

Reliability Solutions for **Life Sciences**

Intelligent Field Device Management | Machinery Health Management | Workflow & Collaboration

Field-Proven, State-of-the-art Reliability Solutions

Emerson's AMS reliability portfolio helps the world's life sciences and pharmaceutical manufacturers improve reliability of every asset throughout their value chains.



AMS™

EMERSON™

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Recognize the Challenges in Life Sciences Operations

From everyday oral solid medications to breakthrough cell and gene therapies, life sciences companies are under pressure to deliver more — faster, safer and with fewer resources. However, these highly regulated production environments are growing more complex, and the cost of downtime has never been higher. Teams are challenged to:

1. Get new products to market faster: Shorter development timelines mean production readiness must be flexible and fast. Equipment downtime or malfunction delays launch.

2. Meet global environmental, social and governance (ESG) goals: Energy efficiency and reduced emissions and waste require better asset performance and monitoring.

3. Release products faster: Speed to market isn't only about R&D — it's about minimizing disruptions, ensuring uptime and reducing batch rework or waste.

4. Make different products quickly: Multi-product facilities need comprehensive, scalable reliability programs that won't silo data or add complexity.

5. Supply products in full, on time: Supply chain pressure means reliability is foundational to meeting market demand and regulatory expectations.

Why Reliability Solutions Matter More Than Ever

Traditional time-based maintenance can no longer keep pace in modern life sciences operations. In facilities where every hour of downtime can cost hundreds of thousands of dollars, and late shipments risk both revenue and reputation, maintenance strategies must evolve.

Emerson reliability solutions help life sciences companies reach top-quartile performance across operations. We help customers:

- Maintain 97% reliability across critical production assets
- Detect 95% of developing problems before asset failure
- Reduce unplanned downtime to less than 1%



Nearly 90% of failures cannot be predicted by calendar- or hour-based approaches, requiring a different approach — in many cases, one based on condition.[1]



Life sciences companies are directing nearly half of their technology investments toward three analytics-driven priorities: applied artificial intelligence (AI), industrialized machine learning (ML) and cloud edge computing.[2]



As recently as 2022, 61% of surveyed life sciences companies had adopted an agile approach to digitally transforming their core business.[3]



1. Nowlan and Heap
2. McKinsey & Company, Top Ten Observations, Life Sciences

Stay Ahead of the Challenges

When you partner with Emerson, our advanced reliability tools and expertise help you overcome operational challenges without compromising efficiency, safety or compliance.

Optimize equipment operation to reduce unplanned downtime

- Move from unplanned to planned downtime by detecting faults early
- Make more effective and efficient business decisions with real-time data
- Create a complete picture of machinery health
- Boost equipment effectiveness and extend time between failures with smarter outage planning
- Optimize equipment economically with right-sized monitoring technology

Improve safety and compliance across sites and production facilities

- Meet challenges using actionable machinery health information
- Simplify compliance with purpose-built applications

Ease staff, resource and cost concerns

- Empower staff with automated processes and analytics
- Lower costs by detecting faults
- Reduce operational costs

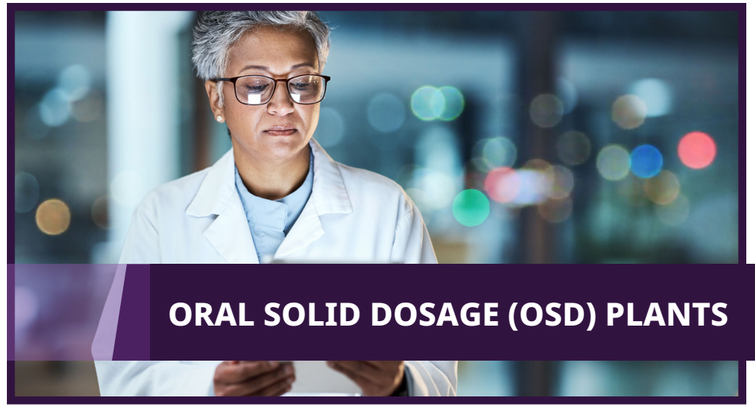


No Plant Left Behind

Emerson's comprehensive AMS portfolio addresses all your life sciences assets across many types of facilities



BIOPHARMACEUTICAL API PRODUCTION



ORAL SOLID DOSAGE (OSD) PLANTS



FILL-FINISH / ASPETIC MANUFACTURING



CONTRACT MANUFACTURERS (CDMOS/CMOS)



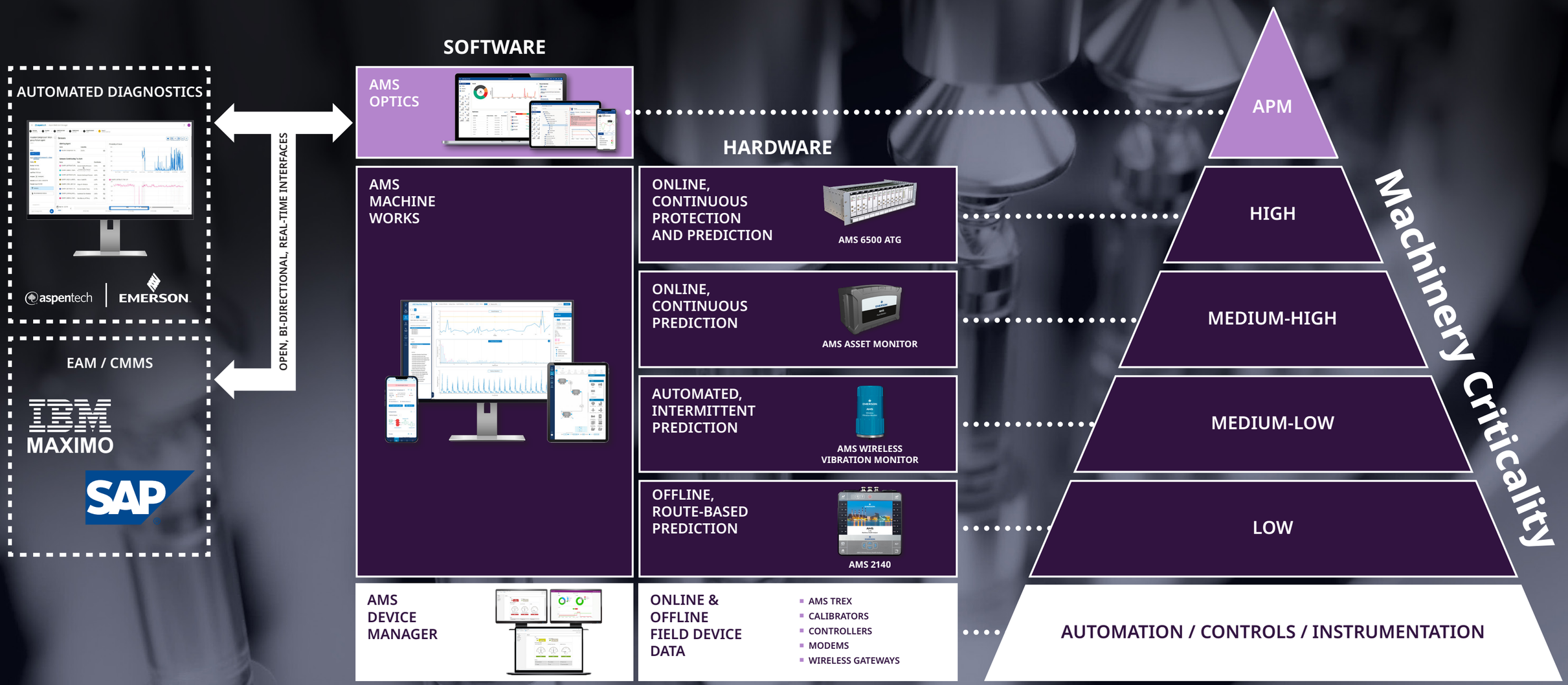
VACCINE, CELL & GENE THERAPY FACILITIES



R&D, PILOT AND SCALE-UP LABS

No Asset Left Behind

The right technology with the right balance of features to economically address every asset – whether machinery or instrumentation



Watch Video

Product Application:
Overview – Field Device Management

From pressure and temperature to level transmitters and control valves, these devices are at the core of every life sciences production operation. In a GMP-regulated environment, reliable field device performance is critical to process control, product quality, audit readiness and patient safety. Yet many life sciences facilities still rely on outdated manual processes that are labor-intensive, risk-prone and non-scalable across complex facilities.

Every batch produced relies on accurate, validated input from hundreds — often thousands — of intelligent field devices.

