Operate Your Site Safely, Reliably and Securely with Emerson Wireless Solutions

Pervasive Sensing™ Technology

EMERSON™

See Your Plant in a Whole New Way

Wireless solutions help you cost-effectively touch more of your plant with predictive intelligence than ever before... with installed cost and time savings over wired technologies. You can eliminate "blind spots" in your plant where it was previously too difficult or expensive to install wired instruments.

Scale wireless applications to meet the needs of your facility for today and tomorrow, starting with Plantweb™ Insight asset monitoring applications, and progressing to real-time control.

Stay on the Leading Edge with Proven Wireless Technology

"(Insight) from predictive wireless filter plugging alerts prevented a shutdown. Operators were able to shut down the pump, clean the filter and get it back on line in a matter of hours."

– Refining Project Manager

Optimize Process Unit Efficiency

"Four days after the order was placed we could see minute-by-minute mid-zone temperatures trending on the control system... Overall, we have improved operation of the lime kiln, and increased throughput by 5%."

– Pulp Mill Leader

High Performance in Challenging Environments

"With five possible trips a year depending on the severity of the winter, and with each trip costing $250,000, that's a savings of up to $1,250,000 per year."
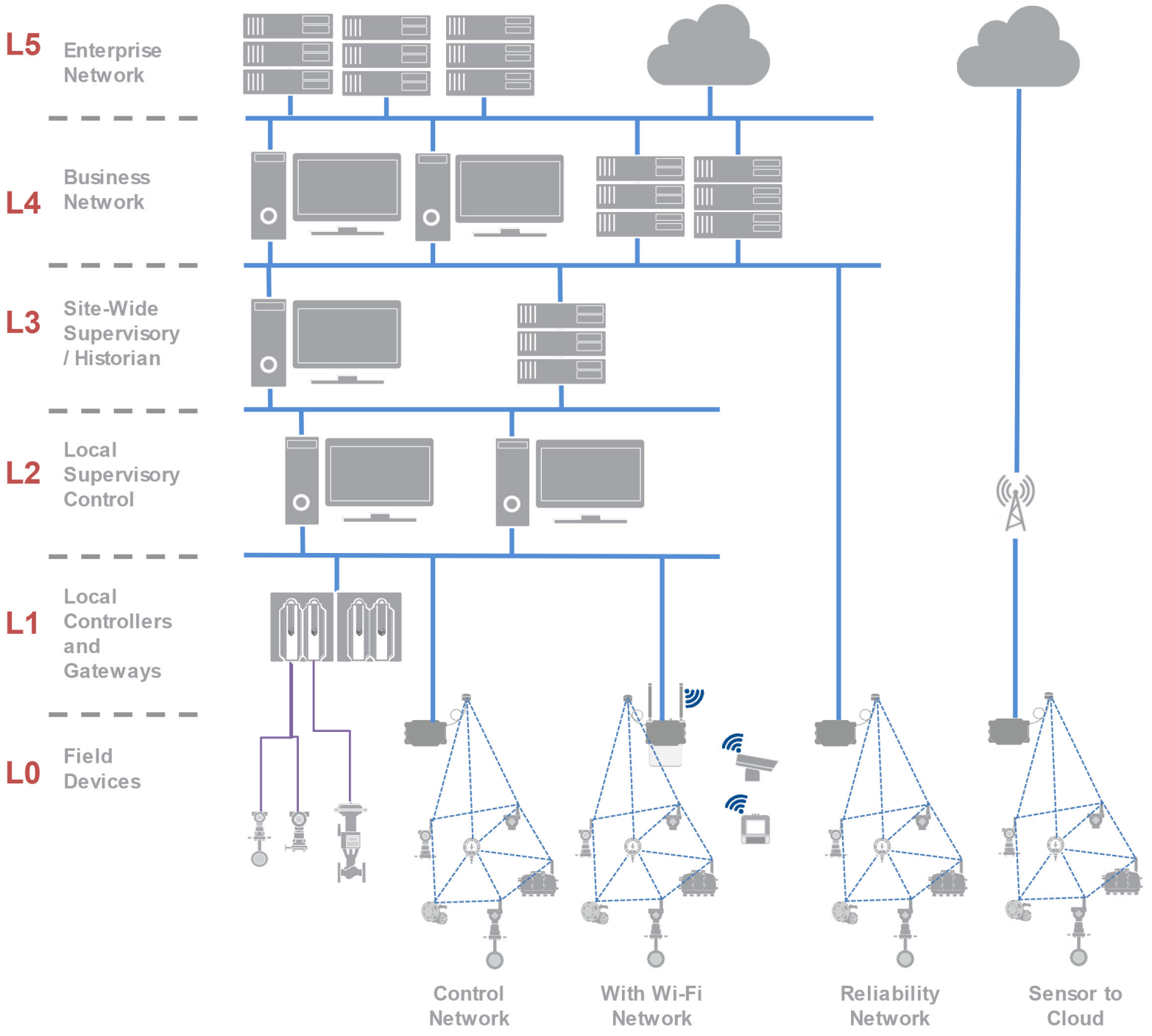
– Power Plant I&E Supervisor

