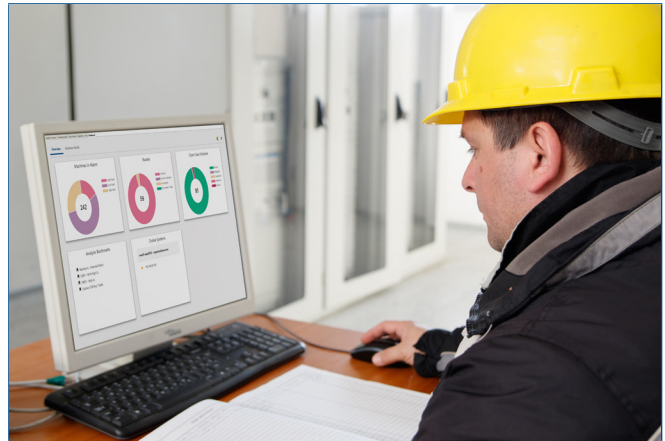# AMS Machinery Manager

- Dashboard overview for status at a glance

- Analysis tools for diagnosis and prognosis of machinery health

- Real-time asset health integration with process automation systems

- Integration with multiple predictive maintenance technologies for a complete picture of mechanical asset health

AMS Machinery Manager provides you with the tools that you need to determine your plant's machinery health.

A Comprehensive View with Accurate Diagnosis

At some point, mechanical equipment will break down. With luck, the breakdown won't occur at the peak of your production schedule or be caused by an out-of-inventory part.

By knowing the health of your rotating mechanical assets, you can plan for repairs rather than react to failures. You can also share the information between maintenance and operations so that repairs are anticipated and production schedules are adjusted accordingly. Your facility can achieve increased availability and performance from production assets, rather than experience expensive downtime and costly repairs.

AMS Machinery Manager combines predictive maintenance techniques with comprehensive analysis tools to provide easy and accurate assessment of the machinery health in your facility.

Integrated Solution

AMS Machinery Manager can integrate with multiple predictive diagnostic technologies to monitor different types of mechanical assets and identify unique failure symptoms.

The modular technology applications incorporate diagnostic and reporting sources into a common database for analysis of machinery health across the entire plant.

Through this integration, you gain a comprehensive view of each monitored machine and more accurate diagnosis of developing problems. Correlation from multiple technologies allows you to identify and fix the root cause of issues once, instead of fixing the symptoms over and over again.

Integrated Technology Solutions Include:

- Portable vibration analysis

- Continuous online machinery monitoring with the AMS 6500 Machinery Health Monitor

- Wireless vibration analysis with the AMS 9420 Wireless Vibration Transmitter

AMS

EMERSON.

- Lubrication analysis

- Infrared thermography

- Laser alignment

- AC motor diagnostics

- Dynamic balancing

Easy to Understand for Users of All Levels

While maintenance personnel may specialize in different monitoring technologies, the centralized dashboard, common user interface, and database administration tools in AMS Machinery Manager modules make the integration of asset health information easy to understand for all users.

Users have a shorter learning curve with each new technology, and some technology modules include different levels of functionality, to give both the beginner and advanced user the experience and information they need.

Simple to Install

Information Technology personnel appreciate the ease of installation and the self-contained database tools that allow a software administrator to handle any issues that may arise, from granting user access to managing the database.

Report, Track, and Trend in a Central Location

AMS Machinery Manager provides a central location for all current and historical reporting, shareable across the organization. Graphical representation from equipment problem trends, work order status, cost savings, and management style reporting are easily generated through an established case history repository.

The case history module is a multi-technology asset information repository, so it allows you to view case history information from many different technologies. This allows you to be well informed on the status of your assets through information logged by oil analysts, vibration analysts, infra red analysts and others. The inclusions of asset images, diagnostic plots, Windows audio and video files, and Microsoft files such as Word and Excel give you the complete information you need in order to make the best diagnosis.
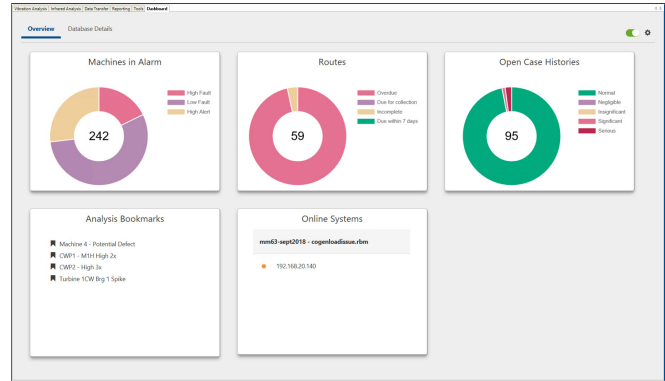
The dashboard allows you to quickly assess the status of your machines and reliability program, then launch directly to areas of importance.