Challenges in Effective Field Device Management

Field device management is a complex balancing act when precision, efficiency and compliance are all non-negotiable. However, facilities often face hurdles that demand innovative solutions:

- Validation burden: Manual calibration and device replacement typically require disruptive requalification and extensive documentation.
- Resource constraints: Instrumentation teams are often overextended and struggle to manage thousands of devices with limited staff.
- Unnecessary calibrations: Time-based schedules often lead to recalibrating devices that don't need adjustment, wasting labor and risking error.
- Downtime sensitivity: Faulty transmitters or valves can lead to deviations, batch failures or out-of-spec product.
- Compliance pressure: Devices must maintain a traceable calibration history and real-time status for audits.



Product Application: Field Device Management | AMS Device Manager

Field instrumentation, including transmitters, control valves and sensors, plays a core role in life sciences manufacturing. These devices deliver the data and control needed for precise, validated production processes, making them essential to batch integrity, cleanroom performance and regulatory compliance.

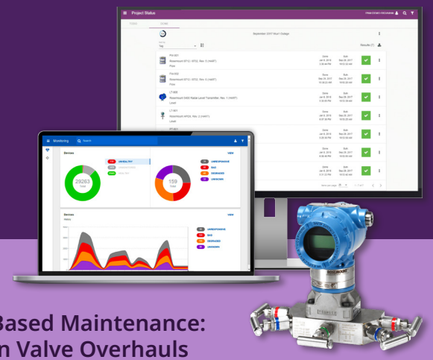
Failure of a single transmitter or improper calibration of a control valve can disrupt an entire batch, resulting in costly product loss or compliance violations.

From loss of control over factors such as temperature or pressure to contamination of cleanrooms, the risks of instrumentation failures are high. Managing numerous devices from various OEMs is complex, and time-consuming manual calibration is error-prone and can lead to revalidation issues. In addition, traditional device management methods create data silos that obstruct efficiency and maintenance.

- AMS Device Manager provides continuous monitoring, at-a-glance device health overview, advanced predictive diagnostics and paperless calibration workflows. The solution also alerts out-of-spec performance or calibration drift for rapid response.
- Paired with Calibration Assistant SNAP-ON, AMS Device Manager supports scheduled, condition-based calibration for audit readiness with documentation and integrated workflows.

AMS Device Manager, used with the Emerson wireless infrastructure and integrated reliability ecosystem, can be the foundation for intelligent field device maintenance across highly regulated, high-performance facilities.





Case Study:

Transform Time-Based Maintenance: 400% Reduction in Valve Overhauls

Lilly
A MEDICINE COMPANY



CHALLENGE

Eli Lilly's biotechnology facility was relying on inefficient time-based maintenance practices, with over 80% of calibration checks and 75% of valve overhauls revealing no need for adjustment or maintenance. The company needed a smarter, more effective approach to enhance reliability and minimize unneeded labor.

SOLUTION

With Emerson AMS Device Manager, the facility shifted to predictive maintenance by using diagnostic data from smart devices and control valves. This approach enabled its team to perform maintenance only when necessary, while also streamlining calibration, reducing paperwork and optimizing resource allocation.

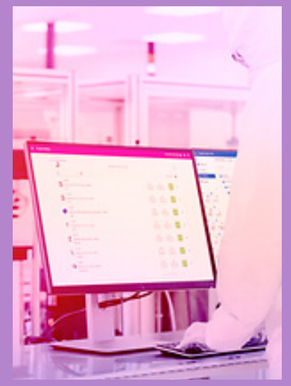
RESULTS

- Achieved a 400% reduction in control valve overhauls
- Saved up to $16,500 annually on control valve repairs
- Reduced annual shutdown periods by 50%
- Saved $52,500 annually on instrument calibration
- Saved 2,000 labor hours annually

Case Study:

Streamline Commissioning: $98,000 saved and 200% ROI

Lonza



CHALLENGE

Lonza AG faced high production and maintenance costs while meeting strict FDA and SHE standards. With 1,400 instruments to commission and tight project timelines, inefficiencies in device configuration, documentation and maintenance created operational risks.

SOLUTION

Lonza adopted Emerson AMS Device Manager, integrating it with their DeltaV system to enable predictive maintenance, streamline device configuration and improve documentation. Along with reducing commissioning time, the solution enhanced accuracy and provided real-time device health insights.

RESULTS

- Saved $98,000 in commissioning 1,400 instruments
- Achieved 200% ROI
- Experienced improved documentation with the AMS Device Manager Audit Trail

Product Application | Overview – Machinery Health Management

Rotating and mechanical equipment, including agitators, centrifuges, pumps, fans, HVAC components and chillers, form the physical and mechanical infrastructure for life sciences production facilities. These assets drive efficiency and safety.

While rotating and mechanical equipment may be taken for granted, failures can lead to batch loss, process delays, product contamination and costly revalidation. In environments where GMP compliance and schedule adherence are essential, equipment reliability cannot be left to chance or time-based maintenance alone.

Challenges in Effective Machinery Health Management

Mechanical equipment operates under demanding conditions, where even minor faults, such as bearing wear or misalignment, can escalate into unexpected failures. Production operations need a more proactive and efficient approach to equipment management challenges:

- Unexpected failures: Mechanical faults such as bearing wear, imbalance or misalignment often go undetected until failure occurs.
- Limited asset access: Many mechanical systems are in cleanrooms, on ceilings or on skids, making physical inspection difficult and disruptive.
- Compliance risk: Equipment failure can trigger environmental excursions or incomplete processing that require deviation reports or full revalidation.
- Labor shortages: Skilled technicians are increasingly stretched, and routine walkdowns don't scale well across extensive facilities.
- Inefficient preventive maintenance: Time-based schedules result in over-maintenance of healthy assets and the missed detection of early-stage faults.



Product Application | Machinery Health Management | Agitators and Mixers

Agitators and mixers ensure ingredients are blended under precisely controlled conditions, supporting product uniformity, preventing contamination and ensuring consistent batch quality. While they may be considered as secondary to other process equipment, they are essential to biopharmaceutical and chemical processes.

Often located in hard-to-access or restricted areas, agitators and mixers can be difficult for teams to inspect, which places these assets at an increased risk of mechanical or contamination issues. Failures can cause product contamination, incomplete mixing or batch loss, resulting in the costly disposal of biologics or APIs. Even minor faults risk regulatory compliance and product consistency, especially in GMP environments. All these factors make proactive maintenance strategies critical.

- AMS Asset Monitor tracks real-time, online vibration and process variables, like motor temperature and shaft alignment, using edge-based analytics. Condition-based alerts allow reliability and maintenance teams to pre-plan intervention during shutdown windows. Move beyond simple fault recognition and take analysis a step further by integrating this device with the AMS Machine Works software.

- With AMS Wireless Vibration Monitors, teams can access waveform data multiple times per day on interval to detect early degradation trends. The monitors are ideal for mobile mixer units or those with complicated wiring.

- The AMS 2140 performs routine-based manual diagnostics by exception, rather than at regular intervals, in easy-access mixers. It can be combined with visual inspections where needed and can be supported by historical asset condition trends from AMS Machine Works.

Emerson's comprehensive asset-criticality coverage provides visibility into hidden issues that impact product quality, safety and delivery timelines, assuring mixing operations remain a source of reliability — not risk. By implementing software-based, unified asset condition monitoring on agitators and mixers, life sciences facilities can improve the reliability of rotating machinery.



Product Application | Machinery Health Management | AMS Wireless Monitor and AMS Machine Works Software | Pumps, Blowers, Fans

Pumps, blowers and fans support fluid movement, airflow, HVAC stability and environmental containment — each of which is critical to validated production environments. Because they're often deployed in large numbers across sites that aren't easily accessible, like cleanrooms, utility skids and mechanical spaces, facilities teams must use scalable monitoring to ensure overall plant reliability.

Common failures, such as bearing wear, shaft misalignment or pump cavitation, degrade equipment and lead to inefficiencies, as well as trigger alarms, process deviations or cleanroom revalidations. The resulting unplanned shutdowns delay product releases and require labor-intensive troubleshooting.

- AMS Wireless Vibration Monitors provide near-continuous tracking of vibration and process variables. Teams can monitor inaccessible fans or pumps embedded in skids or on ceilings, reducing the need for manual rounds.
- AMS Machine Works Software collects, analyzes and visualizes asset health data over time to identify failure patterns early. As a result, teams can plan interventions based on trends, not time.

The Emerson AMS Wireless Vibration Monitors and AMS Machine Works Software provide life sciences facilities with precise, scalable diagnostics to prevent cascading failures, reduce maintenance workload and support GMP compliance.

