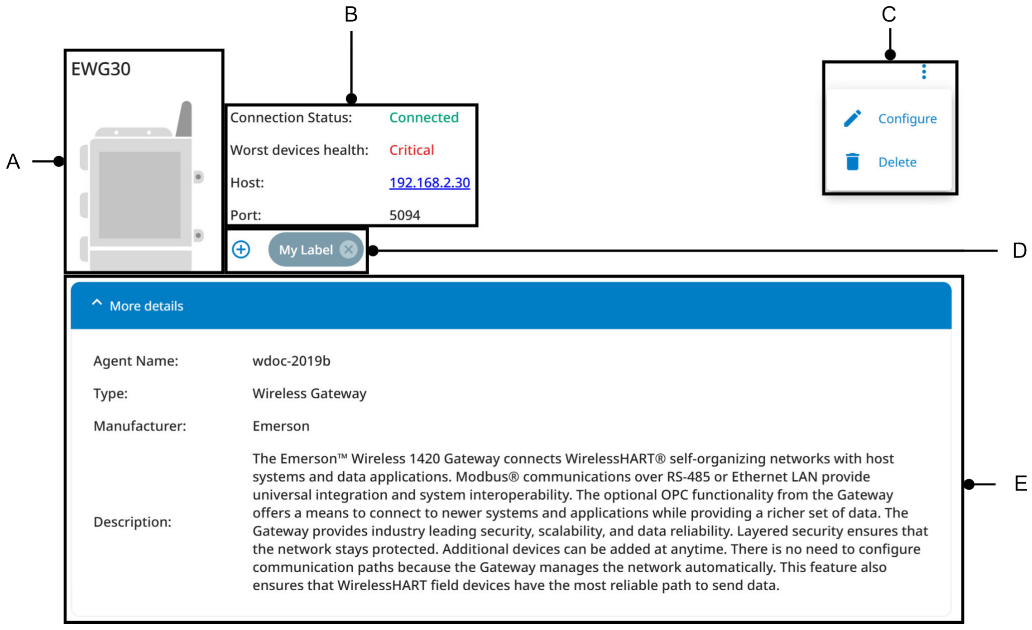
- ***Configure*** — *See: Reconfigure a Wireless Gateway Connection*
- ***Delete*** — *See: Remove Device*

Wireless Gateway Details

When you view the details of any device, the header of the window displays a breadcrumb path to the device. You can click on any item in the path to navigate between views.

EWG Details — Main Section

Figure 8-18: EWG Details

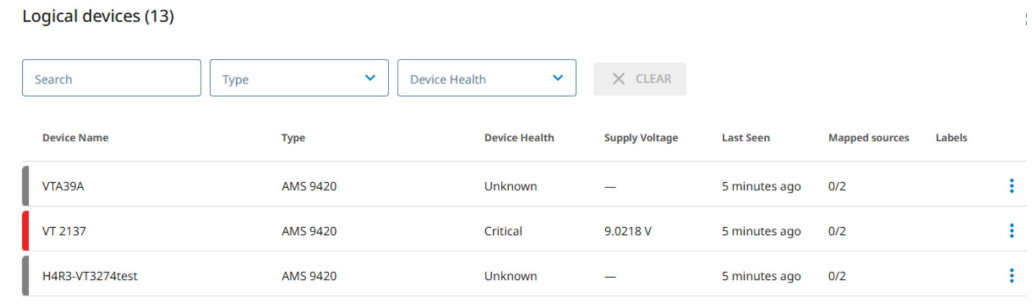


1. **Wireless Gateway Icon** and **Device Name**
2. **Information Section** — This section contains information about the device configuration and status.
   - **Connection Status** — See: Connection Status
   - **Worst devices health** — This health is the same as the health of the device with the worst health connected to this gateway. The health information is written and color coded to match. See: Device Health
   - **Host** — The IP Address of the Wireless Gateway.
   - **Port** — The port used to access the Wireless Gateway.

3. **Vertical Ellipsis** and **Configuration Controls** — Controls for changing or deleting the configuration:
   - **Configure** — To change the configuration of a **device**. See: Reconfigure a Wireless Gateway Connection
   - **Delete** — To remove a **device**. See: Remove Device
4. **Add Label** — Add a custom label for this Wireless Gateway. See: Add Label
5. **More Details** — The information contained here gives some context about the device.
   - **Agent Name** — This is the name of which agent is being used to access this device. See: Agents
   - **Type** — **Wireless Gateway**
   - **Manufacturer** — The name of the producer of the **Wireless Gateway** device.
     - Emerson
     - Honeywell
     - Centero
   - **Description** — Description of the device is and what it does.

Logical Devices

Figure 8-19: Logical Devices



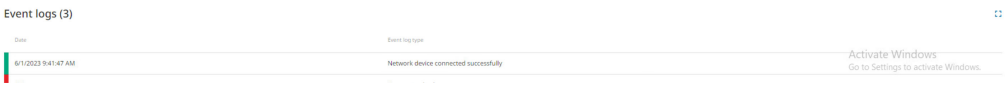
Logical Devices — This is a list of the devices that have access to your AMS Machine Works installation through this gateway. Click on any device in the list to go to the AMS Wireless Details for that device.

- Filtering Options
  - **Search** — Use this field to search for a particular device.
  - **Type** — Use this to filter to by a particular type of **device**.
  - **Device Health** — Use this to filter by a particular Device Health.
- **Health** — **Health** is displayed by color code and text. See: Device Health
- **Device Name** — The name of **wireless device**. To change the name see: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter

- **Type** — The type of the device connected through this gateway. (i.e., AMS Wireless Vibration Monitor, or AMS 9420)
- **Device Health** — This is the health of this particular sensor. Given in written form and color coded to match. See: Device Health
- **Supply Voltage** — The voltage of the **wireless device** connected to through this gateway.
- **Last Seen** — The time the device was last in contact with the network. (e.g., a minute ago)
- **Mapped Sources** — The number of **sources** that are mapped from 0 to X out of X **sources**.
- **Labels** — Any custom label you have defined and given to the device.
- **Mini Menu** — Click here to open a menu: **Bulk Configuration**, **Configure**, and **Delete**.

Event Logs

Figure 8-20: Event Logs



A. ***Event Severity Indicator*** — *This indicator gives a visual representation of the severity of the **Event**. These match in color and severity to the Device Health scale. For example, **Red** indicates a **Critical Event**, and **Green** indicates a **Good Event**.*
B. ***Date*** — *The date of the **Event**.*
C. ***Severity*** — *The **Event Severity** in text form.*
D. ***Event log type*** — *The type of event, e.g., **Network error** or **Network device connected successfully**.*

Event Types

Table 8-2: Event Types

Event Message	Severity	Recommended Action
Agent closing	Warning	
Network device connected successfully	Good	None.
Connection broken	Critical	Check your network connection to this device.
Network error	Critical	Check your network connection to this device.
Unknown event log	Unknown	

Add a Wireless Gateway

To add a **Wireless Gateway** unit to your system, follow these steps.

A **Wireless Gateway** does not use any **Vibration Tags** itself. The **Vibration Tags** are used by the devices connected through the gateway.

- **AMS Wireless Vibration Monitor** — 3 **Channels** = 3 **Vibration Tags** consumed.
- **AMS 9420 Wireless Vibration Transmitter** — 3 **Channels** = 3 **Vibration Tags** consumed.

Note
Temperature Measurements do not consume **Vibration Tags**.

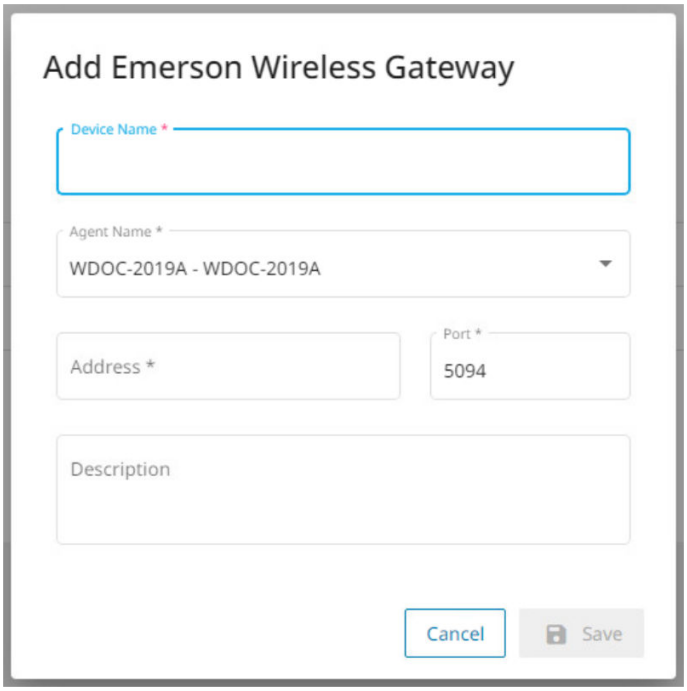
The **Vibration Tags** are consumed as the wireless devices are discovered.

To release the **Vibration Tags**, remove the **Device**. See: Remove Device

Prerequisites

- Verify the **Agent Name**, **Address**, and **Port** needed for the **Wireless Gateway**.
- Select: **Network Device Module** → **Devices** → **Wireless Gateway Tab** → **+ New Device**

Figure 8-21: Add a Wireless Gateway



Procedure

1. **Device Name** — (Required) Enter the name that you choose for this device in AMS Machine Works. The maximum length is 100 characters.
2. **Agent Name** — (Required) Choose the **Agent Name** from the dropdown list for this connection. See: Agents
3. **Address** — (Required) Enter the IP address of the **Wireless Gateway**. The maximum length is 250 characters.

4. **Port** — (Required) The standard port, **5094**, is filled in by default. In some installations this port could be different. The valid range is from 1 to 65535.
5. **Description** — (Optional) You can enter any useful description information or notes here. The maximum length is 500 characters.
6. **Cancel** or **Save**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

Reconfigure a Wireless Gateway Connection

You can edit a previously configured Wireless Gateway. Every field is required except for the **Description** field.

Prerequisites

Verify the **Address** and **Port** needed for the **Wireless Gateway**.

⚠ CAUTION

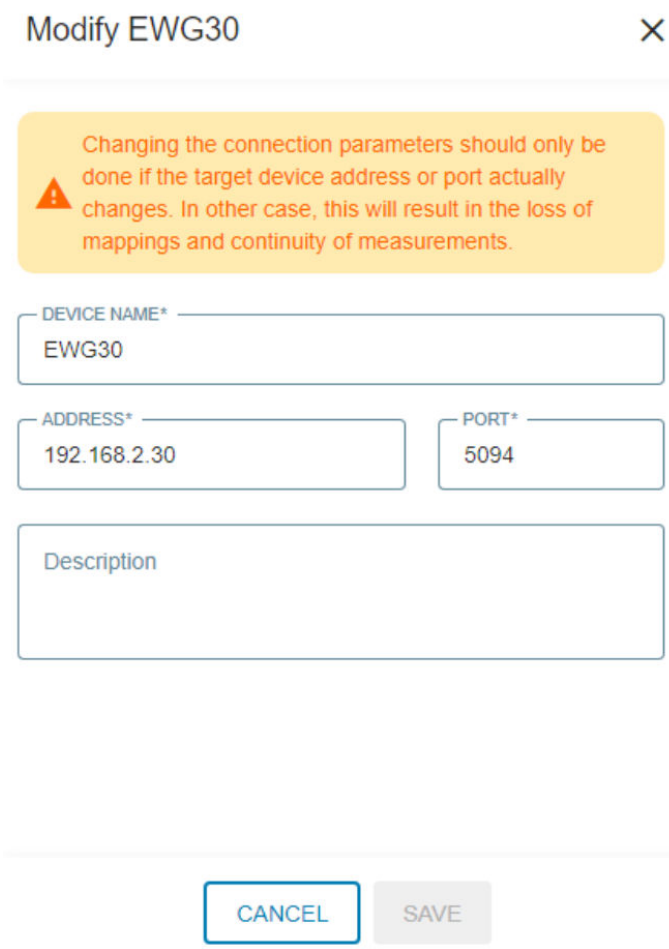
Ensure that the change is actually necessary. An unnecessary change can result in:

- Loss of **measurement device** mappings.
- Breaking the continuity of **measurements**.

Procedure

1. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → Wireless Gateway Tab → Wireless Gateway List → Vertical Ellipsis Menu of the affected device → Configure**
   - **Network Device Module → Devices → Wireless Gateway Tab → Wireless Gateway List → Select a device → Configure**

Figure 8-22: Modify a Wireless Gateway

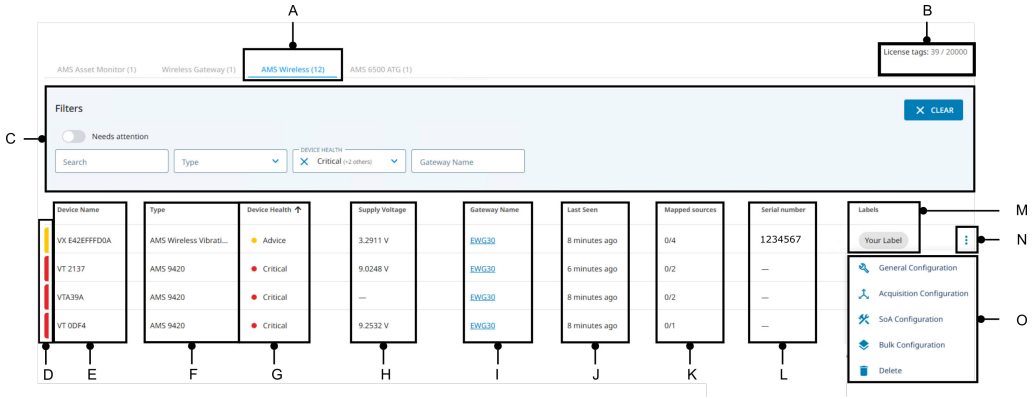


2. **Device Name** — (Required) Enter the name that you choose for this device in AMS Machine Works.
3. **Address** — (Required) Enter the IP address where the **Wireless Gateway** is located.
4. **Port** — (Required) The standard port is **443**, and this value is filled in by default. In some installations this port could be different.
5. **Description** — (Optional) You can enter any useful description information or notes here.
6. **Cancel** or **Save**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

8.2.3 AMS Wireless Tab

The **AMS Wireless Tab** lists all the wireless devices connected to the system through your **Wireless Gateway** devices.

Figure 8-23: AMS Wireless Tab



A. ***AMS Wireless Tab*** — *When this tab is underlined with a blue line, the **AMS Wireless Tab** is selected.*

B. ***License tags*** — *Shows the number of license tags used over the total number of license tabs.*

C. ***Search Area*** — *Search fields, filters, the **Clear** filter button, and the **Needs attention** toggle.*

- ***Needs attention*** *toggle — (Default: **Off**) When the **Needs attention** toggle is in the **On** position, only the AMS Wireless devices which are connected through **Agent Servers** which have expired security certificates are displayed.*

  ⚠ CAUTION

  Data is not collected while security certificates are expired.

  A. *Take note of all the **Gateway Names** of the **AMS Wireless** devices listed.*
  B. *In the Wireless Gateway Tab, take note of the **Agent Name** of the affected **Wireless Gateways**.*
  C. *Update the security certificates on those **External Agent Servers**. See: AMS Machine Works System Guide for details.*

- ***Clear*** — *Click **Clear** to reset all the filters. (Default: No filters)*

  Note
  *Click **X** next to a filter to clear only that filter.*

- ***Search*** — *Use this field to search for devices by some characters contained in the device's name.*
- ***Device Type Filter*** — *Filter by **AMS 9420** or **AMS Wireless Vibration Monitor**.*
- ***Device Health Filter*** — *Filter by **Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*
- ***Gateway Name Filter*** — *You can enter a **Gateway Name** to filter by, or select a **Gateway Name** from the dropdown list.*

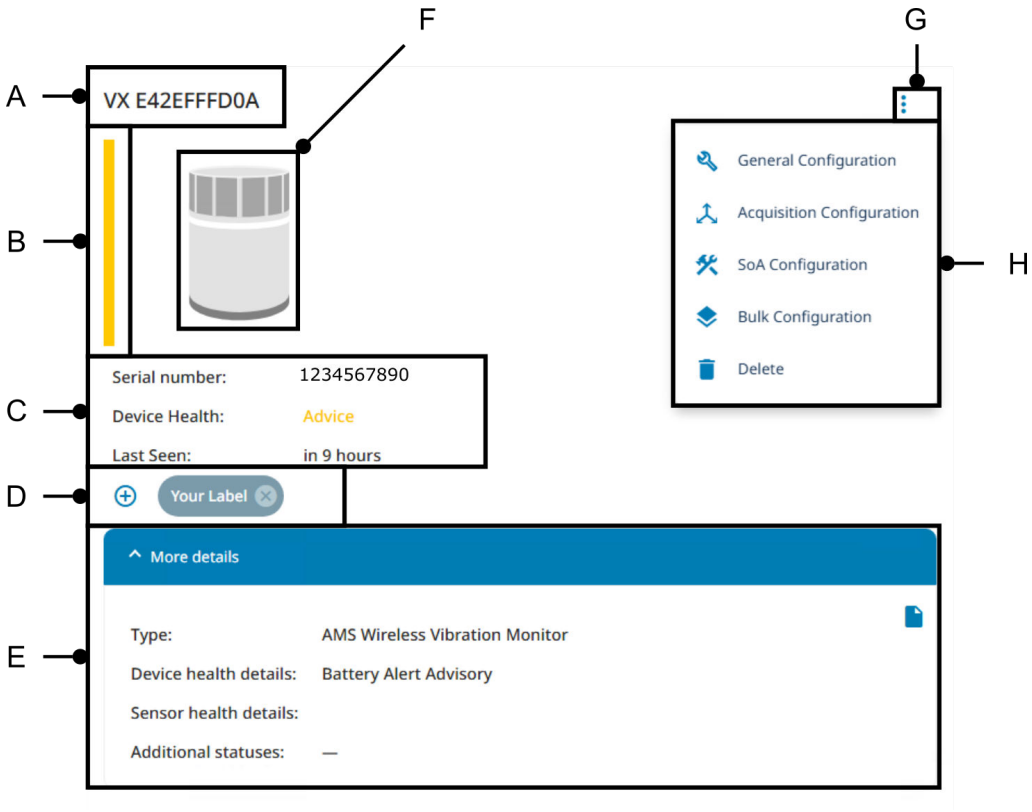
D. ***Health Bar*** — *The color of the vertical **Health Bar** matches the color and description of the **Device Health**. See: Device Health*

E. ***Device Name*** — *Name of the* ***device****.*
F. ***Type*** — *The* ***device*** *is either* ***AMS 9420*** *or* ***AMS Wireless Vibration Monitor****.*
G. ***Device Health*** — *This displays the health of the* ***monitoring device*** *itself:* ***Critical*** */* ***Warning*** */* ***Advice*** */* ***Good*** */* ***Unknown****. See: Device Health*
H. ***Supply Voltage*** — *The voltage of the power supply connected to the* ***device****.*
I. ***Gateway Name*** — *The* ***Gateway Name*** *is the name of the* ***Wireless Gateway*** *as shown in the* ***Device Name*** *field of the Wireless Gateway Tab. Click the* ***Gateway Name*** *to go to the Wireless Gateway Details for that* ***Wireless Gateway****.*
J. ***Last Seen*** — *This field displays how long ago the system had an active connection with the* ***device****.*
K. ***Mapped Sources*** — *Shows the proportion of* ***mapped sources*** *to the* ***total sources*** *from this* ***device****.*
L. ***Serial Number*** — *This unique number is assigned by Emerson for each device.*
M. ***Labels*** — *This column displays the user defined labels for each* ***device****. See: Add Label*
N. ***Vertical Ellipsis Menu*** — *The vertical ellipsis menu has the following options:*
   - ***General Configuration*** — *See: General Configuration — Wireless Devices*
   - ***Acquisition Configuration*** — *The* ***Acquisition Configuration*** *is different for* ***AMS 9420*** *and* ***AMS Wireless Vibration Monitor*** *devices.*
     — *For* ***AMS 9420*** *devices see: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter*
     — *For* ***AMS Wireless Vibration Monitor*** *devices see: Acquisition Configuration — AMS Wireless Vibration Monitor*
   - ***Bulk Configuration*** — *See: Bulk Configuration*
   - ***Delete*** — *See: Remove Device*

AMS Wireless Details

When you view the details of any device, the header of the window displays a breadcrumb path to the device. You can click any item in the path to navigate between views.

Figure 8-24: Main Section: AMS Wireless Vibration Monitor



A. ***Device Name*** *— The name of the device as configured.*
B. ***Device Health Bar*** *— This bar represents the overall health of the device.*
C. ***Information Section*** *— This section contains information about the device configuration and status.*
   - ***Serial Number*** *— This is the unique number assigned to each particular device by Emerson.*
   - ***Device Health*** *— The overall health of the device is written and is color coded to match. See: Device Health*
   - ***Last Seen*** *— How long ago the device was seen on the network. (number / unit of time / ago)*

D. ***Add label*** *— Click this control to add a custom label to this device. You can add more than one label. Labels are for informational purposes only. See: Add Label*
E. ***More details*** *— Click* ***More details*** *to expand the section and see the following items:*
   - ***Type*** *— Shows the device type.*
   - ***Device health details*** *— Shows details about device health.*
   - ***Sensor health details*** *— Shows details about sensor health.*
   - ***Additional statuses*** *— Displays status messages about the device.*

- ***Advanced Details*** *— Click this file icon,*  *, to display a .json file with technical details about your device such as the firmware version, serial number, or other technical details.*

F. ***Device Icon*** *— A picture of the device type: (AMS 9420 or AMS Wireless Vibration Monitor)*

G. ***Vertical Ellipsis*** *menu icon — Click this icon to open the* ***Configuration Controls****.*

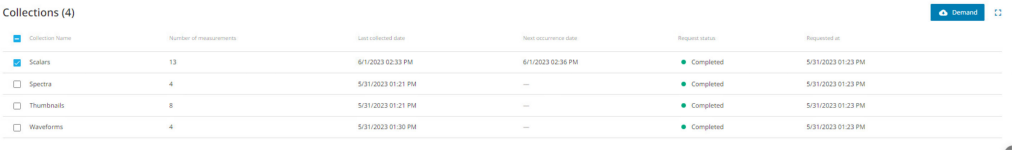
H. ***Configuration Controls*** *— Controls for changing, copying, or deleting the configuration:*

- ***General Configuration*** *— Click this button to modify the device name and set the Wireless Noise Threshold (RMS) level. See: General Configuration — Wireless Devices*
- ***Acquisition Configuration*** *— Each type of device has its own method for configuring acquisition.*
  - ***AMS 9420*** *— See: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter*
  - ***AMS Wireless Vibration Monitor*** *— See: Acquisition Configuration — AMS Wireless Vibration Monitor*
- ***SoA Configuration*** *— (Only available for AMS Wireless Vibration Monitor) See: SoA Configuration*
- ***Bulk configuration*** *— Click this button to do bulk configuration of several settings. See: Bulk Configuration*
- ***Delete*** *— Click this button to delete the device from the list. See: Remove Device*

Collections

For more information about what is included in a **Collection** see: Collection Details

Figure 8-25: Collections



A. ***Demand*** *— When you have one or more* ***Collection*** *boxes marked you can use the* ***Demand*** *button to refresh the data. See: Demand Collection*

B. ***Selection boxes*** *— Mark the* ***Collections*** *you want to* ***Demand*** *here.*

C. ***Collection Name*** *— The name of the* ***Collection****.*

D. ***Number of measurements*** *— This is the number of measurements defined in this* ***Collection****.*

E. ***Last collected date*** *— The date and time of when data was last gathered.*

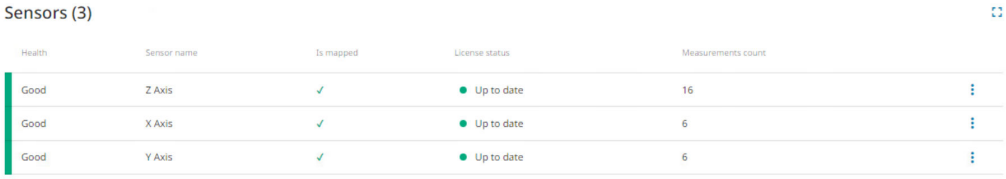
F. ***Next occurrence date*** *— The date and time of when data will be gathered next.*

G. ***Demand status*** *— **Requested** / **Completed** / **Outdated** / **Not requested** / **Failed**. Also shows the progress of the request in percentage.*

H. ***Demanded at*** *— This is the date (MM/DD/YYYY) and time (HH:MM AM/PM) the request was made at.*

Sensors

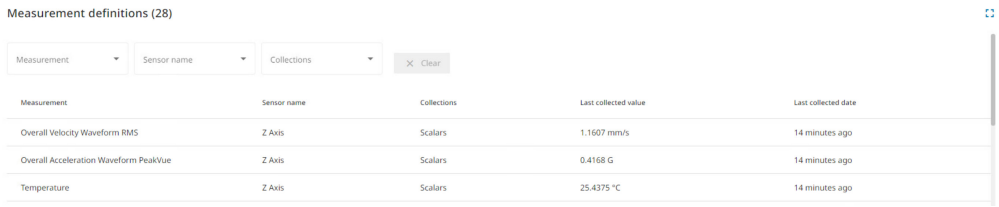
Figure 8-26: Sensors



A. ***Health*** — ***Health*** *is displayed by color code and text. See: Device Health*
B. ***Sensor name*** — *This can be a custom name, or a standard one such as 'Z Axis'.*
C. ***Device path*** —
D. ***Machine Train info*** — *Includes a link from the sensor to the measurement view for that sensor in the Machinery Health Module. See: Point View*
E. ***License status*** — *The three possible statuses are: "Not applicable", "Out of date", and "Up to date"*
F. ***Measurements count*** — *This column displays how many measurements the sensor is capable of delivering.*

Measurement Definitions

Figure 8-27: Measurement Definitions



A. ***Filter Options*** — *The **Measurement Definitions** can be filtered by four characteristics. Only the **Measurement Definitions** which meet all of the conditions you apply will be displayed. Click **Clear** to reset the filter.*
   - ***Measurement*** — *You can filter for **Measurement Definitions** which have a particular type. (Waveform, Spectrum, Scalar, Interval Band, Thumbnail, Peak List)*
   - ***Collections*** — *For wireless devices you can filter by the following types of **Collection: Scalars**, **Spectra**, **Thumbnails**, **Waveforms**.*
   - ***Sensor name*** — *For wireless devices you can filter by **X Axis**, **Y Axis**, and **Z Axis**.*

B. ***Measurement*** — *A short description of the type of measurement.*
C. ***Collections*** — *The name of the **Collection** where this data is gathered.*
D. ***Sensor name*** — *The name of the sensor. (X Axis, Y Axis, or Z Axis)*
E. ***Device path*** —
F. ***Last collected value*** — *The latest value along with the associated unit for that type of **Measurement**.*
G. ***Last collected date*** — *A value along with a unit of time to indicate how long ago the measurement was taken.*

⚠ CAUTION

With **AMS Wireless Vibration Monitor** devices, when **Noise Threshold Toggle** is in the **Off** position this device will not display measurements of the following types:

- PeakVue Plus Mechanical Severity
- PeakVue Plus Lubrication Severity

Device Parameters

The number of **Device Parameters** is different for each type of device:

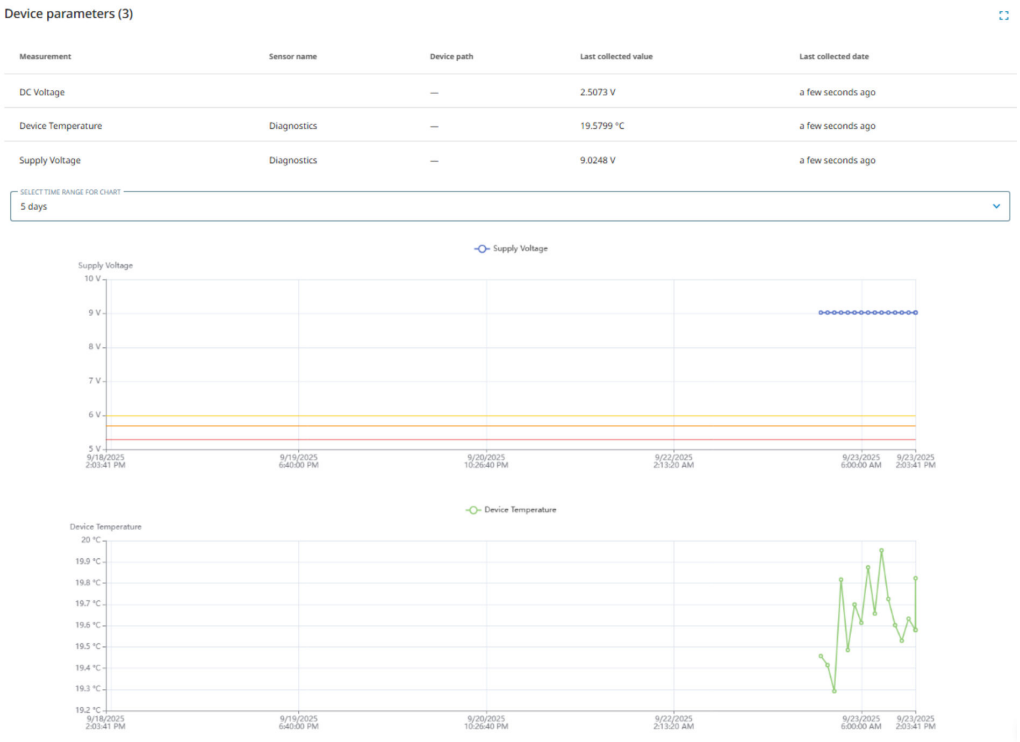
- **AMS 9420** devices have 3 or 4. **DC Voltage** can be registered separately for each sensor in the device.
- **AMS Wireless Vibration Monitor** devices have 1.

The list of **Device Parameters** is:

- **Supply Voltage** — For both **AMS 9420** and **AMS Wireless Vibration Monitor** devices. This value is graphed.

- **Device Temperature** — Only for **AMS 9420** devices. This value is graphed.
- **DC Voltage** — Only for **AMS 9420** devices. This value is not graphed.

Figure 8-28: Device Parameters



A. ***Measurement*** — *This column lists the type of* ***Measurement****:*
   - ***DC Voltage*** — *Only for* ***AMS 9420*** *devices. The* ***DC Voltage*** *is not graphed.*
   - ***Device Temperature*** — *Only for* ***AMS 9420*** *devices.*
   - ***Supply Voltage*** — *For both* ***AMS 9420*** *and* ***AMS Wireless Vibration Monitor*** *devices. This value is graphed.*

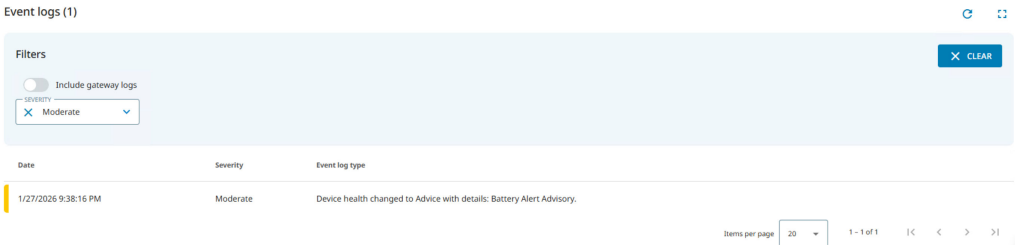
B. ***Sensor name*** — *This column lists the name of the sensor.*
C. ***Device path*** —
D. ***Last collected value*** — *The latest value along with the associated unit for that type of* ***Measurement****.*
E. ***Last collected date*** — *A value along with a unit of time to indicate how long ago the measurement was taken.*
F. ***Select Time Range For Chart*** — *(Default: 5) Select from 1, 3, 5, 10, and 14 days.*
G. ***Supply Voltage Chart*** — *This is the graph of the* ***Supply Voltage*** *over the selected period. For both* ***AMS 9420*** *and* ***AMS Wireless Vibration Monitor*** *devices.*

> ***Note***
> ***Alerts*** *can be configured for* ***Supply Voltage*** *levels. See:*

H. ***Device Temperature Chart*** — *This is the graph of the* ***Device Temperature*** *over the selected period. Only for* ***AMS 9420*** *devices.*

Event Logs

Figure 8-29: Event Logs



A. ***Include gateway logs*** *toggle — (Default: **Off**) Click this toggle to add the logs from the Wireless Gateway that this wireless device is connected through.*
B. ***Severity Filter*** *— Choose from **Low**, **Moderate**, **Major**, **Critical**.*
C. ***Clear*** *— Click **Clear** to remove any filters.*
D. ***Event Severity Indicator*** *— This colored bar gives a visual representation of the severity of the **Event**. These match in color and severity to the Device Health scale. For example, **Red** indicates a **Critical Event**, and **Green** indicates a **Good Event**.*
E. ***Date*** *— The date of the **Event**.*
F. ***Severity*** *— The **Event Severity** in text form.*
G. ***Event log type*** *— The type of event, for example, **Network error** or **Network device connected successfully**.*

Event Types

The **Event Types** include everything that has happened with this device and, if the **Include gateway logs** toggle is in the **On** position, you can see the associated **Wireless Gateway** logs as well.

Table 8-3: Event Types

Event Message	Severity	Recommended Action
Agent closing	Warning	
Network device connected successfully	Good	None.
Connection broken	Critical	Check your network connection to this device.
Network error	Critical	Check your network connection to this device.
Unknown event log	Unknown	

General Configuration — Wireless Devices

You can configure the **Name**, and **Noise Thresholds** for **AMS 9420** and **AMS Wireless Vibration Monitor** devices.

