

AMS[™] Suite: Machinery Health[™] Manager v5.4

The AMS Machinery Manager v5.4 release is the result of user input collected during plant visits and documented by our customer support and marketing teams. This release includes enhancements that will simplify the work of users of every experience level.

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AMS Suite: Machinery Health Manager

Version v5.4 Features and Enhancements

The major AMS Machinery Manager v5.4 enhancements focus on data visibility and ease of use. For example, spectral and waveform data from the CSI 9420 Wireless Vibration Transmitter can now be viewed in the AMS Machinery Manager application. And machinery health programs are strengthened through the 3-step integration of AMS Machinery Manager with Emerson's DeltaV and Ovation process automation systems.

CSI portable technology users will find increased software functionality and reduced time spent performing routine procedures, especially in the vibration and infrared thermography modules. New database reporting capabilities allow summarized reporting of analysis parameter, fault frequency, and alarm limit sets by machine and/or analysis group. A new Overall Vibration Index report in the Export application identifies all monitored assets in the plant that have exceeded their assigned vibration threshold limits. There are also significant user interface changes to the Infrared Analysis module, a new zip utility available from the navigation tree, multiple route-load capability for the CSI 2130 Machinery Health Analyzer, new vibration analysis plotting options, and customization options in the RBMview reporting module.

Online and Wireless Enhancements

Easy Setup and Integration of Online Data

Before the release of AMS Machinery Manager v5.4, integrating machinery protection into Ovation[®] or DeltaV[™] process automation systems was a tedious process. In-depth knowledge of the hardware, software, and mapping details was required. The risk of input errors was very high.

In this latest release, AMS Machinery Manager will scan the CSI 6500 hardware, select alarms and parameters, and import the information into DeltaV or Ovation. This is an automatic process that creates control modules, alarms and limits. Setup can now be done in three easy steps and usually in less than 10 minutes.

**Integrated Machinery Protection
 MADE EASY**

1) Scan CSI 6500 hardware 2) Select alarms & parameters 3) Import to DeltaV / Ovation 3 steps! 10 minutes

Easy!

- Automatically create:
 - Control modules
 - Mapping of control modules to designated controller
 - Alarms and limits

**Integrated Machinery Protection
 MADE EASY**

Machinery Health Faceplate as standard

Dynamos to build machinery graphics

Alarm Banner automatically populated

CSI 6500 Vibration Monitoring

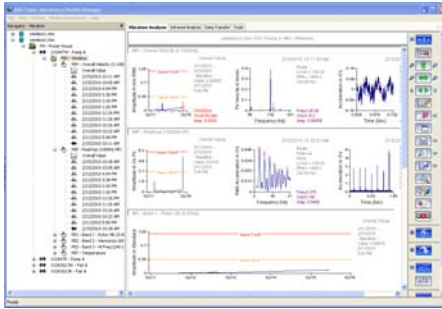
Easy integration of CSI 6500 protection diagnostics with DeltaV and Ovation digital control systems.

Users of the CSI 6500 and AMS Machinery Manager will also experience:

- improved extraction of transient data across gaps, including feedback during transient data extract for success or failure reporting, time remaining, percent complete, and consolidation
- ability to re-order Modbus registers
- time synchronization of online monitors with the process control system

Import of Wireless Vibration Data from CSI 9420

Import spectrum, waveform and trend data from the CSI 9420 Wireless Vibration Transmitter to AMS Machinery Manager v5.4. You can also create equipment and



CSI 9420 data in AMS Machinery Manager

measurement point information within the database for storage of wireless data.

The software can be setup for demand acquisition (initiated each time by the user) or interval acquisition (regularly scheduled acquisition). There is also a low resolution spectrum that can be retrieved from the CSI 9420, called a thumbnail or EDDL (Enhanced Device Descriptor Language) spectrum. This spectrum can be pulled from the device connections setup.