Case Study:

Life Sciences Leader Expands Production Capacity with Emerson's Wireless Monitoring — Cutting Wiring Costs by 300% and Boosting Reliability



CHALLENGE

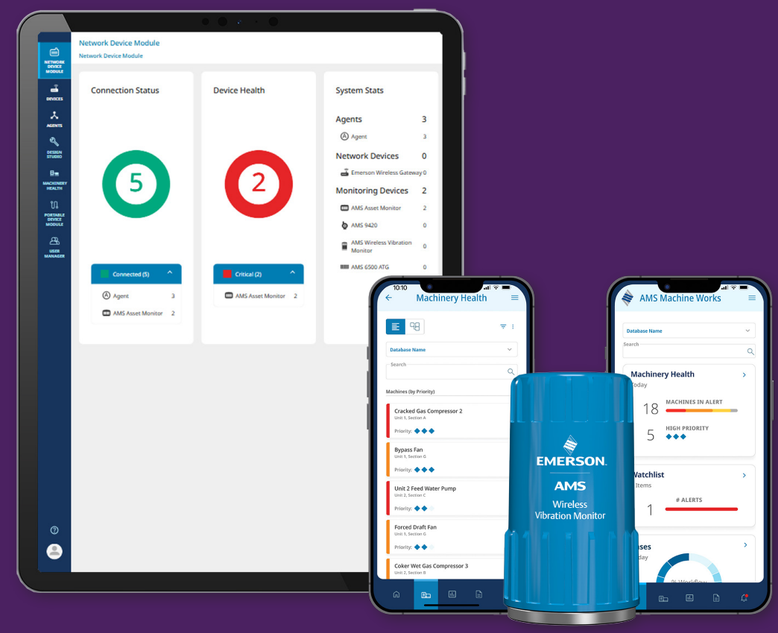
A world renowned life sciences company's facility faced the challenge of doubling its capacity for manufacturing biological drug substances while maintaining reliability. With over 200 injection pumps and 300 steam traps to monitor, unplanned outages and costly mechanical errors were significant risks. An AMS 6500 system previously installed by a third party had exceeded wiring costs by 300%, highlighting the need for a more cost-efficient solution.

SOLUTION

Emerson implemented a remote monitoring solution that seamlessly integrated with their existing AMS 6500 and Software. The setup included several solutions, including AMS Wireless Vibration Monitors, AMS Machine Works and AMS Device Manager. This wireless technology enabled centralized asset health monitoring via their shared Reliability Network.

RESULTS

The company reduced wiring costs and enabled fault detection, minimized unscheduled downtime and cut maintenance expenses. The Emerson solution also extended asset lifecycles, ensuring reliable operations to support expanded manufacturing capacity.



Product Application: Centrifuge Monitoring | AMS Wireless Vibration Monitor, AMS Machine Works Software

Critical in downstream processing, centrifuges are high-speed, high-value assets. Protecting them with proactive machinery health management is crucial for precise, reliable operations, safeguarding both operational efficiency and compliance.

The speed, complexity and mechanical load of centrifuges make them a challenge. From bearing breakdowns to misalignment, failures risk batch yield, purity and delivery timelines. Even minor deviations compromise batch integrity, delay production and require costly cleanup and revalidation. Enclosed designs and specialized maintenance add to the challenges and increase maintenance and repair costs.

- AMS Wireless Vibration Monitors are rapid-deployment sensors that detect early-stage mechanical issues, like imbalance, misalignment or looseness, by tracking vibration signatures. They enable teams to intervene before performance degrades. With a three- to five-year battery life, AMS Wireless Vibration Monitors are ideal for hazardous or hard-to-reach locations.

- AMS Machine Works Software collects vibration data and trend performance and correlates anomalies, displaying data on visual dashboards that maintenance teams can use to predict wear patterns and prioritize repairs.

Emerson wireless and analytics-based machinery health solutions transform centrifuge reliability into a strategic advantage. As a result, facilities can ensure regulatory confidence while preventing failures, improving yield, reducing downtime and extending equipment life.

Case Study:

Avoiding a $400,000 production loss with automated wireless vibration monitoring

CHALLENGE

A global pharmaceutical company in Florida struggled to maintain a centrifuge that operated for only four hours every five days. Inconsistent time-based vibration monitoring hindered the shift to condition-based maintenance and triggered several unplanned outages. High vibration and bearing degradation also threatened reliability.

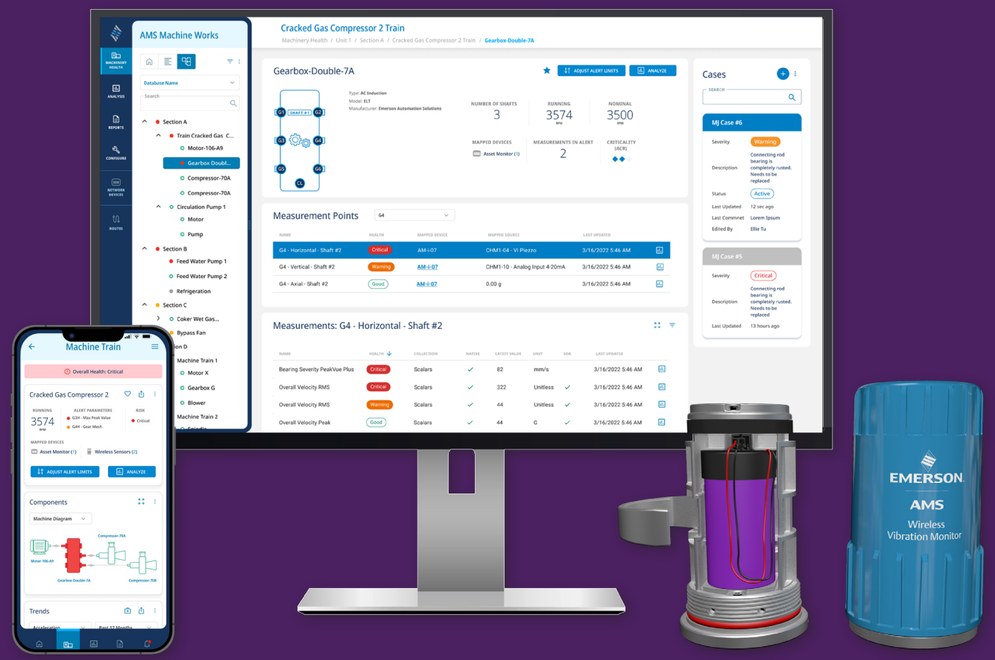
SOLUTION

Using Emerson's AMS Wireless Vibration Monitor with AMS Machine Works software, the company was able to continuously track the motor and centrifuge bearings. The solution was integrated into the site's DeltaV network for real-time monitoring and proactive maintenance.

RESULTS

The system detected damaged bearings with PeakVue technology, avoiding a $400,000 production loss. The ROI quickly justified the cost of the Vibration Monitoring System. Early detection also enabled scheduled balancing, which extended bearing life and boosted efficiency.





Product Application | Machinery Health Management | HVAC Monitoring | AMS Asset Monitor

From air handling units and compressors to fans and ducts, HVAC equipment is the lifeline for life sciences facilities, where cleanroom classifications, temperature control and more must stay within validated parameters across every stage of production. HVAC equipment also directly supports GMP-controlled environments, where even minor issues can have significant consequences.

Maintaining HVAC components in large or hard-to-reach spaces, such as cleanrooms, is challenging. Manual checks are inefficient and reactive, especially for assets in ceilings, mechanical rooms or classified areas. Yet equipment failures can trigger compliance risks that range from deviation reports to delayed batch releases to regulatory inspection findings. Proactive monitoring and maintenance are crucial for maintaining consistent performance and ensuring GMP audit readiness.

- Built to support integration with Building Automation Systems (BAS), AMS Asset Monitor provides edge-based analytics on fan motors, drive belts and vibration data. Since it monitors continuously, it can detect faults within seconds — not days.

With AMS Asset Monitor and integrated analytics, teams can streamline HVAC reliability while improving efficiency and sustainability, in even the most critical production environments.

Case Study:

World's Largest Biologics Facility Strengthens Reliability and Cuts Maintenance Costs with AMS Asset Monitor



CHALLENGE

Monitoring air handling units in the world's largest biologics manufacturing facility, spanning 96,000m² and with a capacity of 180,000 liters in mammalian cell culture bioreactors, required reliable vibration analysis and seamless integration with the DeltaV Control system, despite limited onsite capabilities.

SOLUTION

The facility deployed the Emerson AMS Asset Monitor with Edge Analytics to collect and analyze vibration data in real time, diagnosing issues and providing actionable alerts. This approach enabled staff to quickly and easily detect roller element bearing problems, allowing for proactive maintenance and ensuring reliability.