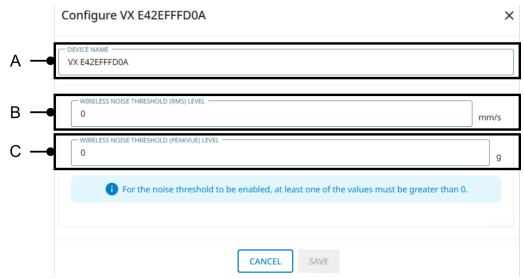
These devices can be configured individually by following the instructions below. To replicate the configuration of an individual device to many other devices, use the Bulk Configuration feature.

Prerequisites

1. You must select a device from the device list.
2. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Vertical Ellipsis Menu for a device → Configure**
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Select a device → Vertical Ellipsis Menu → Configure**

Procedure

Figure 8-30: AMS 9420 Configuration - Name and Noise Threshold Step



A. ***Device Name*** *— (Required) Enter up to 100 characters.*

B. ***Noise Threshold (RMS)*** *— (Default: 0)*

- *Input a value from 0 (disabled) to 100 mm/s when using metric units.*
- *Input a value from 0 (disabled) to 3.937 in/s when using imperial units.*

C. ***Noise Threshold (PeakVue)*** *— (Default: 0)*

- *Input a value from 0 (disabled) to 50 g when using metric or imperial units.*
- *Input a value from 0 (disabled) to 490.3 m/s^2 when using custom units.*

1. **Device Name** — (Required) Enter the name that you choose for this device in AMS Machine Works. (Max: 100 characters.)
2. **Wireless Noise Threshold (RMS) Level** — (Optional) Enter a value from 0 to 100 mm/s, or 0 to 3.937 in/s. The default value is 0, (0 = disabled).

Note
Velocity Overall RMS must be enabled in the scalar **Collection** from this device for the **Wireless Noise Threshold** to work.

3. **Wireless Noise Threshold (PeakVue) Level** — (Optional) Enter a value from 0 to 490.3 m/s2, or 0 to 50 G. The default value is 0, (0 = disabled).

Note
PeakVue Overall 0-Pk must be enabled in the scalar **Collection** from this device for the **Wireless Noise Threshold** to work.

4. **Cancel** or **Next**:
   - Click **Cancel** to exit.

     Note
     In this step every valid entry is immediately written to the device.

   - Click **Save** to go to record your changes.

Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter

AMS Machine Works reads the actual current configuration of the **AMS 9420 Wireless Vibration Transmitter**. If the **AMS 9420 Wireless Vibration Transmitter** was already configured by using either AMS Machine Works or the AMS Device Manager application, the default values can be different than those shown below.

Note
Values marked as (Default) refer to the factory presets of the device.

Follow these steps to configure the **Acquisition Parameters** for **AMS 9420 Wireless Vibration Transmitter** devices.

The **Acquisition Parameters** are device level configurations that directly affect how **AMS 9420 Wireless Vibration Transmitter** devices operate.

An **AMS 9420 Wireless Vibration Transmitter** device can be configured individually by following the instructions below. To replicate the configuration of an **AMS 9420 Wireless Vibration Transmitter** device to many other **AMS 9420 Wireless Vibration Transmitter** devices use the Bulk Configuration feature.

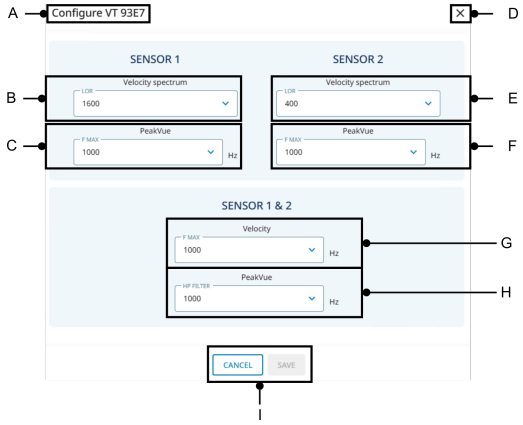
Prerequisites

1. You must select an **AMS 9420 Wireless Vibration Transmitter** from the device list. (For **AMS Wireless Vibration Monitor** configuration see: Acquisition Configuration — AMS Wireless Vibration Monitor)
2. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Vertical Ellipsis Menu for an AMS 9420 Wireless Vibration Transmitter device → Acquisition Configuration**
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Select an AMS 9420 Wireless Vibration Transmitter device → Vertical Ellipsis Menu for the AMS 9420 Wireless Vibration Transmitter device → Acquisition Configuration**

Procedure

The **Acquisition Parameters** that you configure on this step are written to the **AMS 9420 Wireless Vibration Transmitter** device, and directly affect the operation of the device.

Figure 8-31: AMS 9420 - Acquisition Configuration



*A. **Configure <Your_Device_Name>***
*B. **Sensor 1 — Velocity Spectrum LOR***
*C. **Sensor 1 — PeakVue F Max***
*D. **Close** control.*
*E. **Sensor 2 — Velocity Spectrum LOR***
*F. **Sensor 2 — PeakVue F Max***
*G. **Sensor 1 & 2 — Velocity F Max***
*H. **Sensor 1 & 2 — PeakVue HP Filter***
*I. **Save / Cancel Controls***

1. For Sensor 1 set the **Velocity Spectrum LOR**:
   - 400 — (Only available with Rev 4 or later **AMS 9420 Wireless Vibration Transmitter** units.)
   - 800
   - 1600
2. For Sensor 1 set the **PeakVue F Max**:
   - 500
   - 1000
3. For Sensor 2 set the **Velocity Spectrum LOR**:
   - 400 — (Only available with Rev 4 or later **AMS 9420 Wireless Vibration Transmitter** units.)
   - 800
   - 1600
4. For Sensor 2 set the **PeakVue F Max**:

- 500
- 1000

5. For Sensor 1 & 2 set the **Velocity F Max**:
   - 1000
6. For Sensor 1 & 2 set the **PeakVue HP Filter**:
   - 1000
7. Choose between **Save** / **Cancel**:
   - Click **Save** to save your changes.
   - Click **Cancel** to exit.

Note
All unsaved changes will be lost.

Acquisition Configuration — AMS Wireless Vibration Monitor

AMS Machine Works reads the actual current configuration of the **AMS Wireless Vibration Monitor**. If the **AMS Wireless Vibration Monitor** was already configured by using either AMS Machine Works or the AMS Device Manager application, the default values can be different than those shown below.

Note
Values marked as (Default) refer to the factory presets of the device.

Follow these steps to configure the **Acquisition Parameters** for **AMS 9420 Wireless Vibration Transmitter** devices.

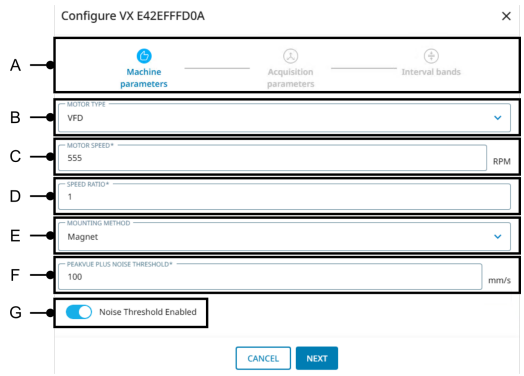
To configure the acquisition parameters for an AMS Wireless Vibration Monitor follow these steps.

Prerequisites

1. You must select an AMS Wireless Vibration Monitor from the device list. (For AMS 9420 Wireless Vibration Transmitter configuration see: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter)
2. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Vertical Ellipsis Menu of an AMS Wireless Vibration Monitor device → Acquisition Configuration**
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Select an AMS Wireless Vibration Monitor device → Vertical Ellipsis Menu of the AMS Wireless Vibration Monitor device → Acquisition Configuration**

Procedure

Figure 8-32: AMS Wireless Vibration Monitor Configuration: Machine Parameters



The initial values seen in the **Machine Parameters Step** are read from the **device**. The possible values in these fields are interdependent, for example, when a **Motor Type** is not set, it is not possible to set a **Motor Speed**. For more information refer to the AMS Wireless Vibration Monitor documentation.

A. ***Step List*** — *There are three steps:*
   A. ***Machine Parameters*** — *The current step.*
   B. ***Acquisition Parameters***
   C. ***Interval Bands***
B. ***Motor Type*** — *(Default:* ***Not Set****)*
C. ***Motor Speed*** — *Only available when a* ***Motor Type*** *is set.*
D. ***Speed Ratio*** — *Only available when a* ***Motor Type*** *is set.*
E. ***Mounting Method*** — *Only available when a* ***Motor Type*** *is set.*
F. ***PeakVue Plus Noise Threshold*** — *(Default: 0.05 in/sec or 1.27 mm/sec) This is the factory default for the* ***PeakVue Plus Noise Threshold****. When AMS Machine Works connects to the device it reads the configuration that is presently on the device.*

⚠ *CAUTION*

When ***Noise Threshold Toggle*** *is in the* ***Off*** *position this device will not display measurements of the following types:*

- *PeakVue Plus Mechanical Severity*
- *PeakVue Plus Lubrication Severity*

G. ***Noise Threshold Toggle*** — *(Default:* ***On****) Set this toggle in the* ***Off*** *position to disable the* ***PeakVue Plus Noise Threshold****.*

1. Choose the **Motor Type**:
   - **Not Set** (Default)
   - **50 Hz** — An induction motor driven by a line frequency of 50 Hz.

- **60 Hz** — An induction motor driven by a line frequency of 60 Hz.
- **VFD** — An induction motor driven by a non-standard frequency.

2. **Motor Speed**
   - When the **Motor Type** is **Not Set**, this field is disabled.
   - When the **Motor Type** is **50 Hz**, enter the nominal (nameplate) speed of the motor.

     Note
     Do **not** enter the synchronous speed of the motor.
   - When the **Motor Type** is **60 Hz**, enter the nominal (nameplate) speed of the motor.

     Note
     Do **not** enter the synchronous speed of the motor.
   - When the **Motor Type** is **VFD**, enter the nominal speed of the motor.
3. **Speed Ratio**
   - When the **Motor Type** is **Not Set**, this field is disabled.
   - When the **Motor Type** is **50 Hz**, enter a value where the **Motor Speed** / **Speed Ratio** produces the expected (nominal) speed value at the sensor location.
   - When the **Motor Type** is **60 Hz**, enter a value where the **Motor Speed** / **Speed Ratio** produces the expected (nominal) speed value at the sensor location.
   - When the **Motor Type** is **VFD**, enter a value where the **Motor Speed** / **Speed Ratio** produces the expected (nominal) speed value at the sensor location.
4. Choose the **Mounting Method**:
   - **Not Set** (Default)
   - **Magnet**
   - **Motor Fin**
   - **Pad**
   - **Stud**
5. (Default: 0.05 in/sec) Enter a value for the **PeakVue Plus Noise Threshold**. (Range: 0.001 to 100 mm/sec or 0.001 to 3.937 in/sec)
6. (Default: **On**) **Noise Threshold Toggle** — Set this toggle in the **Off** position to disable the **PeakVue Plus Noise Threshold**.

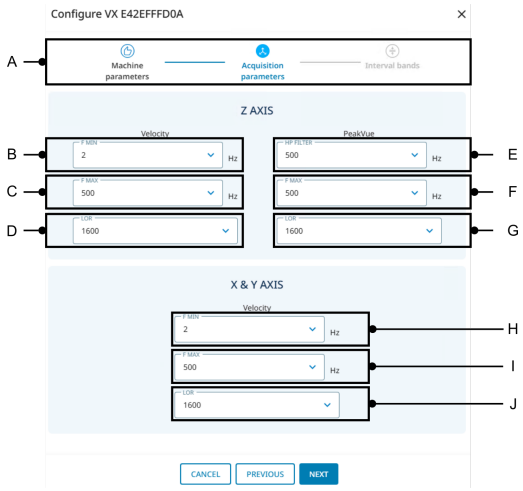
⚠ CAUTION

When **Noise Threshold Toggle** is in the **Off** position this device will not display measurements of the following types:

- PeakVue Plus Mechanical Severity
- PeakVue Plus Lubrication Severity

7. Choose how to proceed:
   - Click **X** to close the panel and discard your changes.
   - Click **Cancel** to close the panel and discard your changes.
   - Click **Next** to go to the **Acquisition Parameters** step.

Figure 8-33: AMS Wireless Vibration Monitor Configuration: Acquisition Parameters



The initial values seen in the **Acquisition Parameters Step** are read from the **device**. The possible values in these fields are interdependent, for more information refer to the AMS Wireless Vibration Monitor documentation.

A. ***Step List*** — *There are three steps:*
   A. ***Machine Parameters***
   B. ***Acquisition Parameters*** — *The current step.*
   C. ***Interval Bands***
B. *Z Axis Velocity* ***F Min***
C. *Z Axis Velocity* ***F Max***
D. *Z Axis Velocity* ***LOR*** — *(LOR) Lines of Resolution*
E. *Z Axis Velocity* ***HP Filter*** — *(HPF) High Pass Filter for PeakVue acquisition.*
F. *Z Axis PeakVue* ***F Max***
G. *Z Axis PeakVue* ***LOR*** — *(LOR) Lines of Resolution*
H. *X & Y Axis Velocity* ***F Min***
I. *X & Y Axis Velocity* ***F Max***
J. *X & Y Axis Velocity* ***LOR*** — *(LOR) Lines of Resolution*

8. Set the Z Axis Velocity **F Min** value:
   - **2**
   - **10** (Default)
9. Set the Z Axis Velocity **F Max** value:
   - **100**
   - **200**
   - **500**
   - **1000** (Default)
   - **2000**

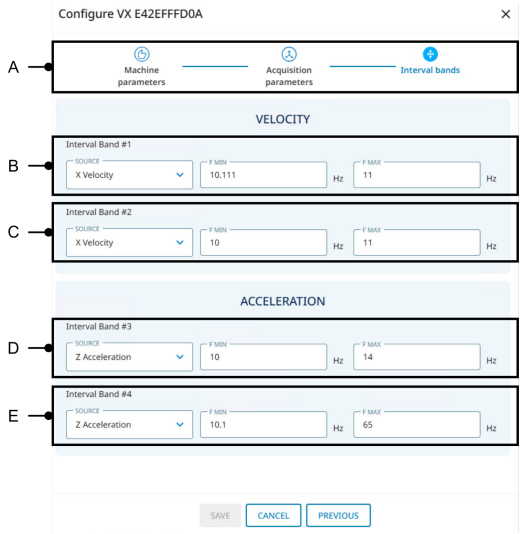
- **5000**
- **10000**
- **20000**

10. Set the Z Axis Velocity **LOR** value:
    - **100**
    - **200**
    - **400**
    - **800**
    - **1600** (Default)
11. Set the Z Axis PeakVue **HP Filter** value:
    - **500**
    - **1000** (Default)
    - **2000**
    - **5000**
12. Set the Z Axis PeakVue **F Max** value:
    - **100**
    - **200**
    - **500**
    - **1000** (Default)
    - **2000**
    - **5000**
    - **10000**
    - **20000**
13. Set the Z Axis PeakVue **LOR** value:
    - **100**
    - **200**
    - **400**
    - **800**
    - **1600** (Default)
14. Set the X & Y Axis Velocity **F Min** value:
    - **2**
    - **10** (Default)
15. Set the X & Y Axis Velocity **F Max** value:

- **100**
- **200**
- **500**
- **1000** (Default)
- **2000**
- **5000**
- **10000**
- **20000**

16. Set the X & Y Axis Velocity **LOR** value:
    - **100**
    - **200**
    - **400**
    - **800**
    - **1600** (Default)
17. Choose how to proceed:
    - Click **X** to close the panel and discard your changes.
    - Click **Cancel** to close the panel and discard your changes.
    - Click **Previous** to go back to the **Machine Parameters** step.
    - Click **Next** to go to the **Interval Bands** step.

Figure 8-34: AMS Wireless Vibration Monitor Configuration: Interval Bands



A. ***Step List*** — *There are three steps:*
   A. ***Machine Parameters***
   B. ***Acquisition Parameters***
   C. ***Interval Bands*** — *The current step.*

B. *Velocity Section — Interval Band #1* ***Source*** / ***F Min*** / ***F Max***
C. *Velocity Section — Interval Band #2* ***Source*** / ***F Min*** / ***F Max***
D. *Acceleration Section — Interval Band #3* ***Source*** / ***F Min*** / ***F Max***
E. *Acceleration Section — Interval Band #4* ***Source*** / ***F Min*** / ***F Max***

You can configure up to four **Interval Bands**:

- 2 **Velocity Interval Bands**
- 2 **Acceleration Interval Bands**

18. Configure up to four **Interval Bands**:
    a) Choose the **Source Axis**: **X** / **Y** / **Z**
    b) Enter a value for **F MIN**: From 10 Hz to the current value of **F MAX**, with up to 3 decimal digits of precision.
    c) Enter a value for **F MAX**: From the current value of **F MIN** up to 1000 Hz, with up to 3 decimal digits of precision.
19. Choose how to proceed:
    - Click **X** to close the panel and discard your changes.
    - Click **Cancel** to close the panel and discard your changes.
    - Click **Previous** to go back to the **Machine Parameters** step.
    - Click **Save** to record your changes and exit the configuration process.

SoA Configuration

SoA, or Store on Alert, configuration of **AMS Wireless Vibration Monitor** devices can be performed from within AMS Machine Works.

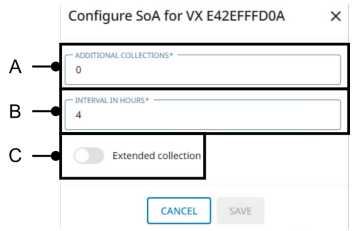
Prerequisites

Select: **Network Device Module** → **Devices Subsection** → **AMS Wireless Tab**

Procedure

1. In the **Device List**, find the **AMS Wireless Vibration Monitor** that you want to configure.
2. To open the SoA Configuration sidepanel, click the **Vertical Ellipses** next to that item and select **SoA Configuration**.

Figure 8-35: SoA Configuration Sidepanel



*A. **Additional Collections** — (Default: 0) Max: 3*
*B. **Interval in Hours** — (Default: 4) Range: 2 to 8*
*C. **Extended collection** toggle — (Default: **Off**) When the **Extended collection** feature is **On**, an **Alert** on this device triggers the **Store on Alert** functions on every other device connected to the same **Asset**.*

3. (Optional) Configure how many **Additional Collections** to collect when an **Alert** occurs. (Default: 0) Max: 3
4. (Optional) Configure the **Interval in Hours** between collections when an **Alert** occurs. (Default: 4) Range: 2 to 8
5. (Optional) Configure the **Extended collection** feature to **On** to also trigger the **Store on Alert** functions on every other device connected to the same **Asset**. (Default: **Off**)
6. Choose to **Save** your changes, or to **Cancel** the action.
   - Click **Cancel** to cancel the action without making any changes.
   - Click **Save** to save your changes.

Bulk Configuration

Bulk Configuration is a four step process that takes the configuration from a source device and transfers that configuration into the target devices that you select.

The **Bulk Configuration** process is available for two types of wireless units:

- **AMS 9420** — The source device should be configured. See: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter
- **AMS Wireless Vibration Monitor** — The source device should be configured. See: Acquisition Configuration — AMS Wireless Vibration Monitor

Note
The configuration can only be copied to other units of the same type.

Prerequisites

1. The configuration of the source device should be complete.
2. A list of target devices should be prepared.
3. The **Bulk Configuration** dialog can be opened from two places:
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Vertical Ellipsis Menu of the affected device → Bulk Configuration**
   - **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → Select a device → Bulk Configuration**

Procedure

1. Step One: Select which types of configuration information to copy and then proceed to the next step.

Note
AMS 9420 and **AMS Wireless Vibration Monitor** devices have different categories of information available.

Figure 8-36: Step One — Select Configuration (AMS 9420)

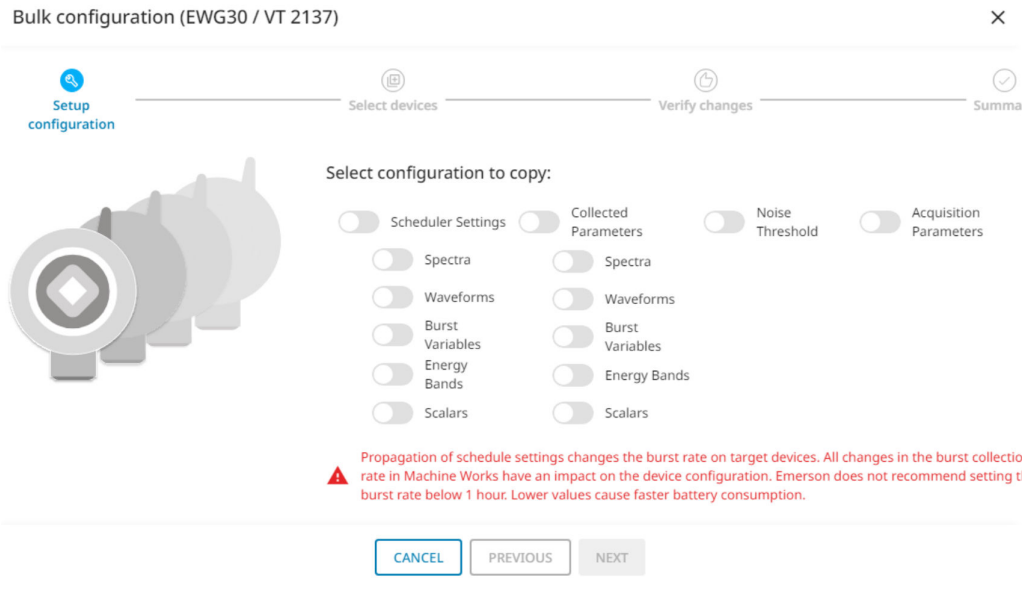
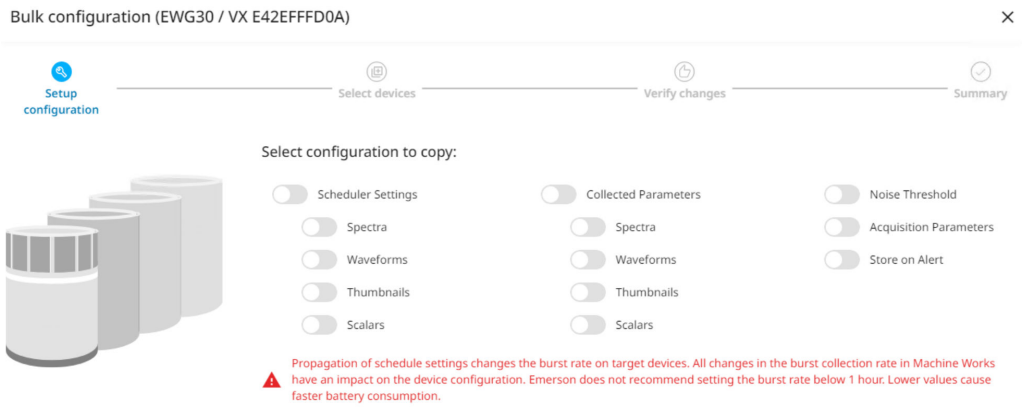


Figure 8-37: Step One — Select Configuration (AMS Wireless Vibration Monitor)



a) **Scheduler Settings** — These settings relate to the period between automated data collection. Toggle this switch to the **On** position to select all the options.

- **Spectra** — Toggle this switch to the **On** position to copy the spectra measurements which are collected.
- **Waveforms** — Toggle this switch to the **On** position to copy the waveform measurements which are collected.
- **Thumbnails** — (Only AMS Wireless Vibration Monitor) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Burst Variables** — (Only AMS 9420) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Energy Bands** — (Only AMS 9420) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Scalars** — Toggle this switch to the **On** position to copy the list of scalar measurements which are collected.

Note
The period is copied but its starting time is randomly offset to avoid network congestion. The burst rate on the target device is also changed.

b) **Collected Parameters** — These settings relate to what data is collected. Toggle this switch to the **On** position to select all the options.

- **Spectra** — Toggle this switch to the **On** position to copy the spectra measurements which are collected.
- **Waveforms** — Toggle this switch to the **On** position to copy the waveform measurements which are collected.

- **Thumbnails** — (Only AMS Wireless Vibration Monitor) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Burst Variables** — (Only AMS 9420) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Energy Bands** — (Only AMS 9420) Toggle this switch to the **On** position to copy the thumbnail measurements which are collected.
- **Scalars** — Toggle this switch to the **On** position to copy the list of scalar measurements which are collected.

c) **Noise Threshold** — Toggle this switch to the **On** position to copy the **Noise Threshold** of this **device**.

Note
Ensure that a **Noise Threshold** is set for the **device** before attempting to copy it.

d) **Acquisition Parameters** — Toggle this switch to the **On** position to copy the **Acquisition Parameters** to the target devices. These parameters are configured directly in the **AMS 9420**, or the **AMS Wireless Vibration Monitor** device. See: Acquisition Configuration — AMS 9420 Wireless Vibration Transmitter and Acquisition Configuration — AMS Wireless Vibration Monitor

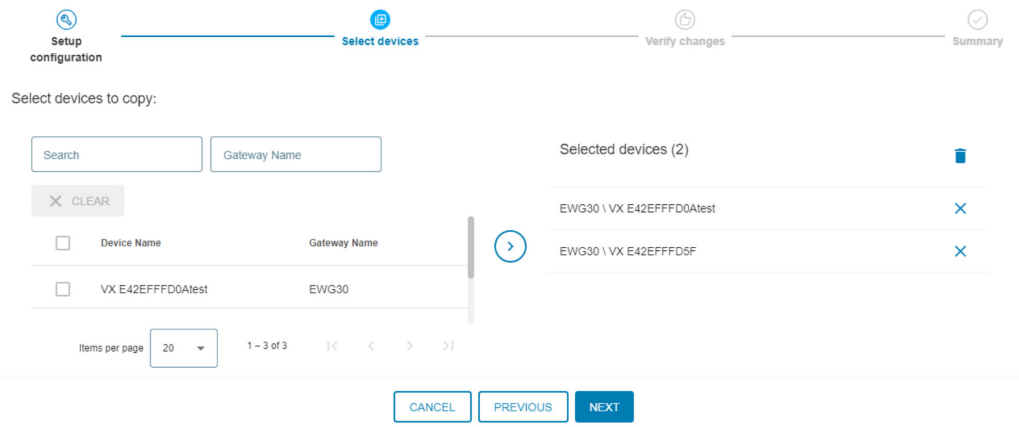
e) **Store on Alert** — (Only AMS Wireless Vibration Monitor) Toggle this switch to the **On** position to copy the **Store on Alert** settings to the target devices.

f) Choose to proceed to the next step, return to the previous step, or cancel the process.

- Click **Next** to proceed to the next step.
- Click **Previous** to go back to the previous step.
- Click **Cancel** to exit without making any changes.

2. Select the target devices to copy the configuration to.

Figure 8-38: Step Two — Select Devices to Copy



a) **Search** — Use this field to search for a specific device, or a group of similarly named devices.

b) **Gateway Name** — You can filter the device selection list by the gateway used to gain access to those devices.

c) **Clear** — Click this button to clear the **Search** field and **Gateway Name** filters. This button is gray when no filter is set, and blue when a filter is active.

d) **Selection Checkboxes** — Check the boxes next to the items you want to configure, or check the box at the top of the column to select every item currently in the list.

e) **Device Name** — The name of each **device** available for configuration.

f) **Gateway Name** — The name of the gateway used to gain access to the **device**.

g) **Items per page** — Select the number of items to display per page. (5, 10, 20, 50, 100)

h) **Page Forward / Page Back** — Use the arrows to navigate between different pages of the device list.

i) **Select Devices** — (Repeatable) Click the **Select Devices** button to confirm your selections and transfer those devices to the **Selected Devices** list.

Figure 8-39: Select Devices Button



Note

1. You can select **devices** to configure from one page at a time in this process. (Max: 100 devices per page)

2. You can repeat the selection process for every page of **devices**.

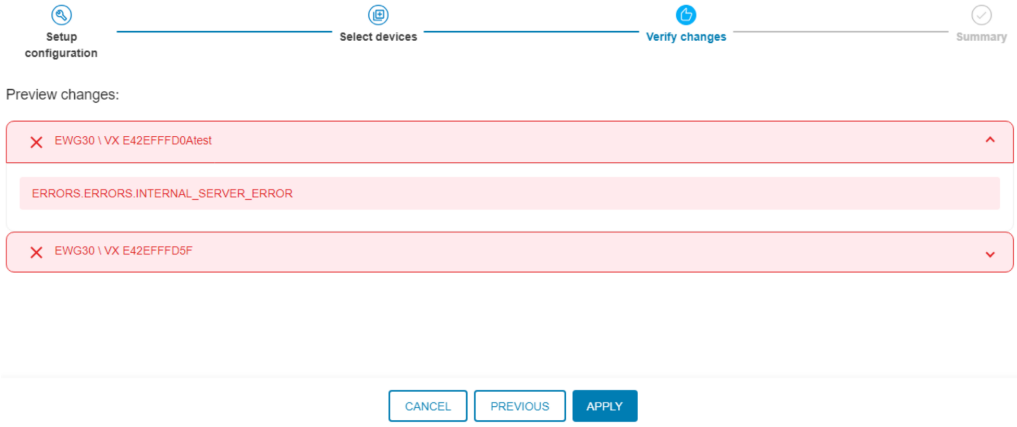
j) **Clear selection** — Click the **X** next to an item to remove it from the list of selected devices, or click the **Trash** icon at the top to clear the entire list.

k) Choose to proceed to the next step, return to the previous step, or cancel the process.

- **Cancel** — Click **Cancel** to cancel the process without making any changes.
- **Previous** — Click **Previous** to return to the previous screen.
- **Next** — Click **Next** to proceed to the verification phase.

3. Verify changes and review warnings.

Figure 8-40: Step Three — Verify Changes



Note
The line for each **device** has detailed information area which can be expanded or collapsed.

There are three colors for the verification messages:

a. **Green** — No problems or issues.

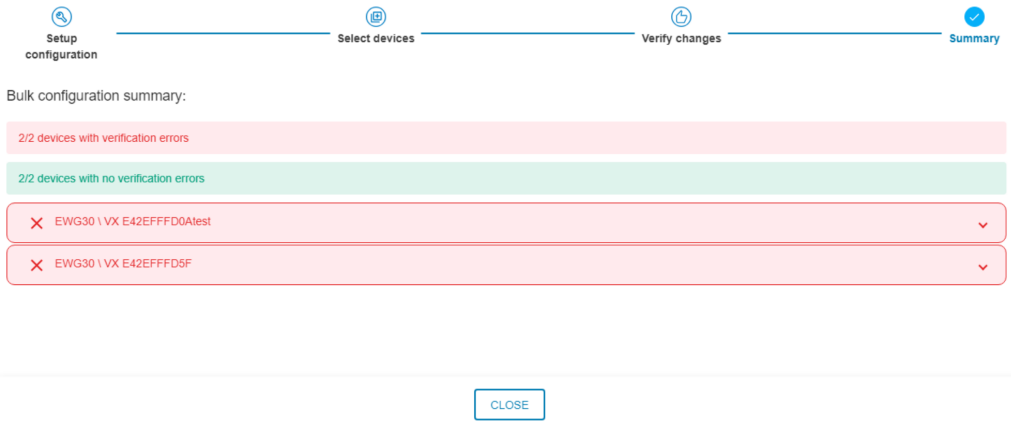
b. **Yellow** — Notification of a change in the measurement collection status.
   1. From **On** to **Off**.
   2. From **Off** to **On**.

c. **Red** — Notification of an error. No configuration will be performed for this item.

- **Cancel** — Click **Cancel** to cancel the process without making any changes.
- **Previous** — Click **Previous** to return to the previous screen.
- **Apply** — Click **Apply** to proceed to the verification phase.

4. Review any error messages, and then click **Close**.

Figure 8-41: Step Four — Summary



Note
Each **device** name is a clickable link to the **device** page.

There are three colors for the verification messages:

a. **Green** — No problems or issues.

b. **Yellow** — Notification of a change in the measurement collection status.
   1. From **On** to **Off**.
   2. From **Off** to **On**.

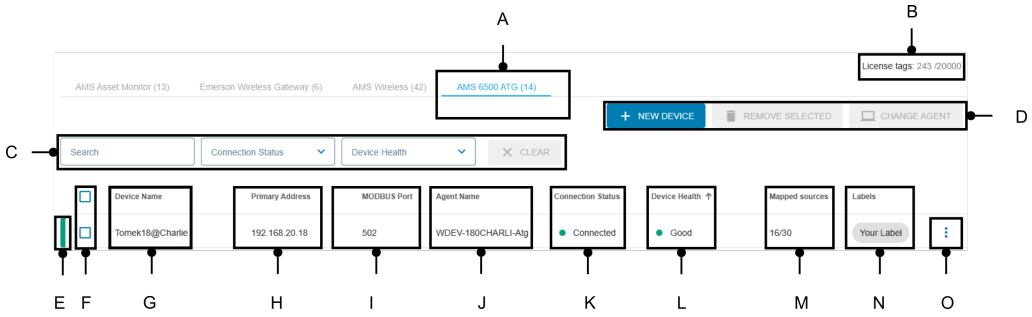
c. **Red** — Notification of an error. No configuration will be performed for this item.

8.2.4 AMS 6500 ATG Tab

An **AMS 6500 ATG** is a rack mounted system which can contain a variety of cards for monitoring machines.

When the **AMS 6500 ATG Tab** is selected in the **Devices** area of the **Network Device Module** the following screen is displayed, followed by a list of the connected **AMS 6500 ATG** devices.