A web-based Machine History Viewer allows diagnostics to be viewed from any computer with Internet Explorer access to your intranet or internet. Management and maintenance personnel can access machinery health status and historical information to make informed decisions.

Machine History Viewer allows the user to select the fields to display for fast review of critical asset information. You can also search on specific items, filter by dates, and print detailed reports. In addition, the Machine History Viewer is an array of web parts. Each web part can be minimized, maximized, moved, closed, and reopened. This functionality provides added flexibility to arrange the web application in any manner desired.
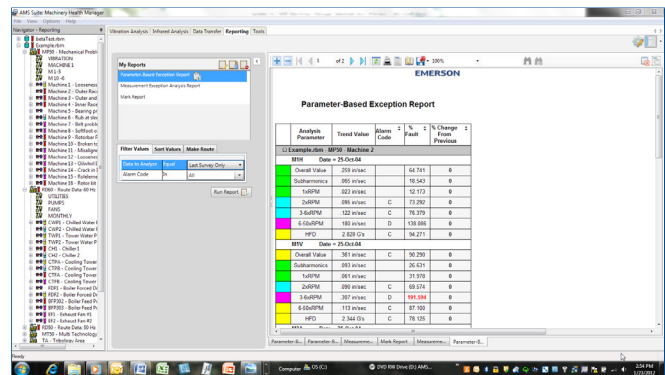
Interactive reports allow you to customize what information will be included and how it will appear.

Interactive Reporting

The Reporting Application allows you to generate interactive reports from their databases. You can sort, expand and collapse asset results, and select parameter data in the report to be viewed in the vibration plot. Print and customize the reports with company logos and export reports to Word, Excel and or .pdf for further edits. This Reporting application allows you to define exactly what types of parameters to view within a report as well as to share 'your setup' with other AMS Machinery Manager users.

Deployment Options to Fit Any Organization

Whether you are a small organization or a global multi-plant operation, AMS Machinery Manager's platform offers a wide variety of licensing and deployment options to fit your needs. From a standalone system to wide area networking capabilities, AMS Machinery Manager provides efficient and reliable storage and analysis of data that can be accessed from anywhere in your organization.

Single-Users

Single-user, standalone systems operate on a single PC. If you operate two or more single-user PCs, a keyed version will allow you to run AMS Machinery Manager based on the computer with the key. The keyed version is great for consultants or co-workers.

Local Area Networks (LAN)

Local area networks are perfect for organizations that need to share their data internally. The network license has read access capability for up to 249 users. This allows other plant personnel to access and view the data concurrently. Write seats, database access, analysis, reporting, and communications are controlled by the user's job responsibilities.
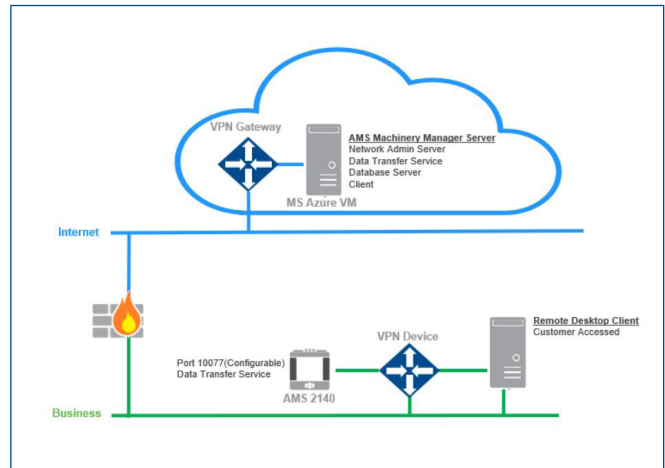
Wide Area Network (WAN)

For a global environment, a wide area network license allows for communication around the world. Data transfer can be completed by simply uploading a route by ethernet or intermediate file transfer. In addition, route definition information can be emailed to personnel and uploaded to an analyzer at any time without having access to a client or server software application.

