

AMS Machine Works

- Full suite of tools for analysis and tracking machine health
- Supports a variety of Emerson's monitoring technologies, including:
 - AMS Wireless Vibration Monitor
 - AMS 9420 Wireless Vibration Transmitter
 - AMS Asset Monitor for online condition monitoring
 - AMS 6500 ATG for online vibration monitoring
 - Ovation™ Machinery Health™ Monitor for online vibration monitoring
- Intuitive dashboard makes keeping up with day-to-day activities and machinery health possible at a glance



AMS Machine Works provides both familiar and next generation tools for tracking and analyzing rotating machinery faults.

Overview

In the past when a problem arose with one of your critical assets you might have had to comb through tons of data, and potentially even different software and databases to identify what's important to you at that moment. Unfortunately, time isn't always on your side in these scenarios. You need relevant information fast, and you need the right tools there to diagnose faults as fast as possible.

AMS Machine Works is a comprehensive software solution that greatly simplifies the fault diagnosis and analysis process by combining predictive maintenance techniques with comprehensive analysis tools to provide easy and accurate assessment of machinery health in your facility.

- One software application and database for all Emerson vibration hardware
- Easy to get started and understand, but contains the power tools necessary for experts
- Scalable and flexible deployment models

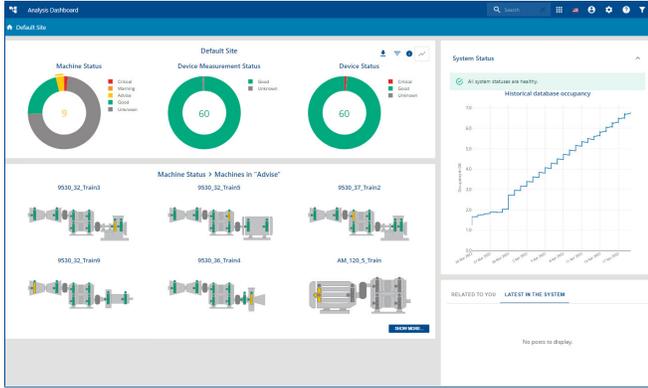


Powerful Tools in an Intuitive Interface

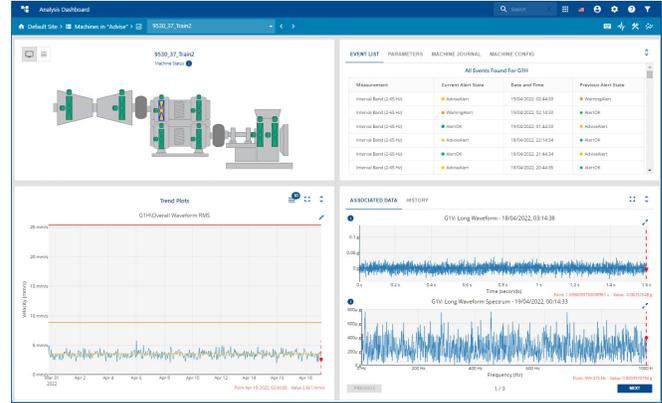
AMS Machine Works includes a vibration analysis module with familiar, easy-to-use analytical tools such as:

- Scalar value trending
- 1x, 2x, Nx, peak/phase trending, energy in a band trending
- Waveform
- Spectrum
- Spectrum Waterfall and Cascade
- PeakVue™ measurements including overall, waveform*, spectrum*
- Fault frequencies
- Standard, harmonic, and sideband cursor
- Circular plot
- Orbit
- Bode/Nyquist
- Harmonic family detection
- Sideband frequency detection
- Shaft centerline

*PeakVue waveform and spectrum are not supported with Ovation Machinery Health Monitor



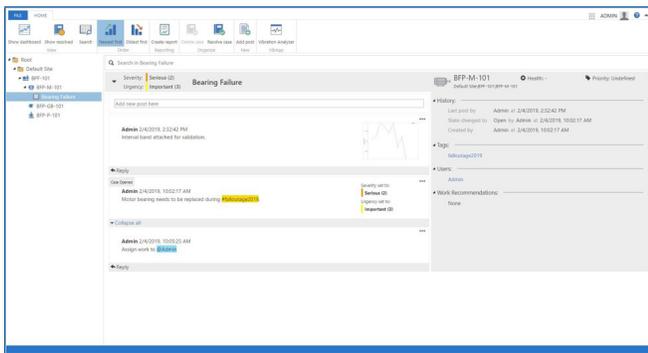
The AMS Machine Works Analysis Dashboard allows users to easily identify what's important.



Intuitive user interface makes diagnosing faults easier than ever.

Easily Document Machine History and Recommendations

The Machine Journal utility enables you to keep track of your analysis activities and record information to be used for asset management. The flexible interface allows you to add documents, images, and add data directly from the Vibration Analyzer application. It is also persona-specific, so you see what's important to you, but you can also tag other users when necessary. When it's time to take action, you can generate work recommendations, which when connected to AMS Optics can be published to your CMMS.