Figure 8-42: AMS 6500 ATG Tab



A. ***AMS 6500 ATG Tab*** — *When this tab is underlined with a blue line the **AMS 6500 ATG Tab** is selected.*

B. ***License tags*** — *Shows the number of license tags used over the total number of license tags.*

C. ***Search Area*** — *Search field, filters, and **Clear**.*

- ***Search*** — *Use this field to search for devices by:*
- ***Connection Status Filter*** — *Filter by **Connected** / **Disconnected**.*
- ***Device Health Filter*** — *Filter by **Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*
- ***Clear*** — *Click **Clear** to reset all the filters.*

D. ***Functional Buttons*** —

- ***New Device*** — *Add a new device. See: Add an AMS Asset Monitor*
- ***Remove Selected*** — *Use this to remove a **device** from the list. See: Remove Device*
- ***Change Agent*** — *Change the agent responsible for handling this **device**. See: Change Agent*

E. ***Health Bar*** — *The color of the vertical **Health Bar** matches the color and description of the **Device Health**. See: Device Health*

F. ***Checkboxes*** — *Two **Functional Buttons** are enabled for items which have a **checkbox** checked. To select all **devices** you can check the **checkbox** at the top of the column.*

- *The **Remove Selected** function will affect each **Device** which has a checkbox selected.*
- *The **Change Agent** function will affect each **Device** which has a checkbox selected.*

G. ***Device Name*** — *Name of the **device**.*

H. ***Primary Address*** — *The IP address and port number for accessing this **device**.*

I. ***MODBUS Port*** — *This is the port number used to connect to the **AMS 6500 ATG** unit at the **Primary Address**.*

J. ***Agent Name*** — *The name of the **Agent** used to communicate with the **device**.*

K. ***Connection Status*** — *This field displays **Connected** or **Disconnected**.*

L. ***Device Health*** — *This displays the health of the **AMS 6500 ATG** monitoring device: **Critical** / **Warning** / **Advice** / **Good** / **Unknown**. See: Device Health*

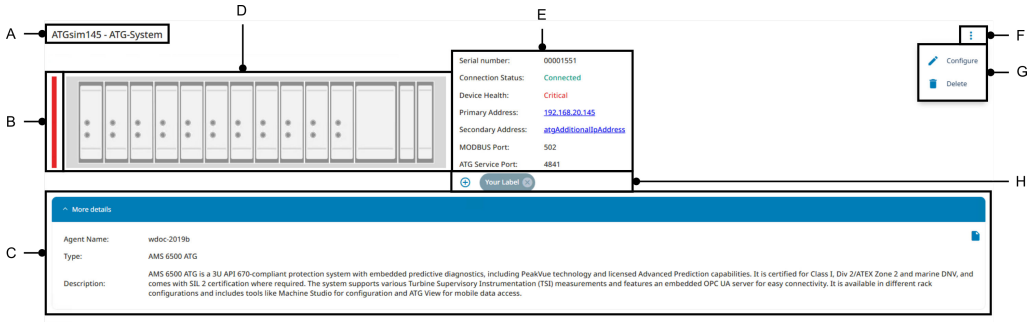
M. ***Mapped Sources*** *— Shows the proportion of* ***mapped sources*** *to the* ***total sources*** *from this* ***device****.*
N. ***Labels*** *— This column displays the user defined labels for each* ***device****. See: Add Label*
O. ***Vertical Ellipsis Menu*** *— The vertical ellipsis menu has the following options:*
   - ***Configure*** *— See: Reconfigure an Asset Monitor Connection*
   - ***Delete*** *— See: Remove Device*

AMS 6500 ATG Details

When you view the details of any device, the header of the window displays a breadcrumb path to the device. You can click on any item in the path to navigate between views.

AMS 6500 ATG Details — Main Section

Figure 8-43: Main



A. ***Device Name***
B. ***Device Health Bar*** *— Health is shown by a colored bar. See: Device Health*
C. ***More Details*** *— This expandable section contains some contextual information about the device.*
   - ***Agent Name*** *— This is the name of which agent is being used to access this device. See: Agents*
   - ***Type*** *— The type of device.*
   - ***Description*** *— Description of what the device is and what it does.*
   - ***Advanced Details*** *— Click this file icon, , to display a .json file with technical details about your device such as the firmware version, serial number, or other technical details.*

D. ***AMS 6500 ATG Icon*** *— A representation of the physical AMS 6500 ATG system.*
E. ***Information Section*** *— This section contains information about the device configuration and status.*
   - ***Serial number*** *— The unique serial number assigned to this physical device.*
   - ***Connection Status*** *— See: Connection Status*
   - ***Device Health*** *— This health is the same as the health of the **Charm** with the worst health inside this AMS 6500 ATG. The health information is written and color coded to match. See: Device Health*
   - ***Primary Address*** *— The primary IP Address of the AMS 6500 ATG system.*
   - ***Secondary Address*** *— The secondary IP Address of the AMS 6500 ATG system.*
   - ***Modbus Port*** *— The modbus port used to for data collection from the AMS 6500 ATG system.*
   - ***ATG Service Port*** *— The port used to configure and maintain the AMS 6500 ATG system.*

F. ***Configuration Menu Icon***
G. ***Configuration Menu*** *— The menu items for changing or deleting the configuration when the **Configuration Menu Icon** is clicked:*

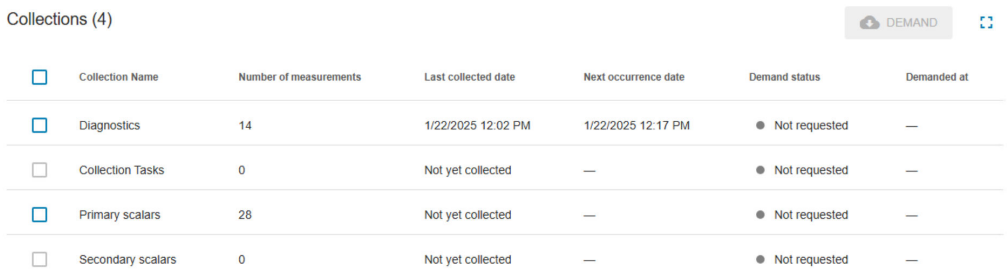
- ***Configure*** *— To change the configuration of a* ***device****. See: Reconfigure an AMS 6500 ATG Connection*
- ***Delete*** *— To delete a* ***device****. See: Remove Device*

H. ***Label Section*** *— Your custom labels are displayed here. Click the plus icon to add a custom label for this AMS 6500 ATG. See: Add Label*

Collections

For more information about what is included in a **Collection** see: Collection Details

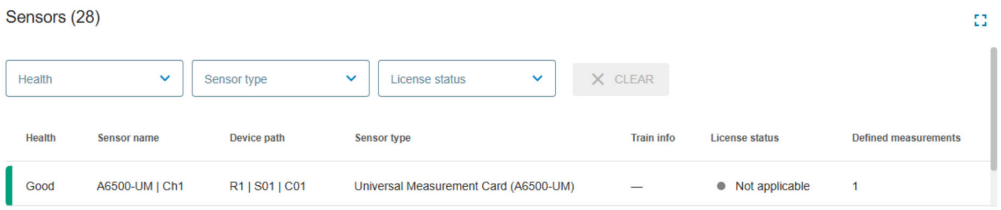
Figure 8-44: Collections



A. ***Demand*** *— When you have one or more* ***Collection*** *boxes marked you can use the* ***Demand*** *button to refresh the data. See: Demand Collection*
B. ***Selection boxes*** *— Mark the* ***Collections*** *you want to* ***Demand*** *here.*
C. ***Collection Name*** *— The name of the* ***Collection*** *is displayed here. The name is defined in the* ***AMS 6500 ATG*** *interface, and the instructions for this are described in that product's documentation.*
D. ***Number of measurements*** *— This is the number of measurements defined in this* ***AMS 6500 ATG Collection****.*
E. ***Last collected date*** *— The date and time of when data was last gathered.*
F. ***Next occurrence date*** *— The date and time of when data will be gathered next.*
G. ***Demand status*** *—* ***Requested*** */* ***Completed*** */* ***Outdated*** */* ***Not requested*** */* ***Failed****. Also shows the progress of the request in percentage.*
H. ***Demanded at*** *— This is the date (MM/DD/YYYY) and time (HH:MM AM/PM) the request was made at.*

Sensors

Figure 8-45: Sensors

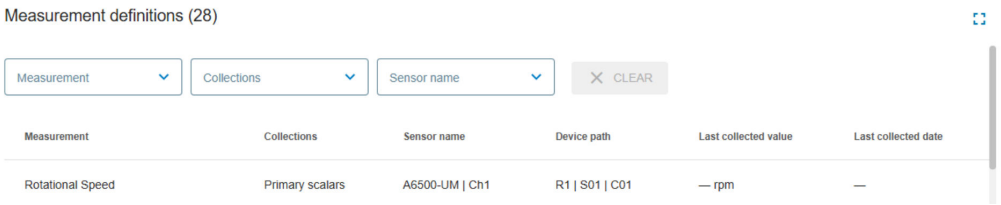


A. ***Sensor Filters*** — *The **Sensors** can be filtered by four characteristics. Only the **Sensors** which meet all of the conditions you apply will be displayed. Click **Clear** to reset the filter.*
   - ***Sensor Filters*** — *Filtering option for the **Sensors** section.*
     - ***Health*** — *You can select the **Sensors** which have a particular **Health**.*
     - ***Sensor type*** — *There is a wide range of **Sensor types** available for AMS 6500 ATG units.*
     - ***License status*** — *"Not applicable" / "Out of date" / "Up to date"*
     - ***Clear*** — *Click **Clear** to reset the filters.*

B. ***Health*** — ***Health** is displayed by color code and text. See: Device Health*
C. ***Sensor name*** — *This name is set in the **AMS 6500 ATG** interfaces and is documented in the **AMS 6500 ATG** documentation.*
D. ***Device path*** — *The path of a the sensor, e.g., `R1 | S01 | C01`, means Rack 1, Slot 1, Card 1.*
E. ***Sensor Type*** — *This can be either **Universal Measurement Card** or **Temp/Process Card**.*
F. ***Machine Train info*** — *Includes a link from the sensor to the measurement view for that sensor in the Machinery Health Module. See: Point View*
G. ***License status*** — *The three possible statuses are: "Not applicable", "Out of date", and "Up to date".*
H. ***Defined measurement count*** — *This column displays how many measurements the card is able to deliver.*

Measurement Definitions

Figure 8-46: Measurement Definitions



A. ***Measurement Definition Filters*** *— The* ***Measurement Definitions*** *can be filtered by four characteristics. Only the* ***Measurement Definitions*** *which meet all of the conditions you apply will be displayed. Click* ***Clear*** *to reset the filter.*
   - ***Measurement*** *— You can filter for* ***Measurement Definitions*** *which have a particular type. (Waveform, Spectrum, Scalar, Interval Band, Thumbnail)*
   - ***Collections*** *— For an AMS 6500 ATG you can filter by the following types of* ***Collection****:* ***Diagnostics****,* ***Collection Tasks****,* ***Primary Scalars****, or* ***Secondary Scalars****.*
   - ***Sensor name*** *— You can filter by* ***Sensor name****. For an AMS 6500 ATG there can be custom names which are defined in the AMS 6500 ATG interface.*
   - ***Clear*** *— Click* ***Clear*** *to reset the filters.*

B. ***Measurement*** *— A short description of the type of measurement.*
C. ***Collections*** *— The name of the* ***Collection*** *that this data is gathered in.*
D. ***Sensor name*** *— The name of the sensor.*
E. ***Device path*** *— The path of a the sensor, e.g.,* `R1 | S01 | C01`*, means Rack 1, Slot 1, Card 1.*
F. ***Last collected value*** *— The latest value along with the associated unit for that type of* ***Measurement****.*
G. ***Last collected date*** *— A value along with a unit of time to indicate how long ago the measurement was taken.*

Device Parameters

These are measurements of the measuring device itself.

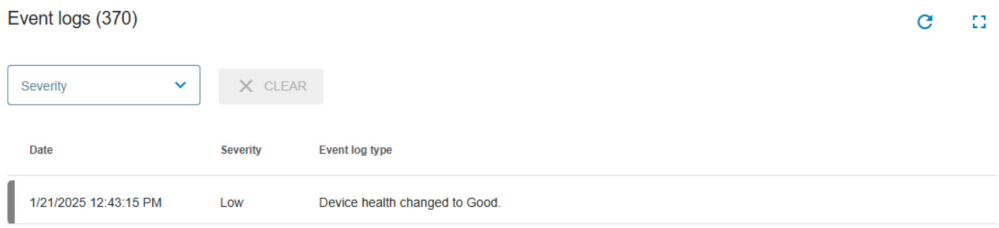
Figure 8-47: Device Parameters



A. ***Measurement*** — *This column lists the type of **Measurement**, e.g., Temperature or Voltage.*
B. ***Sensor name*** — *The name of the sensor.*
C. ***Device path*** — *R = Rack (1,2) and S = Slot (1 to 11)*
D. ***Last collected value*** — *The latest value along with the associated unit for that type of **Measurement**.*
E. ***Last collected date*** — *A value along with a unit of time to indicate how long ago the measurement was taken.*

Event Logs

Figure 8-48: Event Logs



A. ***Event Log Filters*** — *The **Measurement Definitions** can be filtered by four characteristics. Only the **Measurement Definitions** which meet all of the conditions you apply will be displayed. Click **Clear** to reset the filter.*
   - ***Severity*** — *You can filter for the **severity** of the **Event Log Entry**. Choose from: (Critical, Major, Moderate, Low)*
   - ***Clear*** — *Click **Clear** to reset the filters.*
B. ***Event Severity Indicator*** — *This indicator gives a visual representation of the severity of the **Event**. These match in color and severity to the Device Health scale. For example, **Red** indicates a **Critical Event**, and **Green** indicates a **Good Event**.*
C. ***Date*** — *The date of the **Event**.*
D. ***Severity*** — *The **Event Severity** in text form.*
E. ***Event log type*** — *The type of event, e.g., **Network error** or **Network device connected successfully**.*

Event Types

Table 8-4: Event Types

Event Message	Severity	Recommended Action
Agent closing	Warning	

Table 8-4: Event Types *(continued)*

Event Message	Severity	Recommended Action
Network device connected successfully	Good	None.
Connection broken	Critical	Check your network connection to this device.
Network error	Critical	Check your network connection to this device.
Unknown event log	Unknown	

Add an AMS 6500 ATG System

To add an **AMS 6500 ATG** system to your AMS Machine Works installation, follow these steps.

An **AMS 6500 ATG** system uses from 0 to 22 **Channels** so it consumes from 0 to 22 **Vibration Tags**. The **Vibration Tags** are consumed when you complete this task.

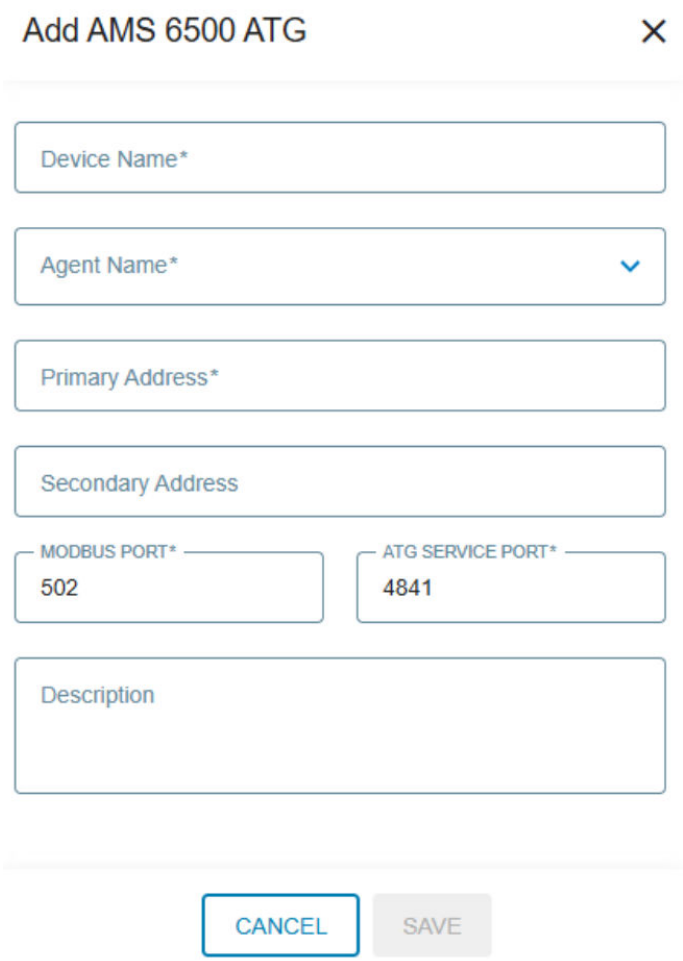
Note
Temperature Measurements do not consume **Vibration Tags**, so an **AMS6500 ATG** system with only **Temperature Measurement** cards will not consume any **Vibration Tags**.

To release the **Vibration Tags**, remove the **Device**. See: Remove Device

Prerequisites

- Verify that all the cards in your **AMS 6500 ATG** system were configured with AMS Machine Studio v4.1. Refer to the AMS 6500 ATG manual for details.
- In the **Modbus** section of AMS Machine Studio, the **Configuration:** must be set to **Standard Modbus**.
- Verify that the **AMS 6500 ATG** system is not connected to any other AMS Machine Works installation.
- Verify the **Agent Name**, **Address**, and **Port** needed for the **AMS 6500 ATG**.
- Select: **Network Device Module** → **Devices** → **AMS 6500 ATG Tab** → **+ New Device**

Figure 8-49: Add an AMS 6500 ATG



Procedure

1. **Device Name** — (Required) Enter the name that you choose for this device in AMS Machine Works. The maximum length is 100 characters.
2. **Agent Name** — (Required) Choose the **Agent Name** from the dropdown list for this connection. See: Agents
3. **Primary Address** — (Required) Enter the IP address of the **AMS 6500ATG** network interface. The maximum length is 250 characters.
4. **Secondary Address** — (Optional) Enter the IP address of the redundant **AMS 6500ATG** network interface. The maximum length is 250 characters.
5. **Modbus Port** — (Required) The standard port, **502**, is filled in by default. In some installations this port could be different. The valid range is from 1 to 65535.
6. **ATG Service Port** — (Required) The standard port, **4841**, is filled in by default. In some installations this port could be different. The valid range is from 1 to 65535.
7. **Description** — (Optional) You can enter any useful description information or notes here. The maximum length is 500 characters.

8. **Cancel** or **Save**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

Reconfigure an AMS 6500 ATG Connection

You can edit a previously configured AMS 6500 ATG. All of the fields except for the **Secondary Address** and **Description** are required.

Prerequisites

Verify the **Address** and **Port** needed for the **AMS 6500 ATG** system.

⚠ CAUTION

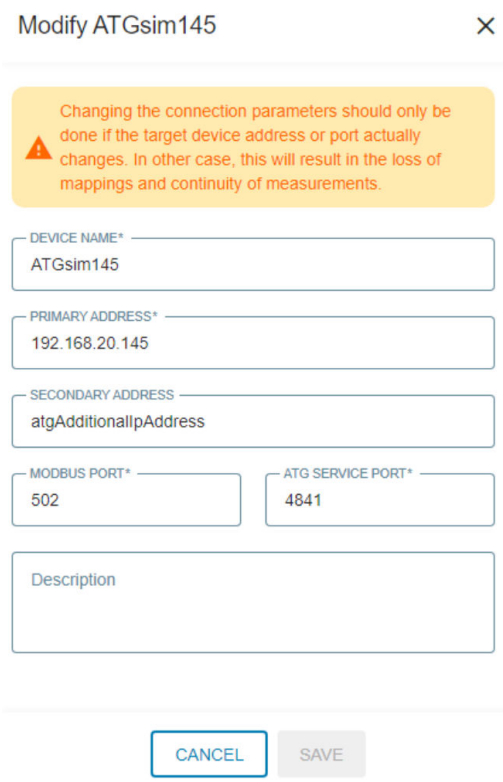
Ensure that the change is actually necessary. An unnecessary change can result in:

- Loss of **measurement device** mappings.
- Breaking the continuity of **measurements**.

Procedure

1. The configuration dialog can be opened from two places:
   - **Network Device Module → Devices → AMS 6500 ATG Tab → AMS 6500 ATG List → Vertical Ellipsis Menu of the affected device → Configure**
   - **Network Device Module → Devices → AMS 6500 ATG Tab → AMS 6500 ATG List → Select a device → Configure**

Figure 8-50: Modify an AMS 6500 ATG



2. **Device Name** — (Required) Enter the name that you choose for this device in AMS Machine Works.
3. **Primary Address** — (Required) Enter the IP address where the **Emerson Wireless Gateway** is located. The maximum length is 250 characters.
4. **Secondary Address** — (Optional) Enter the IP address where the **Emerson Wireless Gateway** is located. The maximum length is 250 characters.
5. **Modbus Port** — (Required) The standard port, **502**, is filled in by default. In some installations this port could be different. The valid range is from 1 to 65535.
6. **ATG Service Port** — (Required) The standard port, **4841**, is filled in by default. In some installations this port could be different. The valid range is from 1 to 65535.
7. **Description** — (Optional) You can enter any useful description information or notes here.
8. **Cancel** or **Save**:
   - Click **Cancel** to exit without making changes.
   - Click **Save** to save your changes and exit.

8.2.5 Common Tasks

These tasks are the same for every type of device in the **Network Device Module**.

Add Label

You can add one or more **labels** to any **device**.

Prerequisites

Select a particular **device** from the list of that type of **device**:

Network Device Module → Devices → Device Type Tab → List of Available Devices

Procedure

In the top section of the device information select: **Add label**

a) (Option 1) Type in a new **label** and press **enter**.

b) (Option 2) Select a **label** from the drop down list of **labels** active in the system.

Change Agent

You can change which **Agent** a **device** uses to communicate with the system.

Prerequisites

Open the list of **devices** you want to modify:

The **Device Type Tab** can be:

1. **AMS Asset Monitor Tab**
2. **Emerson Wireless Gateway Tab**
3. **AMS 6500 ATG Tab**

Network Device Module → Devices → Device Type Tab → List of Available Devices

Note
For **AMS Wireless Devices**, you change the **Agent** by changing the **Agent** of the **AMS Wireless Gateway** that they are connected to. See: Wireless Gateway Tab

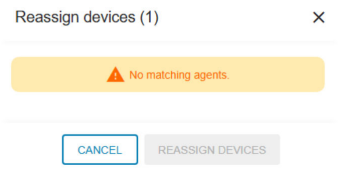
Procedure

1. Select the **checkbox** for the **device** you need to modify.

   Note
   You can select multiple **devices** individually, or you can select all the on the page by clicking the **checkbox** at the top of the column.

2. Click the **Change Agent** button in the top right corner.
3. Select an **Agent** from the list of available **Agents**.

Figure 8-51: Reassign Devices Dialogue



Note
If the dropdown menu is absent or empty, you do not have any **Agents** of the appropriate type to reassign the **device** to.

Remove Device

You can remove a device which is not needed in the system.

Removing a device releases the Vibration Tags that it consumed. See: License Functions

When you remove an AMS Asset Monitor unit, you remove all the CHARMs it contains.

When you remove an AMS 6500 ATG unit, you remove all the Measurement Cards it contains.

When you remove an Emerson Wireless Gateway, you remove all the AMS Wireless Devices that connect through it.

Note
To delete AMS Wireless Devices individually, go to the **AMS Wireless Tab**:

1. Select: **Network Device Module → Devices → AMS Wireless Tab → List of Wireless Devices → Choose a List Item to Delete → Vertical Ellipsis Menu of the List Item → Delete**.
2. Click **Confirm** in the popup dialog.

Prerequisites

Open the list for the type of device you want to modify:

1. To delete an AMS Asset Monitor, Emerson Wireless Gateway, or AMS 6500 ATG: Select: **Network Device Module → Devices → Device Type Tab → List of Available Devices**

Procedure

1. Select the check box for the device you want to remove.

   Note
   You can select multiple devices individually, or you can select all the devices on the page by clicking the check box at the top of the column.

2. Click **Remove Selected** in the top right corner.
3. Click **Confirm** to remove the selected device(s).

Collection Details

Measurement devices can collect data from two sources in general:

- Measurement Data — External sensors about the assets that they are monitoring.
- Device Diagnostics — Internal sensors or other operational information about the measurement devices themselves.

Measurement devices do not supply measurement data to collections when they have an unhealthy status, but they do supply device diagnostics.

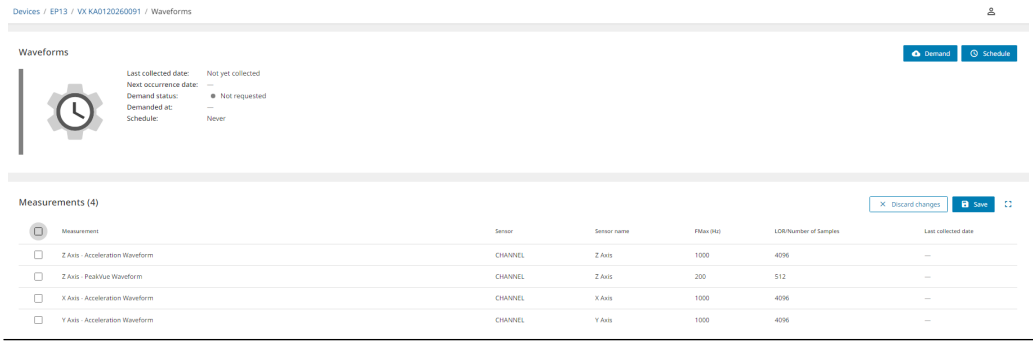
To switch your view to the **Collection Details**, click on an individual **Collection** in the **Collections** section of:

1. AMS Asset Monitor Details
2. AMS Wireless Details
3. AMS 6500 ATG Details

In this view you can:

- **Define Collection** — See: Define Collection
- **Schedule Collection** — See: Schedule Collection
- **Demand Collection** — See: Demand Collection
- **Multiple Demand Collection** — See: Multiple Demand Collection

Figure 8-52: Collection Details



1. **Demand** — Click **Demand** to gather data immediately. A progress bar will be displayed. See: Demand Collection
2. **Multiple Demand** — (Present for AMS Asset Monitor) Click **Multiple Demand** to perform many demands over a period of time. See: Multiple Demand Collection
3. **Schedule** — Click **Schedule** to open the scheduler dialog. See: Schedule Collection

   Note
   The **Schedule** button is not available for AMS Asset Monitor. AMS Asset Monitor has its own scheduling functionality.

4. **Measurements Section** — See: Define Collection

a. **Checkboxes** — Click on individual checkboxes to include or exclude a measurement in the **Collection**. Click on the checkbox at the top of the column to include or exclude all measurements.

b. **Discard changes** / **Save** — Click **Discard changes** to exit without making changes, or click **Save** to exit and save your changes.

Note
This selection only appears when the current selection of checkboxes differs from the previous selection.

c. **Standard Columns** — The following columns are available for all devices:
   - **Measurement**, **Sensor**, **Sensor name**, **Last collection date**

d. **Additional Columns** — Depending on the combination of **Device Type** and **Collection Type**, some additional columns of information will be displayed.

Table 8-5: Additional Columns

Device Type	Collection Type	Optional Columns
AMS 9420	Waveforms & Spectra	FMax (Hz), LOR/Number of Samples
AMS 9420	Burst Variables, Scalars, Energy Bands	Last collected value
AMS Wireless Vibration Monitor	Thumbnails, Waveforms, Spectra	FMax (Hz), LOR/Number of Samples
AMS Wireless Vibration Monitor	Scalars	Last collected value
AMS Asset Monitor	All other collections	FMax (Hz), LOR/Number of Samples
AMS Asset Monitor	Scalars	Last collected value

Define Collection

Edit which measurements are included in the **Collection**. The configuration of a **Collection** defines what data is collected in three situations:

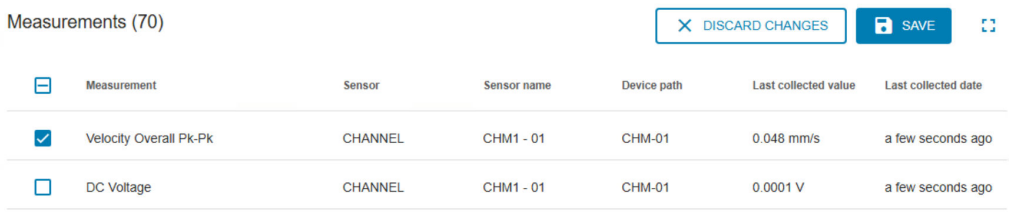
- **Schedule Collection** — See: Schedule Collection
- **Demand Collection** — See: Demand Collection
- **Multiple Demand Collection** — See: Multiple Demand Collection

Prerequisites

Click on any **Collection** in any **Collections List** to open the **Measurements List** which defines that collection.

Procedure

Figure 8-53: Define Collection



1. (Repeatable Step) Select or deselect any **measurement** in the **Measurements List**.
2. **Save** or **Discard Changes**.
   - **Discard Changes** — Click **Discard Changes** to exit without saving any changes.
   - **Save** — Click **Save** to save your changes and exit.

Schedule Collection

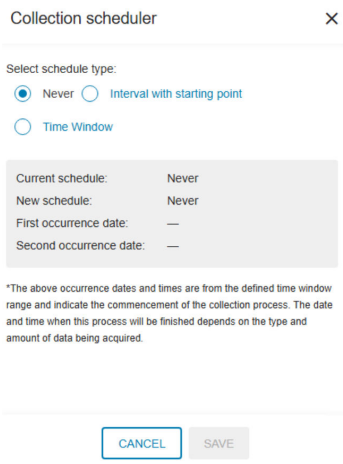
Prerequisites

1. Select: **Network Device Module** → **Devices** → **AMS Wireless** → **AMS Wireless List** → **AMS Wireless List Item** → **Collections List** → **Collections List Item** → **Schedule**

Procedure

1. Choose which type of schedule to set.
   - **Never** — (Default) This **Collection** is only collected when the **Demand** button is clicked. See: Demand Collection
   - **Interval with starting point** — After a given starting point, **Collections** are gathered at the given interval.
   - **Time Window** — This sets a window in which the collection should take place.
2. Never

Figure 8-54: Schedule: Never

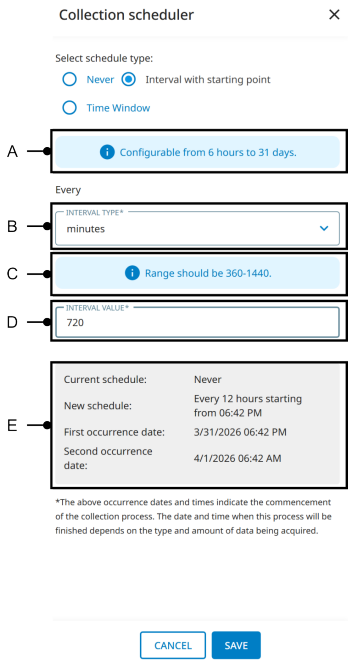


a) No further configuration is needed.

3. **Interval with starting point**

   With this setting, a **Collection** is gathered once per **Interval**, starting from the time you create the schedule..

Figure 8-55: Schedule: Interval with starting point



*A. **Interval Range** — The shortest and longest interval possible.*
*B. **Interval Type** — Select the unit of time used to set the interval. (seconds/minutes/hours/days)*
*C. **Interval Range** — The interval range given in the unit type.*
*D. **Interval Value** — Enter a value to set the interval.*
*E. **Configuration Changes** — Details of the previous configuration followed by the new configuration.*

a) Set the **Interval Value**. (1 to 3600 seconds, 1 to 1440 minutes, 1 to 168 hours, 1 to 31 days.

Note
Two factors affect which **Interval Values** and **Interval Types** are available:

1. The kind of data collected.
2. The kind of device.

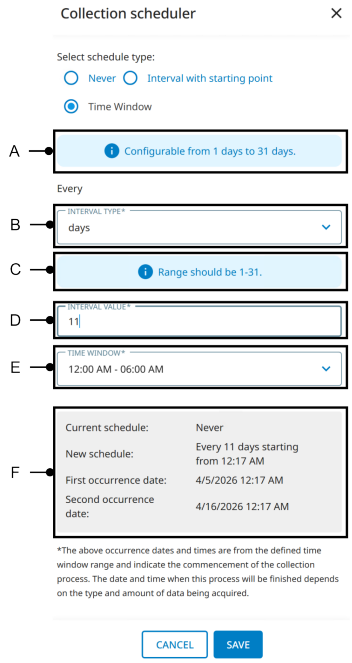
Consult the documentation for the device for details.

b) Set the **Interval Type** from the dropdown menu. (seconds, minutes, hours, days)

4. **Time Window**

   With this setting, a **Collection** is gathered at a randomized time within the **Time Window**, once per **Interval**.

Figure 8-56: Schedule: Time Window



A. ***Interval Range*** *— The shortest and longest interval possible.*
B. ***Interval Type*** *— Select the unit of time used to set the interval. (seconds/minutes/hours/days)*
C. ***Interval Range*** *— The interval range given in the unit type.*
D. ***Interval Value*** *— Enter a value to set the interval.*
E. ***Time Window*** *— Select one of the 6 hour time windows for data collection.*
F. ***Configuration Changes*** *— Details of the previous configuration followed by the new configuration.*

Note

Two factors affect which **Interval Values** and **Interval Types** are available:

a. The kind of data collected.

b. The kind of device.

Consult the documentation for the device for details.

a) Set the **Interval Value**. (1 to 3600 seconds, 1 to 1440 minutes, 1 to 168 hours, 1 to 31 days.

b) Set the **Interval Type** from the dropdown menu. (seconds, minutes, hours, days)

c) Set the **Time Window** from the dropdown menu. (Select one of four 6-hour long time windows starting from 12:00 AM, 6:00 AM, 12:00 PM, and 6:00 PM.)

5. **Save** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.
   - **Save** — Click **Save** to save your changes and exit.