Analysis and other tasks can be performed globally as if you were at the server site. Read access for up to 249 users and configurable write access customized to a user's job responsibilities are a part of the WAN environment.
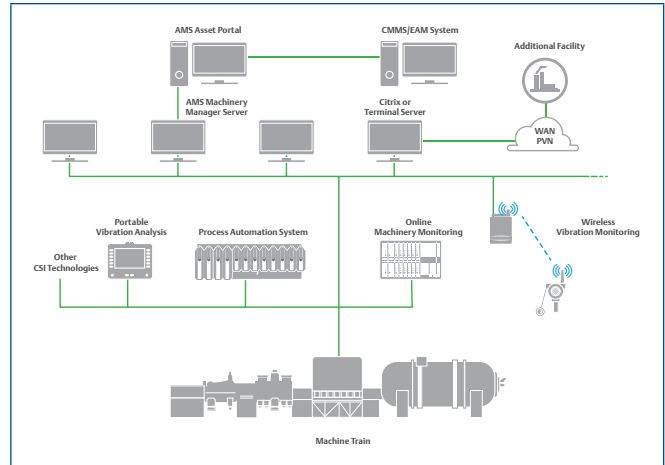
A wide area network allows communication and analysis of machinery health information around the globe.

Cloud based installations can reduce maintenance costs and provides an alternative to wide area network installations.

To better enable digital transformation, AMS Machinery Manager can also be deployed in the Microsoft Azure cloud, removing the need to install software locally. The supported architectures in the cloud can support single servers, as well as client/server architectures including data lockers, and allow for up to ten concurrent users. Please note, cloud deployment is supported for AMS 2140 users only.

Quickly build a predictive maintenance database through the step-by-step, graphical, drag-and-drop wizard application.

Drag-and-drop your route to upload and download your data.

Within a network environment, you can communicate with other AMS Machinery Manager users logged into the system through the Collaboration Tool. See which other users are currently available online and exchange messages on problem assets with appropriate personnel. These messages can contain files and images related to the asset, including vibration plots and thermographic images. The tool also displays current conversations between users, allowing others to participate in the conversation as needed.

Build Databases in Minutes and Access Predictive Diagnostics Immediately

Setting up your database can be one of the most challenging parts of building a predictive maintenance program. Gathering and organizing the appropriate asset information is a daunting task, especially for novice users.

With AMS Machinery Manager, a database wizard eliminates the guesswork by stepping you through the entire process with a graphical drag-and-drop interface. You can set up everything you need – from individual machine components to machine trains.

Automatically Setup Alarms, Analysis Parameters, and Measurement Points

Simply choose assets from an extensive library of motors, bearings, gearboxes, belts, and other components. A knowledge engine compiled from years of field analyst experience automatically creates multi-technology measurement points, analysis parameter sets, and alarm limit settings along with configurations for the automated diagnostic system.

With a few simple keystrokes, you can build the database, download route information, analyze data, and report your machinery health findings.

Dynamic display controls allow you to adjust the angle of the plot display.

View a complete machine at one time and customize your plot view by selecting what you want to see on the screen. This view shows spectrum, waveform, and trend plots.

Efficient Route Setup

A route is an ordered list of asset data collection points that can be used to efficiently acquire data. Route collection options allow you to determine the type of data you wish to store, along with when and how to store the data.

Choose the assets you want to include in the route by simply right-clicking on the navigator and selecting Create Route. Then drag-and-drop the routes to the portable analyzer or folder on your computer. Once you have collected your data, drag-and-drop the route information back to AMS Machinery Manager for analysis.

Flexible Analysis Interface

With AMS Machinery Manager, you can view data more efficiently because you don't need to constantly switch screens. All plots can be displayed as full screen or several plots can be combined in a single window. With multiple monitor support, separate plots can be displayed on up to three monitors.

Common applications of this powerful flexibility include:

- Looking at three directions: the X, Y, and Z plot in a single screen

- Viewing the complete machine component: all measurement points on a motor in a single screen

- Viewing a complete machine

- Viewing similar machines from more than one database

- Selecting how many and what types of plots will appear in your view

- Identifying changes in data from month to month

Quickly Determine Machine Status

Use the AMS Machinery Manager Parameter Status Profile to quickly view parameter alarm status of a machine with a simple, configurable color selection (like green, yellow, and red). This capability helps you to determine where additional attention is needed.

Quickly determine the status of a machine with the Parameter Status Profile.

Navigational Ease

Navigational functionality allows you to maneuver between different plot types like single spectrum, multiple-point wavefoms, and trends. Navigation between data, measurement points, machines, areas, and multiple databases is easy with the navigational tree.

Prescreen to narrow the search by selecting only points in alarm, survey dates, or notes that have been assigned to a machine or data point.

Automated Diagnostics Narrow the Search

When you are unsure or need a second opinion on your analysis, the Automated Diagnostic module can confirm your diagnosis or point you to other underlying faults. The Automated Diagnostic program will help you understand how it reached its conclusion and can also be used as a training tool. The module steps you through reasoning, rules, and facts as it analyzes the collected data to increase your knowledge and diagnostic skills.