General Functionality

| Tag | Created | Node | Program | Activity | Description |
|-----------|-----------|----------|------------|---|-------------|
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00014.jpg | |
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00016.jpg | |
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00017.jpg | |
| 23-Oct-06 | Machine 1 | RBMView | Data Image | ...:\RBM\user\CustData\view_Examples | |
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00013.jpg | |
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00020.jpg | |
| 23-Oct-06 | Machine 1 | ISMGAITE | Data Image | File: img00018.jpg | |
| 15-May-09 | Machine 1 | RBMView | DOCX file | ...:\ntsl\interface affected by enhancem | |
| 15-May-09 | Machine 1 | RBMView | PDF file | ...:\alvin.manabatt\Documents\Documen | |
| 15-May-09 | Machine 1 | RBMView | XLSX file | ...:\anastasya.D\Documents\Documents\AO | |
| 15-May-09 | Machine 1 | RBMView | MP3 file | ...:\ings\alvin.manabatt\Desktop\the eagles | |
| 15-May-09 | Machine 1 | RBMView | WMV file | ...:\Documents and Settings\alvin.manabatt\De | |
| 15-May-09 | Machine 1 | RBMView | DOC file | ...:\d Settings\alvin.manabatt\Desktop\CPQ | |
| 15-May-09 | Machine 1 | RBMView | XLS file | ...:\manabatt\Documents\Documents\C | |

Attach new file types to RBMview Case History

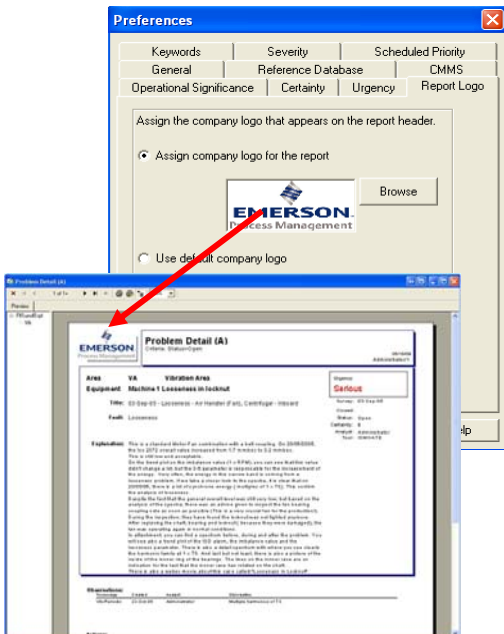
Expanded File Types for RBMview Case Histories

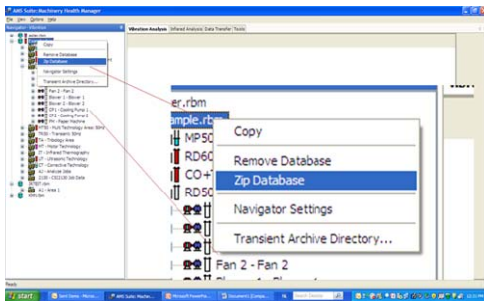
AMS Machinery Manager's RBMview reporting module allows you to attach several file types, including images, to the case history. The file extensions supported include Adobe PDF files (*.pdf) and Microsoft files like Word (*.doc, *.docx), Excel (*.xls, *.xlsx), Windows audio file (*.wav, *.wma, *.mp3), Windows video file (*.avi, *.wmv, *.mpg), and Extended Windows metafiles (*.emf).

Attach important files that are relevant to the asset, such as a diagram or documents containing other critical information.

Import Logos and Images into Reports

Add your company logo or customize your RBMview reports by adding other images to the report heading. Supported image types include *.bmp, *.jpg, *.png, *.gif, and *.ico.