Demand Collection

You can either demand the collection of data in two general ways:

1. By selecting one or more checkboxes in a list of **Collections** and then clicking **Demand** to receive those **Collections**.
2. By selecting one or more checkboxes in a list of **Measurements** and then clicking **Demand** to receive those **Measurements**.

Prerequisites

There are many places in the AMS Machine Works interface where you can **Demand** the collection of data:

1. For **Asset Monitors**:
   - Select: **Network Device Module → Devices → Asset Monitor Tab → Asset Monitor Device List → Asset Monitor Device List Item → Collections List → Collections List Checkbox → Demand**
   - Select: **Network Device Module → Devices → Asset Monitor Tab → Asset Monitor Device List → Asset Monitor Device List Item → Collections List → Collections List Item → Measurements List Checkbox → Demand**
2. For **Wireless Devices**:
   - Select: **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → AMS Wireless List Item → Collections List → Collections List Checkbox → Demand**
   - Select: **Network Device Module → Devices → AMS Wireless Tab → AMS Wireless Device List → AMS Wireless List Item → Collections List → Collections List Item → Measurements List Checkbox → Demand**
3. For **AMS 6500 ATG Units**:
   - Select: **Network Device Module → Devices → AMS 6500 ATG Tab → AMS 6500 ATG Device List → AMS 6500 ATG List Item → Collections List → Collections List Checkbox → Demand**
   - Select: **Network Device Module → Devices → AMS 6500 ATG Tab → AMS 6500 ATG Device List → AMS 6500 ATG List Item → Collections List → Collections List Item → Measurements List Checkbox → Demand**

Procedure

1. Click the **Demand** button, progress is shown in one of two ways.

- **Figure 8-57: Progress Bar — Under Device Details**

- **Figure 8-58: Progress Indicator — Demand Status Column**



2. Observe the progress, and refer to the newly loaded data when it becomes available.

Multiple Demand Collection

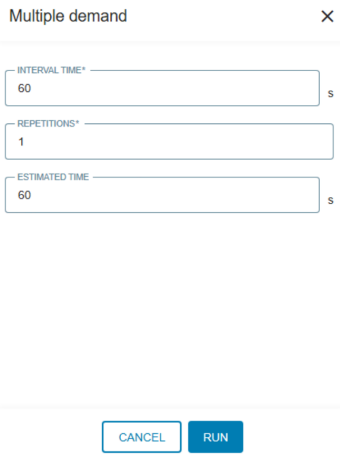
When you need to collect data many times over a period, you can use the **Multiple Demand** command. You can demand data from 1 to 30 times at an interval of 60 to 120 seconds.

Prerequisites

There are two places in the AMS Machine Works interface where you can initiate a **Multiple Demand** collection of data:

1. Select: **Network Device Module → Devices → Asset Monitor Tab → Asset Monitor Device List → Asset Monitor Device List Item → Collections List → Collections List Checkbox → Multiple Demand**
2. Select: **Network Device Module → Devices → Asset Monitor Tab → Asset Monitor Device List → Asset Monitor Device List Item → Collections List → Collections List Item → Measurements List Checkbox → Multiple Demand**

Figure 8-59: Multiple Demand Configuration



Procedure

1. Enter the **Interval Time**. — (Default: 60 seconds) From: 60 to 120 seconds.

2. Enter the number of **Repetitions**. — The number of times to repeat the demand. From: 1 to 30 repetitions.
3. Observe the total **Estimated Time**. — (Calculated) From: 60 to 3600 seconds. **Estimated Time** = **Interval Time** * **Repetitions**
4. **Run** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.
   - **Run** — Click **Run** to save your changes and exit.

Show Advanced Device Details

Detailed technical information about each device is available in the **Network Device Module**.

Note
AMS 6500 ATG and **Emerson Wireless Gateway devices** do not have any **Advanced details** associated with them.

Prerequisites

Select a particular **device** from either:

- **Network Device Module** → **Devices** → **AMS Asset Monitor Tab** → **List of Available Devices**
- **Network Device Module** → **Devices** → **AMS Wireless Tab** → **List of Available Devices**

Procedure

In the top section of the device information select: **More details** → **Advanced details**



A `.json` file is displayed with technical details about your device such as the firmware version, serial number, or other technical details.

8.3 Agents

An **Agent** in AMS Machine Works enables communication with different types of devices.

There are the following types of **Agent** :

- **AMS Asset Monitor Agent**
- **Emerson Wireless Gateway Agent**
- **AMS 6500 ATG Agent**
- **AMS Portables Agent** See: Portable Device Module

A standard installation of AMS Machine Works has one of each type of **Agent** installed on the same machine as AMS Machine Works. To add more agents you can install just the **Agent** software on additional machines. These machines can act as gateways through firewalls in complicated secure networks.

Expanded installations with many agents can be done to access secure areas, or to improve throughput in extremely large networks of monitoring infrastructure.

Figure 8-60: Agents View

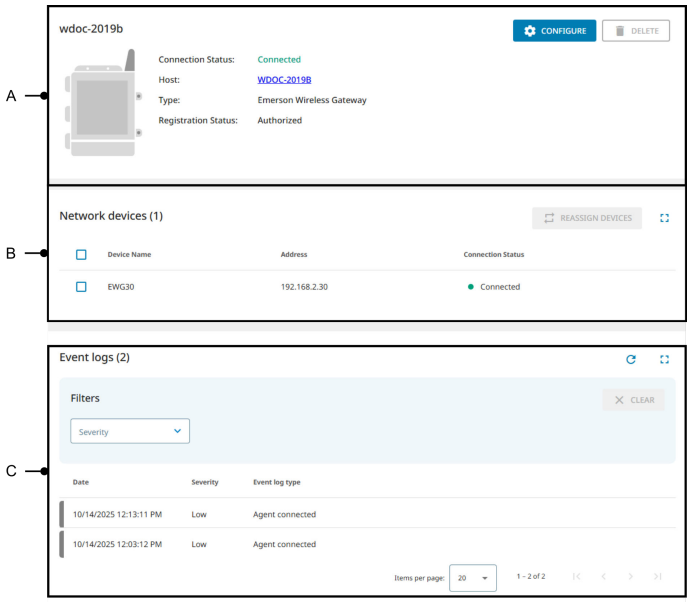


1. **Total Agent Count** — The number in brackets indicates the total number of **Agents** which have an **Authorized** or **Pending** authorization status.
2. **Needs attention** toggle — (Default: **Off**) When the toggle is in the **On** position, only the **Agents** which have expired security certificates and meet the filter criteria are displayed. To renew the security certificates see: AMS Machine Works System Guide (Add AMS Machine Works Certificates)
3. **Search Area** — Use these controls to find a particular **Agent**.
    a. **Name** — Enter text to search for a particular **Agent**.
    b. **Connection Status** — Choose between **Connected** and **Disconnected** status to narrow your search.
    c. **Type** — Choose between **AMS Asset Monitor**, **AMS 6500 ATG**, and **Emerson Wireless Gateway** to narrow your search.
    d. **Registration Status** — Choose between **Authorized** and **Pending** status to narrow your search.
4. **New Agent** — Click the **New Agent** button to configure an **Agent**. See: Add Agent
5. **Agent Settings** — Click the **Agent Settings** button to change the requirements for configuring new **Agents**. See: Change Agent Settings
6. **Clear** — Click the **Clear** button to reset your filter criteria.
7. **Health Bar** — The **Health Bar** has a color which matches the written **Connection Status** next to it.
8. **Connection Status** — The written form of the connection status matches the **Health Bar**.
9. **Agent Name** — The name of the **Agent**.
10. **Host** — The name of the computer which this **Agent** runs on.

11. **Type** — The type of **Agent**; **AMS Asset Monitor**, **Emerson Wireless Gateway**, or **AMS 6500 ATG**.
12. **Defined Network Devices** — The number of **AMS Asset Monitor**, **Emerson Wireless Gateway**, or **AMS 6500 ATG** devices defined for this **Agent**.
13. **Connected Network Devices** — The number of **AMS Asset Monitor**, **Emerson Wireless Gateway**, or **AMS 6500 ATG** devices currently connected to this **Agent**.
14. **Defined Logical Devices** — The number of endpoint devices which are connected to this **Agent**.
15. **Registration Status** — This column displays the authorization status of the **Agent**.
16. **Menu** — This vertical ellipsis menu has the following controls:
    - **Reassign devices** — Select this option to reassign all the devices connected to this **Agent** to another **Agent**. See: Reassign devices
    - **Rename** — Select this option to rename this **Agent**. See: Rename Agent
    - (Optional) **Authorize** — If the registration status of the **Agent** is **Pending**, this menu item is available. Click **Authorize** to complete the authorization process.
    - (Optional) **Delete** — If you have removed all the devices from the **Agent**, you can see the option to **Delete** the **Agent**.

When you click on any **Agent** in the **Agent List**, you can open the **Agent Details** page for that **Agent**.

Figure 8-61: Agent Details



A. ***Agent Info Section*** —
   - *Information about the* ***Agent***
     - ***Connection Status***
     - ***Host***
     - ***Type***
     - ***Registration Status***
   - *Controls*
     - ***Configure*** *— See: Change Agent Settings*
     - ***Delete*** *— See: Delete Agent*

B. ***Network Device Section*** *— Every* ***device*** *currently connected to the* ***Agent*** *is listed here.*
   - ***Reassign Devices*** *control — See: Reassign devices*

C. ***Event Log Section*** *— Every event concerning this* ***Agent*** *is listed here. You can filter this list by the* ***Severity*** *of the event.*

8.3.1 Reassign devices

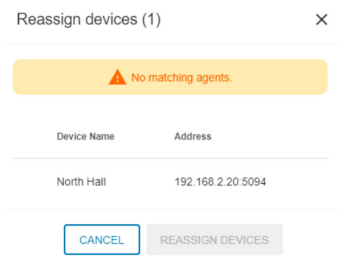
You can change which **devices** are assigned to an **Agent**.

Prerequisites

Open the list of **Agents** and select the **Reassign devices** command:

Network Device Module → Agents → List of Available Agents → Vertical Ellipsis Menu → Reassign devices

Figure 8-62: Reassign Devices Dialogue



Note
If the dropdown menu is absent or empty, you do not have any **Agents** of the appropriate type to reassign the **device** to.

Procedure

1. Select an **Agent** from the list to reassign the **devices** to.
2. **Reassign Devices** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.
   - **Reassign Devices** — Click **Reassign Devices** to save your changes and exit.

8.3.2 Rename Agent

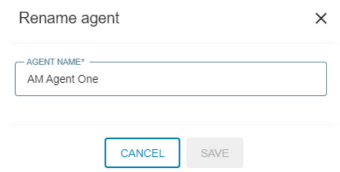
Each **Agent** can have a unique name, and you can change the name of an **Agent** at any time. An **Agent** name can have a combination of letters, numbers, and symbols. To rename an **Agent** follow the instructions below.

Prerequisites

To open the **Rename agent** dialog select:

Network Device Module → Agents → Agent List → Agent Entry → Vertical Ellipsis Menu → Rename

Figure 8-63: Rename Agent Dialog



Procedure

1. **Agent Name** — Enter the new name for this **Agent**. The maximum is 100 characters.
2. **Save** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.

- **Save** — Click **Save** to save your changes and exit.

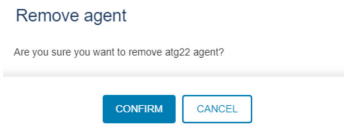
8.3.3 Delete Agent

If you need to delete an **Agent** follow these steps.

Prerequisites

1. Every **device** must be removed from an **Agent** before you can remove the **Agent**. See: Remove Device
2. You must have admin privileges on the **Host** system where the **Agent** is located.
3. Open the list of **Agents** and select the **Delete** command:
   Network Device Module → Agents → List of Available Agents → Vertical Ellipsis Menu → Delete

Figure 8-64: Remove Agent Dialogue



Procedure

1. **Delete** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.
   - **Delete** — Click **Confirm** to delete the **Agent** and exit.
2. Stop the correct **Windows Service** for the **Agent**.
   - For the **Asset Monitor Agent**: Stop the **Emerson MW Asset Monitor Agent** service.
   - For the **Emerson Wireless Gateway Agent**: Stop the **Emerson MW Wireless Agent** service.
   - For the **AMS 6500 ATG Agent**: Stop the **Emerson MW ATG Agent** service.
3. After you delete an **Agent** you must manually delete all of the files in the data directory for that **Agent** before that type of **Agent** can be added to the system again.

   Note
   These files must be deleted, or renamed, on the **Host** system where the **Agent** was located. For an **External Agent** this will be a system other than the main system. The network location is listed in the **Agent List**.

   Network Device Module → Agents → Agent List → Host Column

   - For an **Asset Monitor Agent**:
     Navigate to: `C:\ProgramData\Emerson\AMSMachineWorks\Data\AMI`

Delete the all the files, including hidden files, in this directory.

- For an **Emerson Wireless Gateway Agent**:
  Navigate to: `C:\ProgramData\Emerson\AMSMachineWorks\Data\EWA`
  Delete the all the files, including hidden files, in this directory.
- For an **AMS 6500 ATG Agent**:
  Navigate to: `C:\ProgramData\Emerson\AMSMachineWorks\Data\ATGA`
  Delete the all the files, including hidden files, in this directory.

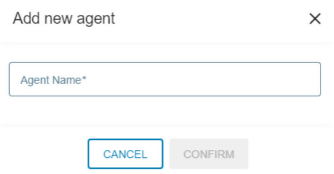
8.3.4 Add Agent

To add an **Agent** follow these steps.

Prerequisites

1. Ensure that the **Agent** software is installed before trying to register the **Agent**.
2. You must have admin privileges on the **Host** system where the **Agent** is located.
3. (Optional) If this type of **Agent** was removed from your system, ensure that you followed all the steps in the Delete Agent procedure.
4. To open the **New Agent** dialog select:
   Network Device Module → Agents → New Agent

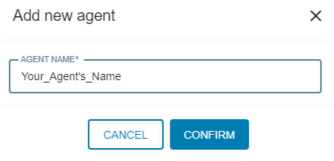
Figure 8-65: Add Agent Dialog



Procedure

1. (Required) Enter an **Agent Name**. (From 1 to 255 characters with no spaces.)

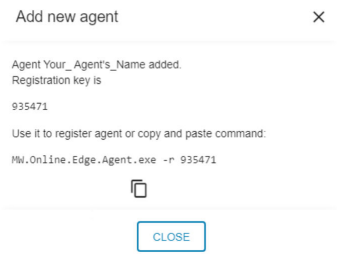
Figure 8-66: Add Agent Dialog - Filled In



2. Choose to proceed or cancel.
   - Click **Cancel** to discard your changes without making any changes.
   - Click **Confirm** to discard your changes without making any changes.

   When you choose **Confirm** you see:

Figure 8-67: Registration Key Dialog



3. Copy the **Register Agent** command from the dialog.
4. Run the **Windows Command Console** as an Administrator.
5. On the system where the **Agent** is installed, navigate to the correct directory for the type of **Agent** that you want to register:
   - For the **Asset Monitor Agent** navigate to:
     `C:\Program Files\Emerson\AMS Machine Works\AMA`
   - For the **Emerson Wireless Gateway Agent** navigate to:
     `C:\Program Files\Emerson\AMS Machine Works\EWA`
   - For the **AMS 6500 ATG Agent** navigate to:
     `C:\Program Files\Emerson\AMS Machine Works\ATGA`
6. Execute the **Register Agent** command in the **Windows Command Console**.
   `MW.Online.Edge.Agent.exe -r <REGISTRATION_KEY>`
7. (Optional) If the registration fails, check that the **Windows Service** for the **Agent** is running, and start the service if necessary.
   - For the **Asset Monitor Agent**: Start the **Emerson MW Asset Monitor Agent** service if necessary.
   - For the **Emerson Wireless Gateway Agent**: Start the **Emerson MW Wireless Agent** service if necessary.
   - For the **AMS 6500 ATG Agent**: Start the **Emerson MW ATG Agent** service if necessary.

Note
If restarting the **Agent** fails, or other problems have occurred, consult the log files found at `C:\ProgramData\Emerson\AMSMachineWorks\Logs\<Agent_Type>`, or contact Emerson Customer Support.

8. Reload the **Network Device Module** → **Agents** page, and find the line for the **Agent** that you added.
   The **Connection Status** is now **Connected**, and you can now add some **devices**.
9. (Optional) If **Auto Accept Agents** is set to **Off**, you must manually **Authorize** each **Agent**. See: Change Agent Settings

a) Select: **Network Device Module** → **Agents** → **Agent List** → **Agent List Item** → **Vertical Ellipsis Menu** → **Authorize**

b) Select **Confirm** to **Authorize** the **Agent**.

10. Now you can add **devices** for the **Agent**.
    - For **Asset Monitor** units see: Add an AMS Asset Monitor
    - For **Emerson Wireless Gateway** units see: Add a Wireless Gateway
    - For **AMS 6500 ATG** units see: Add an AMS 6500 ATG System

8.3.5 Change Agent Settings

AMS Machine Works can support a maximum of one of each of the four **Agent Types** per server:

1. **AMS Asset Monitor Agent**
2. **Emerson Wireless Gateway Agent**
3. **AMS 6500 ATG Agent**
4. **AMS Portables Agent**

- Four **Agents** in the **Internal** location, with one of each **Agent Type**.
- Four **Agents** in each **External** location, with one of each **Agent Type**.

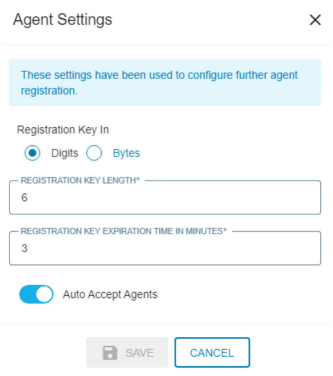
The potential maximum number of **Agents** available in your AMS Machine Works system is not limited, but the main AMS Machine Works server is limited by hardware and bandwidth constraints.

Prerequisites

To open the **Change Agent Settings** dialog select:

Network Device Module → **Agents** → **Agent Settings**

Figure 8-68: Agent Settings Dialog



Procedure

1. **Registration Key** —
   - **Digits** — (Default) Uses only numbers.
   - **Bytes** — Uses a character set.
2. **Registration Key Length** — (Required) Default: 6 Enter an integer from 6 to 256.
3. **Registration Key Expiration Time In Minutes** — (Required) Default: 3 Enter an integer from 2 to 60.
4. **Auto Accept Agents** —
   - **On** — (Default) Only one of each **Agent Type** will be accepted.
   - **Off** — When **Auto Accept Agents** is set to **Off**, you must use the **Authorize** command. See: Add Agent
5. **Save** or **Cancel** your changes.
   - **Cancel** — Click **Cancel** to exit without saving any changes.
   - **Save** — Click **Save** to save your changes and exit.

8.4 OPC UA Tags

AMS Machine Works supports integration with OPC UA tags and information exchange. There are two types of OPC UA tags available in AMS Machine Works:

1. **Export Tags** — Export tags are automatically defined OPC UA tags which allow data to be read from AMS Machine Works. See: AMS Machine Works System Guide
2. **Import Tags** — Import tags are manually defined OPC UA tags which allow data to be written into AMS Machine Works.

The OPC UA tags listed in this section of the **Network Device Module** are **Import Tags** that are designed to bring data into AMS Machine Works.

They have the following characteristics:

1. Each OPC UA tag defined in AMS Machine Works must have a unique name.
2. Each OPC UA tag must have the same unit set as the external data source is using.

   ⚠ CAUTION

   Using an incorrect unit will result in errors in both the collected data, and calculations based on that data.

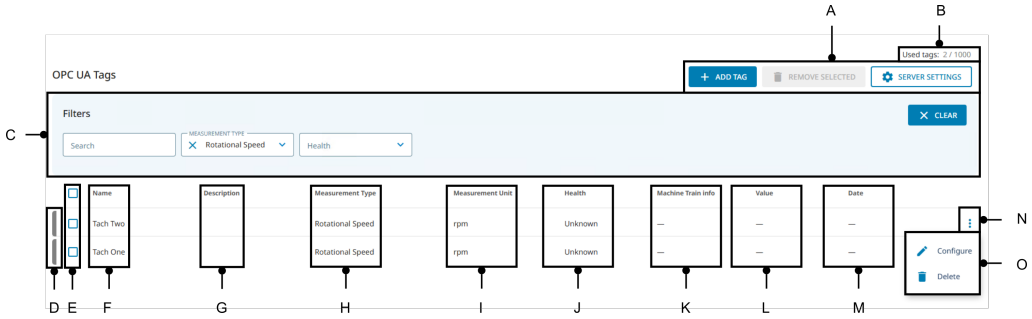
3. Each OPC UA tag can only be assigned to one **Asset**. See: Add an OPC UA Tag to an Asset
4. OPC UA tags defined in AMS Machine Works can be matched with OPC UA tags available on your network. This is performed in the 3rd party OPC UA client of your choice.

- The OPC UA tags are found on the AMS Machine Works server in a flat list in the OPC hierarchy here: **Root** → **Objects** → **AMS Machine Works** → **Opc adapter**
- Until an OPC UA tag has been mapped to an external data source and received some data it will have the **Health** status of **Unknown**.

OPC UA Server configuration:

1. To configure a connection to an OPC UA server consult the AMS Machine Works System Guide.
2. To configure the OPC UA Server refresh rate and timeout see: Change the OPC UA Server Settings

Figure 8-69: OPC UA Tag List



A. ***Controls*** — *Use these buttons to manage the* ***OPC UA Tag List****, and the* ***OPC UA Server Settings****.*
   - ***Add Tag*** — *Click this button to add an OPC UA tag. See: Add / Edit an OPC UA Tag*
   - ***Remove Selected*** — *Select one or more checkboxes to select some OPC UA tags, and then click this button to remove one or more OPC UA tags. See: Remove an OPC UA Tag*
   - ***Server Settings*** — *Click this button to set the* ***Refresh Rate*** *and* ***Timeout*** *for the OPC UA server connection. See: Change the OPC UA Server Settings*

     Note
     To configure other elements of the OPC UA server connection consult the AMS Machine Works System Guide.

B. ***OPC UA Tag Usage*** — `<number of tags used> / <total number of tags>`
   The `<total number of tags>` *= 1000.*
C. ***Filters*** — *This area contains filters for finding specific OPC UA tags.*
   - ***Search*** — *Search for an OPC UA tag by matching some text in its name.*
   - ***Measurement Type*** — *Narrow your search to OPC UA tags with a specific measurement type.*
     The supported measurement types are:

     A. ***Acceleration***
     B. ***Acoustic Emission***
     C. ***Arbitrary Unit***
     D. ***Current***
     E. ***Degree***
     F. ***Displacement***
     G. ***Force***
     H. ***Mass Flow Rate***
     I. ***Moisture In Oil Saturation***
     J. ***Moisture In Oil Water Activity***
     K. ***Moisture In Oil Water Content***
     L. ***Oil Quality***
     M. ***Pressure***
     N. ***Proportion***

O. ***Resistance***
P. ***Rotational Speed***
Q. ***Strain***
R. ***Temperature***
S. ***Velocity***
T. ***Voltage***

- ***Health*** *— Filter by the health of the OPC UA tag. (**Unknown** / **Good** / **Critical**)*
- ***Clear*** *button — Click the **Clear** button to reset the filters.*

D. ***Health Indicator*** *— The color indicates the **Health** status of the connection between each tag and an external data source. (Gray = **Unknown** / Green = **Good** / Red = **Critical**)*
E. *Selection checkboxes — Select individual items, or use the checkbox at the top to select all. For use with the **Remove Selected** button. See: Remove an OPC UA Tag*
F. ***Name*** *— The **Name** you assigned to the OPC UA tag in AMS Machine Works.*
G. ***Description*** *— If a **Description** was set when you added or edited the OPC UA tag, it is displayed here.*
H. ***Measurement Type*** *— The correct **Measurement Type** must be set for calculations to be performed correctly.*
I. ***Measurement Unit*** *— The correct **Measurement Unit** must be set for calculations to be performed correctly.*
J. ***Health*** *— **Unknown** / **Good** / **Critical***
K. ***Machine Train Info*** *— The*
L. ***Value*** *— The most recent value associated with this OPC UA tag.*
M. ***Date*** *— The date when the most recent value was collected.*
N. ***Vertical Ellipsis Icon*** *— Click the **Vertical Ellipsis Icon** to open the **OPC UA Tag Management** menu.*
O. ***OPC UA Tag Management*** *menu — This menu has the following options:*
    A. ***Configure*** *— Select **Configure** to begin the process to edit the **OPC UA** tag. See: Add / Edit an OPC UA Tag*
    B. ***Delete*** *— Select **Delete** to delete the **OPC UA** tag. See: Remove an OPC UA Tag*

8.4.1 Add / Edit an OPC UA Tag

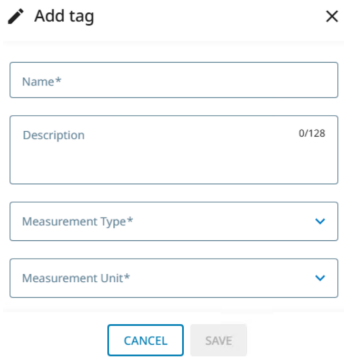
To add or edit an OPC UA tag follow this process.

Prerequisites

In the **OPC UA Tags** section of the **Network Device Module**, initiate the Add / Edit process.

- To **create** a new tag, click **Add Tag**. See: OPC UA Tags
- To **edit** an existing tag, click the vertical ellipsis next to the tag you want to edit, and select **Configure**. See: OPC UA Tags

Figure 8-70: Add / Edit Tag Interface



Procedure

1. (Required) Enter a unique name. (Maximum 128 characters)
2. (Optional) Enter a description. (Maximum 128 characters)
3. (Required) Select the **Measurement Type**.
   - **Acceleration**
   - **Acoustic Emission**
   - **Arbitrary Unit**
   - **Current**
   - **Degree**
   - **Displacement**
   - **Force**
   - **Mass Flow Rate**
   - **Moisture In Oil Saturation**
   - **Moisture In Oil Water Activity**
   - **Moisture In Oil Water Content**
   - **Oil Quality**
   - **Pressure**
   - **Proportion**
   - **Resistance**
   - **Rotational Speed**
   - **Strain**
   - **Temperature**
   - **Velocity**
   - **Voltage**

4. (Required) Select the **Measurement Unit** that the **external system** uses.

⚠ CAUTION

Choosing the wrong **Measurement Unit** causes inaccuracies in the calculation and display of your data. Some **Measurement Types** only have one **Measurement Unit** to choose from. In general, the default unit is **metric**.

   a. **Acceleration** — Choose: (Default) **g** or **m/s²**
   b. **Acoustic Emission** — Only: **dB**
   c. **Arbitrary Unit** — No unit is specified.
   d. **Current** — Only: **A**
   e. **Degree** — Only: °
   f. **Displacement** — Choose: (Default) **µ** or **mil**
   g. **Force** — Only: **kN**
   h. **Mass Flow Rate** — Choose: (Default) **kg/h** or **lb/h**
   i. **Moisture In Oil Saturation** — Only: **%**
   j. **Moisture In Oil Water Activity** — Only: **%**
   k. **Moisture In Oil Water Content** — Only: **ppm**
   l. **Oil Quality** — Only: **OQU**
   m. **Pressure** — Choose: (Default) **kPa** or **psi**
   n. **Proportion** — Only: **%**
   o. **Resistance** — Only: **Ω**
   p. **Rotational Speed** — Only: **rpm**
   q. **Strain** — Only: **µε**
   r. **Temperature** — Choose: (Default) **°C** or **°F**
   s. **Velocity** — Choose: (Default) **mm/s** or **in/s**
   t. **Voltage** — Only: **V**

5. Create the **OPC UA Tag** or cancel the process.
   - Click **Save** to record your changes.
   - Click **Cancel** exit without making changes.

8.4.2 Remove an OPC UA Tag

An OPC UA tag can be removed, even if it is in use. The data associated with the tag remains with the **Machine Train**.

Prerequisites

Ensure that you have selected the proper OCU UA tag.

Procedure

1. In the **Vertical Ellipsis Menu** next to the OPC UA tag, select **Delete**.
2. In the **Delete tag** dialog, choose to proceed or cancel.
   - Choose **Confirm** to delete the OPC UA tag.
   - Choose **Cancel** to exit without making any changes.

8.4.3 Remove selected OPC UA Tags

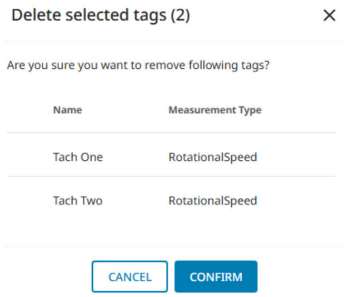
Multiple OPC UA tags can be removed at one time, even if they are in use. The data associated with the tags remains with the **Machine Train**.

Prerequisites

Ensure that you have selected the proper OCU UA tags. See: OPC UA Tags

1. In the **OPC UA Tags** list window:
   - **Either**: Select the **Checkboxes** next to as many OPC UA tags as you want to **Delete**.
   - **Or**: Click the **Checkbox** at the top of the column to select every OPC UA tag.
2. In the **OPC UA Tags** list window, click the **Remove Selected** button.
3. The **Delete Selected Tags Dialog** is open.

Figure 8-71: Delete Selected Tags Dialog



Procedure

1. Confirm that you have only selected the OPC UA tags that you want to delete.
2. In the **Delete Selected Tags** dialog, choose to proceed or cancel.
   - Choose **Confirm** to delete the OPC UA tags.

Note
The OPC UA tags are immediately deleted, even if they are in use.

- Choose **Cancel** to exit without making any changes.

8.4.4 Change the OPC UA Server Settings

The OPC UA Server Settings dialog has fields for two independent values, the **Refresh Rate** and **Timeout**.

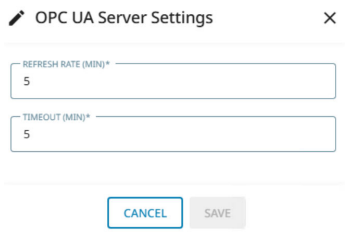
The **Refresh Rate** sets how often AMS Machine Works accepts a new value. The system records a value once during each period of the **Refresh Rate**.

The **Timeout** sets how long AMS Machine Works waits after the last value was received for a new value. If no new value is received within the **Timeout** period, the **Health** of the OPC UA tag is set to **Critical** until a value is received.

Prerequisites

1. In the **OPC UA Tags** window, click the **Server Settings** button.
2. The **OPC UA Server Settings** dialog opens.

Figure 8-72: OPC UA Server Settings



- **Refresh Rate** — (Required)(Default: 5)(Range from 1 to 60 minutes.)
- **Timeout** — (Required)(Default: 5)(Range from 1 to 60 minutes.)

Procedure

1. (Optional)To make a change, set the **Refresh Rate** within the range of 1 to 60 minutes.
2. (Optional) Set the **Timeout** within the range of 1 to 60 minutes.
3. In the **OPC UA Server Settings** dialog, choose to proceed or cancel.
   - Choose **Save** to record your changes.
   - Choose **Cancel** to exit without making any changes.

9 Portable Device Module

The Portable Device Module is responsible for defining and managing measurement routes, loading the routes to AMS 2140 Machinery Health Analyzers, dumping or importing route data from the AMS 2140 devices to the AMS Machine Works Server, and managing Portables Agents and analyzers that are added to the system.

AMS 2140 is a portable vibration analyzer used in measuring and collecting vibration data from a broad range of machinery. The data collected are then transferred to AMS Machine Works for storage and further analysis. The AMS 2140 can be connected to your network in three ways: wireless, Ethernet, or via USB.

The Portable Device Module can connect to a maximum of 20 AMS 2140 analyzers simultaneously. You can add more devices to the system as long as there are only 20 devices connected at a time. Data transfer can be performed simultaneously with up to two AMS 2140 analyzers .

To access this module, click **PORTABLE DEVICE MODULE** on the sidebar.

Note

- Access to features and functions in the Portable Device Module may be limited depending on your user role as set in User Manager.
  The following users can add agents and devices, manage routes, and perform data transfer: Administrator, Co-Administrator, and Operator. The Portable Device User can perform the same actions except manage agents.
- Users without access to a particular location will not be able to view the routes in that location.
- Users without an assigned location will not be able to view some features in the Portable Device Module.

9.1 Supported AMS 2140 Firmware

AMS Machine Works supports firmware version 1.3.13.0 or later of the AMS 2140 Machinery Health Analyzer. Emerson recommends upgrading to the latest firmware version for best use of the device.

To view the firmware version on your AMS 2140 analyzer, select **Home > ALT > F1 Version** on the device.

The software will prompt and notify you if the firmware needs to be updated.

To upgrade to the latest firmware, check the AMS 2140 Machinery Health Analyzer User Guide, or contact Technical Support.

9.2 Analysis Expert Tools

The Portable Device Module supports the following analysis expert tools in the AMS 2140.

Table 9-1: Analysis Expert Tools

Analysis	Analyze Mode
Manual Analyze	Waveform
Manual Analyze	Spectra
Manual Analyze	Third Octave
Analysis Experts	True Zoom
Analysis Experts	High Frequency Analysis
Analysis Experts	High Resolution Analysis
Analysis Experts	PeakVue Analysis - Bearing/Gears
Analysis Experts	PeakVue Plus
Analysis Experts	Turning Speed Detection
Analysis Experts	Laser Speed Detection
Analysis Experts	Bump Test Equipment Off
Analysis Experts	Bump Test Equipment Running
Analysis Experts	Coast Down Peak Hold
Analysis Experts	Rotor Bar Test Motor Current
Analysis Experts	Order Tracking
Analysis Experts	Synchronous Analysis
Analysis Experts	Cross Channel Amplitude/Phase
Analysis Experts	Low Frequency Analysis - SST

9.3 Connecting to an AMS 2140

AMS Machine Works connects to the AMS 2140 Machinery Health Analyzer via:

- USB
- Ethernet
- Wireless

Note

- If you plan to connect via USB, make sure you install the CSI USB driver. The installer can be found here: `C:\Installer_<version number>\dep\_Support\CSIUSBDriver`

  The `<version number>` is given in the **Service Status** page. See: Service Status Page
- To be able to communicate with the AMS 2140 using Ethernet or Wireless, the AMS Machine Works server needs to have Transport Layer Security or TLS 1.1 enabled on the operating system. If you intend to use either of these connections, check with your local IT to enable this setting. Consult the AMS Machine Works System Guide for details.