Protect Your People, Community and Environment

"There are savings of in reduced operation and maintenance costs, but the incalculable savings were in safety."

– Chemical I&E Designer

L5 Enterprise Network	
L4 Business Network	
L3 Site-Wide Supervisory / Historian	
L2 Local Supervisory Control	
L1 Local Controllers and Gateways	
L0 Field Devices	

Control Network   With Wi-Fi Network   Reliability Network   Sensor to Cloud

Flexible architecture and integration for new insights that only Emerson wireless solutions can offer.

Secure Your Future with Wireless

To operate your sites safely, reliably, and securely, you need a stream of timely data — without sending personnel into the field more often than necessary. Emerson's wireless technology enables measurements that may have once been relegated to manual rounds to be digitalized cost effectively and frees up operators and maintenance personnel to perform more valuable tasks. The additional data gives you visibility to detect problems before they occur, transforming your operation into a proactive facility.

Proven Technology. Proven Solutions.

- Strong and proven industrial experience with billions of operating hours and tens of thousands of networks

- Cover a wide range of applications with an extensive wireless portfolio

- Simplify network deployments through our robust networking capabilities and unparalleled ease of use

- Protect your network with always-on security

- Know your host system and instrumentation work together with IEC 62591 *Wireless*HART®

Reliability in Challenging Conditions.

Count on Emerson's wireless solutions to work no matter what. Robust network monitoring and management allow you to:

- Ensure 99% data reliability

- Identify trouble spots

- Minimize downtime

- Cost-effectively optimize your operation

WIRELESS PLANT APPLICATIONS INCLUDE:

- Field data backhaul
- Mobile worker access
- Control network bridge
- Remote video monitoring
- Mobile Video & Voice

WIRELESS APPLICATIONS:

- Steam Trap
- Pump
- Heat Exchanger
- Air Cooled Heat Exchanger
- Pressure Relief Valve
- Cooling Tower
- Inline Corrosion
- Non-intrusive Corrosion
- Pressure Gauge
- Network Management
- Power Module Management
- Location Awareness
- Connected Lighting