Fine Tune Alarms

During your analysis or after you have had time to acquire several months of data, you may need to adjust your original alarm setups. The Automated Statistical Limit Calculation module can take data from vibration patterns and construct narrowband alarms. Envelope alarms can also be manually defined and created from a reference spectrum.

Waveform Audio Replay

Replay the audio from a periodic or online waveform, a transient detailed waveform, or an analyze job waveform. A loop button is available to continuously repeat shorter waveforms. You can also compare the audio from two waveforms. For example, a waveform collected from a problem machine will often sound different than a waveform from a similar machine without a fault present. The audio output can be saved as a .wav file and attached to reports for sharing.
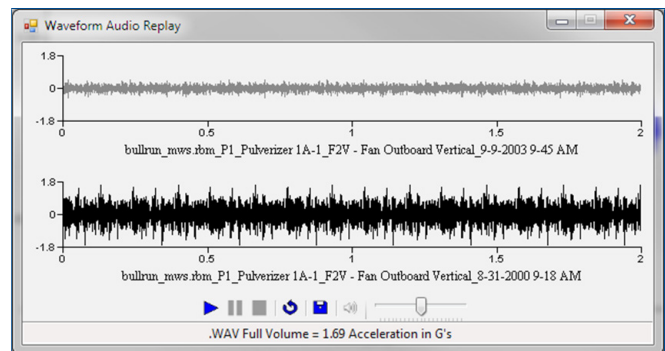
Compare the audio from two different waveforms with the Waveform Audio Replay option.
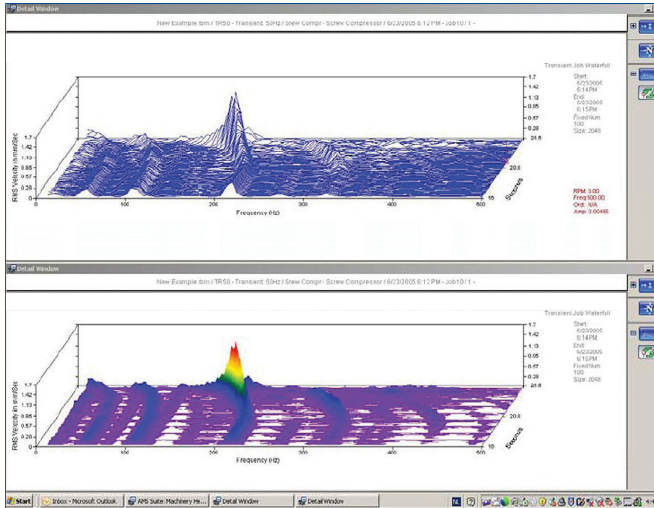
Viewing a waterfall plot in color allows you to see the difference in the amplitudes more readily.
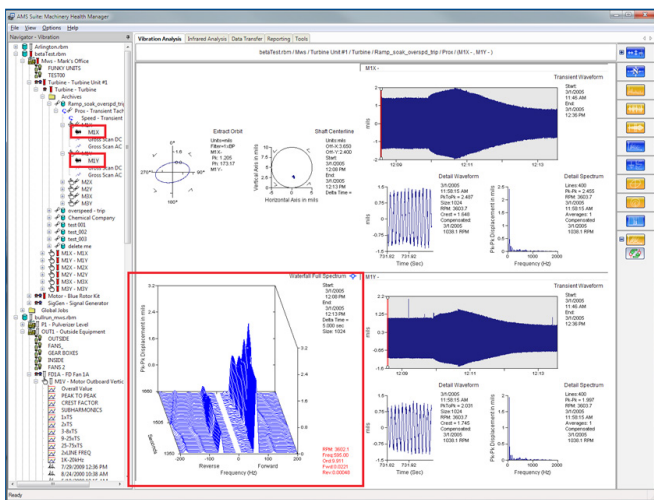
With Cascade Full Spectrum, the user can quickly differentiate between a rub and an oil swirl anomaly.

Advanced Analytical Tools

AMS Machinery Manager offers extensive analysis tools to enable accurate diagnosis of machine health.

Analysis tools are available for specific challenges, such as slow or variable speed equipment, rolls, waveform analysis, early bearing or gear impacting, electrical defects, and more. Advanced tools include:

- Colored waterfall plots
- Waveform autocorrelation
- Waveform Audio Replay
- Circular waveform plot
- Orbits/filtered orbits
- Bode nyquist
- Full Spectrum & Cascade Full Spectrum (online data)
- 3D Shaft Centerline Animation Plot (online data)
- Transient replay that replays a AMS 2140 transient signal, including the startup of your critical machinery
- Transient waveform runout correction
- Customizable narrow band trends
- Dynamic display control to customize the view of 3D plots

The Perfect Vibration Analysis Package for Your Organization

AMS Machinery Manager provides a wide breadth of vibration capabilities – from entry level packages with basic vibration analysis tools to more advanced capabilities like dual-channel and transient analysis.