9.4 Portable Edge Agents

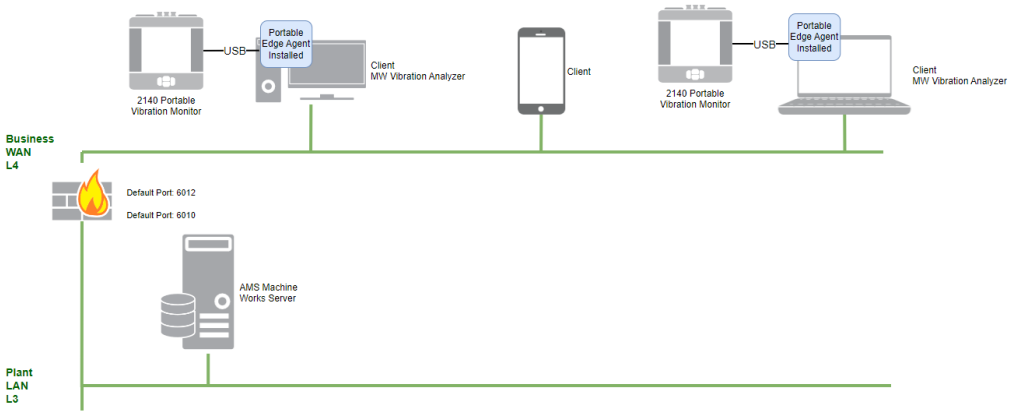
A Portables Agent is an agent that is specifically designed to communicate with AMS 2140 Machinery Health Analyzers. You need to set up and add Portables Agents to the AMS Machine Works system before you can connect to AMS 2140 analyzers, load routes to the analyzers, and then transfer data.

Multiple Portables Agents can operate simultaneously on an AMS Machine Works system. The system can connect to 20 analyzers at the same time and can perform data transfer simultaneously with up to two analyzers.

The application or service running Portables Agents is called the Portables Edge Agent. It establishes the communications connection between the AMS Machine Works Server and the analyzers.

The Portables Edge Agent can be installed with the AMS Machine Works Server on the same computer during the initial installation, or at a later time on the same computer. It can also be installed on other computers on the network as external agents. You can install the Portables Edge Agent on laptops and desktop computers.

Figure 9-1: Portables Agents on Premises



The process for setting up Portable Agents depends on your set-up. See Set up portable agents for details.

9.4.1 Supported Operating Systems

The Portables Edge Agent may be installed on the following operating systems:

For Portables Agents installed with the AMS Machine Works Server

- Windows Server 2016
- Windows Server 2019
- Windows Server 2022

For external Portables Agents

Note
External Portables Agents may be either desktop computers or laptops.

- Windows 10
- Windows 11

9.4.2 Portable Edge Agent Configuration

The process for adding Portable Edge Agents depends on your setup.

If you install the agent with the AMS Machine Works Server during the initial installation, you can add and register the agent right after the installation.

If at a later time you want to install an agent on the same computer where the AMS Machine Works Server is installed, see Installing on the AMS Machine Works Server.

If you are adding an external agent, or a Portables Agent on a computer separate from the AMS Machine Works Server, see Installing on an External Computer.

Installing on the AMS Machine Works Server

Follow this procedure (a) if you want to add a Portables Agent on the same computer as the AMS Machine Works Server, and (b) if you did not install it during the initial installation.

Procedure

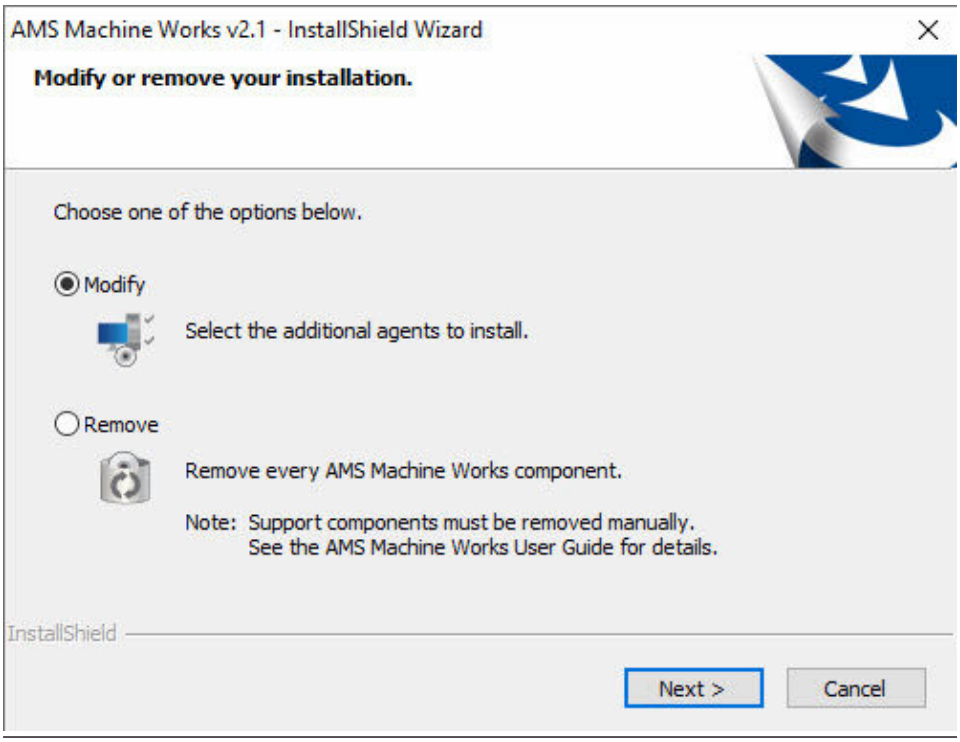
1. If you plan to connect to the AMS 2140 analyzer via USB, install the CSI USB driver first.

   Find the installer in the installation media: `C:\Installer_<version number>\dep\_Support\CSIUSBDriver`

   The `<version number>` is given in the **Service Status** page. See: Service Status Page

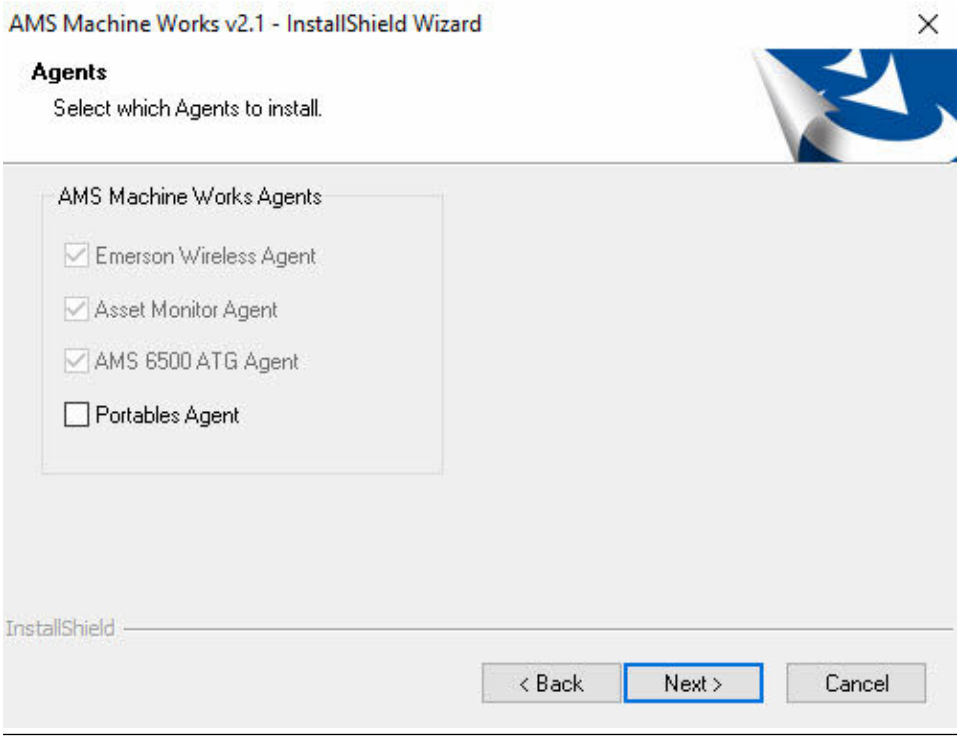
   If you plan to connect via Ethernet or wireless, skip this step.
2. Run the AMS Machine Works Installer.
3. When you get to this dialog, select **Modify**, and then click **Next**.

Figure 9-2: Modify installation dialog



4. When prompted to select which agents to install, select **Portables Agent**, and then click **Next**.

Figure 9-3: Select agents dialog



Note
If the Portables Agent is already installed on the computer, the selection for Portables Agent will be disabled in this dialog.

5. Follow the instructions on the install wizard until you finish.
6. After installing the Portables Agent, open the Portable Device Module.
7. Follow the procedure in Adding and Registering an Agent.

Installing on an External Computer

If you are adding an external agent, or a Portables Agent on a computer separate from the AMS Machine Works Server, do the following:

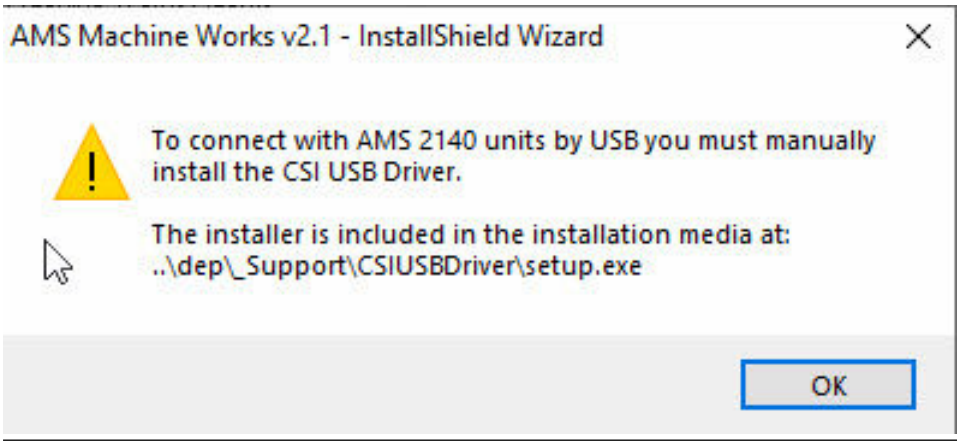
Procedure

1. If you plan to connect to the AMS 2140 analyzer via USB, install the CSI USB driver first.

   Find the installer in the installation media: `C:\Installer_<version number>\dep\_Support\CSIUSBDriver`

   The `<version number>` is given in the **Service Status** page. See: Service Status Page

Figure 9-4: Install CSI USB driver



If you plan to connect via Ethernet or wireless, skip this step.

2. Install the Portables Edge Agent on the separate computer.
3. Install the TLS certificate on the separate computer.
4. Add and register the external agent on the Portable Device Module.

Portable Edge Agent Installation

For external agents, the Portables Edge Agent is compatible with Windows 10 and Windows 11.

Procedure

1. On the computer where you plan to install the external agent, access the installer file for AMS Machine Works.
2. Run the install wizard.
3. When prompted, select **Agent Server**, and then click **Next**.
4. Select **Portables Agent**, and then click **Next**.
5. Enter the machine name and port of the AMS Machine Works Server.

Note
The wizard defaults to the machine name of the computer that you are using. Make sure to edit this to the machine name of the AMS Machine Works Server.

Note
If your network has a proxy server between this computer and the AMS Machine Works server, enter the proxy server name. For further details refer to the AMS Machine Works System Guide.

6. Complete the wizard.

TLS Certificate Installation

Procedure

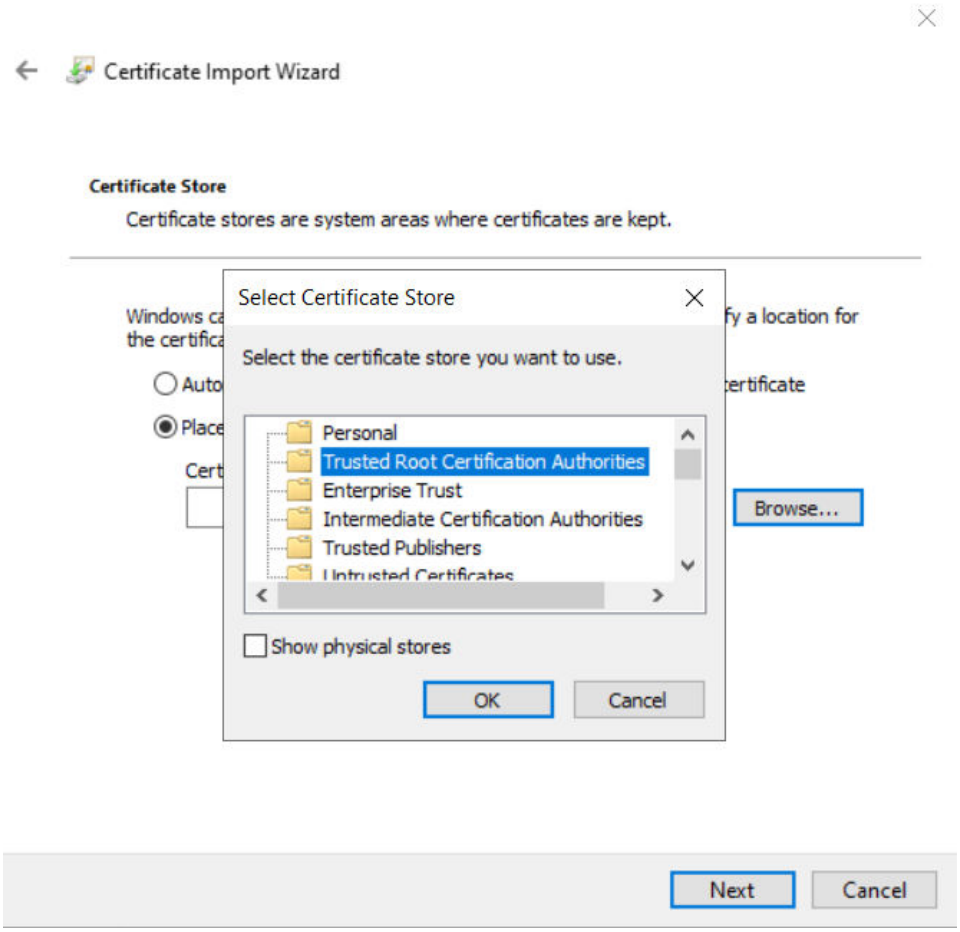
1. On the computer where you want to install the Portables Agent, add the Hostname and IP address of the AMS Machine Works Server to the hosts file.

   The hosts file is usually located at `C:\Windows\System32\drivers\etc\hosts`.

---

2. Open Microsoft Edge.
3. Launch the Portable Device Module: `https://<Your_AMS_Machine_Works_Server_Name>/PortablesApp/`

   You will see a "Not Secure" prompt on the browser. This means that there is no TLS certificate installed.
4. Click the "Not Secure" button to start the process of installing the AMS Machine Works TLS certificate.
5. Click the right arrow.
6. Click the certificate icon highlighted in red to see the certificate details.
7. Click the **Details** tab, then click **Export**.
8. Click **Save**.
9. Go to the location where the certificate was saved. Find the certificate and double click on it.
10. Click **Install Certificate...**
11. Select **Local Machine**, then click **Next**.
12. Select **Place all certificates in the following store**, and then click **Browse**.
13. Select **Trusted Route Certification Authorities**, and then click **OK**.



14. Click **Next**, and then click **Finish** to complete the installation.
15. Close the browser and then open a new one.
16. Launch the Portable Device Module: `https://<Your_AMS_Machine_Works_Server_Name>/PortablesApp/`

    The lock on the browser verifies that the certificate was installed successfully and that the Portables Agent will be able to communicate with the Portables Interface gateway on the AMS Machine Works server.

9.4.3 Adding and Registering an Agent

Procedure

1. Launch the Portable Device Module.
2. Do either of the following:
   - On the Navigator menu, click the vertical ellipsis, and then click **Add Agent**.
   - On the Navigator, click .

   The Add New Agent side panel opens.

3. Create an agent name, and then click **SAVE**.

   A random registration key is generated.

4. Copy the registration code. You will need this code to register the agent. This key expires in two minutes by default.

Note
You can change the expiration time for the registration key in Agent Settings.

The newly created agent appears on the Agents list in the Navigator. A yellow strip appears beside the agent name. On the main window, the status appears as **Not connected** and **Registration pending**.

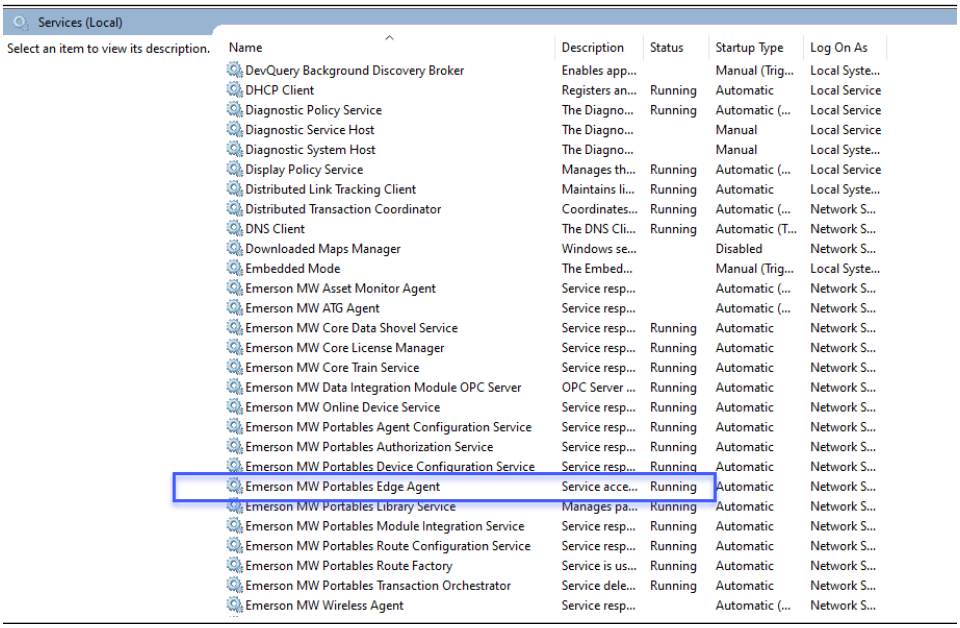
Figure 9-5: Agent registration pending



Note
If you are unable to paste the registration code before it expires, click **REFRESH REGISTRATION KEY** to generate a new code.

5. Open Command Prompt as computer administrator.
6. Change directory, and then type the path to the Portable Edge Agent files: `C:\Program Files\Emerson\AMS Machine Works\PEA`.
7. Paste the registration code, and then press **Enter**.
8. Close Command Prompt.
9. Open Windows Services.
10. On the list of Services, check the status of **Emerson MW Portables Edge Agent**.

    If the status is not **Running**, right-click **Emerson MW Portables Edge Agent**, and then click **Start**.



The Portables Agent is successfully registered.

To verify, check the Agents list on the Navigator. If the registration is successful, the color strip beside the agent name is green.

On the agent details on the main window, the status appears as **Connected** and **Registered**.

Figure 9-6: Agent registered and connected



Note

Make sure to follow the steps exactly as described when adding and registering an agent. You may encounter issues with loading routes if you improperly register an agent. If this happens, stop the Portables Edge Agent in Windows services, delete the original agent, navigate to `C:\ProgramData\Emerson\AMSMachineWorks\Data\PEA\auth`, and then delete **gen.auth.appSettings.json file** to clear out any faulty registrations. Follow the steps again to add and register an agent.

9.4.4 Deleting Agents

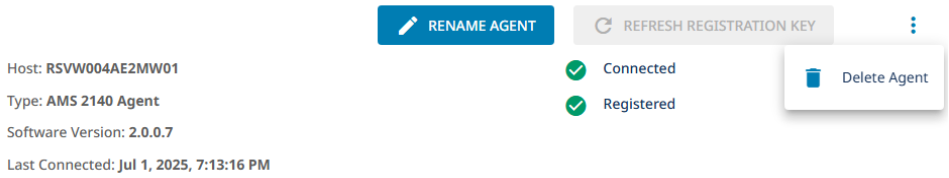
To delete a **Portable Edge Agent**, you must perform some steps in the AMS Machine Works interface, and some steps in the operating system of the device that the **Agent** is running on.

Prerequisites

Before deleting an agent, you need to disconnect the AMS 2140 devices connected to that agent. Make sure that you delete the file in the last step when you delete an agent from the user interface.

Procedure

1. Launch the Portable Device Module.
2. Open the Agents tab.
3. From the Side Panel, select an agent.
4. Click the vertical ellipsis, and then click **Delete Agent**.



5. When prompted, click **CONFIRM**.
6. Open the **Windows Service** console.
7. Stop the **Emerson MW Portables Edge Agent** service.
8. Go to the following directory: `C:\ProgramData\Emerson\AMSMachineWorks\Data\PEA\auth`
9. Clear the files from the directory. Delete: **gen.auth.appSettings.json**.

9.4.5 Agent Settings

This screen lets you configure the default settings to generate the agent registration key.

Procedure

1. Launch the Portable Device Module.
2. Open the Agents tab.
3. On the Navigator, click .
   The Agent Settings side panel opens.
4. Configure the following:
   - **Digits or Bytes**—Registration key will be in either format.
   - **Registration Key**—Key length can be from 6 to 256.
   - **Registration Key Time in Minutes**—Expiration time can be from 2 to 60 minutes.
5. Click **SAVE**.

9.5 Routes

A route is a sequence of equipment and measurement points from a site arranged in the order that an operator collects data using an analyzer. A route also contains instructions for how the analyzer collects and stores data. All information transferred between AMS Machine Works and an analyzer such as the AMS 2140 must be in the form of a route.

The system has capacity for up to 100 routes and 100 collections with a combination of some or all of the machine trains and measurement points. A route can contain up to 1040 measurement points. Routes do not affect the definitions of machines and measurement points. Routes can be created, modified, and/or deleted without causing changes in the definitions within the database.

Tip
Emerson recommends reloading routes on your analyzer regularly before periodic data collection. Database administrators can coordinate changes to database definitions based on data collection schedules. Only change the database definitions after active routes are completed and saved to the database.

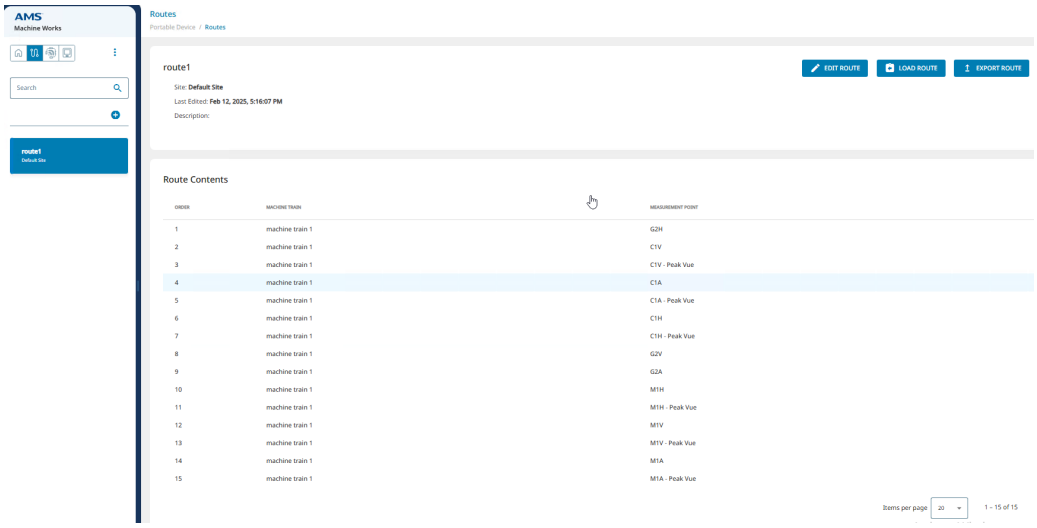
9.5.1 Routes Interface

The list of routes on the system is shown in the Navigator on the left. Route information such as the location, last edit timestamp, description, and the contents of the route are shown on the right of the screen.

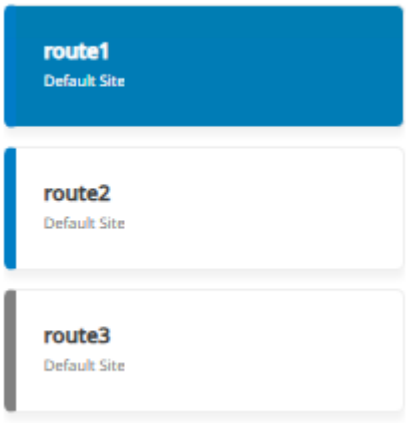
The Route Contents on the right of the screen show the machine trains and measurement points in the route highlighted in the Navigator. Arrows appear when you point the cursor to ORDER, MACHINE TRAIN, and MEASUREMENT POINT at the top of the columns. You can use these arrows to sort the order of the measurements in ascending or descending order, or sort the machine trains and measurement points in alphabetical or reverse alphabetical order.

Sorting the route contents here does not affect the order of the measurement points in the route.

Figure 9-7: Routes tab



Route names are highlighted when the route is selected. The blue health strip beside the route name indicates that the route has at least one measurement point. The gray health strip means that the route is empty. Routes with no measurements cannot be loaded to devices.



9.5.2 Managing Routes

You must have read/write permission to create, edit, copy, or delete routes. Users with the following roles can manage routes in the Portable Device Module:

1. Administrator
2. Co-Administrator
3. Operator
4. Portable Device User

Contact the AMS Machine Works Administrator or Co-Administrator for more information about your user role and permissions.

Creating Routes

Prerequisites

Before creating a route, make sure that you have built machine trains, added measurement points and locations, assigned analysis parameters and alerts to components, and configured the sensors and measurement points. For more information, see the instructions in DESIGN STUDIO.

Procedure

1. Launch the Portable Device Module.
2. Open the Routes tab.
3. Do either of the following:
   - From the Navigator menu, click the vertical ellipsis, and then click **Add Route**.
   - From the Navigator, click .

   The Add Route side panel opens on the right.
4. Create a route name.
5. Select a site.
6. Click **ADD**.

   A notification appears on the lower right if the route is created successfully.

   The Edit Route screen appears.
7. [Optional] Fill out the route description.
8. From the Machines list, select the measurement points that you want to add to the route. You can also select a parent node (folder, machine train, or machine) in the hierarchy to include everything under the parent node.

   Do either of the following:
   - Click  to add the selected items to Route Contents.
   - Drag and drop the selected items to Route Contents.
9. Click **SAVE**.

Note
The health strip color beside the route name in the route list indicates if the route has a measurement point. If the color is gray, it means the route is empty.

Editing Routes

You can modify routes at a later time to add, remove, or reorder measurement points. You can only add machines and measurement points from the site where the route is located, and only from the sites that you have access to as set in User Manager.

Procedure

1. Launch the Portable Device Module.
2. Open the Routes tab.

   The list of routes appears in the Navigator. The Route Contents are displayed on the right.
3. Click **EDIT ROUTE** .

   The machine trains appear on the left and the measurement points are shown on the right. These are the machine trains that are in the selected site and the measurement points that were created in DESIGN STUDIO.
4. To add measurement points:
   a. On the Machines list, select the measurement points that you want to add, and then click .
   If the selected points are not yet in the route, the arrow pointing to the right will be enabled.
   Measurement points and machines already in the route will be highlighted gray. The items will be checked and inactive.
   You can also select a parent node (folder, machine train, or machine) in the hierarchy to include everything under it.
   You can also drag and drop items to the Route Contents on the right.
   b. Click **SAVE**.
5. To remove measurement points:
   a. On the Route Contents, select the measurement points that you want to remove, and then click **REMOVE SELECTED**.
   If you want to remove all the measurement points, click **REMOVE ALL**.
   b. Click **SAVE**.
6. To reorder measurement points:
   a. Drag the measurement points in the order that you want.
   b. Click **SAVE**.

Duplicating Routes

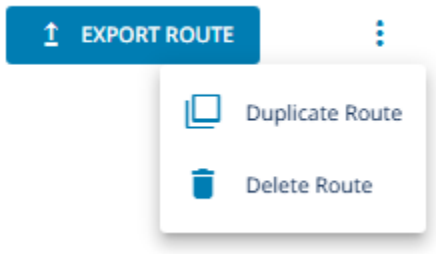
Use this feature to copy existing routes. This feature is useful when you need to create a new route that is similar to an existing route but need to make some modifications, especially if it's a large route with hundreds of machines and measurement points.

Procedure

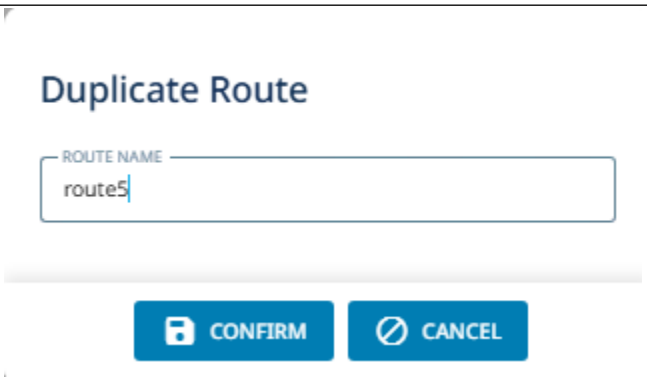
1. Launch the Portable Device Module.
2. Open the Routes tab.

   The list of routes appears in the Navigator. The Route Contents are displayed in the work area.

3. Click the vertical ellipsis on the top menu, and then click **Duplicate Route**.



4. Create a route name, and then click **CONFIRM**.



The new route appears on the list of routes in the Navigator.

5. Click **EDIT ROUTE** .
6. To add measurement points:
   a. On the Machines list, select the measurement points that you want to add, and then click .
   If the selected points are not yet in the route, the arrow pointing to the right will be enabled.
   Measurement points and machines already in the route will be highlighted gray. The items will be checked and inactive.
   You can also select a parent node (folder, machine train, or machine) in the hierarchy to include everything under it.
   You can also drag and drop items to the Route Contents on the right.
   b. Click **SAVE**.
7. To remove measurement points:
   a. On the Route Contents, select the measurement points that you want to remove, and then click **REMOVE SELECTED**.
   If you want to remove all the measurement points, click **REMOVE ALL**.
   b. Click **SAVE**.

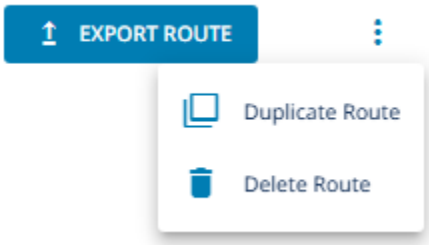
8. To reorder measurement points:
    a. Drag the measurement points in the order that you want.
    b. Click **SAVE**.

Deleting Routes

Deleting a route from the database does not remove it from the analyzer.

Procedure

1. Launch the Portable Device Module.
2. Open the Routes tab.
3. From the Routes list on the Navigator, select a route.
4. Click the vertical ellipsis on the top menu, and then click **Delete Route**.



Exporting Routes

This feature lets you export routes into a file which can be loaded later to AMS 2140 devices. Each route is saved as one RDF file. The RDF file contains information on how data will be collected but does not include the data.

You can transfer the RDF file to a device using the Stand Alone Data Transfer (SADT) application, or by using the AMS Machinery Manager. To download SADT, refer to the knowledge base article **NK-2200-0246** on Guardian or contact Product Support.

Procedure

1. Launch the Portable Device Module.
2. Open the Routes tab.
   The list of routes appears in the Navigator.
3. From the top menu on the main page, click **EXPORT ROUTE**.

   Note
   This button is disabled if the route is empty.

   A notification appears on the lower right of the screen when the file is downloaded successfully.
   Check the file in your Downloads folder.

Importing Route Data

This feature lets you import files that contain route collected vibration data from your local computers to AMS Machine Works. These collected data are saved in RDA file format.

Procedure

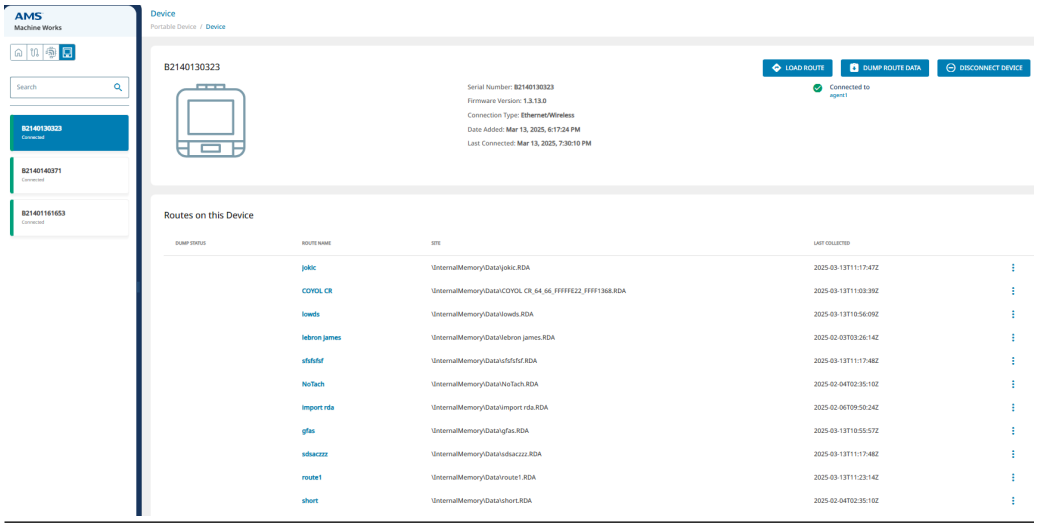
1. Launch the Portable Device Module.
2. Click **Home**.
3. From the Navigator menu, click the vertical ellipsis, and then click **Import Route Data**.

