# AMS Wireless Vibration Monitor

- Embedded prescriptive analytics deliver fast, accurate diagnostic information.

- Default settings provide the shortest path to actionable information. Experts can customize settings to fine tune results.

- Easy installation for fast deployment and ROI

- Standard long-life battery means less maintenance and fewer trips to the field.

- Robust Industrial Design for hassle free operation

- Hazardous area ratings extend monitoring across the plant while keeping personnel safe.

- Fully compatible with existing *Wireless*HART® networks and AMS 9420 Wireless Vibration Transmitter installations
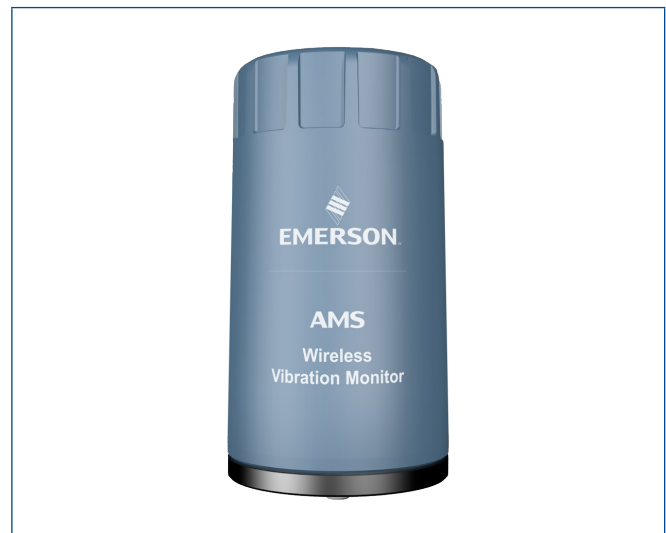
Complete data acquisition - triax vibration with temperature and PeakVue measurements – provides a complete view of asset health, including overall values, analysis parameter trends, spectrum and waveform.

Overview

Based on more than a decade of wireless experience, Emerson's new AMS Wireless Vibration Monitor is the most advanced device available today. It delivers full vibration data over a self-organizing wireless mesh network. It provides rich information about machinery health for both operations and maintenance personnel. Overall vibration, PeakVue™ measurements and temperature readings can be easily integrated into any control system or plant historian, while diagnostic data can be displayed by AMS Device Manager and AMS Machine Works software with alerts broadcast via the Plantweb Optics asset performance platform. For advanced diagnostics, high resolution data can be delivered to AMS Machine Works software for detailed analysis.

Cost-Effective Reliable Monitoring

This device extends vibration monitoring to a wide range of new applications. While appropriate for most vibration monitoring tasks, it is especially well suited for hard-to-reach locations such as cooling towers, pumping stations, remote equipment, and hazardous area equipment.

The AMS Vibration Monitor is an excellent alternative to any application that might otherwise involve extensive engineering, cabling, or installation costs. Advanced electronics deliver a high level of accuracy, while the IEC 62591 *Wireless*HART standard delivers exceptional reliability and is fully compatible with any current AMS 9420 Wireless Vibration Transmitter installation.

Advanced Sensing Technology

Like most wireless vibration sensors, the AMS Wireless Vibration Monitor is equipped with a triaxial accelerometer and a temperature sensor – but it doesn't stop there. The AMS Vibration Monitor also features a special high performance sensor that is used to measure high frequency impacting on the machine. This data is used along with advanced algorithms to automatically identify the machine shaft speed[4] and correlate measurements to specific types of defects – all internal to the device.

PeakVue Plus Automated Embedded Prescriptive Analytics

The AMS Wireless Vibration Monitor utilizes Emerson's patented PeakVue technology to generate actionable information. First, it confirms when a machine is in good condition. Further, when it identifies a developing issue, it can quantify the nature and severity of the defect. It differentiates between mechanical problems – such as rolling element bearing defects – and root cause issues like insufficient lubrication. With PeakVue Plus capabilities, a control room operator can flag troubled equipment and even task maintenance crews to evaluate a specific aspect of the asset health.
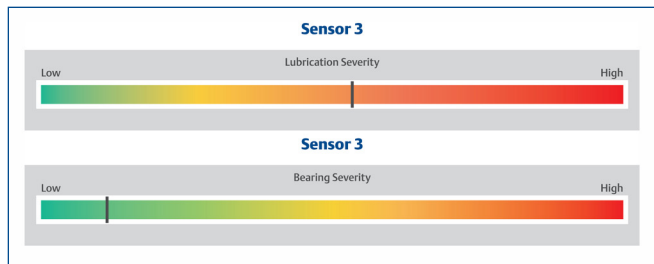
PeakVue Plus prescriptive analytics show that this machine has insufficient lubrication, but the bearing has not been damaged yet.