Start here

WIRELESS PLANT APPLICATIONS

WIRELESS FIELD APPLICATIONS
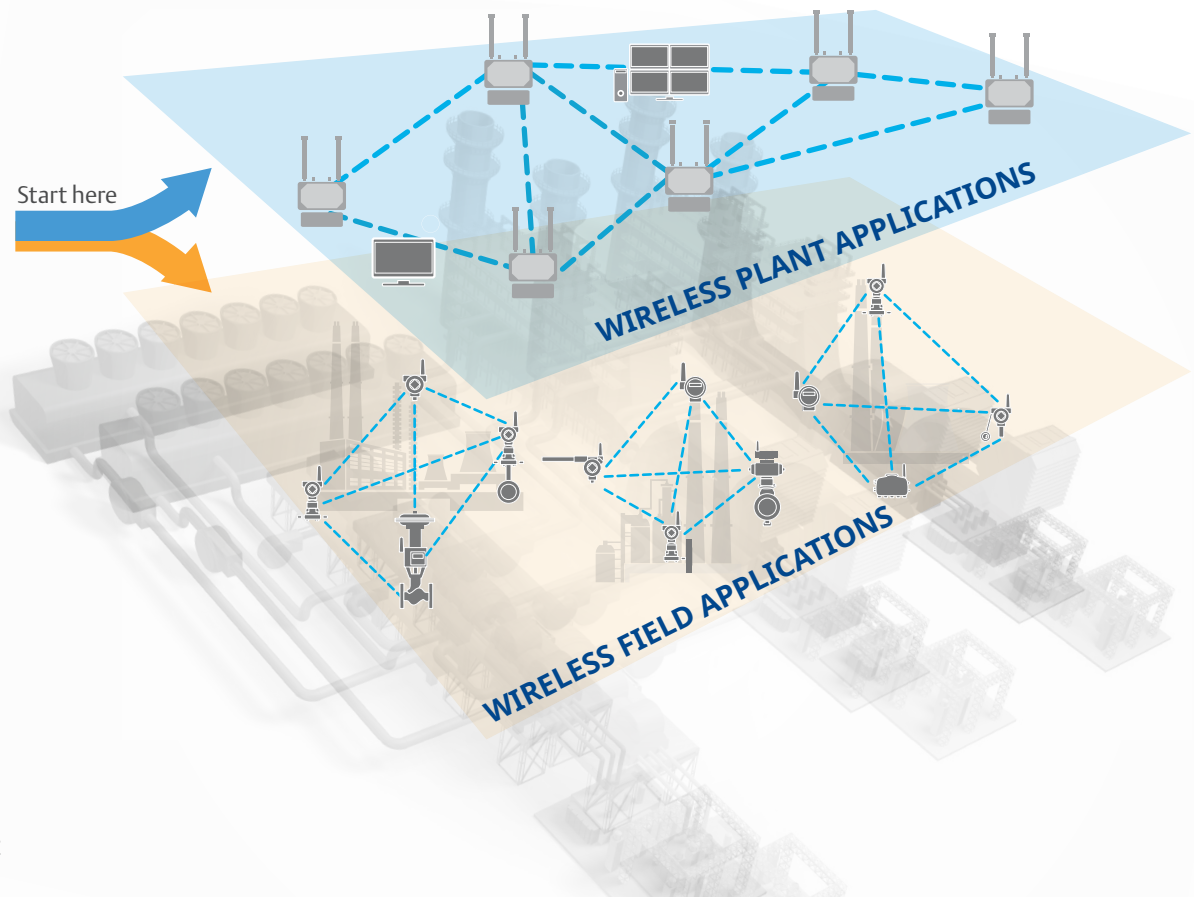
Plant-wide sensing increases your monitoring reach and provides real-time smart data that is reliable, accurate, and always available.

No Wires. No Limits

- Lower installation costs — calibration-free, reduced cabling, and fast commissioning add up to 50% savings per measurement point

- Low maintenance, non-intrusive and self-powered — wireless networks up and running in minutes, even when integrating into existing systems

- Robust design — operates in the harshest environments and under the most challenging conditions

- Increased flexibility — Add temporary or additional measurement points in minutes

- Change tolerant — Self organizing mesh will automatically reroute signals in the event of new physical interference

- No wires — Enables monitoring of constantly moving equipment such as rotating kilns

Network Infrastructure Key Components

Wireless solutions for plant operation applications include key components that all work together to deliver a secure, consistent and reliable wireless infrastructure scalable to fit any need from a single application through plant-wide implementation.

Wireless Gateways and Access Points

- A universal standard network infrastructure for easy integration of all the wireless applications in your plant
- Up to 200 devices per gateway (dependent on application and update rates)
- Suitable for installation in hazardous industrial environments
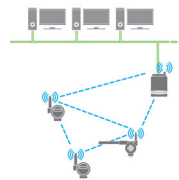
Seamless Integration via LAN to all Existing Host Systems

- Native integration into DeltaV™ and OvationTM is transparent and seamless
- Gateways interface with existing host systems via a LAN, using industry standard protocols including OPC UA®, Modbus® TCP/IP, Modbus RTU, and EtherNet/IPTM

Wired and Wireless Devices

- Upgrade existing wired HART devices already installed in your plant to *Wireless*HART® with the Wireless 775 THUMTM Adapter
- Auto-sense the Wireless Gateways and devices for quick and easy startup and commissioning

Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, network automatically finds the best communication paths
- The self-organizing, self-healing network manages multiple communication paths for any given device.