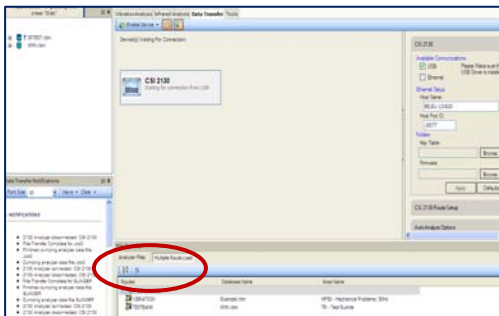




Autozip database from the Navigator

Zip Databases Directly from Navigator

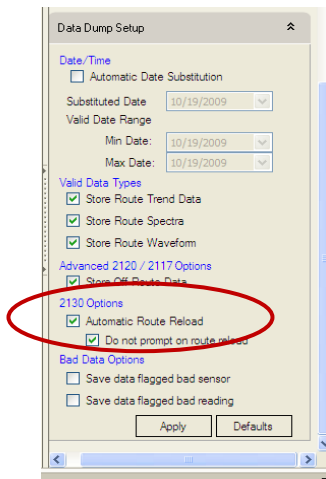
In previous versions of AMS Machinery Manager, zipping a database file meant running the Database Zip Utility. With the v5.4 release, you have the added option of zipping a database faster by simply selecting the database in the navigator tree and right clicking for the zip database option. A pop-up dialog box allows you to name the backup file and select the location where the file is saved.



Load multiple routes to the CSI 2130

Multiple Route Load and Reload for the CSI 2130

There are two ways to load multiple routes to the CSI 2130 Machinery Health Analyzer. In the software, new routes are dragged-and-dropped from the Route Management module to the connected CSI 2130. You can also load multiple routes from the analyzer while connected to your computer. A firmware upgrade may be needed if using the CSI 2130 to load multiple routes.



Automatic Route Reload in Data Transfer

Routes that appear in the Data Transfer and Multiple Route Load windows can be sorted by name, size, date, or status.

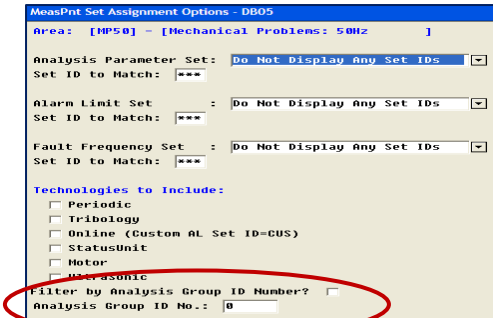
After dumping a route from the CSI 2130 directly into the database, you can automatically reload the route back to the data collector by simply selecting the Automatic Route Reload option in Data Transfer. This new functionality will keep your trend data updated in the analyzer and eliminates the need to load the route every time you go out to collect data.

Note: Data is deleted out of the analyzer when this option is selected. This option is not available in standalone Data Transfer.

New Reporting Enhancements

Summary Reports of Data Sets

In the Database Management program, a new filter summarizes analysis parameter sets, fault frequency sets, and alarm limit sets assigned to a specific analysis group. This allows you to only display those sets that you are interested in.



Filter analysis parameter, alarm limit, and fault frequency sets

Simplified Vibration Index Report in Export

The Simplified Vibration Index report provides an average monthly overall vibration level based on your defined requirements – asset, equipment type, area, database, or database group. This report also allows you to enter two threshold values (similar to alert and fault levels) and view a report displaying equipment that exceeds threshold values in each of the monthly periods.

Simplified Vibration Index Report

Database: Example_rhm
 Area: Route Data: 50 No World
 Report Date: 20-Oct-09 08:59

| Time Period | Overall Value mm/Sec RMS | Number Exceeding Threshold 1 | Number Exceeding Threshold 2 |
|-------------|--------------------------|------------------------------|------------------------------|
| Sep 2007 | 2.974 | 2 | 1 |
| Oct 2007 | 2.832 | 0 | 3 |
| Nov 2007 | 3.668 | 2 | 3 |
| Dec 2007 | 3.765 | 1 | 3 |
| Jan 2008 | 3.009 | 1 | 1 |
| Feb 2008 | 2.805 | 2 | 2 |
| Mar 2008 | 4.043 | 1 | 2 |
| Apr 2008 | 3.274 | 1 | 2 |
| May 2008 | 3.625 | 4 | 2 |
| Jun 2008 | 6.131 | 1 | 3 |
| Jul 2008 | 5.418 | 0 | 3 |
| Aug 2008 | 3.593 | 2 | 1 |

