

# 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 *WirelessHART*® 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.

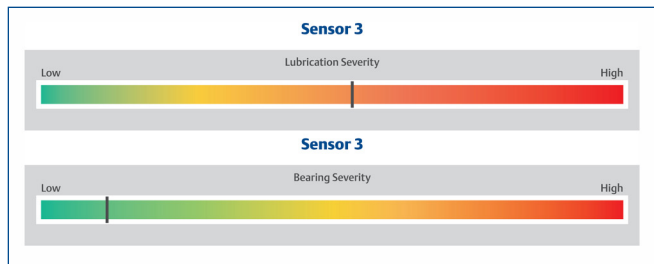
The AMS Vibration Monitor is an excellent alternative to any application that might otherwise involve extensive engineering, cabling, or installation costs. Advanced electronics deliver a high level of accuracy, while the IEC 62591 *WirelessHART* standard delivers exceptional reliability and is fully 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<sup>4</sup> 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

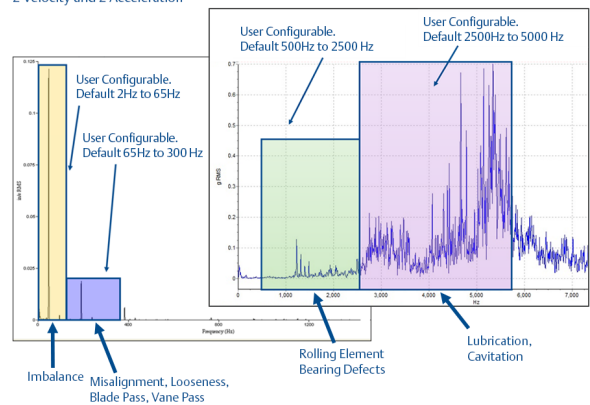
## Configurable Analysis Parameters

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.

### Flexible Analysis Parameters

#### AMS Wireless Vibration Monitor

4 user configurable Analysis Parameters:  
2 Velocity and 2 Acceleration



Default settings for the Analysis Parameters address most common process equipment.

## Diagnostic Data

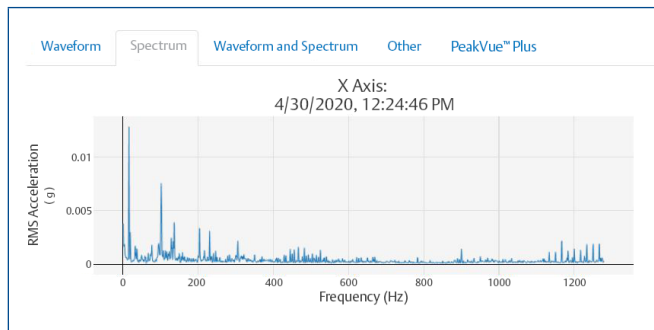
In addition to providing health status and actionable information, the AMS Wireless Vibration Monitor also offers detailed diagnostic data featuring an industry-leading sampling rate of 51.2 kHz, this device is able to detect crucial high frequency events for complete machinery analysis.

### 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 battery issues receiving data from the 13 device variables every hour and four high resolution waveforms every day<sup>(6)</sup>.

### Hourly Scalar Values (13)

- X-axis Overall
- Y-axis Overall
- Z-axis Overall
- Z-axis PeakVue
- Bearing/Mechanical Severity
- Lubrication Severity
- Calculated Speed
- Skin Temperature
- Supply Voltage
- Velocity Parameter 1
- Velocity Parameter 2
- Acceleration Parameter 1
- Acceleration Parameter 2

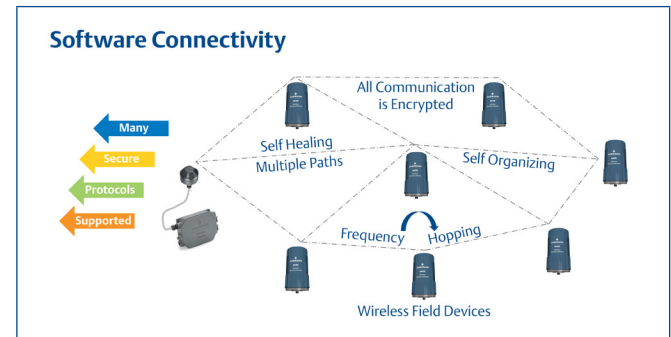
### Daily High Resolution Waveforms (4)

- Z-axis PeakVue
- Z-axis Acceleration
- Y-axis Acceleration
- X-axis Acceleration

**3 to 5 years  
of battery life**

## Improved WirelessHART network management

The AMS Wireless Vibration Monitor, like all Emerson’s Smart Wireless transmitters, uses *WirelessHART*, 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 <sup>(1)</sup>                 |                    |               |
|                         | Y-axis Overall <sup>(1)</sup>                 |                    |               |
|                         | Z-axis PeakVue (maximum peak in the waveform) |                    |               |
|                         | Machine Temperature                           |                    |               |
|                         | Supply Voltage                                |                    |               |

(1) This feature only available in the Advanced Version.

| Advance Diagnostics                            |   |
|--|---|
| Analysis Parameters <sup>(1)</sup>             | 2 Velocity Bands (Default: 2-65 Hz and 65-300 Hz)   |
|  | 2 Acceleration Bands (Default: 10-500Hz and 500 to 1000Hz)  |
| Prescriptive Analytics <sup>(1)</sup>          | Bearing/Mechanical Severity   |
|  | Lubrication Severity  |
|  | Calculated Machine Speed (RPM) <sup>(4)</sup>   |
| Vibration Waveform and Spectrum <sup>(1)</sup> | Main Axis (Z)   |
|  | User Selectable FMax <sup>(2)</sup> : 100Hz, 200Hz; 500Hz; 1kHz <sup>(5)</sup> ; 2kHz; 5kHz, 10kHz, 20kHz   |
|  | User Selectable FMin <sup>(2)</sup> : 2Hz <sup>(5)</sup> , 10Hz   |
|  | User Selectable Resolution <sup>(2)</sup> : 100, 200, 400, 800, 1600 <sup>(5)</sup> Lines of Resolution   |
|  | Secondary Axes (X,Y) <sup>(1)</sup>   |
|  | User Selectable FMax: 200, 500 and 1000 <sup>(5)</sup> Hz   |
|  | User Selectable Lines or Resolution: 100, 200, 400 <sup>(5)</sup> , 800, 1600   |
| Diagnostic Thumbnail Spectra <sup>(1)</sup>    | 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 WirelessHART®   |
| 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, B, C & D T4<br>Class II, Div. 1 Grps E, F & G<br>Class 1 Zone 0, AEx/Ex ia IIC T4 Ga<br>Zone 20, AEx/Ex ia IIIC T135° Da |
| ATEX/ IECEx                                    | Ex ia IIC T4 Ga<br>Ex ia IIC T135°C Da<br>Ta: -40° ≤ Ta ≤ 85°   |

(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.

(6) System update rate limits may be different and dependent on the system architecture.

| General Certifications       |  |
|------------------------------|--|
| Telecommunication Compliance | 2.4 GHz <i>Wireless</i> HART<br>FCC ID: NL5-A9530M1<br>IC: 3434A-A9530M1<br>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  |

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