RESULTS

The Emerson solution prevented critical failures, reduced maintenance costs and improved operational reliability to ensure efficient biologics manufacturing.



Product Application:
Chillers Monitoring | AMS Asset Monitor, AMS Machine Works, AMS 2140

Chillers operate around-the-clock to maintain precise temperature control across biopharmaceutical production processes, HVAC systems and environmental conditioning. Beyond process support, chillers also help sustain cleanroom conditions and laboratory environments, making them vital for both GMP compliance and operational continuity.

Any failure in chiller systems can disrupt temperature-controlled environments, compromise product quality, delay time-sensitive processing and trigger regulatory deviations that require investigation and reporting. Whether the failure is gradual or sudden, root-cause diagnosis is complex without real-time reliability solutions.

- AMS Asset Monitor ensures peak chiller efficiency by continuously monitoring chiller health, compressor vibration and bearing condition. By monitoring multiple data points, it can detect real-time issues, such as cavitation, imbalance or refrigerant loss.
- AMS Machine Works runs automated diagnostics to balance loads across chillers and avoid unnecessary wear on primary units. In addition, it tracks condition and runtime behavior to ensure standby units are ready when needed.
- AMS 2140 is a portable analyzer and data collector. Guided by alerts and trends generated in AMS Machine Works, it applies a hybrid approach with periodic data collection or route-based monitoring.

With the AMS Asset Monitor and integrated diagnostics, life sciences teams can maintain reliable chiller performance to safeguard product integrity and process consistency in temperature-sensitive environments.

Case Study:

Biopharmaceutical Company Boosts Energy Efficiency and Equipment Health with AMS Wireless Vibration Monitor

CHALLENGE

A California-based biopharmaceutical company aimed to reduce energy usage by 25% by 2025. To help achieve this, they needed to optimize three redundant chillers supporting R&D labs and retrovirus production. However, the company lacked monitoring data to assess machine performance and identify energy savings.

SOLUTION

Emerson implemented AMS Wireless Vibration Monitor and AMS Asset Monitor to collect data and diagnose issues using embedded analytics. With PeakVue technology, they identified vibration or lubrication issues in roller element bearings early, eliminating the need for expert intervention.

RESULTS

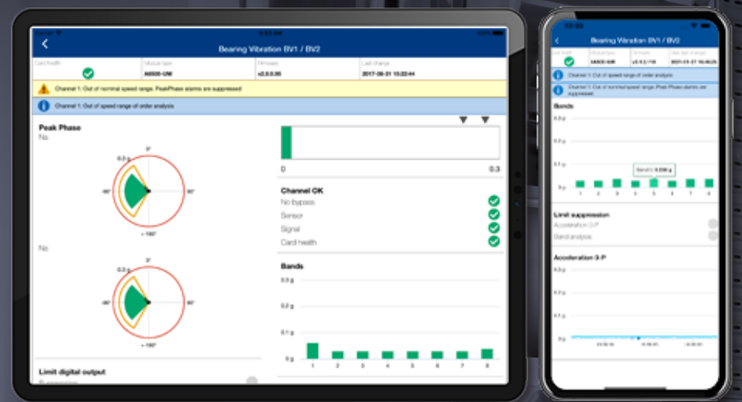
A vibration study using PeakVue technology identified significantly higher amplitudes in Chiller 3. The issue was traced to plugging, enabling the team to promptly resolve it to improve chiller performance and support energy efficiency targets.





AMS 6500 ATG

Integrated protection and prediction for your most critical assets



The protection you need. The condition monitoring you rely on.

The AMS 6500 platform has been protecting the world's most important machinery for more than two decades, establishing a rock-solid track record of reliability. With the release of the next-gen AMS 6500 ATG enhancements, we've made a great product even better with all the functionality needed by operators.

Features such as a universal monitoring card reduce your spare parts burden from many cards to just a handful. Our embedded "flight recorder" means you never miss capturing full-fidelity, critical event data during alarms or shutdowns – even if network connectivity is intermittent or missing entirely.

With embedded PeakVue capabilities, your critical machinery with rolling element bearings can be addressed just as capably as your fluid-film bearing machinery.

But you also need more than just protection for your critical machinery and with the AMS 6500 ATG platform, you're getting the very best the industry has to offer: world-class protection and world-class condition monitoring with world-class cybersecurity thanks to all-new, embedded data diode capabilities.

And, for assets that need the advanced condition monitoring capabilities of AMS 6500 ATG but without protection, the system can be easily configured and deployed for CM-only applications when functionality beyond our AMS Wireless Vibration Monitor and AMS Asset Monitor are required.

Learn More

- **Landing Page: AMS 6500 ATG**
- **Catalog Page: AMS 6500 ATG**
- **Article: Feel the Pulse**
- **Video: Scalable Prediction Opportunities**
- **Video: Protection System Modernization**
- **Video: 6500 ATG Protection System Embedded Prediction**
- **Case Study: AMS 6500 for FD Fans**
- **Product Data Sheet: Protection + Prediction**
- **Product Data Sheet: Prediction-Only**
- **Connect with an Expert**

AMS 6300 SIS Digital Overspeed System

Rapid, redundant, and highly reliable overspeed detection that meets API 670

When the stakes couldn't be higher.

Nothing can ruin your day quite like an overspeed event. Unlike other types of vibration-related events, an unrestrained overspeed event doesn't just have the potential to destroy the machine – the collateral damage can be severe, endangering both property and personnel as blades are liberated, components become projectiles – and for steam turbines – the pressure vessel that is the turbine case releases high-temperature, high-pressure steam with potentially catastrophic effects.

API 670 requirements take this fully into account by mandating systems that must be lightning fast – capable of responding in less than the time it takes to blink your eye: 40 milliseconds. And to ensure no missed trips while also minimizing false trips, steam and gas turbines require redundancy of not just sensors, but protective tachometers dedicated to the overspeed measurement and not used for speed control.

The AMS 6300 Safety Instrumented System (SIS) was designed specifically for overspeed detection and specifically to fully address the requirements of API 670, resulting in a modern, reliable, 2-out-of-3 voting system backed by the expertise and strength of one of the strongest names in the business: Emerson. And, it carries a SIL3 certification from TÜV, a recognized global leader in Safety Integrity Level (SIL) certification.

The system is designed for use on gas and steam turbines, variable frequency drives, and any asset that can enter overspeed conditions. This is especially critical on machines in power generation service that can incur instantaneous loss of load, such as a main generator breaker opening.

Learn More

- **Catalog Page: AMS 6300 SIS**
- **Video: AMS 6300 SIS**
- **Product Data Sheet**
- **Connect with an Expert**

AMS Asset Monitor

Embedded, real-time analytics at the edge



Online protection and prediction for essential machinery.

Our award-winning AMS Asset Manager is revolutionizing the industry by putting analytics at the edge rather than in the cloud. This approach allows real-time, intelligent condition monitoring that can instantly notify you of developing problems on your plant's fixed equipment such as heat exchangers as well as rotating equipment such as pumps, fans, motors, gearboxes, blowers, and more. A library of more than a dozen templates allow AMS Asset Monitor to go to work right out of the box, with minimal configuration. And, for machinery with rolling element bearings, embedded PeakVue technology ensures that you have the industry's most innovative and reliable detection capabilities at your disposal.

Because the AMS Asset Monitor is based on Emerson's innovative CHARMS architecture, the same I/O modules as used in our award-winning DeltaV™ Distributed Control System are at your disposal. In addition to vibration and speed, choose from temperature, discrete, and analog inputs as well as discrete outputs for alarming and even machinery protection where the cost of an API 670-compliant architecture – such as our AMS 6500 ATG – isn't warranted: lower-criticality assets that still benefit from continuous monitoring.

AMS Asset Monitor takes the hard work of analyzing data and does it for you with a simple 5-level alarming scheme that uses the embedded, predictive analytics to tell you not just that a problem is present, but what it is.

AMS Asset Monitor is also designed to seamlessly connect* to our AMS Machine Works software, ensuring it can be part of your plantwide asset health ecosystem and available to your AMS Optics dashboard.