Equipment Total Analyzed: 9
 Threshold 1: 2.000
 Threshold 2: 4.000

Vibration Index Report by Area

Simplified Vibration Index Report

Database: Example_rhm
 Area: Route Data: 50 No World
 Report Date: 20-Oct-09 08:59

| Time Period | Overall Value mm/Sec RMS | Number Exceeding Threshold 1 | Number Exceeding Threshold 2 |
|-------------|--------------------------|------------------------------|------------------------------|
| Sep 2007 | 2.974 | 2 | 1 |
| Oct 2007 | 2.832 | 0 | 3 |
| Nov 2007 | 3.668 | 2 | 3 |
| Dec 2007 | 3.765 | 1 | 3 |
| Jan 2008 | 3.009 | 1 | 1 |
| Feb 2008 | 2.805 | 2 | 2 |
| Mar 2008 | 4.043 | 1 | 2 |
| Apr 2008 | 3.274 | 1 | 2 |
| May 2008 | 3.625 | 4 | 2 |
| Jun 2008 | 6.131 | 1 | 3 |
| Jul 2008 | 5.418 | 0 | 3 |
| Aug 2008 | 3.593 | 2 | 1 |

Equipment Total Analyzed: 9
 Threshold 1: 2.000
 Threshold 2: 4.000

ID# is the Equipment ID

| ID# | Feb 2008 | Mar 2008 | Apr 2008 | May 2008 | Jun 2008 | Jul 2008 | Aug 2008 |
|----------|----------|----------|----------|----------|----------|----------|----------|
| Center 1 | 3.199* | 3.554* | 4.372* | 2.966* | 6.125* | 4.963* | 3.339* |
| Center 2 | 5.412* | 4.489* | 5.453* | 7.032* | 6.188* | 6.389* | 6.522* |
| Jan 3 | --- | --- | 2.288* | 2.974* | --- | --- | 1.900* |
| Blower 1 | 5.222* | 6.889* | --- | 5.221* | 9.418* | 4.981* | --- |
| Blower 2 | 1.800* | 1.921* | --- | 3.169* | 2.587* | --- | --- |
| SP1 | --- | --- | --- | --- | --- | --- | --- |
| SP2 | 1.917* | --- | --- | --- | --- | --- | --- |
| PH | --- | --- | --- | 1.726* | --- | --- | --- |

* Exceeds Threshold 2
 * Exceeds Threshold 1

Simplified Vibration Report by Equipment

Export Deviation Report

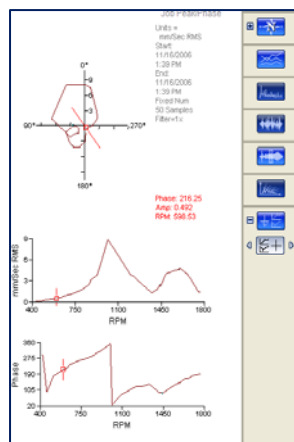
With previous releases of AMS Machinery Manager, the export deviation report provided the deviation of recent data from the previous or baseline value. With AMS Machinery Manager v5.4, this report allows you to enter a date of your choice to compare against recent data.

Vibration Analysis Enhancements

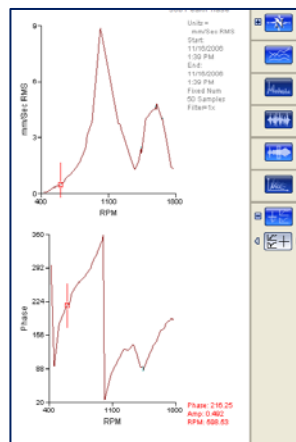
Bode Nyquist Plotting

You can now separate Bode plots from Nyquist plots in the Vibration Analysis Application. There are two ways to access this new functionality – from the Function Bar button as well as from the Peak/Phase setup options.

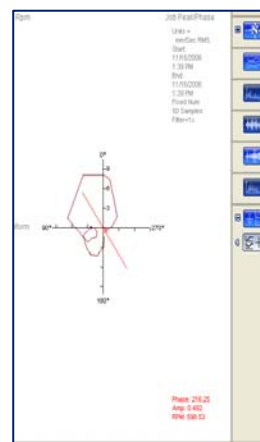
The function bar button allows you to cycle through three view modes that include the Bode-Nyquist view, Bode-only view, and Nyquist-only view. Through this functionality, you can select the appropriate plot or pan through each view. Print the separated Bode-Nyquist plots for easier interpretation of the data.