Advanced Vibration Analysis Module

The Advanced Vibration Analysis module provides in-depth analysis options for transient and cross-channel data collected with a AMS 2140 Machinery Health Analyzer, including cross-channel phase, coherence, and transfer functions. You can post process transient data to show the vibration frequency characteristics during machine coastdown or startup.

Export data directly from AMS Machinery Manager to a companion software module for Operating Deflection Shape (ODS) and Modal analysis.

Create a machine model and animate vibration readings to generate powerful documentation on machinery faults. Perform in-depth structural analysis with the Modal Analysis module and test virtual design modifications to eliminate the root cause of reliability issues.

Continuous Online Machinery Monitoring

The same powerful predictive analysis tools available for the portable vibration analysis module are available online monitoring systems, including plotting, trending, transient, spectral analysis, PeakVue™ technology, autocorrelation, and statistical analysis.

Predictive monitoring and analysis features include:

- Web-based current and historical data
- Web-based asset prioritization and maintenance planning
- Web-based performance monitoring
- Customized graphical user interface
- Integration to 3rd party control systems via Modbus protocol
- Shaft animation plots for transient archives
- Full spectrum and cascade full spectrum

Easy Reciprocating Compressor Monitoring

AMS Machinery Manager displays PeakVue waveforms on a circular polar plot for easy identification of leaking exhaust valves on reciprocating compressors.

Properly operating valve   Leaking exhaust valve
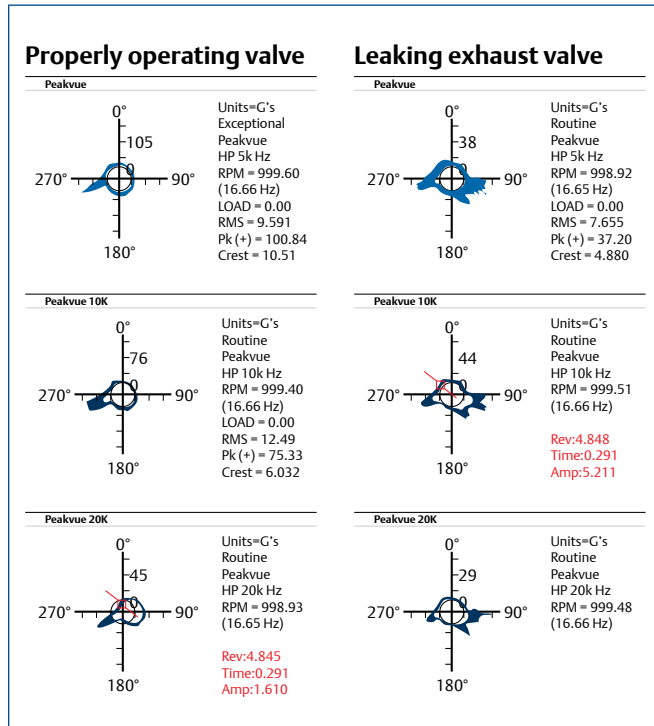
*Waveform data incorporated onto circular polar plots delivers insight to developing valve faults.*

Transient Live Display Mode

The live mode in AMS Machinery Manager provides real-time data plots, including overall levels, orbits, shaft centerline, Bode/Nyquist, cascade, waveform, and spectrum. Overlay baseline plots (from portable or online systems) on good startup plots to view differences.