Machine Journal enables users to document analysis activities and pending faults.

Machine Health at a Glance

With the AMS Machine Works Analysis Dashboard you are no longer required to search through alarm logs or dig through hierarchies to find out what machines need your attention. Nor are you required to look through notes and emails to find out what predictive maintenance activities are taking place and what machines need repair.

With one glance at the Analysis Dashboard you can see:

- Machine health
- Device/system health
- Machines that need your immediate attention
- Machine Journal activity
- Work recommendations and status

Selecting any of the items on the dashboard allows you to quickly focus in on what's important, greatly improving workflow and optimizing user experience.



AMS Machine Works software provides a common interfacing software application for condition monitoring data from your monitored rotating equipment, presenting users with a comprehensive view of asset health from across their facility.

AMS Wireless Vibration Monitor and AMS 9420 Wireless Vibration Transmitter

Emerson’s AMS Wireless Vibration Monitor and AMS 9420 Wireless Vibration Transmitter’s are integrated into AMS Machine Works through the Emerson Smart Wireless Gateway (1410 and 1420 models). AMS Machine Works then utilizes that data to perform in-depth vibration analysis of the monitored rotating assets.

AMS Machine Works provides wireless vibration users with all of the necessary tools and functionality needed to utilize the wireless vibration transmitters to their full potential. This includes complete vibration data including overall levels, energy bands, high resolution spectra, and waveforms.

Also included is Emerson’s unique PeakVue technology that filters out traditional vibration signals to focus exclusively on impacting, a more reliable indication of asset health in specific types of equipment. PeakVue can visualize distress signals on a machine that are simply not visible with other vibration measurements.

The AMS Wireless Vibration Monitor also supports Emerson’s new PeakVue Plus technology which automates analysis and presents the information in a color-coded graphic so that users can, at a glance, identify not only a machinery issue but its severity.



Emerson’s wireless vibration solutions provide best-in-class wireless vibration data and capabilities.

AMS Asset Monitor

With this release, Emerson’s AMS Asset Monitor communicates directly with AMS Machine Works. Now it’s possible to store process and vibration data from the AMS Asset Monitor in order to perform in-depth analysis of your important assets.

It accommodates up to 12 CHARMs including several Vibration CHARMs as well as DeltaV CHARMs for process inputs. Predicates can be configured to optimize collection of high resolution waveforms and spectra.



Up to the moment process and condition monitoring results with Store on Alert for automated fault detection.

AMS 6500 ATG

Emerson’s AMS 6500 ATG communicates directly over Ethernet to AMS Machine Works to provide high resolution waveform and spectrum analysis and “transient” recordings of data, all available on demand, by alert or scheduled.

This now makes it simple to extend this prediction/protection monitoring from critical assets to include BOP (balance of plant) assets in a comprehensive monitoring solution.



Real-time machinery health feedback integrates to digital control systems so you can run your plant with confidence.

Ovation Machinery Health Monitor

Emerson’s Ovation Machinery Health Monitor communicates directly with AMS Machine Works to store high resolution vibration data and perform advanced condition monitoring securely outside of your Ovation network.

This solution supports a firewall, DMZ or data diode for hardware-enforced, one-way communications from the Ovation control system to AMS Machine Works, even at a remote operations or diagnostics center.



The Ovation Machinery Health Monitor combines Ovation control with precise vibration protection & advanced analysis capabilities.

System Requirements: AMS Machine Works Server	
AMS Machine Works Version	1.7
Operating System	Windows Server 2016 Datacenter Windows Server 2016 Standard Windows Server 2019 Datacenter Windows Server 2019 Standard
CPU Architecture	64-bit
Internet Information Services (IIS)	v8.5, v10 (supplied with OS)
Microsoft SQL Server	MS SQL Server 2017 / 2019 Full (must be purchased separately) (recommended) MS SQL Server 2017 Express (included with product, 10GB limit) (proof of concept)
Browsers	Google Chrome (latest version) Microsoft Edge (latest version)
Processor	3.2 GHz, 8-core processor, Intel Xeon-scalable (Gold) or faster (recommended) 2.4 GHz, 4-core processor, Intel Xeon-scalable (Gold) or faster (minimum)
RAM	64 GB (recommended) 16 GB (minimum)
Hard Drive	SSD drive (recommended) SAS hard drive (10K RPM) (supported)
Available Disk Space	1 TB (recommended) 500 GB (minimum) 100 GB (for wireless-only setup)
Screen Resolution	4K UHD (3840 x 2160 pixels) (maximum) SXGA (1280 x 1024 pixels) (minimum)
Network	2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)
Data Diodes (Ovation Machinery Health Monitor only)	OWL data diodes are supported. For data diode support with Ovation Machinery Health Monitor, two servers are required for replication of data across the diode.