SmartPower™ Solutions

- Choose the mode of power that works best for your application
- Intrinsically safe to provide long-lasting instrument life
- Robust design to handle any environment
- Easily installed and field changeable

Wireless Mobile Voice & Video

- Your field technician can video conference with an expert at the source of the problem to troubleshoot in real-time
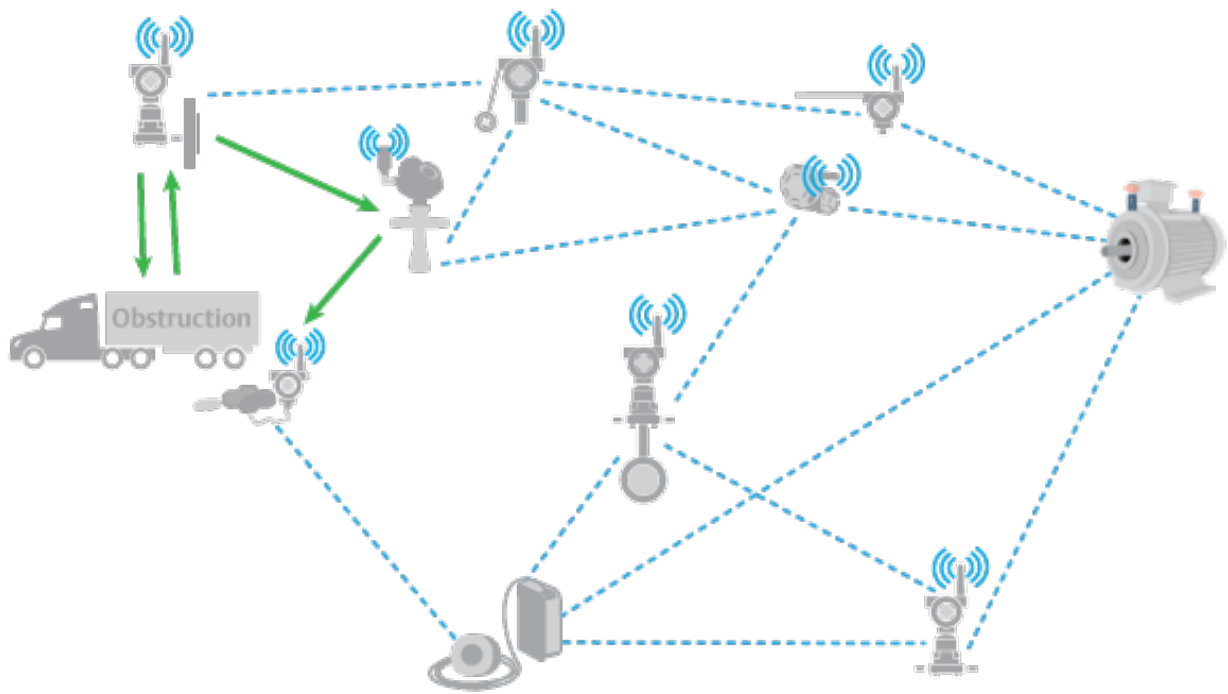
*Wireless*HART is a backward compatible, cost-effective, secure, common sense approach to wireless communication.

Wireless Sensor Network Protocol

- Based on the HART protocol used in wired devices since 1986

- Includes full communication stack, including the application layer to ensure interoperability across vendors

- Common data structure with HART and HART-IP protocols designed specifically for industrial sensor applications

- Mandatory security protocols including Data link layer hop-by-hop authentication and Transport layer authentication and encryption

- 99.9% reliable communications in well-formed networks with self-organizing mesh networking, TDMA slotted access scheduling, and channel-hopping frequency diversity

- Managed by the independent Fieldcomm Group

Gateways

- Connect up-to 200 devices per antenna, up-to 400 when using our dual *Wireless*Hart option.

- Easily integrate network wireless data to any host system or architecture with common industry protocols, including HART-IP, Modbus, OPC, and Ethernet-IP

- Flexible power options including AC/DC or Power over Ethernet

- Redundancy operation available

- Integrates with Cisco IW6300 Wi-Fi Access Point for Wi-Fi based data backhaul

Wireless Product Portfolio

Pressure Transmitters and Gauges

- Reduce deployment time and ensure a problem-free installation
- Enhance process insight, minimize variability, and reduce maintenance and downtime
- Access data continuously

Totalizing Transmitter

- Measure turbine flow continuously, with reliable pulse data from the field
- Get average flow rate and totalized volume measurements, even in remote and challenging environments
- Generate predictive diagnostics data to indicate instrument health and support timely maintenance

Temperature Transmitters

- Increase visibility into your process and run a smarter operation through efficient temperature measurements
- Choose from a complete portfolio of wireless temperature solutions for any use, including non-intrusive and high-density applications
- Accurate, repeatable process temperature measurement while eliminating leak points
- Simplify specification, installation and maintenance

Discrete Transmitter

- Wirelessly monitor any single or double throw, unpowered dry contact switch
- Cost-effectively gain access to discrete points that are not connected to the control system due to wiring costs and lack of I/O
- Dual channels are configurable for discrete input or discrete output
- Utilize in safety showers, plunger arrival, flow/no flow, rupture discs, or safety guards/rails