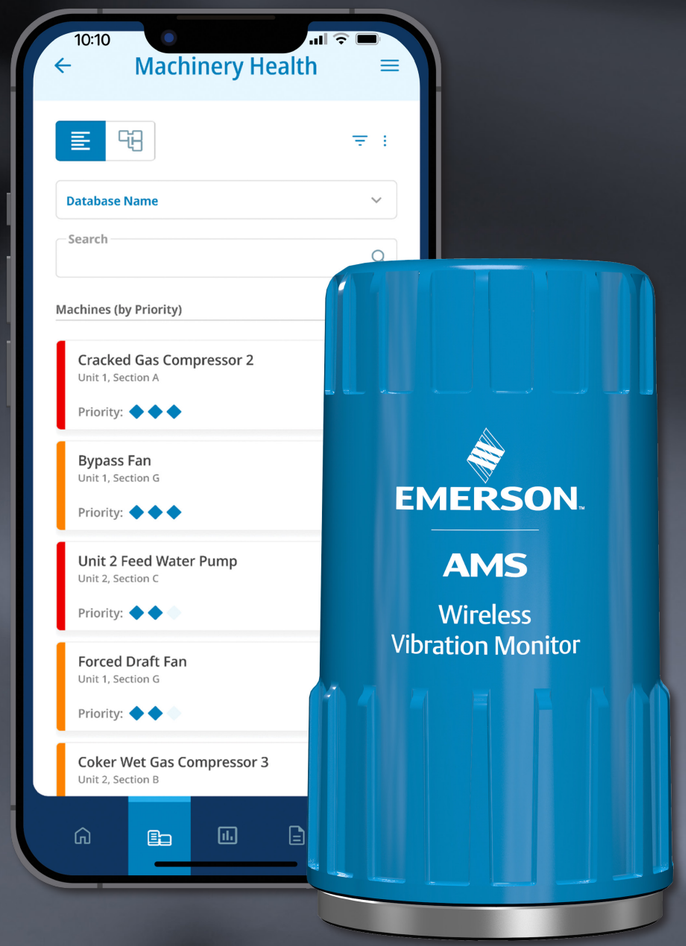
*A connection to AMS Machine Works is entirely at the user's discretion. It is not required for AMS Asset Monitor to perform automatic analytics and produce intelligent advisories.

Learn More

- **Landing Page: AMS Asset Monitor**
- **Catalog Page: AMS Asset Monitor**
- **Video: AMS Asset Monitor Overview**
- **Video: AMS Asset Monitor – Emerson's New Edge Analytics Device**
- **Video: More Monitoring Benefits for More Assets**
- **Video: Improved Reliability at the Industrial Edge**
- **Case Study**
- **Brochure**
- **Connect with an Expert**

AMS Wireless Vibration Monitor

More than an IIoT sensor – a complete monitoring solution for your less-critical assets



Taking a greater percentage of your assets online – affordably.

As a pioneer in the wireless vibration space nearly two decades ago, we're not newcomers to the crowded IIoT sensing space. But unlike many others, we deeply understand rotating plant machinery – not just wireless communications and sensors. That means we understand what you need in a wireless sensor to truly diagnose problems and get to root cause, without constantly running to your data collector for more data. After all, what's the point of wireless sensing if you can only detect problems – not diagnose them?

With the AMS Wireless Vibration Monitor, we've advanced the industry with not just a sensor, but a true monitor. It delivers its functionality in not only a smaller footprint with longer battery life, but through dramatically improved capabilities, putting everything you need into a compact, rugged package that's barely larger than a salt shaker.

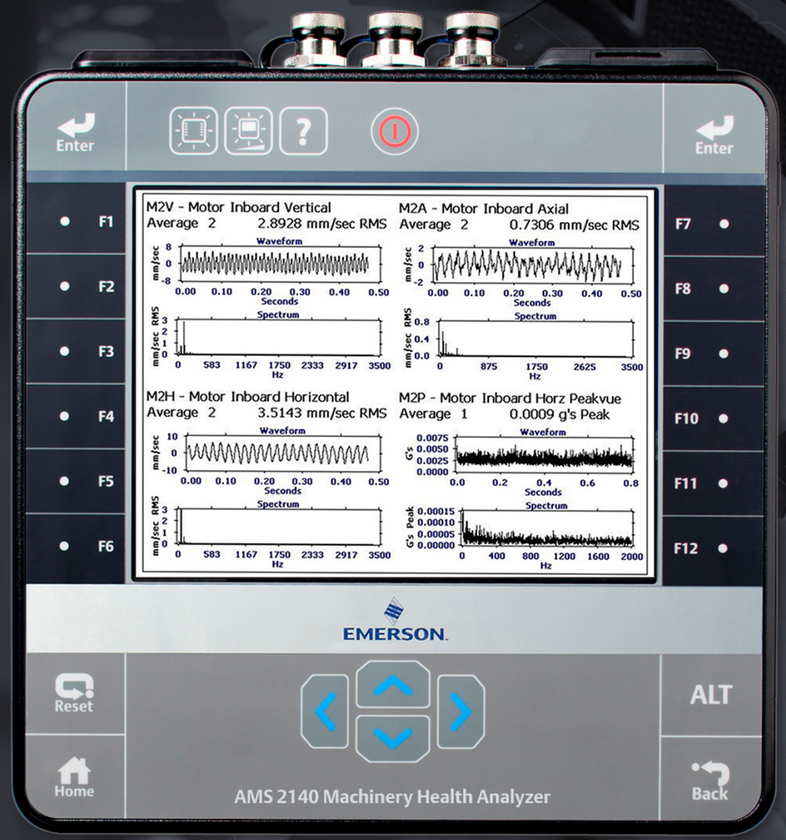
- Embedded Prescriptive Analytics
- Embedded PeakVue Plus Technology
- More Comprehensive Data Acquisition
- Easier Installation
- Field-Replaceable Battery
- Hazardous Area Approvals
- User Configurable
- Backward Compatibility with Existing **AMS 9420** Installations and **WirelessHART** Networks

Learn More

- **Landing Page: AMS Wireless Vibration Monitor**
- **Catalog Page: AMS Wireless Vibration Monitor**
- **Video: Innovation in Wireless Vibration**
- **Video: AMS Wireless Vibration Monitor Overview**
- **Video: Easy Installation of the AMS Wireless Vibration Monitor**
- **Brochure: AMS Wireless Vibration Monitor**
- **Article: Vibration Monitor Delivers Reliable Data**
- **Case History: Replacing Unreliable Wireless Vibration Sensors with the AMS Wireless Vibration Monitor**
- **Whitepaper: PeakVue Plus**
- **Product Data Sheet**
- **Connect with an Expert**

AMS 2140

Best-in-Class portable analyzer / data collector



The industry's gold standard for portable data collection, diagnostics, and troubleshooting.

For more than 40 years, our route-based portable data collectors and analyzers have led the industry with the most advanced features, a rich legacy of patented innovations that continue to deliver faster and more accurate data collection/fault detection, and the ergonomics and battery life that let you collect data all day across a plant without strain.

Available in both 2- and 4-channel versions, plus tach/phase, the AMS 2140 goes where you need it to go and does what you need it to do, whether in-situ diagnostics, bump testing, transient data collection, or simply garden-variety route-based data collection that's fast and easy – particularly when triaxial accelerometers are used to dramatically cut data collection time.

Its power doesn't stop at vibration, either. The AMS 2140 features integrated balancing, laser shaft alignment, and motor current analysis capabilities.

The AMS 2140 also features integrated expert analytics, allowing even novice-level practitioners to conduct sophisticated troubleshooting and data analysis right at the machine.