Status at a Glance

The AMS Wireless Vibration Monitor generates up to thirteen parameters to facilitate fast assessment of machine condition. Each parameter is published from the device for trending. In addition, each value is compared with multiple alert levels internal to the device, so that you can publish health conditions directly to virtually any external software.

13 Trend Values

|	
Shaft Condition	✓ X-axis Overall Velocity
	✓ Y-axis Overall Velocity
	✓ Z-axis Overall Velocity
Impacting	✓ Z-axis PeakVue Acceleration
Lower Frequency Faults	✓ Velocity Parameter 1
	✓ Velocity Parameter 2
Higher Frequency Faults	✓ Acceleration Parameter 1
	✓ Acceleration Parameter 2
Prescriptive Diagnostics	✓ Bearing/Mechanical Severity
	✓ Lubrication Severity
RPM	✓ Calculated Speed
Friction	✓ Skin Temperature
Battery Life	✓ Supply Voltage

Configurable Analysis Parameters

The velocity and acceleration parameters can be particularly insightful. While the default settings will apply to the most common plant assets, these parameters are also fully configurable. They can be customized to focus on specific machine characteristics indicating asset health or process performance. For special applications, these values can be optimized by the end user or as part of our connected services.
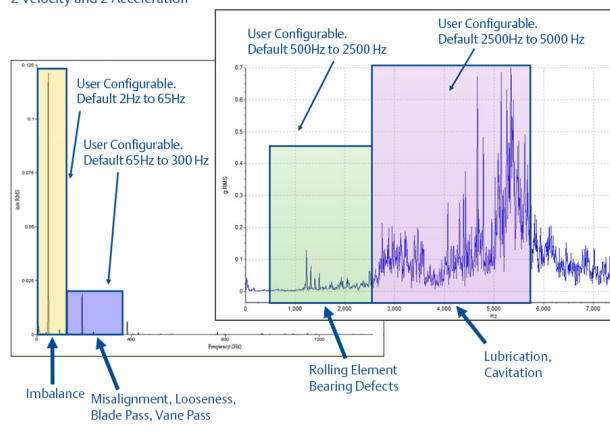
Default settings for the Analysis Parameters address most common process equipment.

Diagnostic Data

In addition to providing health status and actionable information, the AMS Wireless Vibration Monitor also offers detailed diagnostic data featuring an industry-leading sampling rate of 51.2 kHz, this device is able to detect crucial high frequency events for complete machinery analysis.

High Resolution Waveforms...

Unlike simplistic vibration devices, a high frequency, high resolution waveform is at the heart of every vibration measurement performed by the AMS Wireless Vibration Monitor. And these measurements are available to the user on demand and on schedule.

... and Spectra

The AMS Wireless Vibration Monitor calculates and transmits spectra from both the vibration and PeakVue data with up to 1600 Lines or Resolution, making it ideal for more in-depth diagnosis using our best in class AMS Machine Works software.
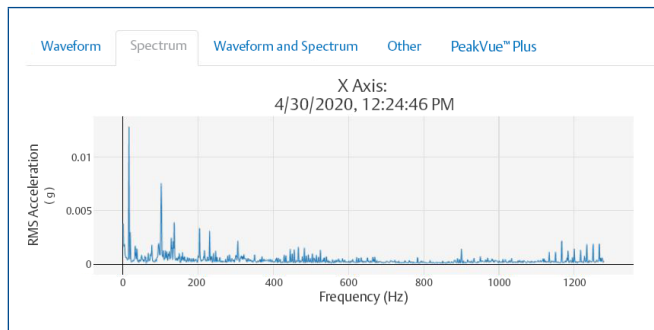
Long Battery Life

Modern electronics and data compression technology combined with both improved data transmission efficiency and best-performance Lithium batteries deliver outstanding 3-5 year battery life. Users will have no issues receiving data from the 13 device variables every hour and 4 high resolution waveforms every day.

Hourly Scalar Values (13)
- X-axis Overall
- Y-axis Overall
- Z-axis Overall
- Z-axis PeakVue
- Bearing/Mechanical Serverity
- Lubrication Severity
- Calculated Speed
- Skin Temperature
- Supply Voltage
- Velocity Parameter 1
- Velocity Parameter 2
- Acceleration Parameter 1
- Acceleration Parameter 2

Daily High Resolution Waveforms (4)
- Z-axis PeakVue
- Z-axis Accelearation
- Y-axis Acceleration
- X-axis Acceleration

3 to 5 years of battery life

Improved *Wireless*HART network management

The AMS Wireless Vibration Monitor, like all Emerson's Smart Wireless transmitters, uses *Wireless*HART, the field proven most secure and reliable wireless industrial protocol in the market.
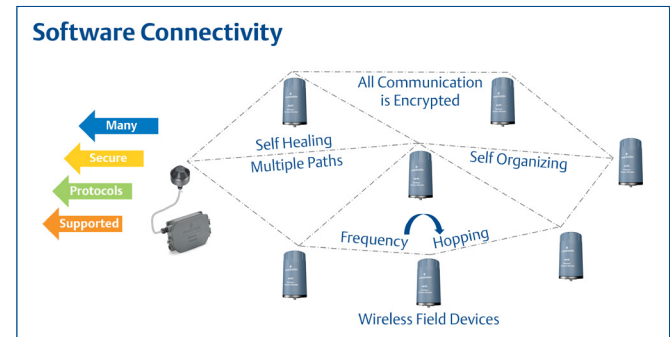
Reliable and Secure Wireless