System Requirements: AMS Machine Works Client	
Operating System	Windows Server 2016 Standard Windows Server 2019 Standard Windows 10 Pro or Enterprise
CPU Architecture	64-bit
Internet Information Services (IIS)	v8.5, v10 (supplied with OS)
Processor	2.2 GHz, 4-core processor Intel Xeon, Intel Core i5 6th Gen (i5 6400T) or better
RAM	16 GB (recommended) 8 GB (minimum)
Hard Drive	SAS hard drive (10K RPM)
Available Disk Space	100 GB
Screen Resolution	4K UHD (3840 x 2160 pixels) (maximum) SXGA (1280 x 1024 pixels) (minimum)

Ordering and Licensing Information

AMS Machine Works can be licensed on a subscription basis. The length of the subscription and renewal terms will be three years unless otherwise set forth in the applicable Emerson proposal. Each license must include an AMS Machine Works Server and a purchased quantity of users and vibration tags.

The purchaser may not use the AMS Machine Works software with more than the purchased number of users and vibration tags, all of which as set forth in the applicable Emerson proposal.

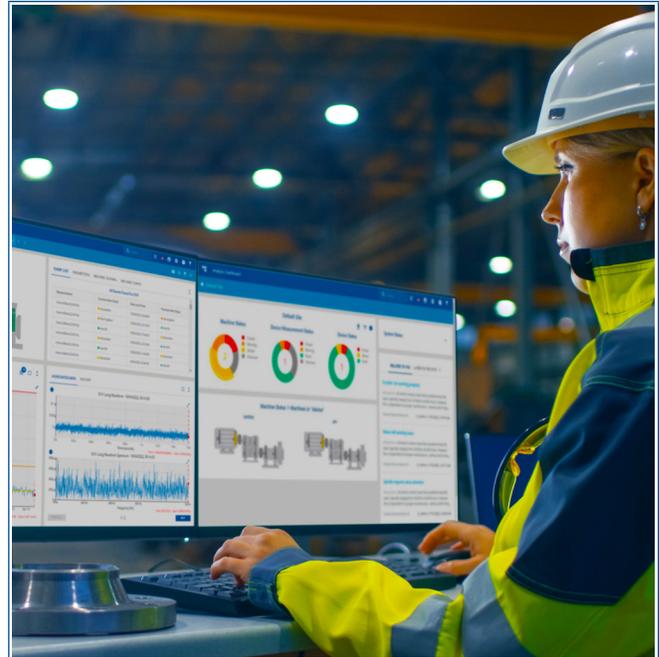
Supported Device Quantities	
AMS 6500 ATG	Up to 1,100 channels or 50 AMS 6500 ATGs on a single AMS Machine Works system
AMS Wireless Vibration Monitor	Up to 4,000 devices connected across 120 Emerson Wireless Gateways
AMS 9420	Up to 600 devices across 50 Emerson Wireless Gateways
Ovation Machinery Health Monitor	Up to 800 channels or 100 Ovation MHM Modules on a single AMS Machine Works system
AMS Asset Monitor	Up to 3,600 channels or 300 AMS Asset Monitors on a single AMS Machine Works system

License Options	Subscription Part Number
AMS Machine Works Server	A43-SYSTEM
Users (combine for desired amount, max of 25 total per system)	
1 User	A43USER-1
5 Users	A43USER-5
15 Users	A43USER-15
25 Users	A43USER-25
Vibration Tags (combine for desired amount, max of 12000 total per system)	
100	A43TAGS-100
500	A43TAGS-500
1000	A43TAGS-1000
2000	A43TAGS-2000
5000	A43TAGS-5000
10000	A43TAGS-10000
12000	A43TAGS-12000
Add-on Licenses	
OPC UA	A43-OPCUA

AMS Machine Works Cloud Hosted Solution

Emerson has partnered with Microsoft to offer **AMS Machine Works Cloud Hosted Solution** in the Azure cloud platform. This eliminates the need for customers to deploy and maintain on-premise installations of the software along with costly infrastructure investment. AMS Wireless Vibration Monitor and AMS 9420 Wireless Vibration Transmitters are easily integrated into AMS Machine Works in the cloud through the Emerson Smart Wireless Gateway and a secure VPN connection established via Cisco Industrial 4G routers.

Having your system on the cloud means that authorized staff can securely access information and data anytime and anywhere. This translates into enhanced mobility, flexibility and collaboration within your teams, with your corporate analyst pool, or even with Emerson experts.



Asset Condition Monitoring Services

Emerson's team of machinery monitoring experts can supplement plant programs with **Asset Condition Monitoring Services**. Specialists are available to monitor and analyze data from Emerson's route-based vibration analyzers, wireless vibration devices, and online systems. They follow up with easy-to-read, actionable periodic reports for your maintenance department.

Get off to a strong start with Guardian

Guardian is Emerson's digital platform for addressing the end-to-end lifecycle needs of control software and assets. The Guardian digital experience enables users to quickly connect to product support and interact with additional software and services that propel performance.

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