   The Import Route Data side panel opens.
4. Do either of the following:
   - Click **Browse**, and then browse to the location of the files that you want to import.
   - Drag and drop the files to the Upload Files box.
5. Click **IMPORT ROUTE DATA**.

9.6 Devices

The Devices tab shows the list of all AMS 2140 devices that have been added to the system. It also shows details of each device such as the serial number, firmware version, connection type, connection status, and the Portables Agent to which it is connected.

Figure 9-8: Devices tab interface



The Portable Device Module can connect to a maximum of 20 AMS 2140 analyzers simultaneously. You can add more devices to the system as long as there are only 20 devices connected at a time. If you are already connected to 20 devices and you need to connect a new one, disconnect first from any of the currently connected devices.

All devices appear on the side Navigator regardless of connection status. A color strip appears beside the device name on the Device list to indicate the connection status of the device.

Table 9-2: Device Color Indicator

Color Indicator	Connection Status
Green	Device is connected.
Gray	Device is not connected.
Yellow	Device is connected but the firmware is outdated.

9.7 Data Transfer

Data transfer from an AMS 2140 analyzer to AMS Machine Works must be done using the software.

Data transfer to the AMS Machine Works Server using the device is currently not supported.

You can load multiple routes to an analyzer and dump multiple routes at the same time from a single analyzer. You can also dump all the routes that are on the analyzer in one dump. There is no limit as to the data size of the routes and the amount of data that can be transferred. The only limit is the memory that is available on the AMS 2140 analyzer.

Only two AMS 2140 analyzers can transfer data simultaneously.

9.7.1 Loading Routes

Loading routes is the process of sending routes from AMS Machine Works to AMS 2140 analyzers. After creating routes and each time you edit the routes to modify machine trains and measurements, you need to load the routes to the devices.

Tip
Emerson recommends reloading routes on your analyzer regularly before periodic data collection. Database administrators can coordinate changes to database definitions based on data collection schedules. Only change the database definitions after active routes are completed and saved to the database.

Procedure

1. Launch the Portable Device Module.
2. Open the Routes tab.
3. On the Navigator, select a route from the list.
4. Click **LOAD ROUTE**.
5. Select a device, and then click **CONFIRM**.
   A notification appears on the lower right of the screen when the route is loaded successfully.

Need help?
When you have installed a **Portable Edge Agent** more than once on the same machine, the **Route** loading process only displays, "Routes on this Device", and does not complete.

You must:

a. Completely delete every **Portable Edge Agent** from that machine. See: Deleting Agents

b. Add **only one** new **Portable Edge Agent** to the system again. See: Adding and Registering an Agent

9.7.2 Loading Multiple Routes

Emerson recommends reloading routes on your analyzer regularly before periodic data collection. Database administrators can coordinate changes to database definitions based on data collection schedules. Only change the database definitions after active routes are completed and saved to the database.

Procedure

1. Launch the Portable Device Module.
2. Open the Devices tab.
3. From the list of devices on the Navigator, select the device where you want to load the routes.

   Note
   Make sure that the device is connected to the Portables Agent. The device is connected if a green strip appears beside the device name on the Navigator.

4. Click **LOAD ROUTE**.

   The Load Route side panel opens with a list of routes.

   Note
   If a route is already on the selected device, the route name appears with an exclamation mark. If you select a route that is already on the selected device, the system will overwrite the data saved on the device.

5. Select the routes that you want to send to the selected device, and then click **LOAD**.

   A notification appears on the lower right of the screen when the routes are loaded successfully to the selected device.

9.7.3 Dumping Data

This procedure covers importing data from AMS 2140 devices to AMS Machine Works.

Make sure that the Portables Agent is connected and registered before dumping data.

Tip
Emerson recommends adding routes to a collection for easier tracking of data dump progress. For more information, see Collections.

Procedure

1. Launch the Portable Device Module.
2. Open the Devices tab.
3. On the Navigator, select a device from the list.

   Note
   Make sure that the status of the device is currently connected. A check mark and a green indicator shows if the device is connected to the Portables Agent.

   Figure 9-9: Device is connected indicator

   The list of routes on the device is shown on the screen.
4. Click **DUMP ROUTE DATA**.

   Note
   This button is disabled if no route is detected on the device.
5. Select the routes that you want to import, and then click **DUMP**.
   If the import is successful, a notification appears on the lower right of the window.

9.8 Collections

The Collections tab lets you view, track, sort, and analyze the status of data collection activities from analyzers across the system. You can create a collection to monitor the status of data dump transfer for each route. Emerson recommends adding routes to a collection for easier tracking of data dump progress.

You can also generate a report of the collections for external processing and printing.

Collections are either:

- **Scheduled** — This type of collection has a due date and repeats on a set interval.
- **Ad hoc** — This type of collection does not have a due date and does not repeat.

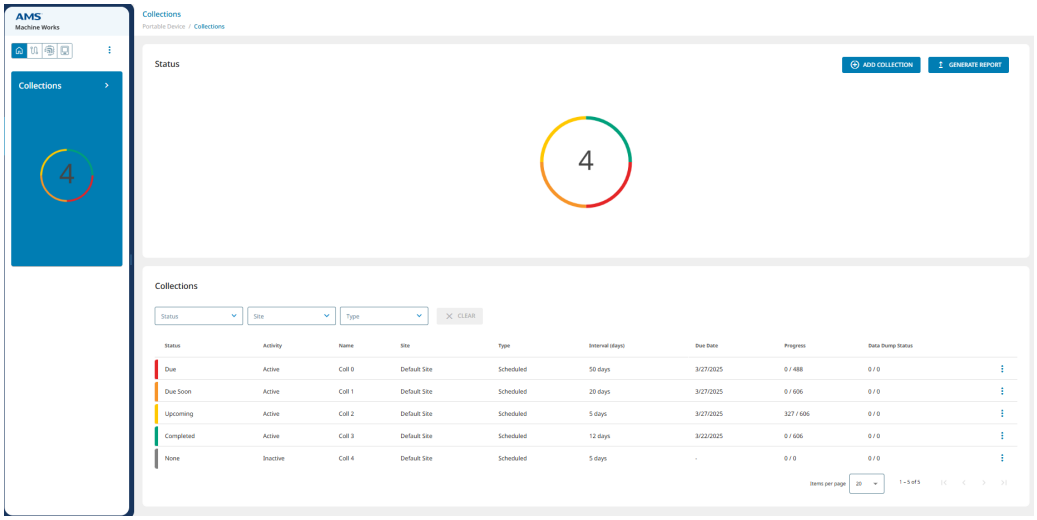
9.8.1 Collections Interface

The Collections tab shows the Collections list and the status of each collection. You can filter the collections in the list according to data dump status, site, and type of collection.

A graphical summary of the collection status or the collection status KPI is also shown as a doughnut chart with different status colors. Clicking a specific color from the doughnut chart also filters the collections list to only show collections that have that status. By default, the number in the middle of the doughnut chart indicates the number of collections included in the summary. This default number changes to the number of collections per status when you click a color status in the doughnut chart.

Only active scheduled collections are included in the collection status KPI or doughnut chart.

Figure 9-10: Collections tab



The table below shows the definitions of the Collection status and colors.

Table 9-3: Collection status and definitions

Color	Status	Definition
Yellow	Upcoming	The collection has not been completed and the remaining days is more than 40% of the interval before the due date.
Orange	Due Soon	The collection has not been completed and the remaining days fall within 40% to 20% of the interval before the due date.
Red	Due	The collection has not been completed and the remaining days fall within 20% to 0% of the interval before the due date.
Green	Completed	The collection has been completed and dumped.
Gray	Inactive	The collection is inactive.

9.8.2 Add a Collection

A one-to-one relationship exists between routes and collections. If you create a collection for a route, you cannot create another collection for the same route.

Procedure

1. Launch the Portable Device Module.
   Make sure that you are in the Collections tab.
2. From the top menu, click **ADD COLLECTION.**
   The Add Collection drawer appears.
3. Fill out the Name field. You may enter up to 255 characters.
4. [Optional] Fill out the Description field. You may enter up to 500 characters.
5. Select a Type from the dropdown menu.
   - **Scheduled** — This type of collection has a due date and repeats on a set interval.
     a. Select a Due date in the calendar.
     b. Enter a number in the Interval field. An interval is the number of days that you want the software to repeat the collection. You may enter a number up to 2000.
     c. Set whether you want the collection to be active or not.

     Note
     Inactive collections are not included in the KPI chart and are listed at the bottom of the Collections list.

   - **Ad-hoc** — This type of collection does not have a due date and does not repeat.
6. Select a Site. Only the sites that a user has access to appear in the dropdown menu.
7. Select a Route. Only the routes that are in the selected site appear in the dropdown menu.
8. Click **ADD**.
   A notification appears on the lower right of the window when the collection is added successfully.

9.8.3 Generating Reports

This feature lets you generate a list of the collections in .csv format so you can export it for external processing. The spreadsheet follows the filtering that you set in the software.

Procedure

1. Launch the Portable Device Module.
   Make sure that you are in the Collections tab.
2. From the top menu, click **GENERATE REPORT**.

   Note
   This button is disabled if there are no available collections.

   A notification appears when the file is downloaded successfully.
   Check the csv file in your Downloads folder.

10 Vibration Analyzer

The Vibration Analyzer is a module of AMS Machine Works. You can use it to diagnose your machines by viewing plots to analyze vibration data collected from devices that are monitoring machines in your site.

A wide variety of plots are available such as Spectrum, Trend, and Waveform, as well as Orbit, Shaft Centerline, Cascade, Bode/Nyquist, and Full-Spectrum.

You need to install the Vibration Analyzer separately after installing AMS Machine Works. To install, see Install the Vibration Analyzer. After you complete the installation, you may access the Vibration Analyzer from the Windows Start menu.

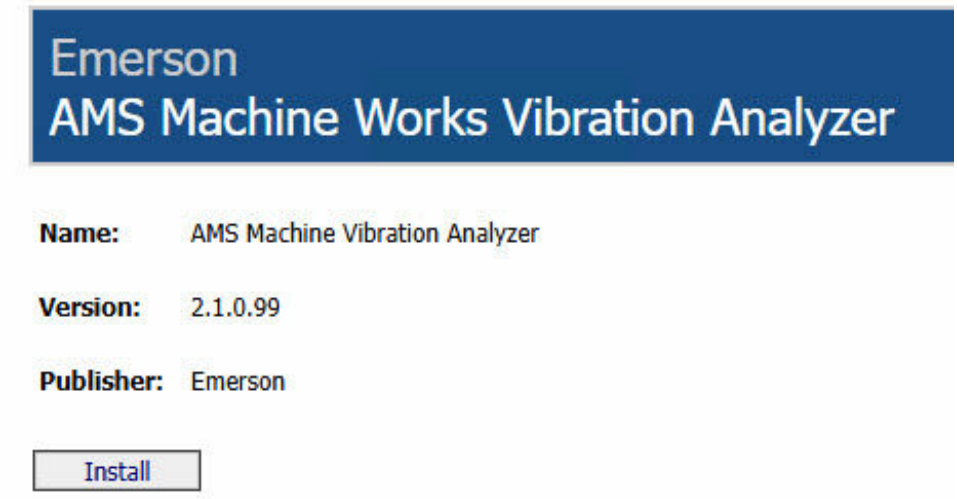
You can launch the Vibration Analyzer on the client or server computer where it is installed.

10.1 Install the Vibration Analyzer

The Vibration Analyzer needs to be installed separately after installing AMS Machine Works.

Procedure

1. Type `https://<Your_AMS_Machine_Works_Server_Name>/vibapp` on the browser.
2. When this page appears, click **Install**.



   The **VibAppSetup.exe** file is downloaded to your Downloads folder, or to the location where you set your downloads to be saved.

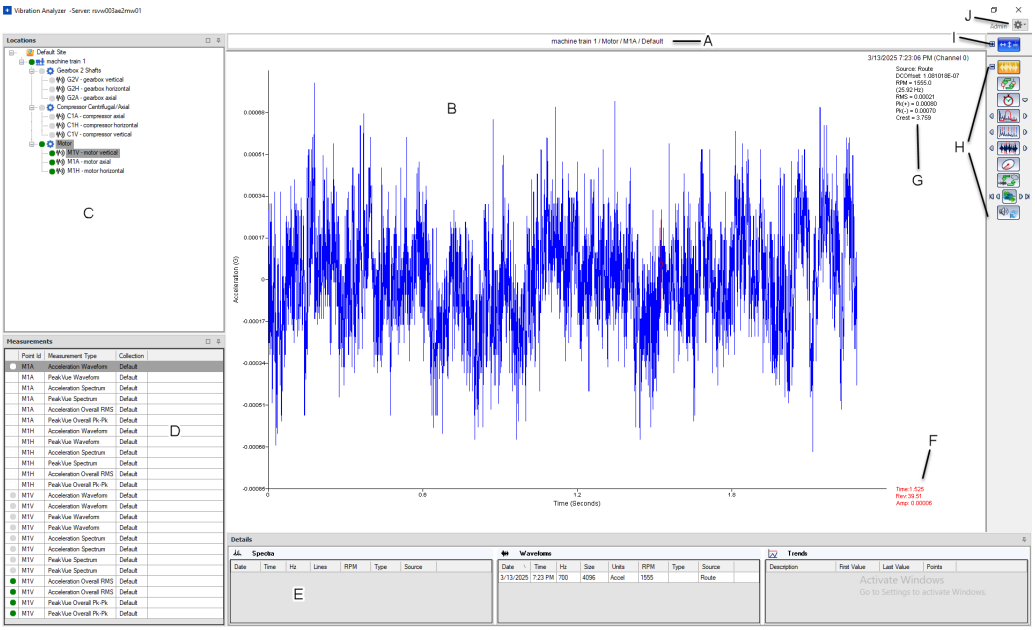
3. Right-click **VibAppSetup.exe**, and then select **Run as administrator**.
   The AMS Machine Works Vibration Analyzer install wizard appears.
4. Click **Next**.

5. When prompted, enter the Server Name or IP Address of the AMS Machine Works Server, and then click **Next**.
6. When this dialog appears, click **Install**.
7. Follow the instructions on the screen until the installation is completed, and then click **Finish**.

After you complete the installation, you may access the Vibration Analyzer from the Windows Start menu.

10.2 Vibration Analyzer user interface

Figure 10-1: Vibration Analyzer user interface



You can organize your workspace to show just the information you need. It may contain any combination of the following:

A. ***Label for plotting workspace*** *— identifies the data currently displayed in the plotting workspace.*
B. ***Plotting workspace*** *— displays plots and information about each plot type.*
C. ***Locations navigator*** *— lets you navigate to a measurement location.*
D. ***Measurements navigator*** *— displays available measurements by location, measurement type, and collection.*
E. ***Details navigator*** *— displays all available measurements for the selection in the Locations and Collections navigators. The measurements are shown under the Spectra, Waveform, and Trends tables.*
F. ***Plot information*** *— information about the current plot.*
G. ***Cursor details*** *— displays details about the cursor location on the plot.*
H. ***Function bar*** *— shows the functions that are available according to the plot selection.*
I. ***Common controls*** *— functions that are available to all plot types.*
J. ***Settings*** *— used to configure Unit Preferences, Selection Type Preferences, AMS Machine Works Server Settings, Refresh Hierarchies, and Hiding Unmapped Measurements.*

Moving the Navigators

The Locations, Measurements, and Details navigators are movable windows. To move these navigators, click and drag the navigator title bar to a desired location. To move it back to the default location, drag it back.

You can also click the Settings icon and then select **Refresh Hierarchies** to return the navigators to their default positions. **Refresh Hierarchies** is also used to update the

Vibration Analyzer application when changes are made in DESIGN STUDIO, NETWORK DEVICE MODULE, or PORTABLE DEVICE MODULE. The software prompts you to do this when changes are made.

If you want to keep your custom navigator locations, exit the Vibration Analyzer application after making the edits in the other modules and then reopen it, instead of using **Refresh Hierarchies** as prompted.

Hiding the Navigators

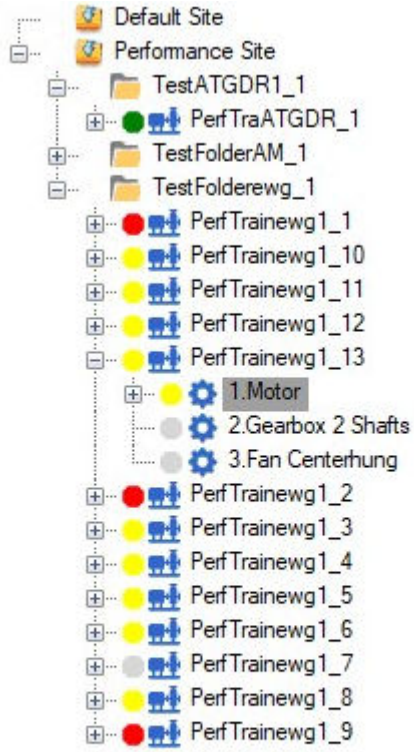
Use the pushpin icon to hide the navigators. When a navigator is hidden, a tab displays to the left or at the bottom of the main application window. Click this tab to toggle the navigator's display.

10.2.1 Locations navigator

This navigator lets you browse machines in your site, including measurement locations. The machines are organized in tree form, which represent all available machine trains onsite. For more information on creating a machine train, see the Design Studio section.

When you add machines in the other modules, this is also reflected in the Locations navigator, including the measurement locations. When you click an item in the Locations navigator, the Measurements navigator shows the available measurements in the selected location.

Figure 10-2: Locations navigator



All items in this navigator have health indicators in the form of a color disk. The table below describes the meaning of the alert colors. The machine component status reflects the most severe measurement point status. Similarly, the machine train status reflects the most severe measurement component status.

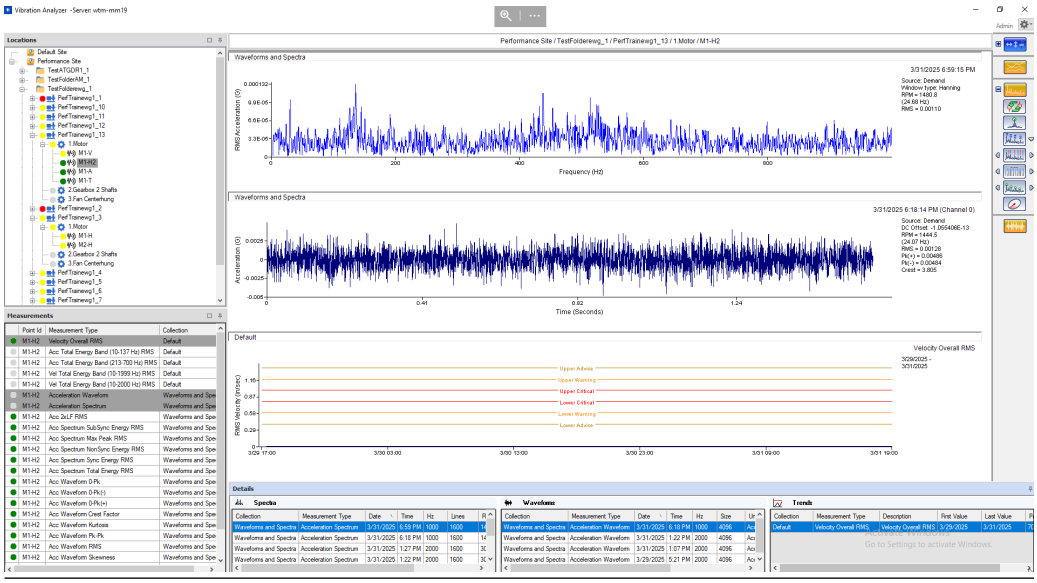
Table 10-1: Locations navigator bubble states for machine trains

Color	Meaning
Red	Critical Alert
Orange	Warning Alert
Yellow	Advise Alert
Green	Normal, No alert
Grey	Alert not applicable Alert not received
White	No Data

When you select a machine train or multiple measurement points in the Locations navigator, the software will automatically select the associated waveform, spectrum, and

trend plot in the Measurements Navigator. The first item in the Details navigator is also automatically selected. The graphs are shown in the plotting workspace, except for PeakVue trends.

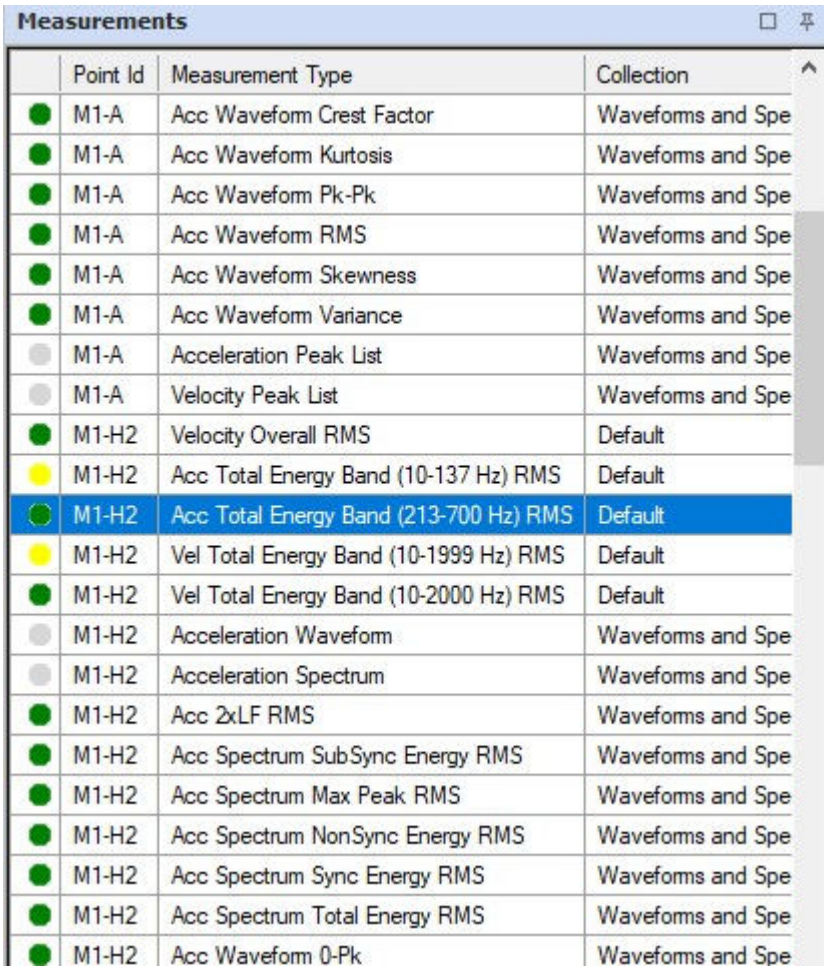
Figure 10-3: Auto selection



10.2.2 Measurements navigator

When a machine or machine train is selected in Locations, the Measurements navigator displays all measurements that are available. The measurements are grouped into collections.

Figure 10-4: Measurements navigator



	Point Id	Measurement Type	Collection
●	M1-A	Acc Waveform Crest Factor	Waveforms and Spe
●	M1-A	Acc Waveform Kurtosis	Waveforms and Spe
●	M1-A	Acc Waveform Pk-Pk	Waveforms and Spe
●	M1-A	Acc Waveform RMS	Waveforms and Spe
●	M1-A	Acc Waveform Skewness	Waveforms and Spe
●	M1-A	Acc Waveform Variance	Waveforms and Spe
○	M1-A	Acceleration Peak List	Waveforms and Spe
○	M1-A	Velocity Peak List	Waveforms and Spe
●	M1-H2	Velocity Overall RMS	Default
●	M1-H2	Acc Total Energy Band (10-137 Hz) RMS	Default
●	M1-H2	Acc Total Energy Band (213-700 Hz) RMS	Default
●	M1-H2	Vel Total Energy Band (10-1999 Hz) RMS	Default
●	M1-H2	Vel Total Energy Band (10-2000 Hz) RMS	Default
○	M1-H2	Acceleration Waveform	Waveforms and Spe
○	M1-H2	Acceleration Spectrum	Waveforms and Spe
●	M1-H2	Acc 2xLF RMS	Waveforms and Spe
●	M1-H2	Acc Spectrum SubSync Energy RMS	Waveforms and Spe
●	M1-H2	Acc Spectrum Max Peak RMS	Waveforms and Spe
●	M1-H2	Acc Spectrum NonSync Energy RMS	Waveforms and Spe
●	M1-H2	Acc Spectrum Sync Energy RMS	Waveforms and Spe
●	M1-H2	Acc Spectrum Total Energy RMS	Waveforms and Spe
●	M1-H2	Acc Waveform 0-Pk	Waveforms and Spe

Selecting a measurement populates the Details navigator. You can select multiple measurements at a time.

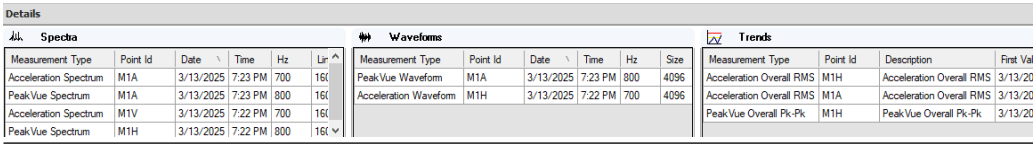
The measurements also have a health indicator colors similar to the Locations navigator.

10.2.3 Details navigator

The Details navigator displays all available measurements from the machines and collections that you selected in the Locations and Measurements navigators. These measurements are shown in the Spectra, Waveforms, and Trends tables.

Click on any of the measurements in the Spectra, Waveforms, and Trends tables to display the plot in the plotting workspace. You can select multiple measurements by pressing **CTRL** or **SHIFT** on the keyboard while clicking.

Figure 10-5: Details navigator



For Spectra and Waveforms tables, users with permissions can delete a row from the table. The following user roles can delete data: Administrator, Co-Administrator, and Operator. To check your user role, inquire with your Administrator.

In addition to user roles, a user also needs to have access to a location to be able to delete data. User roles and access to locations are assigned in User Manager.

10.2.4 Function bar

The Function bar contains controls that you can use while analyzing the plot.

The controls are grouped into functions such as waveform controls which are displayed for waveform data, trend controls for trend data, spectrum controls for spectrum data, and common controls, which are available for all measurement types.

This section discusses the functions and controls in details.

Common controls

Common controls are available for all plot types.



Click ⊞ to display all functions under Common controls.

Button	Function	Description
	Setup Options	Change setup options for all the plots in the plotting workspace.
	Vertical Scale	Enable vertical scaling. Click the left icon (+) to increase the scale and the right icon (-) to decrease the scale around cursor location. Click center button to auto-scale plot.
	Horizontal Scale	Enable horizontal scaling. Click the left icon (+) to increase the scale and the right icon (-) to decrease the scale around cursor location. Click center button to auto-scale plot.
	Horizontal Pan	Enable horizontal panning. Click the gray left / right arrow icons to pan left and right.
	Annotate Plot	Displays a list of plot annotation options.

Button	Function	Description
	Clear Plot	Clear the plotting workspace. Click the arrow to set the default option for the Clear Plot icon. Choose from Clear Active and Clear All.
	New Window	Launch active plots in a new window. Click one plot or shift-click additional plots to activate plots.
	Print/Print Options	Click the Print icon to print an Image Summary Report. Click the arrow to set the default option for the icon. Choose from Print All, Print Active, and Print Workspace.
	Print Preview	Preview the Image Summary Report in the Report Viewer. Click the arrow to set the default option for the icon. Choose from Print Preview All, Print Preview Active, and Print Preview Workspace.
	Save Image	Save a single plot or plotting workspace as an image. Click the arrow to set the default option for the icon.
	Hot Keys	Launch the Hot Keys list to see the key combinations for features available for the active plotting workspace. Hot Keys vary depending on the plots shown in the plotting workspace.

Trend

These functions are available for Trend plots. Click + to view all available functions.



Clicking on the Trend plot icon lets you display (yellow color) or hide (blue color) Trend plots in the plotting workspace.

For more information, see Trend plots.

Spectrum

These functions are available for Spectrum plots. Click + to view all available functions.

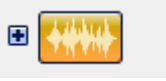


Clicking on the Spectrum plot icon lets you display (yellow color) or hide (blue color) Spectrum plots in the plotting workspace.

For more information, see Spectrum plots.

Waveform

These functions are available for Waveform plots. Click + to view all available functions.



Clicking on the Waveform plot icon lets you display (yellow color) or hide (blue color) Waveform plots in the plotting workspace.

For more information, see Waveform plots.

10.3 Active plots

Active plots allow you to perform functions and view details about a specific point on the plot.

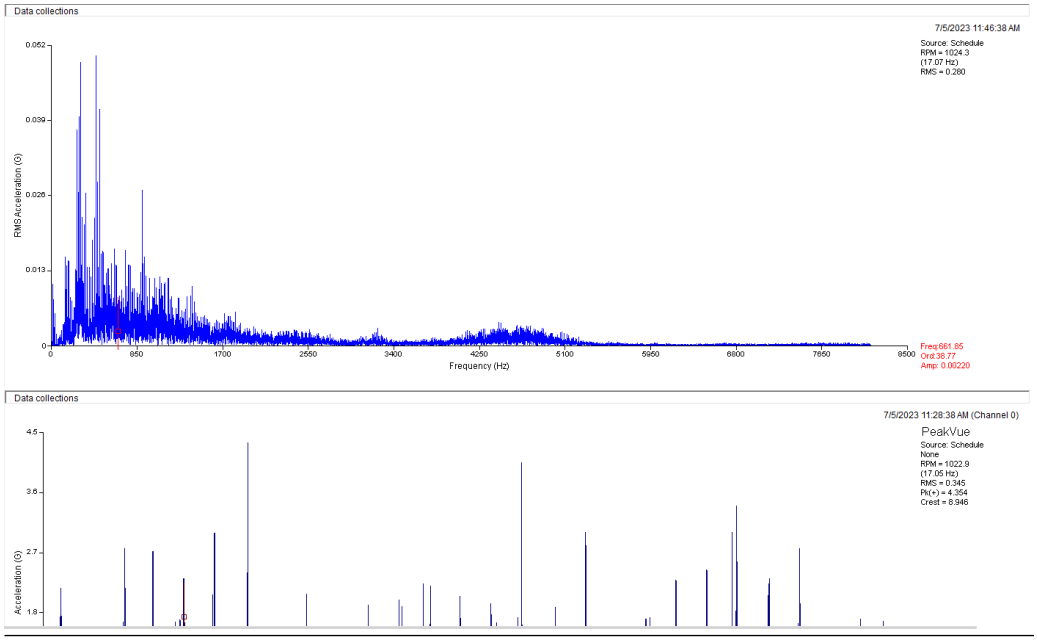
Click on a plot to make it active. The controls in the Function bar change when you switch between active plots presenting different types of data, whether it is waveform, spectrum, or trend.

By default, active plots are bright blue and inactive plots are dark blue.

You can have more than one active plot by holding the **Shift** or **Ctrl** key and clicking on the plots you want to be active. You can make all plots in the plotting area active by pressing **Ctrl** + **A**.

Most function bar options and hot key commands only operate on an active plot. Some exceptions are **Clear Plot**, **Print**, and **Print Preview**, which can be set to work on either active or all plots. The color of the function bar icon changes from blue to orange if you turn plot visibility to **ON**.

Figure 10-6: Active plot (top) vs inactive plot (bottom)



10.4 Cursor types

The available cursor types are: single, reference, difference, harmonic, and sideband. Depending on the plot, one or more cursor types are available.

Cursor mode	Description
Single	A single cursor helps you identify a specific point on the plot. A square identifies a single cursor.

Cursor mode	Description
Reference	A reference cursor is used to calculate the delta (Dfrq) between the primary cursor and the point you select as the reference cursor. A triangle identifies a reference cursor.
Difference	Difference cursors are available on waveform plots. A circle identifies a difference cursor.
Harmonic	Harmonic cursors are available on spectrum and waveform plots. A circle identifies a harmonic cursor.
Sideband	Sideband cursors are only available for spectrum plots. A diamond identifies a sideband cursor.

10.4.1 Mark a single cursor

To mark a single cursor, click on an active plot.

A cursor appears at the nearest data point. The exact cursor position displays in the lower right-hand corner of the plot legend and updates as the cursor moves.

10.4.2 Move a cursor

There are four ways to move a cursor.

Procedure

- Press and hold **Ctrl** while using the left or right arrow key to move the cursor to a short distance (micro-cursor movement).
- Press the left or right arrow keys to move between neighboring points.
- Use your mouse by dragging and dropping the cursor or clicking on a different point on the plot to move the cursor.
- Press **Home** to move the cursor to the start of the data, or press **End** to move the cursor to the end of the data.

10.4.3 Mark cursors on a single spectrum plot

Procedure

1. Set the cursor on a spectrum plot.
2. Right-click the plot and select **Mark Cursors** → **Add**.
   The cursor is marked by a unique symbol. The symbol type changes each time a new cursor is marked.

Note
To clear marked cursor symbols, right-click the plot and select **Mark Cursors** → **Clear**.

10.4.4 Set a reference cursor

If you have a single cursor placed on a plot, you can set a reference cursor on trend, spectra, cascade, and waveform plots.