Acoustic Transmitter

- Improve energy efficiency and environmental compliance with acoustic monitoring of steam traps and pressure relief valves (PRVs)
- Gain instant visibility through a non-intrusive, *Wireless*HART monitoring system
- Know immediately when steam traps and PRVs need attention

Vibration Transmitter

- Receive vibration, temperature, and bearing wear measurements
- Measure vibration on any plant asset — even in hard-to-reach and cost-prohibitive locations
- Get continuous online monitoring for machinery prediction and protection

Guided Wave Radar

- Recieve high/low level alarms and overfill protection
- Utilize in virtually any process condition
- Unaffected by challenging conditions with no moving parts to fail

Vibrating Fork Liquid Level Switch

- Avoid overfills and spills that could harm workers, cause steep fines or even shutdowns
- Communicate output data, instrument health details, and alerts
- Install alarm points in previously inaccessible remote tanks

Tank Gauging

- Utilize for bulk liquid storage applications at refineries, tank terminals, fuel depots, LPG/LNG plants and more
- Provide precise level and temperature data needed for custody transfer, inventory control, and safe tank operations
- Works in parallel with wired emulation protocols, providing a safe and cost-effective way to upgrade legacy systems and to meet requirements for full communication redundancy

Position Monitors

- Reduce valve alignment mistakes by wirelessly automating valve alignment work practices
- Know the status of your valve with predictive diagnostics on position,

Corrosion Monitoring Transmitters

- Choose the best mix of technologies: complementary corrosion and erosion monitoring solutions enabled by *Wireless*HART
- Non-intrusive direct wall thickness monitoring with *Wireless*HART data delivery – measures the impact of changing corrosion or erosion risk on asset integrity
- Powerful data visualization and easy-to-use analytics tools *Wireless*HART intrusive probes – fast response to changes in corrosion or erosion risk (or both with unique multi-element probe) with *Wireless*HART data delivery*
- SAM (sand acoustic monitors) – fast non-intrusive solids detection

Gas Monitor

- Extends the coverage of gas detection technology to applications that were considered to be too challenging/costly to monitor
- Improves toxic gas leak coverage to keep personnel safe and protect critical assets
- Continuously monitor for the presence of toxic hydrogen sulfide in remote locations

Wireless Product Portfolio

Location Awareness

- Digitally design and manage smarter, safer facilities with location technology utilizing reliable, cost-effective WirelessHART infrastructure
- Safety alerts for faster emergency response
- Safety mustering to streamline drill or emergency management
- Geofencing for safer, more efficient facilities and improved contractormanagement
- Social density management and contact tracing to help ensure operational continuity
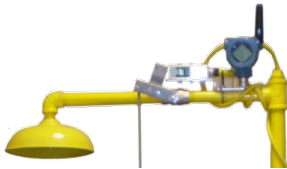
Safety Shower/Eye-wash Monitoring

- Remotely monitor to reduce response time to activation
- Automatically document and report required test activations
- Monitor Safety Shower and Eye Wash with single WirelessHART discrete transmitter

Pressure Relief Valve Monitoring

- Know instantly which PRV is open to reduce response time and emissions
- Non-intrusive acoustic and temperature sensor can be installed and commissioned on operating plant
- Relief event detection time, duration, and emissions reporting
- Installs on any PRV outlet (requires at least 10 PSI/0.7Bar process pressure

THUM Adapter

- Add wireless capabilities to your wired HART devices*
- Tap into the rich diagnostic and process data in your wired HART instrumentation
- Overcome the limitations of outdated legacy control systems
- Increase process visibility to run a safer, more productive operation
- Explosionproof approval options available (U.S./Canada)
    *Devices compliant with Hart 5 or later
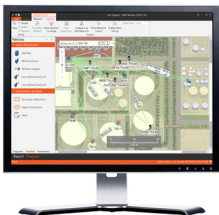
AMS Wireless SNAP-ON™ Application

- Easily plan, customize, and manage your wireless networks with the application's drag-and-drop design simplicity
- Leverage analytical tools for insights to help maximize process network performance
- Free up your crew for higher-priority tasks

Lifecycle Services

Our Lifecycle Service Strategy

- Service technicians are factory-trained and certified on Emerson products

- An established service network that places service technicians close to customers

- From simple repairs to complex projects, Emerson supports you with our Lifecycle Services portfolio