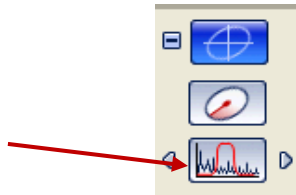
Bode/Nyquist Plots



Bode Plots

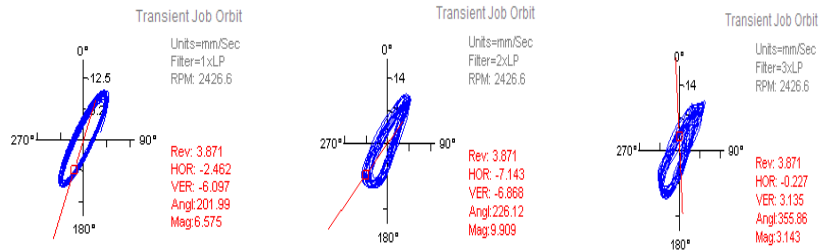


Nyquist Plot



Filtering Waveform and Orbit Plots

The new function bar allows you to quickly pan through filters on waveforms and orbits, such as 1xrpm, 2xrpm, bandpass, and lowpass.

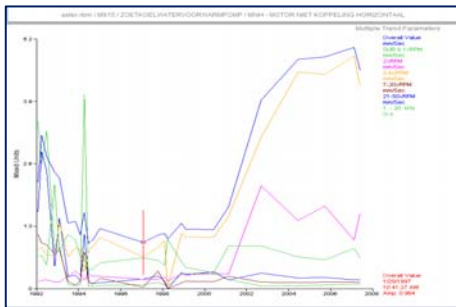


Cycling through filtering an orbit – 1 x rpm, 2 x rpm, and 3 x rpm

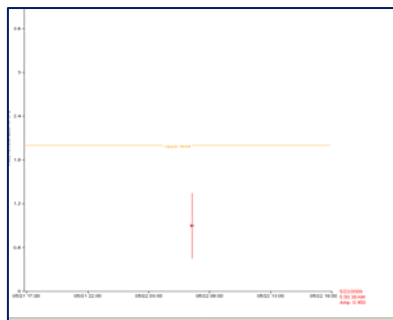
Multiple Trend Parameter Plot

In previous releases of AMS Machinery Manager, you could display several trend parameters in a bar chart or in separate plots for each individual parameter. AMS Machinery Manager v5.4 extends this functionality by enabling multiple trend parameters on one single trend plot.

This new release also allows you to plot only one trend point.



Multiple Trend Parameters displayed on one plot



Display one trend point on plot

Fault Frequencies Added to Analyze Job Data

Spectrum and waveform data associated with Analyze jobs can be used to display fault frequencies. The displayed fault frequencies belong to vibration measurement points associated with the same piece of equipment as the Analyze job.

The job measurement locations must have the same ID as the vibration points with which fault frequencies are associated. For example, the fault frequencies associated with periodic vibration measurement point MOV can be displayed on point MOV in an Analyze job.

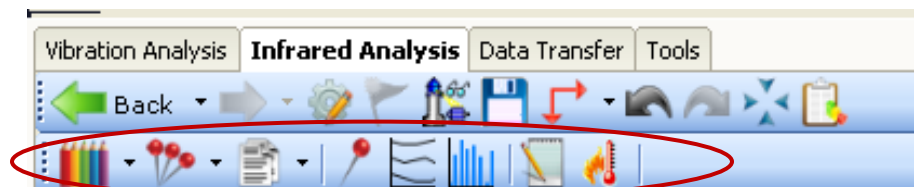
Infrared (IR) Thermography Enhancements

Right Click Options and New Toolbar

To simplify the extensive 'right click' context menu used on an IR image, AMS Machinery Manager v5.4 has scaled down the context menu and pulled some of the features within the menu out to create options on the new tool bar. The new tool bar is shown below with the available icons. These new icons make it faster and easier to manipulate analysis features and other setup options.