WirelessHART is field proven to provide reliable and secure wireless data. The AMS Wireless Vibration Monitor leverages new technology to transmit the high-resolution vibration waveform and spectrum over WirelessHART. This reduces both the power and bandwidth requirements, making it the first device to provide this level of data over an industrial, wireless mesh network while still providing up to 5 years of operating life!

Standard and Advanced version

Features	Standard	Advanced
Overall Vibration (PV)	✔	✔
PeakVue (SV)	✔	✔
Temperature (TV)	✔	✔
Supply Voltage (QV)	✔	✔
Triax Sensor		✔
Analysis Parameters		✔
Prescriptive Analytics		✔
Spectrum / Waveform		✔
Primary Software Interface	Plantweb Insight	AMS Machine Works

Specifications

Part Numbers	
Advanced	A9530V3-T0X
Standard	A9530V1-T0X

Sensor	Amplitude	Fmax	Sampling Rate
Vibration Overall X	Up to 16g's	Up to 1,000 Hz	2.6kHz
Vibration Overall Y	Up to 16g's	Up to 1,000 Hz	2.6kHz
Vibration Overall Z	Up to 80g's	Up to 20,000Hz (3)	51.2kHz
PeakVue Z	Up to 80g's	Up to 5,000Hz	51.2kHz
Temperature	-40°C to 85°C		

Device Variables	
Machinery Health Values	Z-axis Overall
	X-axis Overall[1]
	Y-axis Overall[1]
	Z-axis PeakVue (maximum peak in the waveform)
	Machine Temperature
	Supply Voltage

Advance Diagnostics	
Analysis Parameters[1]	2 Velocity Bands (Default: 2-65 Hz and 65-300 Hz)
	2 Acceleration Bands (Default: 10-500Hz and 500 to 1000Hz)
Prescriptive Analytics[1]	Bearing/Mechanical Severity
	Lubrication Severity
	Calculated Machine Speed (RPM) [4]
Vibration Waveform and Spectrum[1]	Main Axis (Z):
	User Selectable FMax [2]: 100Hz, 200Hz; 500Hz; 1kHz [5]; 2kHz; 5kHz, 10kHz, 20kHz
	User Selectable FMin [2]: 2Hz [5], 10Hz
	User Selectable Resolution [2]: 100, 200, 400, 800, 1600 [5] Line of Resolutions
	Secondary Axes (X,Y) [1]:
	User Selectable FMax: 200, 500 and 1000 [5] Hz
	User Selectable Lines or Resolution: 100, 200, 400[5], 800, 1600
Diagnostic Thumbnail Spectra[1]	Velocity and PeakVue based on 1600 Lines of Resolution
Operating Conditions	
Operating Temperature	-40 to 85 °C
Operating Humidity	95%, non-condensing
Wireless Protocol	
Protocol	IEC 62591 *Wireless*HART®
Broadcast Range	100m line of sight
RF bands	2405 – 2480 MHz
Nominal output power	8dBm or 0.0063W

Hazardous Location Certifications		
US/Canada	Class I, Div 1 Grps A-D	Class II, Div 1 Grps E, F, G (Pending)
ATEX	Zone 0, Ex ia IIC T4	ATEX Directive (94/9/EC)
IECEx	Zone 0, Ex ia IIC T4	

General Certifications		
Approved Manufacturing Locations	Emerson Knoxville, TN	Benchmark Electronics, Inc. Korat, Thailand
Telecommunication Compliance	2.4 GHz *Wireless*HART FCC ID: NL5-A9530M1 IC: 3434A-A9530M1 Approved for use in multiple other countries, contact factory for details.	
CE	Compliant to Electro Magnetic Compatibility (EMC) (2004/108/EC) All Models conforming to the following standards: EN 61326-1	
IP Rating	IP 66, NEMA4X	

(1) This feature only available in the Advanced Version

(2) In the Standard Version these are not configurable, it comes with the following factory defaults: Fmin: 2Hz; Fmax: 1,000Hz. PeakVue HP filter 1,000Hz.

(3) Z-axis: +/- 3dB from 2 Hz to 10kHz, stud mounted resonant greater then 15kHz X and Y Axes: +/-3dB from 2 Hz to 1kHz

(4) This algorithm uses the vibration signals combined with nameplate speed on AC induction motors to determine the actual turning speed based on the current operating conditions.

(5) Factory Default for the Advanced Version.

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