With the transient live mode, you can make real-time decisions with operators and production staff to bring a turbine up for critical production needs or to shut down to protect the asset.
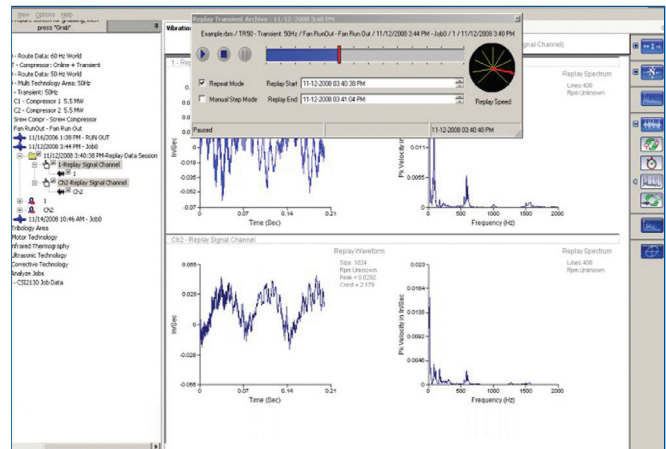
Transient data collection allows for continuous data recording simultaneously on all channels. You can replay the stored data for detailed analysis at any moment within the collection cycle.
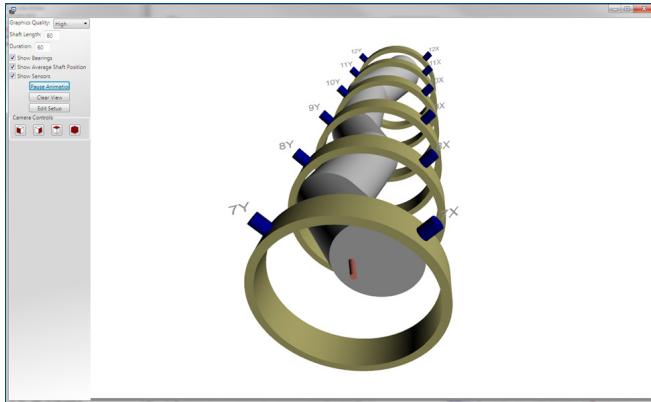
Live 3D shaft animation plots show the actual motion of the shaft around the average shaft position.

Shaft Animation Plots

The shaft animation plot shows the actual motion of the shaft around the average shaft position. Click on displayed sensors to bring up detailed spectrum, waveform, waterfall or bode/Nyquist plots, while clicking on a bearing brings up orbit and shaft centerline plots. Orbit and waveform plots have animated cursors that update as the shaft rotates. You control the setup information for the animation, including graphics quality, play speed, and resting voltage and bearing clearance data crucial for accuracy in the animation. The View Control buttons provide four default views (front, side, top, and a combination of the three). Or you can also rotate or pan across the view by holding down either the left or right mouse button over the plot and dragging. Rotating the mouse wheel changes the zoom.

Wireless and Wired Transmitters

AMS Machinery Manager supports the import of advanced diagnostic data, including spectra and waveforms from the AMS 9420 Wireless Vibration Transmitter. This data along with other types of process variables are imported via the Smart Wireless Gateway. In addition, process data from any IEC-approved *Wireless*HART®-enabled transmitter can be imported into AMS Machinery Manager through the Smart Wireless Gateway. Correlating both vibration and process data allows for a more comprehensive analysis of developing problems.
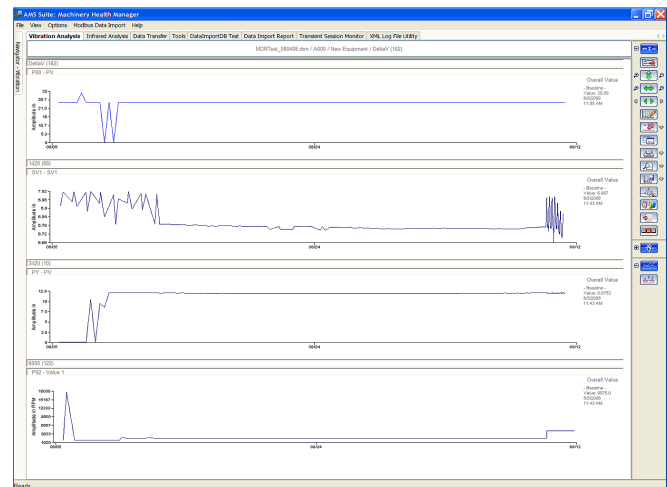
With data import, you can view process automation information or diagnostics from WirelessHART devices.

Configuration and user interface options in AMS Machinery Manager optimize bandwidth usage, battery life, and time spent interacting with transmitters:

- Spectrum-on-Alert automatically retrieves only the data you need, when you need it

- Select spectrum resolution - from 400 to 1,600 lines - to conserve power and bandwidth

- Use efficiency tools for easy mapping and configuration of transmitters

- Auto-calculate capabilities optimize network traffic

- Use the device log to identify and resolve system issue quickly by providing insight into transmitter operations