Procedure

1. Mark a single cursor by first clicking on an active plot. A cursor appears at the nearest data point. The exact cursor position displays in the lower right-hand corner of the plot legend and updates as the cursor moves.
2. Press **Alt** and click on the plot again.
   A second cursor, the reference cursor, appears at the nearest data point. The primary cursor remains and can be moved. The plot legend displays the position of the reference cursor, the primary cursor, and their delta in the X dimension.



3. You can also right-click the plot and select **Set Reference Cursor** to place the reference cursor exactly at the position of the primary cursor.
   This is useful when measuring the precise frequency difference between two peaks.

10.4.5 Display a harmonic cursor

Harmonic cursors are available on all spectrums and waveforms plots.

Procedure

1. Mark a single cursor by first clicking on an active plot.
   A cursor appears at the nearest data point. The exact cursor position displays in the lower right-hand corner of the plot legend and updates as the cursor moves.
2. Right-click on the plot and then select **Cursor Type** → **Harmonic**.
   Moving a harmonic cursor results in moving its harmonics.

10.4.6 Display a sideband cursor

Sideband cursors are only available for spectrum plots.

Procedure

1. Set a reference cursor.
2. Right-click the plot and select **Cursor Type** → **Sideband**.

N sideband cursors are displayed at intervals of the delta of the reference and primary cursor. You can set the value for N in the Spectrum tab of the Setup Options Editor. You

can also move the primary sideband cursor in relation to the reference cursor. This will update the locations of all N sideband cursors.

10.4.7 Display difference cursors

Difference cursors apply only to waveform plots. On a plot, they are used for measuring time difference between selected points.

Procedure

1. Set a reference cursor.
2. Right-click the plot and select **Cursor Type** → **Difference**.

The primary cursor can be moved relative to the reference cursor, and cursor information is displayed for both cursors and delta spacing.

10.4.8 Use linked cursors

Linked cursors let you synchronize the movement of cursors on multiple active plots. Generally, only plots of the same type have linked cursors.

Procedure

1. Display multiple plots of the same type either together or separately.
2. Mark a cursor on one of the plots.
3. Press **Ctrl** and click the plots you want to activate.

When you move a cursor on one active plot, a cursor appears on all other active plots at the same location and moves simultaneously.

10.5 Zoom in or out on a plot

Procedure

1. To zoom in, right-click and hold on the plot, and select the area you want to zoom. A dotted box shows the selection area.
2. Release the right mouse button. The plot zooms in to display only the portion of the plot you selected.
3. To zoom out, right-click near the axis of a plot and select **Zoom Out**. The X and Y axis can be zoomed in and out separately. Zoom to the original view by clicking the green scale arrow icons.

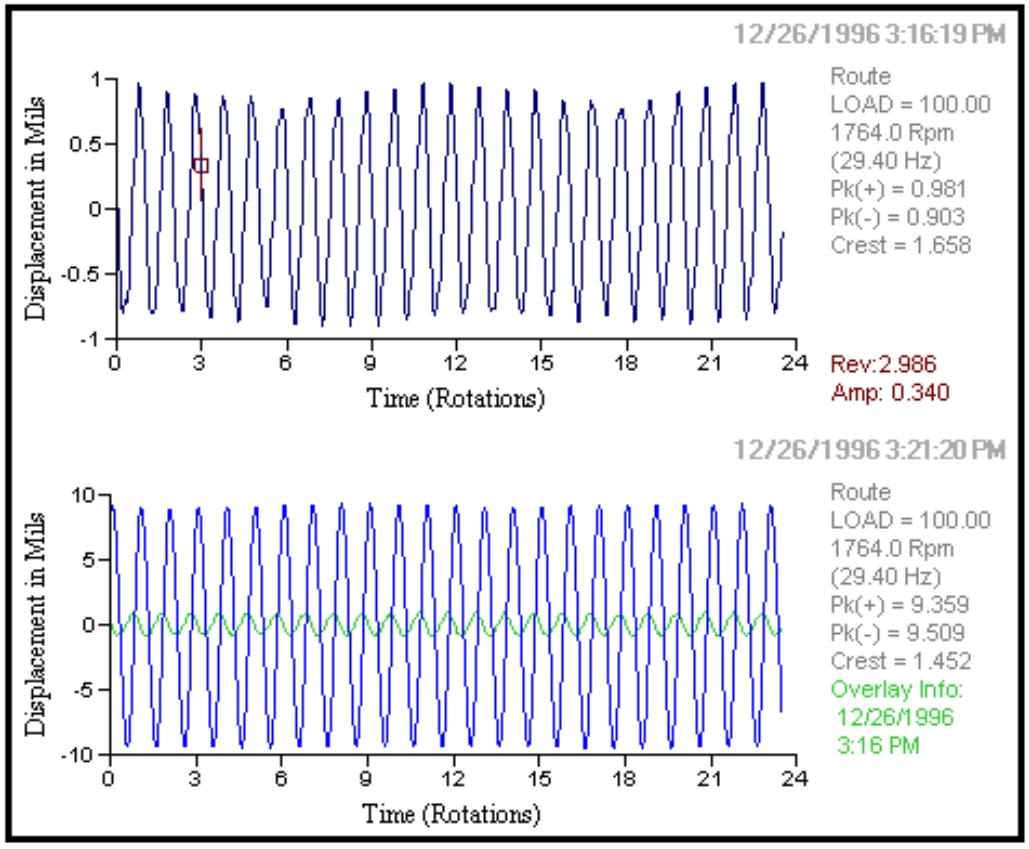
   Alternatively, place a cursor on a plot. Use the Vertical Scale and Horizontal Scale functions from Common controls to zoom in or zoom out.

10.6 Overlay

An overlay lets you compare two plots of the same type using similar units. You can generate an overlay by dragging and dropping one plot onto another plot. All plot types except for cascade plots support overlays.

The image below illustrates two waveform plots with the same amplitude units. The top waveform was dragged and dropped to the bottom waveform to create an overlay. The data from the top waveform is displayed in green. This color can be changed in the **Plot Options** tab of the **Setup Options Editor** dialog.

Figure 10-7: Overlay



For all plot types except spectrum plots, a plot can only have one overlay at a time. If another plot is dragged to a plot that already has an overlay, the current overlay is replaced.

For spectrum plots, the default view of overlay data can be set in the **Spectrum** tab of the Setup Options Editor dialog. Multiple overlays can be displayed by pressing the **Ctrl** key and dragging and dropping multiple spectrum plots to a target spectrum plot.

The overlay function generally requires plots to have the same amplitude units. However, you can overlay spectrum and waveform plots even if the amplitude units are different. Overlay units will be converted to the units of the target plot.

You can view information about the overlay by right-clicking the plot and selecting **Display Overlay Info**.

10.7 Annotate plot

Mark plots with annotations to point out specific areas of interest and make notes.

Procedure

1. Click  on the **Common Controls** function bar, or right-click on a plot and select **Annotate Plot**.

   The **Adjust Annotations** dialog appears.

2. Click the icon for the type of annotation you want to add.

Icon	Option	Description
	New Line Annotation	Adds a new line to the plot.
	New Rectangle Annotation	Adds a new rectangle to the plot.
	New Ellipse Annotation	Add a new ellipse to the plot.
	New Text Annotation	Adds new text to the plot.
	Advanced Editing Tools	Lets you specify additional details for the annotation you selected.

3. Click on the annotation and adjust the size by dragging a sizing handle. You can also move the annotation by dragging it.

4. Click .

   Click  to delete a selected annotation or click  to delete all annotations on the plot.

Note
Annotations are NOT saved. Save the plotting workspace as an image if you want to keep the annotations.

10.8 Configure the plotting workspace

Change the type of information to display automatically when you make a selection in the navigators.

Procedure

1. Click  and select **Selection Type Preferences**.
   The **Selection Type Preferences** dialog appears.
2. Expand a selection type and select an option to modify.
   Display settings appear on the right pane.
3. Modify your desired settings.

   Note
   Click **Defaults** to reset settings to default values.

4. Click **OK**.

10.8.1 Set unit preferences for the Vibration Analyzer

Procedure

1. Click  and select **Units Preferences**.
2. Use the drop-down menu to configure the unit modes and decibel references for the following:
   - Acceleration
   - Velocity
   - Displacement
   - Sound Pressure
   - General Dynamic
   - HFD
   - Motor Current
   - Flux Data
   - Shaft Voltage
   - Shaft Current
3. For **Data Display Units**, select **English** or **Metric**.
4. Click **OK**.

10.9 Customize display for plots

Procedure

1. From the Locations navigator, select a measurement location, and then select a collection from the Measurements navigator.

   Press **CTRL** to make multiple selections.

2. Select a measurement from the tables in the Details navigator to display a plot in the plotting workspace. You can select multiple data entries.
   - **Spectra** — customize display for spectrum plots.
   - **Waveforms** — customize display for waveform plots.
   - **Trends** — customize display for trend plots.

10.9.1 Waveform tab

In the plotting workspace, right-click on a waveform plot, and then select **Setup Options → Waveform tab**. The Waveform tab displays options for waveform plots.

Time Axis Options

Option	Description
Units	Select either time or revolutions as the unit used for the time axis. Revolutions do not apply to live waveforms.
Independent Scaling	Allows each plot to scale independently to maximize data resolution.
Autoscale Across Plots	Scales similar data plots to the same time axis scale to make time differences more visually obvious.
Fixed Scale Enabled	Limits the range of Time or Revolution to a specified lower and upper value.
Starting Position	Set the starting position for the fixed scale.
Ending Position	Set the ending position for the fixed scale.
Defaults	Resets all Time Axis options to default values.

Amplitude Axis Options

Option	Description
Units	Select Stored Units, Acceleration, Velocity, or Displacement as the unit used for the amplitude axis.
Independent Scaling	Allows each plot to scale independently to maximize data resolution.

Option	Description
Autoscale Across Plots	Scales similar data plots to the same amplitude axis scale to make amplitude differences more visually obvious.
Fixed Scale Enabled	Limits the Amplitude Axis range based on specified lower and upper amplitudes for selected units. Enter the lower scale and upper scale values. The lower scale sets the lower amplitude and the upper scale sets the upper amplitude.
Defaults	Resets Amplitude Axis options to default values.

Display Options

Option	Description
Number of Cursor Markers	Sets the number of cursor markers to display. The default value is 5.
Mark Normalizing Frequency	Displays marks for the normalizing frequency.
Plot in Circular Format	Displays the waveform in circular format rather than X-Y format.
Display In Single Column	Displays the analysis pane in a single column.
Display Grid Lines	Displays grid lines on plots.
Display Alarm Levels	Displays alarm levels on waveform plots. Selecting this check box enables the four fields below.
Maximum Peak Acceleration Maximum Peak Velocity Maximum Peak Displacement Maximum Crest Factor	Enter the waveform alarm levels to generate waveform alarms for points that do not have measured waveform analysis.
Defaults	Resets Display options to default values.

Filter Settings

Option	Description
Acceleration	Select a filter for each field. The filters are: • None — No filter is applied to the data. • 1x — A 1xRPM filter is applied to the data. • 2x — A 2xRPM filter is applied to the data. • 3x — A 3xRPM filter is applied to the data. • Custom — A custom filter is applied to data. If any filter is selected, the type of filter can be set to Bandpass or Lowpass. A custom filter is defined by Custom Value - a whole number multiple of the rotation speed.
Velocity	
Displacement	
General Dynamic	

Option	Description
Defaults	Resets all Filter Settings options to default values.

10.9.2 Spectrum tab

From the plotting workspace, right-click on the spectrum plot, and then select **Setup Options → Spectrum**. The Spectrum tab displays options for spectrum plots.

Frequency Axis Options

Option	Description
Units	Select Hz, CPM, or Orders as the unit used for the frequency axis.
Type	Select either Linear or Log as the scale.
Fixed Scale Enabled	Select the check box to limit the frequency axis range to a specified lower and upper frequency.
Lower Frequency	Set the lower frequency for the fixed scale.
Upper Frequency	Set the upper frequency for the fixed scale.
Defaults	Resets Frequency Axis options to default values.

Amplitude Axis Options

Option	Description
Units	Select Stored Units, Acceleration, Velocity, or Displacement as the unit used for the amplitude axis.
Type	Select either Linear or Log as the scale.
Independent Scaling	Allows each plot to scale independently to maximize data resolution.
Autoscale Across Plots	Scales similar data plots to the same amplitude axis scale to make amplitude differences more visually obvious.
Fixed Scale Enabled	Limits the Amplitude Axis range based on specified lower and upper amplitudes for selected units. Enter the lower scale and upper scale values. The lower scale sets the lower amplitude and the upper scale sets the upper amplitude.
Defaults	Resets Amplitude Axis options to default values.

Display Options

Option	Description
Harmonic Cursor Markers	Enter the number of harmonic cursors to display. The default value is 8.

Option	Description
Peaks to List	Enter the number of peaks to be listed when the peak list viewer is displayed. The default value is 24.
Sideband Cursor Markers	Enter the number of sideband cursor markers to display. The default value is 5.
Display Grid Lines	Displays grid lines on plots.
Automatic Overlay Type (Periodic and Online)	Lets you display an automatic overlay. Select None, Reference, or Previous.
Defaults	Resets Display options to default values.

Peak Label Options

Option	Description
Displayed Information	Choose the type of information to be displayed. Select Frequency, Amplitude, or Both.
Automatic Peak Labelling	Select the check box to automatically display peak levels.
Number of Peaks to Label	If Automatic Peak Labelling is selected, specify the number of peaks to label. The default value is 5.

Multiple Spectrum Options

Option	Description
Highlight Active Trace	Highlights the active spectrum in a multi-spectral plot.
Display Floor Cursor	Select the check box to display a floor-type cursor.
Display Plane Cursor	Select the check box to display a plane-type cursor.
Opacity	If Display Plane Cursor is selected, enter the opacity of the plane cursor.
Z-Axis Angle	Enter the Z-axis angle of spectral data in multi-spectral plots.
Overlap Percentage	Enter the overlap percentage of spectral plots displayed in multi-spectral plots.
Plot Sequence	Lets you choose the direction of time for spectral data displayed in multi-spectral plots. Select either Top Down or Bottom Up.
Defaults	Resets Multiple Spectrum options to default values.

10.9.3 Trend tab

From the plotting workspace, right-click on the trend plot, and then select **Setup Options → Trend tab**. The Trend tab displays options for trend plots.

Time Axis Options

Option	Description
Fixed Scale Enabled	Select the check box to limit the range of the Time axis to a specified starting and ending position.
Starting Date	If the Fixed Scale Enabled check box is selected, choose the starting date.
Ending Date	If the Fixed Scale Enabled check box is selected, choose the ending date.
Keep End Date Set to Current on Restart	Select the check box to match the end date with the current date.
Defaults	Resets all Time Axis options to default values.

Amplitude Axis Options

Option	Description
Independent Scaling	Allows each plot to scale independently to maximize data resolution.
Autoscale Across Plots	Scales similar data plots to the same amplitude axis scale to make amplitude differences more visually obvious.
Fixed Scale Enabled	Limits the Amplitude Axis range based on specified lower and upper amplitudes for selected units. Enter the lower scale and upper scale values. The lower scale sets the lower amplitude and the upper scale sets the upper amplitude.
Defaults	Resets Amplitude Axis options to default values.

Display Options

Option	Description
Display Grid Lines	Displays grid lines on plots.
Update Spectrum/ Waveform with Trend Cursor	Select the check box to allow the trend point where the cursor is positioned to simultaneously display the time-associated spectrum and waveform, if available.
Alarms	Select the check box beside each alarm level you want to display.
Defaults	Resets Display options to default values.

10.9.4 Plot Options tab

From the plotting workspace, right-click on the plot, and then select **Setup Options → Plot Options tab**.

The Plot Options tab provides settings available for most plot types. You can change the color settings, labeling preferences, fault frequencies display options, and image saving options.

Plot Color Setup

Select a color for different element types displayed on a plot. Click **Defaults** to reset the color settings to default values.

Miscellaneous

Miscellaneous portion of the Plot Options tab contains the options for Fault Frequencies and Saved Images.

Option	Description
Source	Fault frequencies can come from different sources. Select All, Configuration, or Measurement Location.
Format	Select either Lines or Lines and Values. Lines only display fault frequency lines on the plot while Lines and Values display fault frequency lines on the plot and the value on the plot legend.
Line Thickness	Specify the thickness of the line used to mark the fault frequency position on the data plot. Select either Thin or Thick.
Match Tolerance (%/Order)	Specify the percentage per order of tolerance to be applied to consider the frequency a match.
Specify Colors	Change plot colors for specific components of the plot.
Default Frequency Units	Set the default frequency units. Select either Hz or CPM.
Format for Speed Values	Set the unit for speed. Select either RPM or RPS.
Plot Font Size	Set the size of the text displayed in the plot. Select Small, Medium, Large, or Extra Large. More information is displayed if a smaller font is chosen.
Auto-hide Function Bar	Mark the box to automatically hide the Common Controls function bar when it is not used. Hiding the function bar increases the size of the plot area.

Saved Images

Each plot type can be saved as an image file.

Option	Description
File Format	Set the default file format for images. Select: .bmp, .jpeg, .png, or .emf.
Manually Enter Filename	Mark the box to be prompted to enter a filename when saving an image. Otherwise, the filename will be added automatically.
Link Image to Machine Journal Entry	Select this option to link images to a Journal entry.
Save Image to File on Local Machine	Save images on your computer in the database system.

Option	Description
File Save Location	Location of a file on a Local Machine. The default location is `C:\temp`. Click **Browse** to select a different location.
Defaults	Resets all settings in this section to the default values.

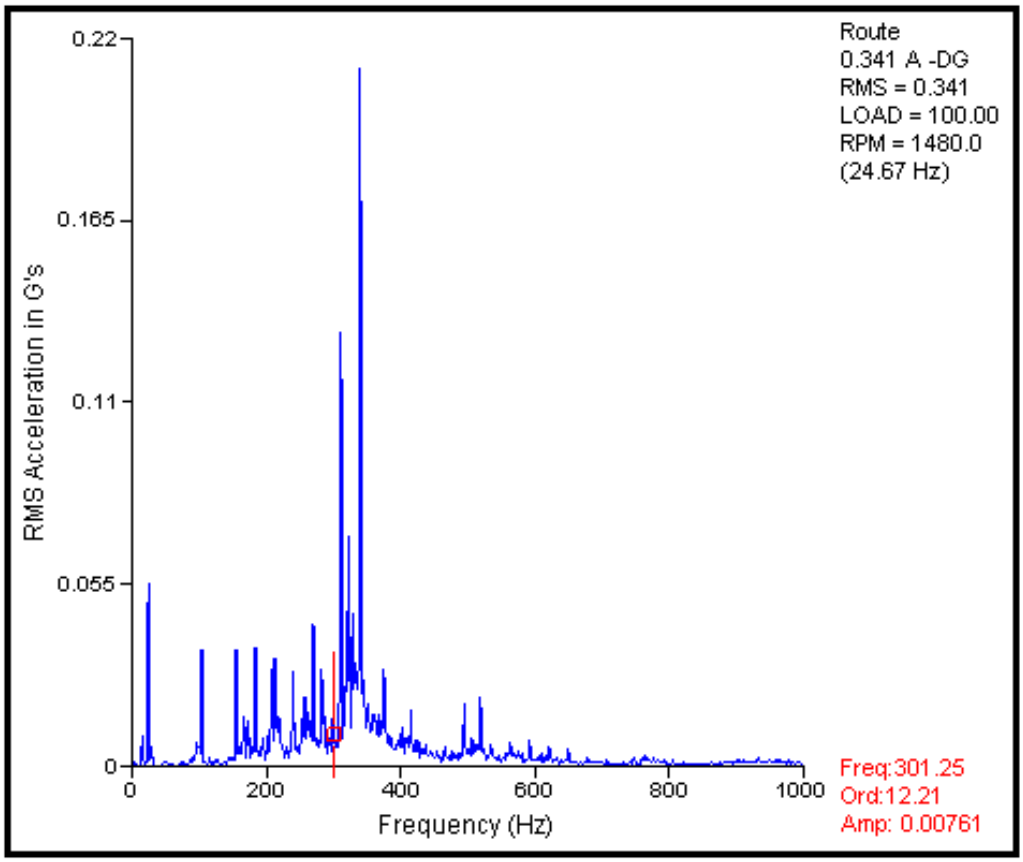
10.10 Spectrum plots

A spectrum plot is a graphical representation of vibration amplitudes in the frequency domain.

To view a spectrum plot, select a measurement location in the Locations navigator, and then select a collection in the Measurements navigator.

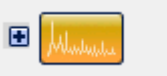
In the Details navigator, under the Spectra table, select a date/time of interest.

Figure 10-8: Spectrum plot



Note
You can overwrite the RPM by right-clicking on the plot and then selecting **Set RPM** from the context menu.

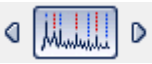
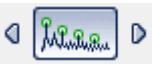
10.10.1 Spectrum function bar



The spectrum function bar is available when:

- a spectrum plot is the only open plot
- a spectrum plot is selected in a plot viewer with multiple plots
- a spectrum plot is an active plot in plotting workspace containing multiple plots

Click ⊞ to display all functions.

Button	Function	Description
	Cursor Type	Click to toggle cursor types.
	Peak Locate	Click to locate a peak.
	Label Peaks	Click to label peaks. Click the arrow to label the primary cursor or all cursors.
	Fault Frequencies	Click to open the Fault Frequency List Viewer. Click the left or right buttons to show the previous or next fault frequency.
	Peak List	Click to open the Peak List Viewer. Click the left or right buttons to show the previous or next peak.
	Harmonic Family List	Click to open the Harmonic Family Viewer. Click the left or right buttons to show the previous or next harmonic family.
	Set Rpm	Click to open pop-up window allowing to set correct RPM speed. Cursor can be used to identify RPM value.

Note
For multiple spectrum plots, only the Cursor Type, Peak List, and Harmonic Family buttons are displayed.

10.10.2 Peak List Viewer

To display the Peak List Viewer, click  on the Spectrum function bar.

Use the Peak List Viewer to:

- Display detailed information about peaks in a spectrum plot.
- Select specific peaks to print detailed information.
- Select specific peaks to label on the plot.

10.10.3 Display harmonic family list

Procedure

1. Open a spectrum plot.
2. Click  on the Spectrum function bar.
   The **Harmonic Family Viewer** dialog appears.
3. Select a harmonic family or difference family.
   The plot displays your selection.
4. You can also use the left or right buttons to display harmonic families or difference families.

10.10.4 Display fault frequencies

You can display fault frequencies in autocorrelation plots, waveforms, and spectra. Fault frequency markers start at the fist point in the waveform and are separated by time distance being a reciprocal of the fault frequency.

Procedure

1. Open a spectrum or waveform plot. To open the autocorrelation plot, right-click on the waveform plot and choose **Autocorrelate**.
2. Expand the Spectrum or Waveform function bar.
3. Click .
   The **Fault Frequency List Viewer** dialog appears.
4. Select a fault frequency.
   The plot displays the selected fault frequency.
5. Select **Keep Frequency Displayed** if you want the plot to always display your chosen fault frequency.

   A checkmark appears beside the selected fault frequency.

Note

- You can select multiple fault frequencies to be always displayed.
- You can also click the left or right buttons to view the previous or next fault frequency without opening the Fault Frequency List Viewer dialog.

To clear fault frequencies, right-click on the plot, and then click **Clear Displayed Frequencies** or **Clear Fault Frequencies**.

10.10.5 Match the fault frequency of a cursor location

AMS Machine Works compares all fault frequencies (including harmonics) to the current cursor location. If the difference between the cursor frequency and a given fault frequency is less than the match tolerance specified in the Plot Options tab, the frequency will be considered a match.

Procedure

1. Activate a spectrum plot.
2. Mark a cursor to identify the location you want to match.
3. Press **K** on your keyboard.
   Matches display on the plot for the current cursor.

10.10.6 Match any available fault frequency

You can find a match from the entire peak list to any of the available fault frequencies. If the difference between the frequency of a peak in the peak list and a given fault frequency is less than the match tolerance specified in the Plot Options tab, the frequency will be considered a match.

Procedure

1. Activate a spectrum plot, but do not place a cursor.
   If you have a cursor on the plot, remove the cursor.
2. Press **K** on your keyboard.
   Matches display on the plot for the entire peak list.

10.10.7 Locate peaks

When you mark a cursor, the cursor may be near the peak, on a slope instead of a peak. Use this function to move the cursor so that it is on a precise peak. For example, it can be used to determine the exact frequency and amplitude of a peak.

Procedure

1. On a spectrum plot, place the cursor on top of the desired peak by clicking near the peak.
2. Click  on the Spectrum function bar or right-click on the plot and select **Locate Peak**.

Note
To remove a peak, right-click on the plot and select **Remove Peak**. This action will temporarily remove a group of points creating the peak from the spectrum plot and will connect neighboring points with a straight line. You can bring all removed peaks back by selecting **Restore Peak**s from a context menu.

10.10.8 Label peaks on single spectrum plots

If you have located peaks on a spectrum plot, you can label the peaks. You can label the primary cursor or all cursors. Use the following methods:

Procedure

- To label the primary cursor, right-click on the plot and select **Label Peak → Primary Cursor**. You can also use the Label Peaks button  on the Spectrum function bar. Click the down arrow and select **Label Primary Cursor**.
  The primary cursor is labeled with the horizontal axis value of the peak.
- To label all cursors, right-click on the plot and select **Label Peak → All Cursors**. You can also use the Label Peaks button  on the Spectrum function bar. Click the down arrow and select **Label All Cursors**.
  All cursors are labeled with the horizontal axis value of the peaks.

10.10.9 View multiple spectra in one plotting workspace

Multiple spectra plots can be viewed in the plot area together or separately.

Procedure

1. From the Details navigator, find a spectrum.
2. Press **Shift** and then click on another spectrum to select a range of data. You can also press **Ctrl** and click more than one spectrum to select multiple, specific data.
   The plots appear separately on the plotting workspace.
3. Right-click on the plotting workspace and select **Display Spectra Together**.

Note
To change the plot display back to separate plots, right-click and select **Display Spectra Separately**.

10.10.10 Display calculated trend from cascade plots

Procedure

1. Mark a cursor on the plot.
2. Right-click and select **Display Calculated Trend → Primary Cursor Location**.
   The **Primary Cursor Amplitude Trend** dialog is displayed.

Notes
- The generated trend plot includes data points from the displayed spectra.
- If a single cursor is marked on the plot, a calculated trend for the frequency or order is displayed.
- If the plot has a reference cursor and a primary cursor, an additional option allows the calculation of a trend for the spectral band bounded by cursors.

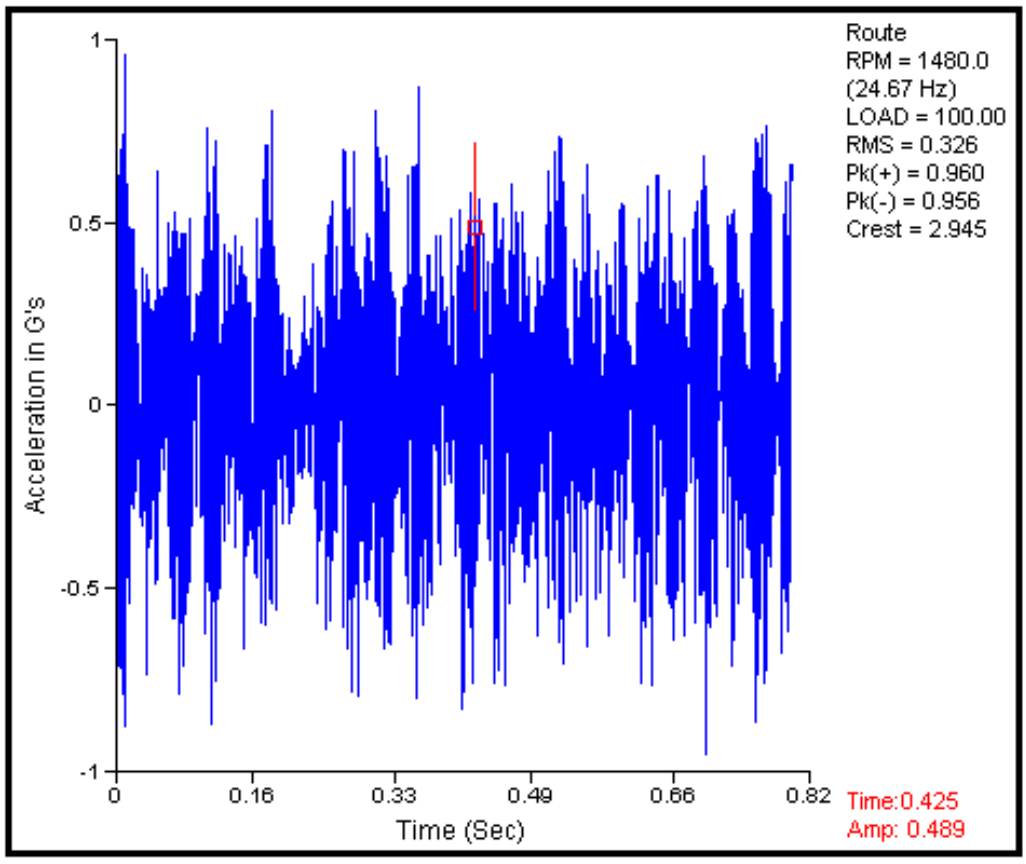
10.11 Waveform plots

A waveform plot is a graphical representation of how the vibration level changes with time.

To view a waveform plot, click on a measurement location from the Locations navigator and then select the appropriate waveform measurement from the Measurements navigator.

In the Details navigator, under the Waveform table, select a date/time of interest.

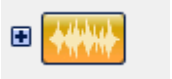
Figure 10-9: Waveform plot



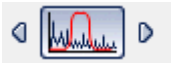
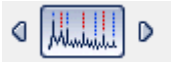
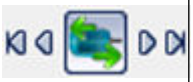
You can overwrite the RPM by right-clicking on the plot and then selecting **Set RPM** from the context menu.

10.11.1 Waveform function bar

These functions are available for waveform plots.



Click ⊞ to display all functions.

Button	Function	Description
	Cursor Type	Click to toggle cursor types: Single, Difference, and Harmonic.
	Mark RPM	Click to display RPM markers. Use the arrow to select **Toggle Markers** or **Set Markers**. **Toggle Markers** displays or hides the RPM markers. **Toggle Markers** synchronizes the RPM markers with the current cursor location.
	Filter Options	Click the left or right button to show the previous or next filter type. You can select all the available options for band-pass and low-pass filters.
	Fault Frequencies	Click to open the Fault Frequency List Viewer. Click the left or right buttons to show the previous or next fault frequency.
	Peak List	Click the left or right buttons to show the previous or next peak.
	Set RPM	Click to open pop-up window allowing to set correct RPM speed. Cursor can be used to identify RPM value.
	Toggle Display Format	Click to change the plot display. You can view a waveform in standard X/Y format or in a circular format.
	Toggle All/One Revolutions	Click to display all revolutions or one revolution at a time. When displaying one revolution, click the left or right arrows to display the previous or next revolution. Click the first or last arrows to show the first or the last full revolution (on some data plots, clicking the arrow again will show the remaining "partial" revolution"). When displaying all revolutions, click the arrows to step through each revolution with the cursor.
	Play Audio	Click to open the Waveform Audio Replay dialog and listen to an audio recording of the waveform.

10.11.2 Use micro-step cursor on waveform plots

Note
When moving the micro-step cursor, you are not moving through different data points, but through virtual points only artificially created between real data points.

Procedure

1. Click on a plot.
2. On keyboard press **Ctrl+LEFT ARROW** or **Ctrl+RIGHT ARROW** to move through different data points.

10.11.3 Display fault frequencies

You can display fault frequencies in autocorrelation plots, waveforms, and spectra. Fault frequency markers start at the fist point in the waveform and are separated by time distance being a reciprocal of the fault frequency.

Procedure

1. Open a spectrum or waveform plot. To open the autocorrelation plot, right-click on the waveform plot and choose **Autocorrelate**.
2. Expand the Spectrum or Waveform function bar.
3. Click .
   The **Fault Frequency List Viewer** dialog appears.
4. Select a fault frequency.
   The plot displays the selected fault frequency.
5. Select **Keep Frequency Displayed** if you want the plot to always display your chosen fault frequency.
   A checkmark appears beside the selected fault frequency.

Note

- You can select multiple fault frequencies to be always displayed.
- You can also click the left or right buttons to view the previous or next fault frequency without opening the Fault Frequency List Viewer dialog.

To clear fault frequencies, right-click on the plot, and then click **Clear Displayed Frequencies** or **Clear Fault Frequencies**.

10.11.4 Play waveform audio

Procedure

1. Activate a waveform plot.
   The controls on the Function bar changes.
2. From the Function bar, click 
   The **Waveform Audio Replay** dialog is displayed.
3. Use these buttons  to play and operate the waveform audio recording.
4. You can also save a copy of the audio file by clicking .
   The **Save Waveform Audio File** dialog is displayed. Browse to your selected folder and then click **Save**.

10.11.5 View each revolution in a waveform

You can view each single revolution in a waveform plot. You can view all the revolutions on the same plot or display them one at a time.

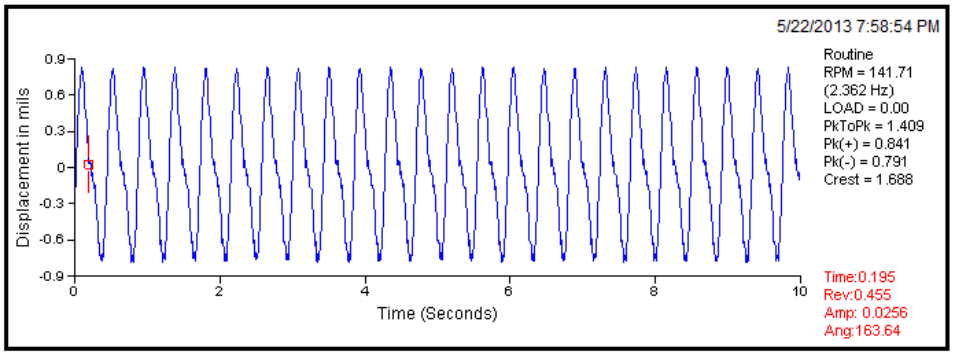
Procedure

1. Use the navigators to find a measurement point.
2. Expand the measurement point and then click a waveform.

   In the plotting workspace, a waveform is displayed for all the revolutions in the measurement. The revolutions are selected based on set rotation speed.