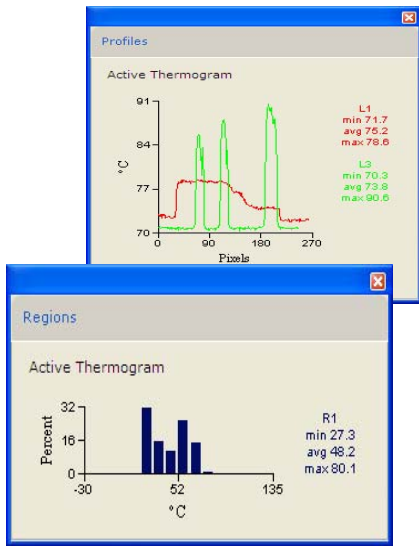
New IR right-click options



*New tools from left to right:
Palette Type, Markers, Image Properties, Spot Meter, Profiles, Regions,
Notes, Temperature Conversion*

Label X and Y Axis

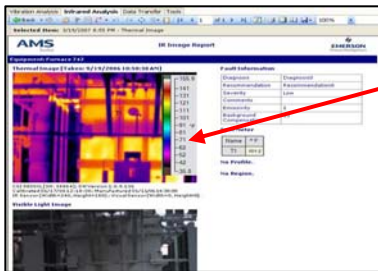
You can now add labels to the X axis on the profile plot and the Y axis on the region plot to identify units of measure. This functionality is also available in the application's profile preferences.



Infrared Profile and Region plots with axis labeling

Color Legends on IR Report

With v5.4, the Image Analysis Report features a graph color legend similar to a color palette bar. You can select bottom, top, left or right-hand placement along with other options in the Color Legend window under IR Preferences.



New color legend on IR report

CSI 2130 Machinery Health Analyzer Firmware Enhancements

Warning Alarms

From the User Setup Alt2 screen, you can disable the Br or Bs values in the status line of the main route point screen in order to suppress all low level alarms that would not be high priority. These alarms are still calculated, transferred back to the database, and can be included in reports.

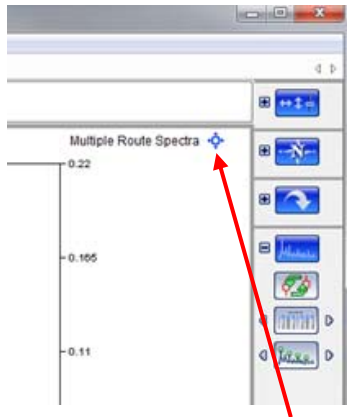
View Trend History Key

You can view trend histories by using the new F10 key on the Route Point screen, assuming that the trend history has been downloaded with the route.

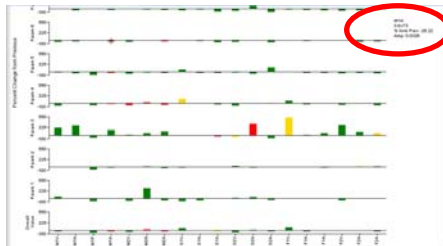
Easier Fault Frequency Navigation

When fault frequencies are downloaded to the analyzer with the route, you can use new keys in the plotting menu to more easily navigate those entries. Next Fault Freq and Prev Fault Freq keys are used to scroll the entries while the Fault ID appears at the bottom of the plot for quick identification

Additional Enhancements for Improved Diagnostic Capability



New display control allows dynamic adjustment of your plot



Display the percentage change from last reading by selecting a parameter

- Full support for up to 6 stages of epicyclic (planetary) gearboxes.
- Specify colors for Fault Frequencies so when data is viewed on background colors other than white it becomes more visible to the end user.
- Dynamically adjust multiple spectrum and cascade plots via a mouse drag instead of the right click option that brings up a separate menu.
- User preferences allow you to see both the parameter profile plot and trend parameter plots in the same autoplot sequence.
- Improved print image quality allows the user to print the plotting workspace as displayed on the screen. In addition, printing equipment-level notes is now supported.
- The preferences menu now allows you to select equipment level, multiple- point trend plots and multiple- point spectrum plots instead of having to navigate the tree to explicitly select measurement points.
- When viewing single or multiple selected trends on an asset, view the next or previous trend parameters using the next and previous arrow buttons.
- Need to know how much the parameter reading has changed since your last data collection? View the percent change from previous reading in the parameter status profile. Another profile type that is now available is the percent change from average reading.

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