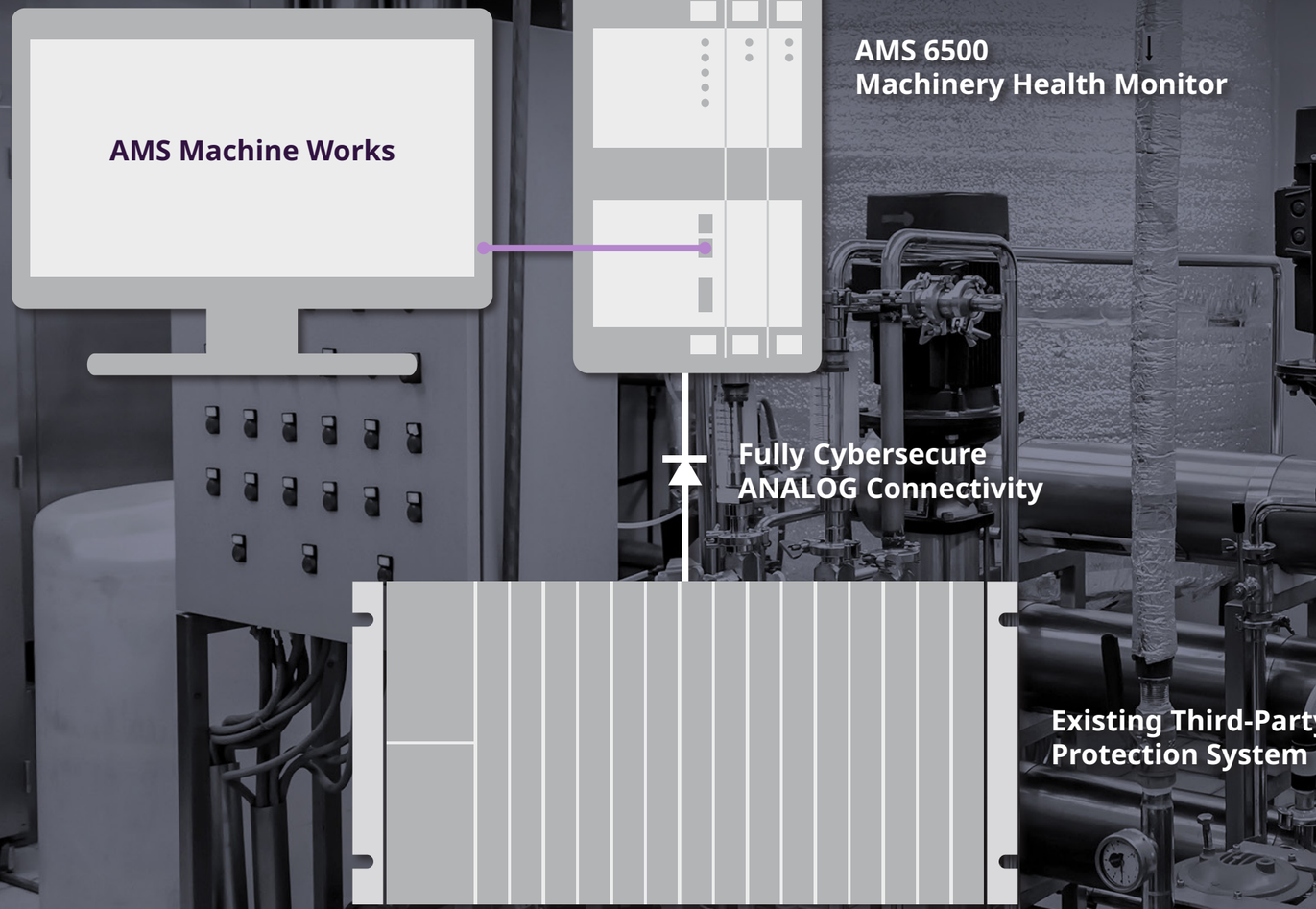
And – like all of our condition monitoring hardware – it seamlessly connects to AMS Machine Works, including wirelessly so you can be online while collecting data.

Learn More

- **Landing Page: AMS 2140**
- **Catalog Page: AMS 2140**
- **Overview Flyer: AMS 2140**
- **Whitepaper: PeakVue Analysis**
- **Video: PeakVue Technology Provides Earlier Indication of Developing Faults**
- **Video: Meet a 2140 Customer**
- **Video: 2140 Durability**
- **Article: Tucson Electric Power**
- **Cost Saving Calculator**
- **Product Data Sheet**
- **Connect with an Expert**

AMS 6500

Secure condition monitoring connectivity with **any** underlying protection system



AMS Machine Works connectivity – no matter what you're starting with.

Let's face it. Your plant can't afford to rip and replace non-Emerson machinery protection systems just because you need a common, plant-wide software platform for condition monitoring.

Fortunately, you don't have to.

With our AMS 6500 Machinery Health Monitor, you can simply add another hardware layer to your existing protection system – both insulating it from the outside world in cybersecure fashion while gaining full access to its raw signals for world-class condition monitoring with AMS Machine Works.

The AMS 6500 Machinery Health Monitor means you can have protection in your existing platform – no matter the manufacturer – while entrusting your condition monitoring to the power, flexibility, and precision of Emerson's AMS Machine Works.

Get the AMS 6500 MHM to go.

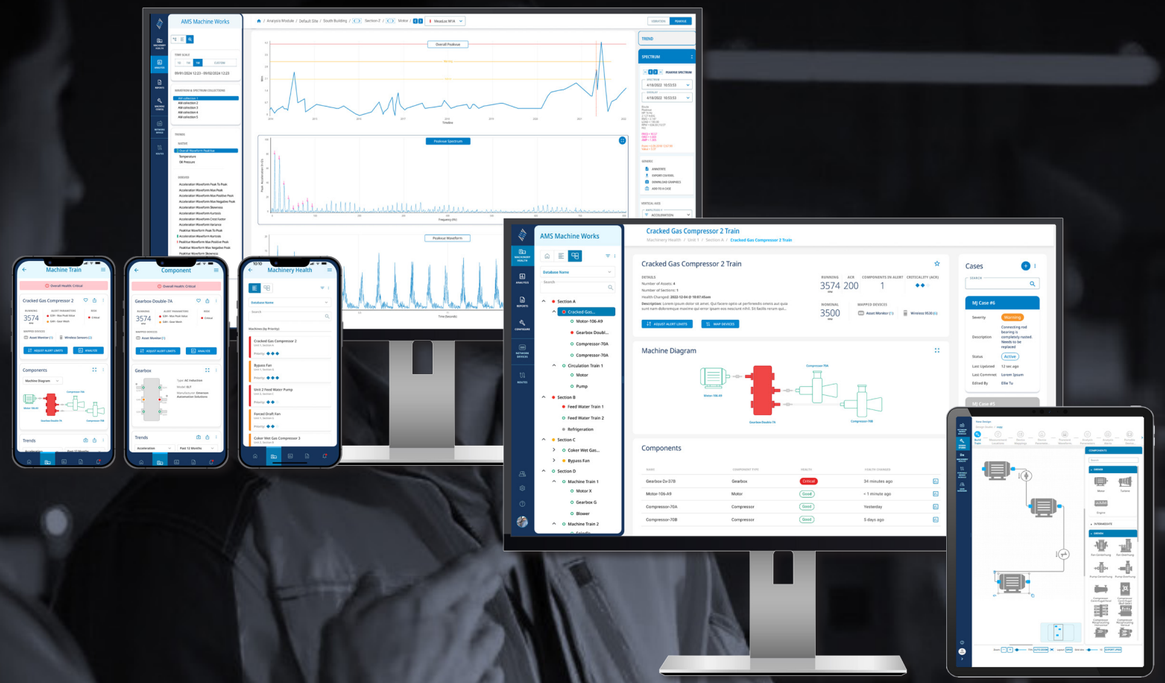
The AMS 2600 is Emerson's portable version of the AMS 6500.

While the 4-channel version of our AMS 2140 provides an adequate number of channels for many machines, there may be times when you need more channels. Perhaps it's a large machine train with only protection and you aren't quite ready to purchase permanent condition monitoring hardware. Or perhaps the machine is partially monitored but you need to supplement it with more channels for in-depth diagnostics. Whatever the reason, our AMS 6500 MHM is available in a ruggedized case with a handle – allowing you to take the power of AMS 6500 everywhere for on-demand, temporary data acquisition of up to 24 channels – with full connectivity to AMS Machine Works.



AMS Machine Works

Plant-wide condition monitoring for every rotating asset



One application. Every machinery asset.

AMS Machine Works reimagines your machinery condition monitoring because it delivers everything you've come to expect from Emerson in the way of award-winning, industry-leading tools for data visualization and analytics, but in an entirely new user interface that is as powerful as it is modern.

With AMS Machine Works, every machinery asset you monitor is brought together in one pane of glass, regardless of where the data originates in your plant: AMS 6500, AMS 2140, AMS Wireless Vibration Monitor, AMS Asset Monitor, or process control systems/historians.

AMS Machine Works combines predictive maintenance techniques with comprehensive, **patented analysis tools** to provide easy and accurate assessment of machinery health. And, it's part of our larger asset management ecosystem including **AMS Device Manager** for your automation and field device assets, and **AMS Optics** to provide a holistic, enterprise-wide Asset Performance Management dashboard that integrates asset health, EAM/CMMS datas, and advanced, AI/ML-powered diagnostics from **Aspen Mtell** – now a powerful **member of Emerson's family of solutions**.

Learn More

- **Landing Page: AMS Machine Works**
- **Catalog Page: AMS Machine Works**
- **Video: Condition Monitoring using AMS Machine Works**
- **Tutorials: AMS Machine Works**
- **Product Data Sheet**
- **Connect with an Expert**

DATA SOURCES

- AMS 6500 ATG
- 3RD PARTY SYSTEMS*
- AMS ASSET MONITOR
- AMS Wireless Vibration Monitor
- AMS 2140
- PROCESS DATA

*via AMS 6500 MHM

AMS Trex

Portable field device management, diagnostics, and configuration

AMS Trex. The industry's gold standard.