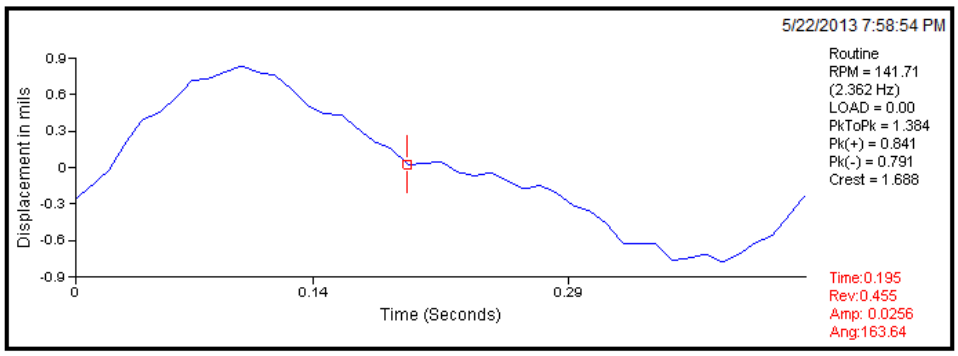
   You can select multiple waveforms. Press **Shift** and click the range of points. You can also press **Ctrl** and then click multiple, specific waveforms.

Figure 10-10: Waveform plot: all revolutions in X/Y mode

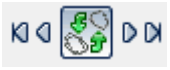


3. Click  to toggle from all rotations to one revolution.

Figure 10-11: Waveform plot: one revolution in X/Y mode



4. Click the right and left arrows  to view the next and previous complete revolution.

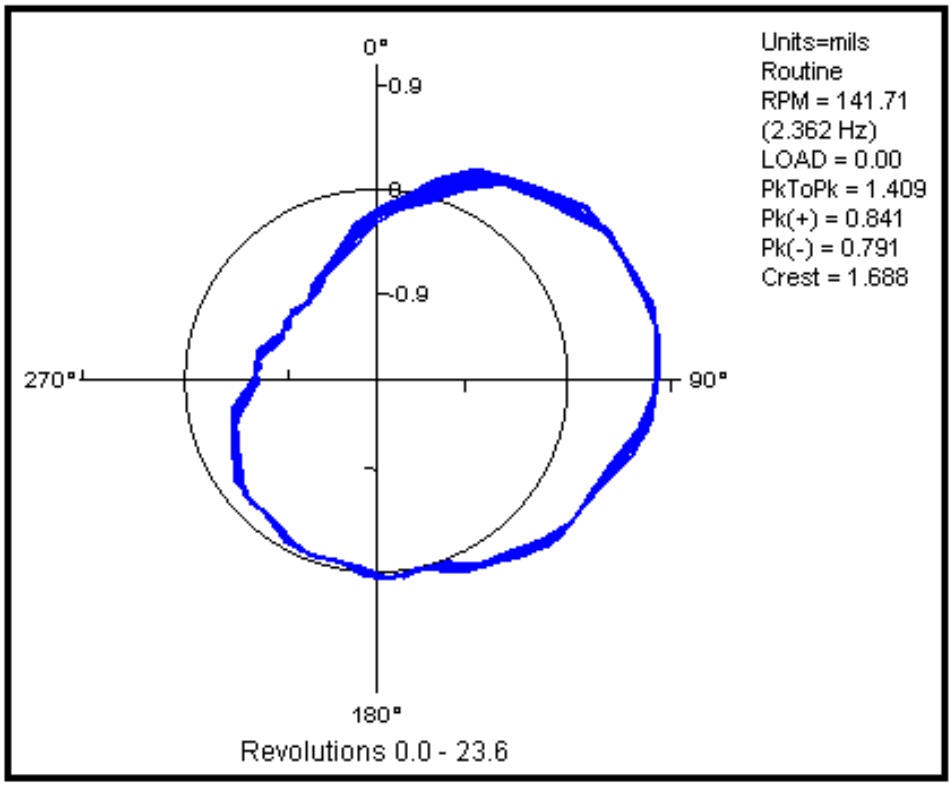
5. Click the first and last arrows  to view the first and last complete revolutions.

   To see a partial revolution after the last complete revolution, click the right arrow.

6. Click  to toggle from the waveform plot in standard X/Y format to a circular format.

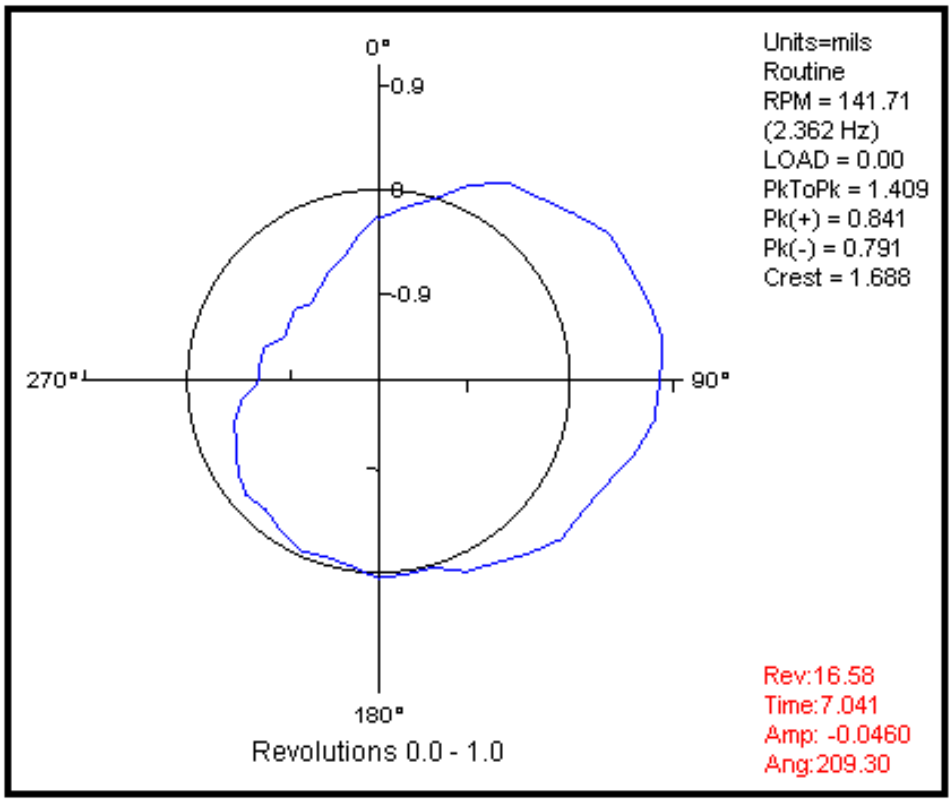
   The waveform plot displays all the revolutions in the measurement.

Figure 10-12: Waveform plot: all revolutions in circular mode



7. Click  to toggle from all rotations to one revolution.

Figure 10-13: Waveform plot: one revolution in circular mode



8. Use the arrows to view each revolution.

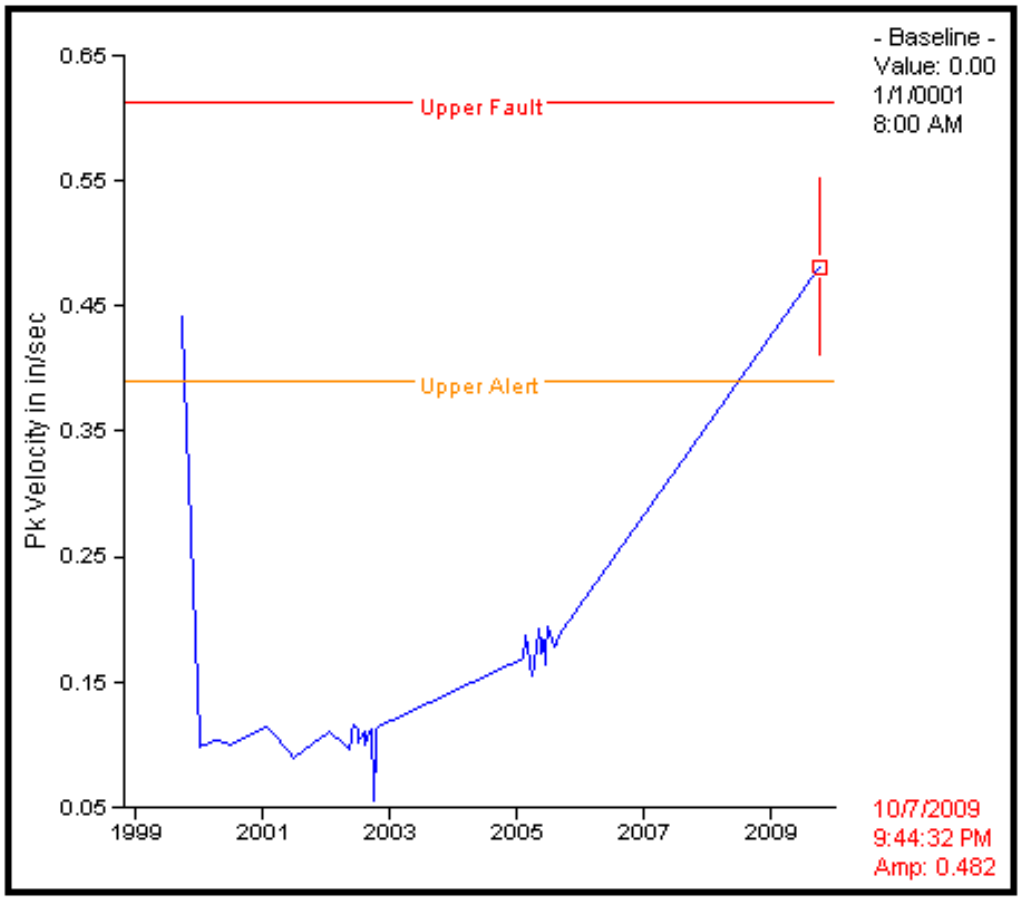
10.12 Trend plots

A trend plot shows a set of values of a vibration parameter over a period of time.

To view a Trend plot, select a measurement location in the Locations navigator, and then select a measurement type in the Measurements navigator.

In the Details navigator, under the Trends table, select a date/time of interest.

Figure 10-14: Trend Plot



Users with permissions can delete a trend point from the plot. The following user roles can delete data: Administrator, Co-Administrator, and Operator. To check your user role, inquire with your Administrator.

In addition to user roles, a user also needs to have access to a location to be able to delete data. User roles and access to locations are assigned in User Manager.

To delete a trend point, right-click on the plot and then select **Delete Trend Point** from the context menu.

10.12.1 Trend function bar

These functions are available when a trend plot is shown on the plotting workspace:

Button	Function	Description
	Trend On/Off	Click the button beside the image to show all functions.
	Label Point	Displays a label for your selected data point.

10.12.2 View multiple trend plots on one plot

Trends with the same amplitude units can be displayed together in the plotting workspace using the overlay feature. You can generate an overlay by dragging and dropping one plot onto another plot.

For more information, see Overlay.

10.12.3 Display critical, warning, and advise alarm levels

Procedure

1. From the plotting workspace, right-click on the trend plot, and then select **Setup Options**.
2. On the Trend tab, go to Vibration Alarms under Display Options.
   Select the alarms that you want to show.

   To show upper alarm levels:

   - **Upper Critical**
   - **Upper Warning**
   - **Upper Advise**

   To show lower alarm levels:

   - **Lower Advise**
   - **Lower Warning**
   - **Lower Critical**

3. Click **Apply**, and then click **OK**.

10.13 Connect Vibration Analyzer to a different AMS Machine Works Server

If you have more than one AMS Machine Works deployment, you can connect Vibration Analyzer to a different AMS Machine Works Server. For example, a site might have different plants with AMS Machine Works set up independently on different networks, or service personnel may use the same laptop to connect to different AMS Machine Works servers as they visit plants and perform analysis on different AMS Machine Works servers.

When you have Vibration Analyzer installed, you can switch the AMS Machine Works server in Vibration Analyzer. This is a convenient option because AMS Machine Works Vibration Analyzer is a Windows-based application. This feature allows a single installation of Vibration Analyzer to select from a list of AMS Machine Works Servers to connect to.

Note
The version of the Vibration Analyzer in the Windows client application must match the version on the AMS Machine Works Server.

Prerequisites

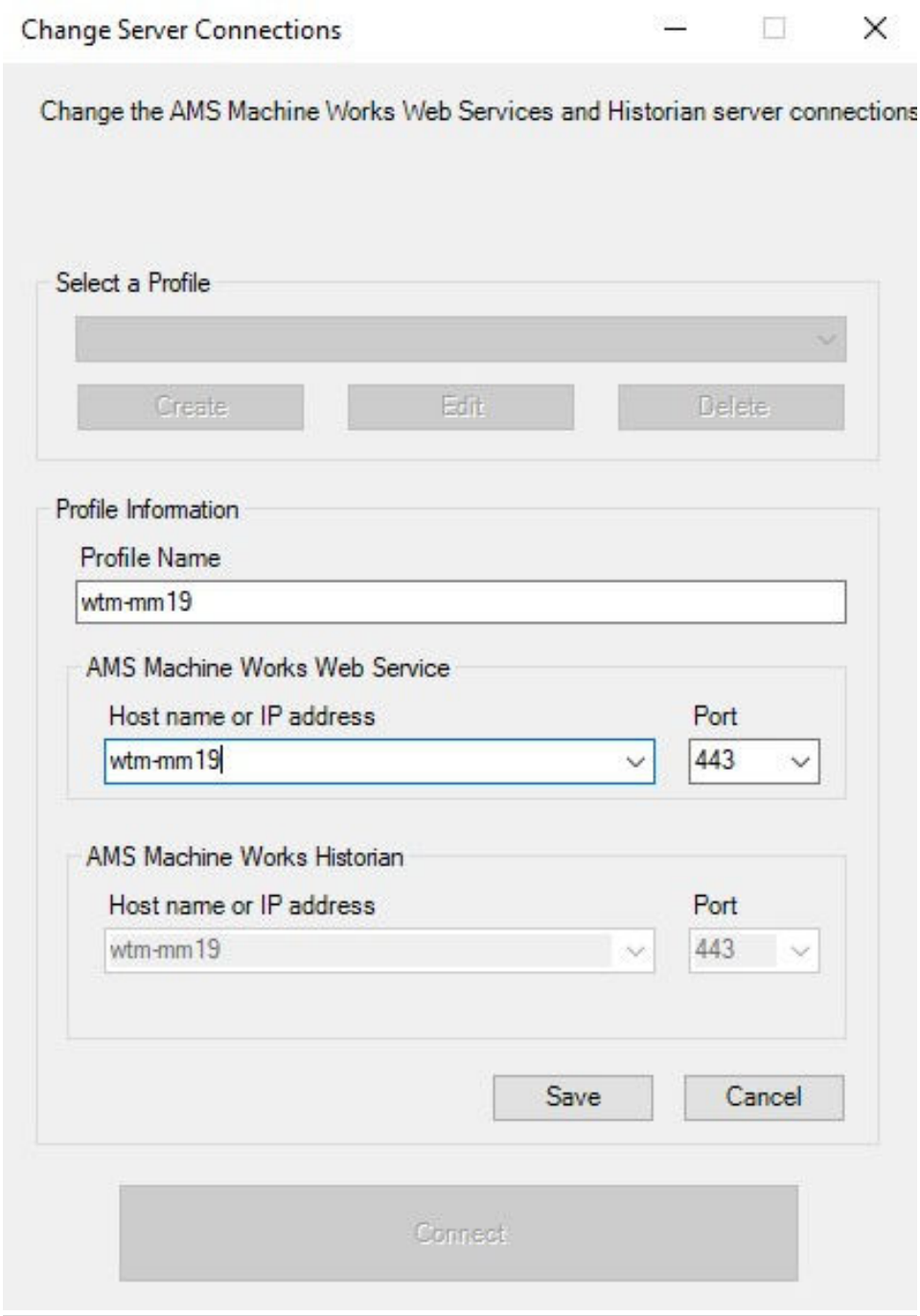
- Refer to your System Architecture drawings or other installation records for information about where AMS Machine Works Web Services is installed. You need the server information before creating a profile for each AMS Machine Works Server connection.
- Confirm the version of AMS Machine Works Vibration Analyzer you have installed is compatible with the AMS Machine Works Server.
- Confirm the other AMS Machine Works Server is available.
- Install the certificate from the AMS Machine Works Server on your PC.

Procedure

1. Click  and select **Machine Works Server Setting**.

   The **Change Server Connections** dialog appears. By default, the option **Use the default application connection settings** is selected.

Figure 10-15: Change Server Connections dialog



2. To change the server, create a profile for the connection.
   a) Select **Use a profile to specify different connection settings**.
   b) Under **Select a Profile**, click **Create**.

c) Under **Profile Information**, enter a name for the profile. Emerson recommends using the name of the AMS Machine Works server.

d) For **AMS Machine Works Web Service**, enter the Host name and Port. The host information for **AMS Machine Works Historian** is automatically updated to the same information, by default.

Note
Only use an IP address if the AMS Machine Works was configured during installation with the **Use IP Address** option. Emerson recommends using a server name instead of an IP address for the setup.

e) If the AMS Machine Works Historian is on a different server, clear the check box beside **Use the same server as AMS Machine Works Web Service**. Then, under **AMS Machine Works Historian**, enter the Host name and Port.

f) Click **Save**.

The profile name appears in the **Select a Profile** menu as the selected profile. You can edit this information later by clicking **Edit**. If you need to delete the profile, click **Delete**.

3. Under **Select a Profile** select the profile name from the menu.
4. Click **Connect**.

   The **Connect** button is only active if a profile is selected.

Vibration Analyzer displays information from the different instance of AMS Machine Works. If there is a problem connecting to the server, an error message displays and prompts you to edit the configuration settings.

Glossary

agent

An AMS Machine Works **agent** is a lightweight service responsible for communicating with devices. Each type of agent is designed to communicate with a specific kind of measurement device. An AMS Machine Works installation can support multiple instances of every type of agent simultaneously. Multiple instances of a single type of agent can be used to load balance network traffic as well as support multiple isolated networks.

There are four types of **agent** in AMS Machine Works:

- AMS Asset Monitor Agent
- Emerson Wireless Gateway Agent
- AMS 6500 ATG Agent
- Emerson Portable Edge Agent

alarm limits

Amplitude levels that define an alarm condition on the equipment being monitored.

alert hysteresis

Alert Hysteresis is expressed as a percentage of the value of an alert by which the value must change towards a safe value before the alert can be triggered again.

For example, if you have an **Upper Absolute Alert** set for x=100, and the **Alert Hysteresis** is set at 5%, the **Alert** will not be repeatedly triggered by fluctuations within the 5% band, (i.e., values where 100 < x > 95).

But if the value of x passes below 95, a fresh alert will be triggered the next time x > 100.

Alert Type

Each **Alert Type** has a different way of defining what values are acceptable.

There are four **Alert Types**:

- **Upper Absolute**: See: Alert Type — Upper Absolute
- **Lower Absolute**: See: Alert Type — Lower Absolute
- **Inside Window**: See: Alert Type — Inside Window
- **Outside Window**: See: Alert Type — Outside Window

Alert Type — Inside Window

An **Inside Window** alert is defined to increase in severity as values move towards a central region.

Alert Type — Lower Absolute

A **Lower Absolute** alert is defined to increase in severity as values decrease.

Alert Type — Outside Window

An **Outside Window** alert is defined to increase in severity as values move away from a central region.

Alert Type — Upper Absolute

An **Upper Absolute** alert is defined to increase in severity as values rise.

amplitude

Indicates the strength (magnitude in RMS, peak, peak-to-peak, average, or D.C.) of a measured signal.

analysis parameter set

Includes individual analysis parameters, and also contains instructions that tell the analyzer how to acquire data.

analysis parameters

Divides the frequency spectrum into bands that are individually measured and analyzed.

ball pass frequency (inner), BPFI

For rolling element bearings, the ball pass frequency (inner), a defect in the inner race of a bearing.

ball pass frequency (outer), BPFO

For rolling element bearings, the ball pass frequency (outer), a defect in the outer race of a bearing.

ball spin frequency, BSF

Bearing ball spin frequency for rolling element bearings.

bandwidth

The analysis frequency range, from lowest to highest, over which data will be collected. Bandwidth is specified with a minimum and maximum frequency.

baseline

A reference spectrum, usually the first spectrum collected on a measurement point.

collection

In the Network Device Module, a **collection** is a group of **measurements** which can be demanded in a single request.

component

A **machine train** is made up of one or more **components**. Each **component** has its own set of **measurement locations**. Examples include motors, gearboxes, fans, and pumps.

criticality

The **criticality** of a **Machine Train** is set as a whole number from 1 to 100, where 1 is the lowest and 100 is the highest.

cursor

A manually controlled marker that can be moved across a spectrum or waveform plot display indicating time or frequency and amplitude at the cursor location.

custom location

A **custom location** is a **measurement location** on a **component** where you can add **measurement points** which are not located at any of the standard physical locations for a **component**.

cycles per minute, CPM

The unit of frequency in cycles per minute. Equal to Hz x 60.

decibels, dB

A relative, logarithmic unit which can be used when measuring signal amplitude.

Default Enterprise

The **Default Enterprise** is the top level element in the AMS Machine Works hierarchy. See: hierarchy

displacement

Refers to the distance that an object moves, usually considered to be the overall range of movement; measured in mils or microns. Displacement is often measured from eddy current probes and represents the physical movement of a rotating shaft relative to its supporting bearing.

Sometimes accelerometers or velocity probes are used, and the data is integrated into displacement. In this case, movement represents the displacement of the equipment casing where the probe is mounted.

event

Any action or status change recorded in the system.

fast fourier transform, FFT

An efficient computational process that allows the conversion of a signal's time waveform into a frequency spectrum.

fault frequency set

A set of predefined frequencies where mechanical faults are expected to occur.

filter

A device that removes certain frequencies from a signal while preserving the rest of the signal.

folder

A **folder** is an element in the AMS Machine Works hierarchy. See: hierarchy

frequency

Number of times an event repeats in a unit of time; usually expressed in hertz (Hz) or cycles per minute (CPM).

fundamental frequency

The frequency of the peak from which related harmonics are referenced. 1xRPM is an example of a fundamental frequency.

gear mesh frequency

Asynchronous vibration frequency associated with each pair of meshing gears. Calculated as RPM divided by 60 times the number of teeth on a particular gear.

Hanning window

Type of window applied to waveform data before frequency analysis; used to prevent peaks in a frequency spectrum from spreading out due to a phenomenon called leakage. The Hanning window is recommended for most frequency analysis measurements where the signal is steady-state.

harmonic

An integer multiple of a fundamental frequency f0 (example 2f0, 3f0, 4f0, etc.).

harmonic marker

A box marker that appears on a spectrum display to indicate the harmonic peaks of a fundamental peak.

health status

The **health status** is set by the latest device alerts or measurement alerts. The **health status** is shown on multiple levels of the **hierarchy**. The worst **health status** from a **measurement** goes upward in the **hierarchy**.

For example, one **measurement point** with a **critical** status would mark that **component** as **critical**, and then that **machine train** as **critical**.

There are five health statuses:

- **Good**: See: health status — good
- **Advice**: See: health status — advice
- **Warning**: See: health status — warning
- **Critical**: See: health status — critical
- **Unknown**: See: health status — unknown

health status — advice

The **advice** alert level detected for a **measurement**. The **advice** status is marked **yellow**.

health status — critical

The **critical** alert level detected for the **measurement**, or a monitoring device/channel malfunction. The **warning** status is marked **red**.

health status — good

The **measurement** value has not crossed any **alert** levels. The **good** status is marked **green**.

health status — unknown

Unknown status is marked grey and is for:

- Devices which currently have no network connection.
- Devices which have not yet communicated their the initial configuration information.
- No **measurements** have ever been reported.
- There is no **alert** configured, which is the most common cause.

health status — warning

The **warning** alert level detected for a **measurement**. The **warning** status is marked **orange**.

hertz, Hz

The unit of frequency in cycles per second.

hierarchy

The **hierarchy** in AMS Machine Works is used to organize the resources which are being monitored.

The **hierarchy** has the following elements:

1. **Default Enterprise** — The **Default Enterprise** contains every **site**.
2. **site** — A **site** can contain a **folder**, **Machine Train**, or **Roll/Pulley Section**.
3. **folder** — A **folder** can contain another **folder**, a **Machine Train**, or a **Roll/Pulley Section**.
4. **Machine Train** and **Roll/Pulley Section** — Every **Machine Train** and **Roll/Pulley Section** contains at least one **component**.
5. **component** — A **component** is the lowest level displayed in the hierarchy. See: hierarchy

high-frequency detection, HFD

The amplitude of vibration in G's over a broad frequency band from 5 kHz up to 20 kHz or greater.

lines

The number of lines of resolution (LOR) used for the spectrum calculation. Resolution (in Hz) equals maximum frequency divided by the number of lines.

machine train

A **machine train** is a representation of every **component** and **measurement device** used to define and monitor a piece real world equipment.

There are two types of **machine train**:

1. **machine train** — A regular **machine train** is made of a wide range of **components**.
2. **Roll/Pulley Section** — This is a specialized **machine train** which is made of only **Pulley/Roll** and **Transfer Gear components**.

mapping

The association of a **measurement** of a **measurement device** with a particular **measurement point** on a **component**.

measurement device

A **measurement device** is a physical device which obtains, processes, or relays information into the system.

measurement location

An approximate representation of the physical location where data is acquired, usually the physical location of a **measurement device** on a **component**. Every **component** has a different number of **measurement locations** and one **custom location**.

measurement point

A **measurement point** is added for every **measurement** from every **measurement device**. A **measurement point** is added to a **measurement location** on a **component** in a **machine train**.

There are four types of **measurement point**:

- **network point** — A **network point** holds a single measurement which could be from a variety of network sources.
- **network triax** — A **network triax** point contains measurements from an AMS Wireless Vibration Monitor for each orientation (Horizontal, Vertical, and Axial), and a measurement of the surface temperature of the equipment that the AMS Wireless Vibration Monitor is mounted on.
- **portable point** — A **portable point** holds a single measurement gathered by an AMS 2140 unit.
- **portable triax** — A **portable triax** point contains measurements from an AMS Wireless Vibration Monitor for each orientation, Horizontal, Vertical, and Axial.

orders

Multiples of equipment turning speed (1xRPM, 2xRPM, 3xRPM, etc.).

peak

The largest signal level seen in a waveform over a period of time. For sinusoidal signals, the peak signal level is always 1.414 times the RMS value of the signal level. For non-sinusoidal signals, the peak level is often larger than the result that this formula would produce.

peak-to-peak

The difference between the maximum and minimum signal levels over a period of time. For a pure sinusoidal signal, the peak-to-peak level is two times the peak signal level and 2.828 times the RMS value of the signal level. For non-sinusoidal signals, the peak-to-peak level is often larger than the result this formula would produce.

period

Time required to complete one cycle in a periodic signal.

phase

1xRPM phase represents the location of the shaft of a piece of equipment in degrees (0–360) with respect to the tachometer pulse where the largest vibration occurs.

plane

Designates one or more of the rotating elements of a piece of equipment that is to be balanced. Each plane lies perpendicular to the line that defines the axis of rotation.

Portable Device Module

An application in AMS Machine Works that facilitates the transfer of data in the form of a route or job between the AMS Machine Works database and AMS 2140 Machinery Health Analyzer units.

predictive maintenance

Technology of periodically monitoring the actual condition of equipment to discover faults, to determine probable time of breakdown, and to provide scheduled downtime for repair that avoids excess cost and lost production.

RMS

The magnitude of a signal calculated or measured by the root mean square method. Equal to 0.707 times the peak value for a pure sinusoidal signal.

rotations per minute, RPM

Represents rotations per minute and is equal to 60 times frequency in Hz. Equivalent to CPM (cycles per minute).

route

One or more machines and their respective measurement points organized in an efficient sequence for data collection.

route data file

An intermediate file (with .RDA or .RDT extension) for transferring route data from an analyzer to an AMS Machinery Manager database. Typically used to transmit route data collected by a remote analyzer without access to an AMS Machinery Manager client or database. A route data file can be created using AMS Machinery Manager Data Transfer or AMS Standalone Data Transfer.

route definition file

An intermediate file (with .RDF extension) for loading a route to an analyzer without access to an AMS Machinery Manager client or database. The file can be created in AMS Machinery Manager Data Transfer. The file can be transferred to an analyzer using AMS Machinery Manager Data Transfer or AMS Standalone Data Transfer.

site

A **site** is an element in the AMS Machine Works hierarchy. See: hierarchy

spectrum

A **spectrum** plot is a graphical representation of vibration frequencies and their amplitude.

standardized parameter names

In AMS Machine Works parameter names are constructed in the following patterns:

1. A combination of the Quantity Display Name and the Evaluation Display. — These are supplied by the **measurement device**.
2. Quantity Display Name — These are supplied by the **measurement device**.
3. Evaluation Display — These are supplied by the **measurement device**.
4. A combination of the Quantity Display Name, the Data Shape, and the Evaluation Display.
5. A combination of the Quantity Display Name, the Evaluation Display, the Band Info, and the Amplitude Mode.
6. A combination of the Quantity Display Name, the Evaluation Display, the Reference Frequency Multiplier, and the Amplitude Mode.
7. A combination of the Quantity Display Name, the Evaluation Display, and the Amplitude Mode.

Where the **Data Shape** is:

1. **Waveform**

2. **Spectrum**
3. **Transient Waveform** — A waveform from AMS 6500 ATG units.
4. **Peak List** — A list of peak values extracted from a waveform.

Where the **Band Info** can be expressed in **Hz** or **Order**:

1. **(X Hz - Y Hz)** — A band defined from **X Hz** to **Y Hz**.
2. **(X - Y Order)** — A band defined from **X Order** to **Y Order**.

Where the **Reference Frequency** can be:

1. **From 1X up to nX** — An **integer** from 1 to n. Typically from 1 to 4.
2. **From 1xLF to nxLF** — An **integer** multiple of the LF (Line Frequency) from 1 to n. Typically 2xLF, or 2 times the line frequency.

Where the **Amplitude Mode** can be:

1. **0-Pk** — From 0 to Peak.
2. **Pk-Pk** — From Peak to Peak.
3. **RMS** — Root Mean Square

store on alert

The **store on alert** function enables additional **waveform**/**spectrum** data capture for the **measurement point**. **Store on alert** settings are only available for device parameters (native scalar measurements).

subharmonics

Vibration frequencies which are integer fractions of the running speed (example ½ RPM, 1/3 RPM, etc.) or some other fundamental frequency.

tachometer

Pulse signal used to measure shaft turning speed. This may also be used to synchronize the acquisition of dynamic data.

transient

A non-steady-state signal of finite duration; often refers to a startup or coastdown of a piece of equipment.

trend

A **trend** is the plot of a number of measurements of a parameter over time.

uniform window

Description of a uniformly weighted signal, where no special window shaping is applied before frequency analysis. Sometimes used for collection of non-steady-state data.

User Manager

The **User Manager** utility enables the **Administrator** or **Co-Administrators** to control and monitor access to various components of the software.

user roles

A **User** can exist without a **Role**, but cannot perform any actions in AMS Machine Works other than managing their own account. Every action a **User** performs is in the context of a **Role**, **Location**, and **Agents**.

There are five different **user roles** in AMS Machine Works, each higher **user role** includes the functionality of all the lower **user roles** below it.

1. **administrator** — There can be only one **administrator** per AMS Machine Works installation.
   The **administrator** can:
   - The **administrator** has full access to every **location**.
   - Can edit every other **user**.
   - Can perform every action in the system.

2. **co-administrator** — There can be many **co-administrator** per AMS Machine Works installation.
   A **co-administrator** can:
   - A **co-administrator** only has access to the **locations** that the **administrator** has assigned to them.
   - A **co-administrator** can edit other **users** which are not the **administrator** or a **co-administrator**.
   - Can perform every action in the system for the **locations** that they have access to.

3. **operator** — There can be many **operators** per AMS Machine Works installation.
   An **operator** can:
   - Access only the **locations** that the **administrator** or **co-administrator** has assigned to them.
   - Configure all settings in the **Design Studio Process**
   - Add/delete/edit elements in the **location hierarchy** that the **operator** has access to.
   - Add/delete/edit entries in the **Design Studio Libraries**.

4. **portable device user** — There can be many **portable device users** per AMS Machine Works installation.
   A **portable device user** can:
   - Access only the **locations** that the **administrator** or **co-administrator** has assigned to them.
   - Access the functionality of the **Portable Device Module**.

5. **viewer** — There can be many **viewers** per AMS Machine Works installation.
   A **viewer** can:
   - Access only the **locations** that the **administrator** or a **co-administrator** has assigned to them.

- View, and perform analysis on, any **measurement data** from the **locations** that the **viewer** has access to.

vectors

Graphical representation of phase and magnitude as a single line on a polar plot. The angle of the line represents phase, and the length of the line represents magnitude.

velocity

A measurement of the time rate of change in the displacement of an object. Vibration is often measured in velocity using a velocity sensor. Velocity can be measured also by integrating an accelerometer signal.

Vibration Analyzer

Also known as VibApp, a module of AMS Machine Works that lets you analyze periodic vibration data collected from supported devices connected to machines in your site.

waveform

A **waveform** plot is an analog or digital representation of a signal or function displayed as amplitude over time.

window

See: Hanning window and uniform window

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