Vibration Analysis Packaging

Module/Package	A472008 Vib View Transmitter	A472001 Vib View Silver	A472002 Vib View Gold	A472003 Vib View Platinum	A474505 Vib View Online
Database Management	✔	✔	✔	✔	✔
OilView Trivector Lab	✔	✔	✔	✔	✔
ODBC Driver	✔	✔	✔	✔	✔
Trend Plotting	✔	✔	✔	✔	✔
Fault Frequencies	✔	✔	✔	✔	✔
Advanced Plotting and Analysis Tools	✔	✔	✔	✔	✔
Wizard Database Setup	✔	✔	✔	✔	✔
CMMS Interface Tools	✔	✔	✔	✔	✔
Advanced Reporting	✔	✔	✔	✔	✔
Machine History Viewer	✔	✔	✔	✔	✔
Asset History Management	✔	✔	✔	✔	✔
Basic Statistical Alarm Management	✔	✔	✔	✔	✔
Multi Window Plotting and Analysis	✔	✔	✔	✔	✔
Dual-Monitor Support	✔	✔	✔	✔	✔
Management Reporting	✔	✔	✔	✔	✔
Multi Speed-Multi Plane Balance Calculator		✔	✔	✔	✔
Manual Data Entry		✔	✔	✔	✔
Route Management		✔	✔	✔	
Advanced Statistical Alarm Management			✔	✔	
Rule-Based Automated Diagnostics			✔	✔	
Additional Management Reporting				✔	
Dual-Channel and Transient Analysis Support				✔	
Advanced Cross-Channel Analysis, ODS/Modal Support				✔	
Online Database Configuration					✔
Dashboard View of Monitored Equipment					✔

Oil Analysis

The AMS Machinery Manager Oil Analysis module turns oil data into maintenance information. Applications for onsite oil analysis, offsite laboratory data, and wear debris analysis can be used individually or together to turn oil analysis data into a predictive maintenance tool.

The Oil Analysis module performs automated analysis, plotting and trending, data storage, and reporting, and has a tutorial to get you running quickly.

The Trivector Plot condenses rows of data into one intuitive plot with three vectors: chemistry, contamination, and wear. Alarm levels on each vector are customized to the type of machine and the operating environment.

The Minilab application supports both the AMS 5200 Machinery Health Oil Analyzer and the Spectro 5200 oil analysis minilab.

It includes easy-to-understand graphical plots and trends for each measurement, automated diagnostic interpretations and recommendations, and step-by-step operational instructions for each instrument.

The Lab Information Management System (LIMS) is a comprehensive oil analysis management application that imports data from most oil labs as well as oil analyzers and minilabs from Spectro Incorporated. In addition to importing data, LIMS also exports oil route information to Spectro Scientific's Q1100, Q230, and Q3050 mini-lab instrumentation. The LIMS applications offers automatic reporting and distribution, detailed sample tracking, and a custom address book. Use of the LIMS package results in an efficient, versatile oil analysis operation.

The Wear Debris Analysis application allows you to analyze and compare images, store data, and report your findings on particulate material in the oil.

Oil Analysis Packaging

	A475100	A475101	A475103
Module/Package	**Minilab**	**LIMS**	**Wear Debris Analysis**
Advanced Plotting and Analysis Tools	✔	✔	✔
Wizard Database Setup	✔	✔	✔
Import Lab and Diagnosis	✔	✔	✔
Step-by-Step Operational Instructions	✔		
Calibration, Operation, and Data Storage for each Minilab Instrument	✔		
Automated Interpretation and Recommendations	✔		
Trivector Plot of Wear, Contamination, and Chemistry	✔		
Database of Common Lubricants	✔		
Alarm Management	✔	✔	
Create and Manage Batches		✔	
Sample Scheduling with Tools		✔	
Export Data and Reports		✔	
Print oil route point labels		✔	
Export oil route to Q1100, Q230, and Q3050		✔	
Import oil data from most Spectro Inc. analyzers		✔	
View and Analyze Wear Debris			✔
WDA Image Library			✔

Infrared Thermography

A successful and efficient infrared thermography inspection program is more than just an infrared camera. With AMS Machinery Manager, you can execute a well-planned program that mirrors the structure of your vibration analysis program – from setup to reporting.

The Infrared Analysis module features a Diagnostic Fault Tree that contains a log of equipment types, fault types, and recommended actions.

Rather than simply annotating IR images, you can create a detailed fault analysis of the image. The Fault Diagnostic Tree reduces the time needed to analyze and report on images and provides consistent analysis of anomalies, even between different thermographers.

Tools for both analysis and reporting are available on a single screen, allowing you to go directly from an IR image to detailed analysis to a machinery health report quickly.

The Infrared Analysis module provides a complete set of postscan analysis tools, allowing you to:

- Indicate specific location temperatures with spot meter placement

- Draw lines across an image and produce a temperature profile plot that indicates the temperature change along the line

- Place shapes on the image to produce a temperature histogram plot

- Identify locations of a specific temperature on an image

Users can view and analyze FLIR® visual and thermal images using AMS Machinery Manager. The Infrared Analysis Module supports FLIR Thermal Images for all current FLIR cameras. The module also supports FLIRspecific palette types of Rainbow and Rainbow High contrast and FLIR polyline annotation types.