When it comes to portable communicators for configuring, diagnosing, and managing field devices, AMS Trex stands alone. With more than a quarter million units delivered, AMS Trex can be found in virtually every E&I department across the globe.

So why do CONTROL Magazine readers consistently rank us #1 year after year after year?

Maybe it's because AMS Trex can talk to more device types from more manufacturers than anyone else in the industry: 2,500 and counting.

Maybe it's because we've made AMS Trex equally convenient to use in the field and on the benchtop with the ability to power devices, not just communicate with them.

Maybe it's because AMS Trex is ruggedized to withstand the rigors of use in the real world – lasting 50% longer than generic tablet-based approaches and with a 56% lower total cost of ownership.

Maybe it's the large, intuitive touchscreen.

Maybe it's the AMS Trex legacy of quality and capability, refined with innovations and usability across more than three decades.

Or maybe it's all of these things.

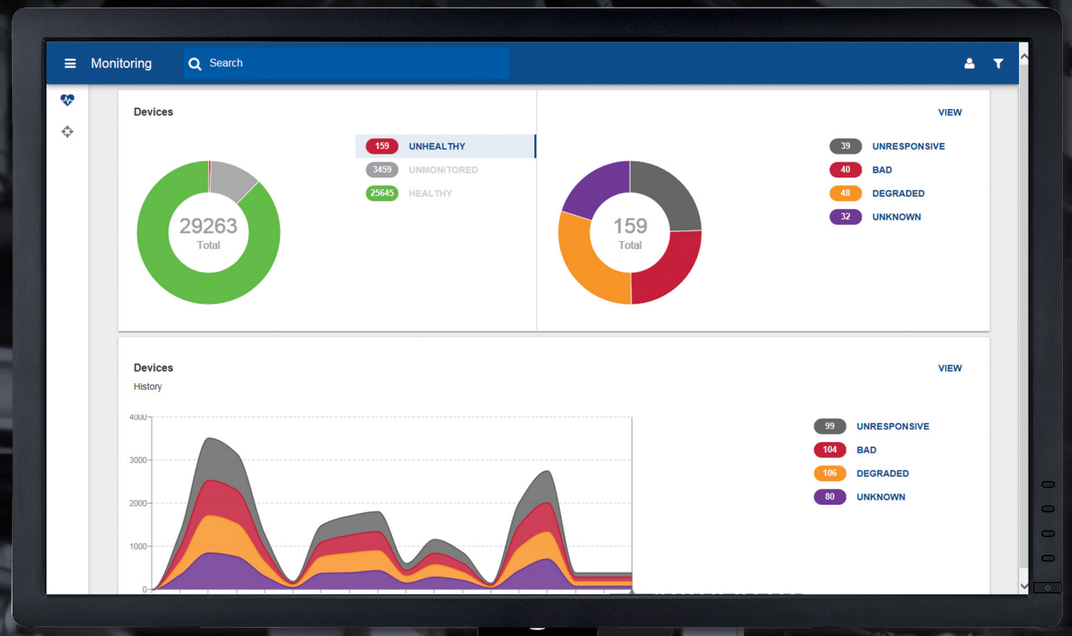
Trex puts you in control of your field devices by allowing a single, universal communicator to work agnostically across all of your installed field devices. Whether you need to configure a device, update it with new firmware, check that it's operating properly, diagnose problems, or simply gather its embedded information for archival, AMS Trex lets you carry less and do more.

Learn More

- **Landing Page: AMS Trex**
- **Catalog Page: AMS Trex**
- **Brochure**
- **Demonstrations and Videos**
- **Video: Streamline Field Maintenance with One Tool**
- **Video: Managing Device Configurations with AMS Trex**
- **Video: Performing Loop Diagnostics with AMS Trex**
- **Whitepaper: 5 Strategies to Drive Reliability**
- **Article: Power the Loop Technology**
- **Product Data Sheet**
- **Connect with an Expert**

AMS Device Manager

Full-featured management and health of automation systems and field devices



Simplify Intelligent Field Device Management based on Real-Time Diagnostic Data.

Emerson is unique in the industry in that we provide a fully integrated solution for not just your machinery assets, but your valuable automation assets as well – assets like transmitters, actuators, valves, controls, and more.

AMS Device Manager connects both directly to devices and to systems that use field devices – systems like **PLCs**, **ESDs**, **SCADAs**, and **DCSs**. This connectivity, in turn, allows AMS Device Manager to communicate with connected field devices like transmitters, actuators, and valves serving as I/O to these systems. With one connection to the system, suddenly all its compatible I/O is accessible, meaning the thousands of field devices that make up a typical plant can be viewed and managed in one convenient and powerful application. And because AMS Device Manager is fully compatible with AMS Optics, you can bring both automation device and rotating machinery information together in a single dashboard, allowing you to manage all your assets while determining whether an issue is fundamentally due to a machine problem, a process problem, or a device controlling a machine or process.

Learn More

- **Landing Page: AMS Device Manager**
- **Catalog Page: AMS Device Manager**
- **Interactive Demo: AMS Device Manager**
- **Flyer: AMS Device Manager**
- **Video: AMS Device Manager**
- **Playlist: AMS Device Manager Videos**
- **Article: As Industry Changes, so Must Device Management**
- **ROI Calculator**
- **Product Data Sheet**
- **Connect with an Expert**

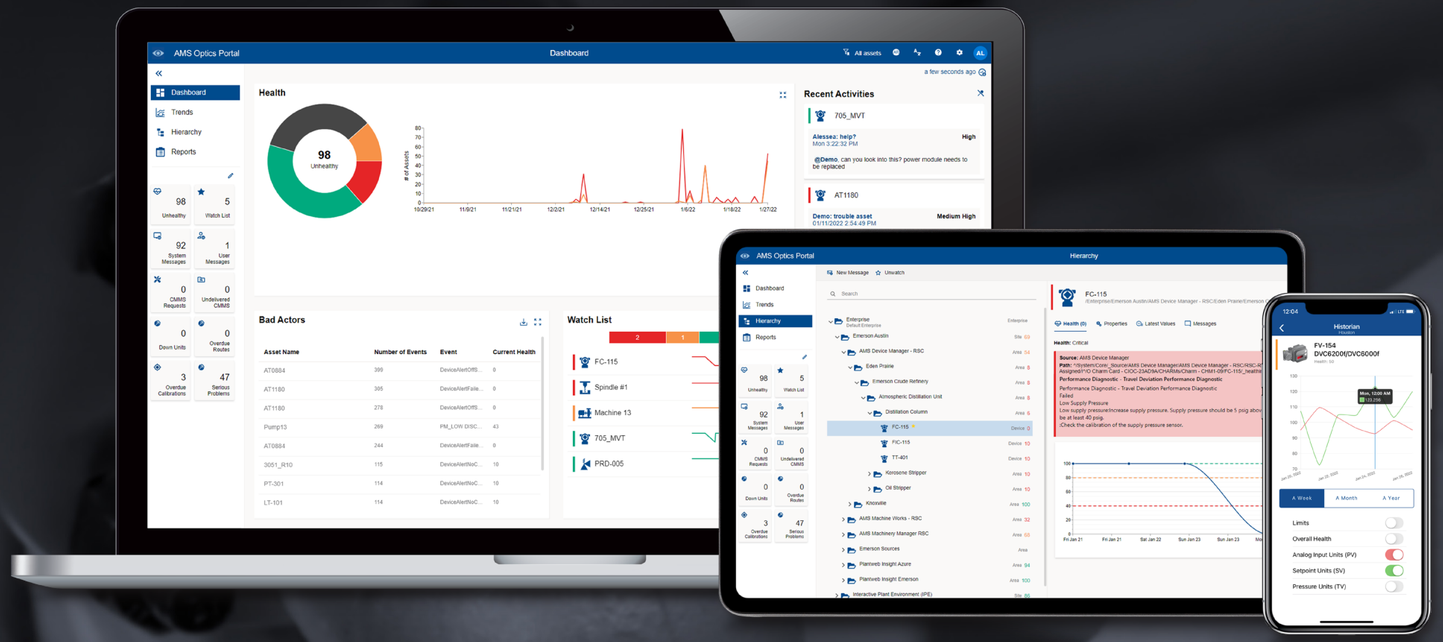
DATA SOURCES

EMERSON DELTAV DCS | EMERSON OVATION DCS | EMERSON CONTROL SYSTEMS | EMERSON WIRELESS GATEWAYS | CALIBRATORS | AMS TREX | MODEMS | 3RD PARTY SYSTEMS | MUX & FIELDBUS GATEWAYS

HART COMMUNICATION PROTOCOL | HART-IP | WirelessHART | PROFIBUS

AMS Optics

Enterprise-wide asset performance management



Moving beyond just asset health.

Today, plants are looking for more than just isolated asset health solutions. They're looking for enterprise-wide solutions that span every asset across the entire operations to ensure improved availability, reliability, and overall equipment effectiveness. They're looking for the ability to make operational decisions based on asset health – not just maintenance decisions. They're looking for the ability to integrate all available data sources. And, they're looking for the ability to augment human knowledge with AI/ML, freeing personnel from the tedium of looking for problems instead of anticipating problems and staving them off – before they can get out of control.

AMS Optics is designed to deliver all of these things by knitting your asset performance management activities together under a common umbrella, viewable in a single pane of glass.

Learn More

- **Landing Page: AMS Optics**
- **Connectivity List: AMS Optics**
- **Video: Enterprise-Level Integrated Workflow and Collaboration Software**
- **Brochure: Mobile Collaboration with AMS Optics**
- **Podcast: Closing the Loop on Maintenance & Reliability**
- **Product Data Sheet: AMS Optics + AMS Machine Works**
- **Product Data Sheet: AMS Optics + AMS Device Manager**
- **Product Data Sheet: AMS Optics**
- **Connect with an Expert**

- ☑ Connect to all of your operations data through a single, unified management interface.
- ☑ Organize multiple forms of data in context to the asset and its place in the overall enterprise so that it's ready for use.
- ☑ Conduct safer, more efficient data aggregation by optimizing the load on OT systems to prevent disruption to operations.
- ☑ Securely deliver prioritized content such as health alerts and KPIs to relevant personnel, on- or off-premise.
- ☑ Gain enhanced visibility into operational health and performance and generate real-time actionable insights.
- ☑ Collaborate with experts, on demand, to accelerate work and guide procedures.
- ☑ Transform traditional workflow practices to fully digital, automated procedures that include creating, tracking, prioritizing, executing and validating actions.

Aspen Mtell®

Actionable, powerful, and fully customizable automated diagnostics

Get early and accurate warning of when an equipment failure will occur, how the failure will occur and what to do about it.

Aspen Mtell® delivers best-in-class automated diagnostics using intelligent agents that ingest data from AMS Machine Works, AMS Device Manager, process controls systems and historians, and other relevant data sources in your facilities.

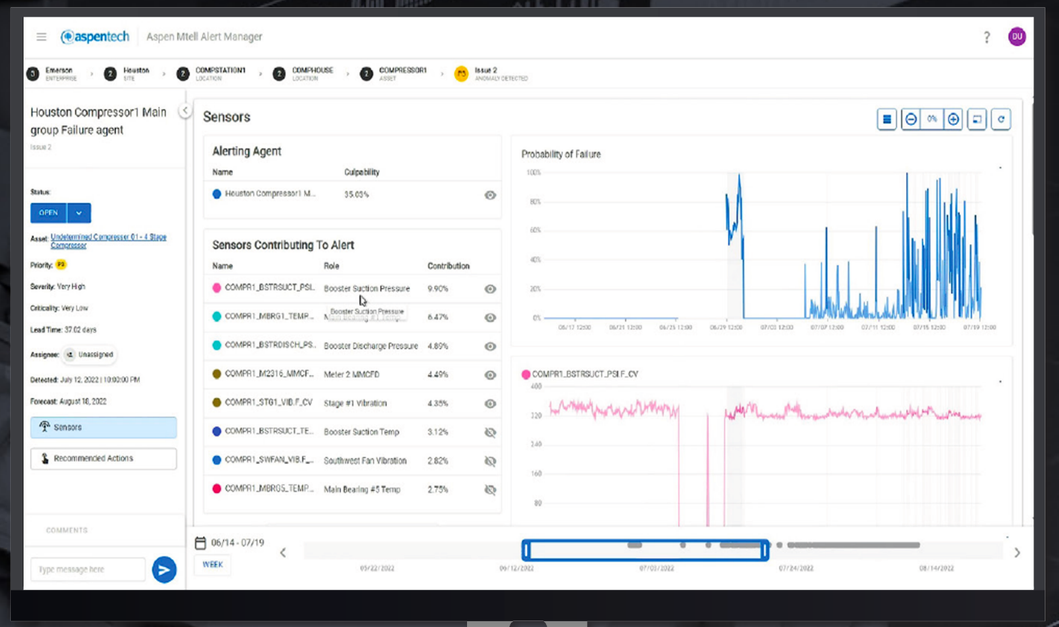
These agents run continuously to detect anomalies and predict failures, notifying users with intelligent advisories through the AMS Optics dashboard and driving appropriate actions in systems such as EAM/CMMS platforms.

Users can build agents using full AI/ML approaches, advanced first principles approaches, simple rules/conditional logic, and hybrid models using multiple methods.

Aspen Mtell® frees your organization to move away from reliance on tedious threshold-based alarming as the primary basis for your asset health program, leveraging the power of AI/ML and first principles rules to review data, detect issues, and notify users. The result is improved detection of developing problems, longer lead times to respond to those problems, better use of personnel who no longer have to manually review data and tweak alarm settings, less unplanned downtime, better outage planning, and ultimately shorter outages because you know exactly what to work on and what can be left alone.

Learn More

- **Landing Page: Aspen Mtell**
- **Video: Improve Reliability with Aspen Mtell**
- **Video: What is an Agent?**
- **Whitepaper: Delivering on the Promise of Prescriptive Maintenance**
- **Article: Practical Asset Analytics for Reliability Engineers**



Machinery Health Sensors

Displacement, acceleration, velocity, speed – and so much more



Comprehensive coverage. Time-saving innovations.

Physically, sensors are typically the smallest element in the chain from the asset to your computer screen. But small doesn't mean unimportant. If you can't rely on the quality of your data, you simply can't make informed decisions – and it all starts with the quality of your sensors.

While our solutions are designed to work agnostically with sensors from any manufacturer, it's good to know that you can rely on Emerson for the **complete** solution. It's why when we say "sensor to boardroom" we mean just that.

Emerson's AMS portfolio comprises one of the largest selections of piezo-electric, electrodynamic, and eddy-current vibration sensors in the industry. And our quality is unrivaled. For example, our eddy-current products are designed and built in our **Gronau, Germany center of excellence** with five decades of proven expertise in building sensors and vibration systems such as our AMS 6500 and AMS 6500 ATG.

We're constantly improving, too. For example, our new AMS EZ 1000 universal signal conditioner means you no longer need different signal conditioners for eddy-current proximity probe systems – one size truly fits all for fewer spares and the confidence that you'll never be caught unprepared, forced to limp along without the critical measurements you need.

And because we're Emerson, our sensor portfolio doesn't end with vibration. You can turn to us for nearly any measurement in your plant – fully confident that we've been there, done that.

Learn More

- **Landing Page: Machinery Health Sensors**
- **Tutorial: Types of Measurements and Choosing the Right Sensor**
- **Proximity Probe Configuration Tool**
- **Video: Introducing the AMS EZ 1000**
- **Video: Gronau, Germany – More than 50 Years of Global Engineering Excellence**
- **Connect with an Expert**

AMS Asset Performance Services

SaaS, installation services, solution design, system commissioning, remote monitoring, product training, and more



The expertise to deliver results – not just technology.

Let's face it. Not every task in your plant needs to be done by your own employees. For some customers, condition monitoring is viewed as a necessary core competence – too important to outsource. But for others, it makes perfect sense to purchase not technology, but outcomes and thus fully outsourced monitoring services. For still others, the right mix is a hybrid of in-house and outsourced with some tasks assumed by your technology provider and some by you.

Wherever you find yourself along that continuum, Emerson is there to help with expertise that understands instrumentation, vibration, machinery behavior, reliability – and the practical realities of making real decisions about real machinery under real operating and process constraints in real time.

We offer training for those parts of your program that you prefer to do in-house. We offer services for those parts you want to outsource. We even offer cloud-hosting when your own IT environment is simply not the ideal approach, allowing you to use our AMS software solutions without the burden of servers, networks, updates, security, and maintenance – not to mention the gauntlet of internal IT policies that often accompanies on-prem installations rather than hosted.

Learn More

- Landing Page: AMS Asset Performance Services
- AMS Condition Monitoring Services
- AMS Machine Works Cloud-Hosted Solution
- AMS Training
- Connect with an Expert



Go Boldly™

CONNECT WITH A LIFE SCIENCES AND PHARMACEUTICAL RELIABILITY EXPERT

Request a consultation to discover how Emerson's team of life sciences and pharmaceutical experts can help you initiate, expand, or improve your current program or projects.

Contact Us

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