AMS Machinery Manager also supports Fluke® infrared camera images. With this functionality, you can view and fully analyze Fluke visual and thermal images. IR reporting formats provide selectable items for inclusion within the reports.

Because the database seamlessly integrates IR analysis with other machinery health technologies, reports generated from AMS Machinery Manager are powerful cross-technology tools for verifying the fault and severity of machinery problems.

Infrared Packaging

	A479400
Module/Package	**Infrared Thermography Silver**
Database Management	✔
Import/Export of IR data	✔
Import IR Off-Route Image Files	✔
Infrared Event Management	✔
Information Framework	✔
Set Environmental and Electrical Parameters	✔
Detection of High-Resistance Joints	✔
Thermal Profile Plot, Histogram, Isotherms, and Temperature Table	✔
Over Ten Available Temperature Pallettes	✔
Associate Temperature with Isotherms	✔
Data Transfer	✔

Motor Diagnostics

AMS Machinery Manager provides analysis and diagnostic tools for electric motor condition monitoring using Emerson's nonintrusive Flux Coil and Current Clamp. The Motor Diagnostic module in AMS Machinery Manager detects motor-related electrical faults, such as broken rotor bars, high-resistance joints, voids in aluminum cast rotors, and cracked rotor end rings in squirrel-cage induction motors.

The gold version of the Motor Diagnostics module can be used to detect additional electrical problems, such as voltage imbalance and faults in rotors and stators.

The Motor Diagnostics module features expert diagnostic systems with patented technology to perform automated analysis of collected flux, temperature, and shaft voltage/current data. After diagnosis, AMS Machinery Manager provides recommendations for appropriate follow-up actions – taking the guesswork out of your analysis.

Laser Alignment and Dynamic Balancing

AMS Machinery Manager includes software modules for laser alignment and dynamic balancing corrective actions. The software archives job documentation generated by AMS-brand alignment and balancing tools.

Results are automatically compared to original condition tolerance specification for display and reporting. Once the job is complete, data can be stored in AMS Machinery Manager for reporting and future use. If it is necessary to revisit the same machine at a later time, data can be downloaded to provide an opportunity for a one-shot rebalance.

Laser alignment and precision balancing jobs can be stored and reported in AMS Machinery Manager.

MotorView Packaging

Module/Package	A473001 MotorView Silver	A473002 MotorView Gold
Database Management	✔	✔
Analyzer Data Transfer	✔	✔
Route Management	✔	✔
Trend Plotting	✔	✔
Fault Frequencies	✔	✔
Motor Diagnostic Plotting and Analysis Tools	✔	✔
Detection of Rotor Related Faults	✔	✔
Detection of Broken Rotor Bars	✔	✔
Detection of High-Resistance Joints	✔	✔
Detection of Voids in Aluminum Cast Rotors & Cracked Rotor End Rings in Squirrel-Cage Induction Motors	✔	✔
Detect Rotor and Voltage Imbalance	✔	✔
Flux Motor Analysis		✔
Motor Surface Temperature Trending		✔
Detect Electrical Problems in Rotors, Stators, and Voltage		✔

Continuing Support to Ensure Success

Training Courses Build Expertise

Emerson Educational Services help maximize the return on your technology and personnel investment. Courses are taught by professionals with experience in developing or working within actual plant predictive or reliability-based maintenance programs. Training is offered in Emerson's state-of-the-art training facilities or onsite, giving you expert training without leaving your facility. Emerson also offers virtual classroom training.

Certified instructors deliver the curriculum using Adobe Connect Meeting Room with full audio and video support. Students can pose question directly to the instructor or share them with the classroom.

Technical Support You Can Count On

Your company makes significant investments in technology to safeguard its production assets. Emerson is committed to providing quality technical support for your machinery analysis tools. Our Technical Support Agreements for hardware and software products do more than keep your technologies running smoothly. They provide the latest functionality for your existing technologies and protect your investment through priority access to support and repair services.

AMS Machinery Manager Cloud Hosted Solution

Emerson has partnered with Microsoft to offer **AMS Machinery Manager Cloud Hosted Solution** in the Azure platform. This eliminates the need for customers to deploy and maintain on-premise installations of the software along with costly infrastructure investment. Available functionality includes route vibration data upload and download, use of data lockers, and the full breadth of vibration analysis and reporting tools traditionally supported for the AMS 2140 in AMS Machinery Manager.

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.

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