Wireless Pervasive Field Network (PFN) Services

The PFN Wireless Solution package includes:

- Project management by a Field Service Specialist

- Site walk-down conducted by a wireless network expert to identify critical and non-critical areas for inclusion

- Plant drawings indicating gateways and access points

- Startup services — installation verification, commissioning, and FAT/SAT

Wireless Start-Up and Commissioning Services

- Installation verification and commissioning of wireless transmitters

- A complete check of the transmitter's configuration, diagnostics, and all the variables for each transmitter, including mechanical, wiring, and loop verifications

Educational Services

- Learn from certified instructors with real-world experience and increase proficiency with hands-on experience

- Convenient locations and schedules that minimize disruptions to your employees' schedules

- Customized curriculums that cater to your process needs

- Improved production quality with services that improve the maintenance, reliability, and performance of your measurement products and process equipment

Real-time Insight into Your Operations, Anytime, Anywhere

Plantweb Insight™

Gain insight and clarity into your operations with a powerful software platform. Plantweb Insight is an industrial analytics solution which offers instant visibility to key assets, enabling you to make better, faster decisions to digitally transform your operations. Engineered with machine learning based asset models and analytics, this solution easily integrates with existing infrastructure and features intuitive navigation across a web based visual environment. Plantweb Insight instantly interprets key health data with pre-built, industry-accepted analytics and delivers actionable information you can use to improve your operations rapidly.

Improve Reliability and Energy Efficiency

- Spot abnormal situations
- Recognize optimum maintenance times
- Reduce energy costs
- Identify and prevent failures before they occur
- Track asset health

Provides Ability to

- Monitor key assets in real-time
- Quickly identify abnormal situations
- Prioritize maintenance

Improve Safety and Compliance

- Comply with regulations
- Identify leaking and sticking situations
- Gain real-time visibility
- Avoid potential safety hazards
- Reduce fines and environmental impact

IIoT Benefits

- Optimize operations
- Improve reliability
- Multiple applications on a single software platform reduces complexity and management
- Edge, Server, or Cloud deployments to match your architecture
- Active directory simplifies user management
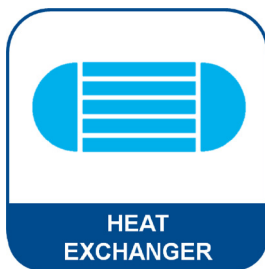
Plantweb Insight Applications

Steam Trap

The Plantweb Insight Steam Trap application determines the online health status of your steam traps by verifying if a trap is in failure mode. This is calculated using a status algorithm established by years of Emerson industry experience and analytics. With this app, you can view trending of past health, emissions and energy loss on a per trap basis and track impact set against key performance objectives. The Steam Trap application utilizes data from the Rosemount 708 Wireless Acoustic Transmitters to continuously determine steam trap status. This includes identifying steam trap failures (blow through, flooded, plugged) and inactivity.

STEAM TRAP
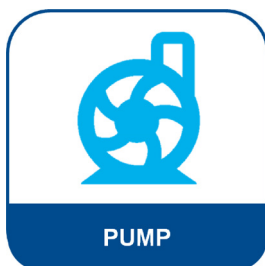
Pump

The Plantweb Insight Pump application offers in-depth monitoring of industrial pumps. The application displays real-time pump status and alerts using machine learning based asset models and analytics. Providing warnings of pump cavitation, plugged strainers, early bearing and gear wear, and imminent seal leaks, this application helps you shift your maintenance strategy from reactive to predictive. Status and alerts are calculated by pre-built algorithms based on years of experience and industry-vetted analytics.

PUMP

Heat Exchanger

The Plantweb Insight Heat Exchanger application provides in-depth monitoring of shell and tube heat exchangers by analyzing plant sensor data gathered through existing infrastructure. Leveraging pre-built algorithms based on decades of process experience and industry-vetted analytics, this solution delivers reliable predictive diagnostics. This app continually calculates and tracks key performance indicators like fouling, heat duty, heat transfer coefficient and several more.

HEAT EXCHANGER

Air Cooled Heat Exchanger

The Plantweb Insight Air Cooled Heat Exchanger application provides in-depth monitoring of air cooled heat exchangers and fin fans, by analyzing wireless sensor data gathered through existing infrastructure. Predictive and continuous air cooled heat exchanger monitoring helps reduce unexpected failures and process shutdowns. It easily integrates with existing infrastructure, and features real-time status and alerts, including fouling, high vibration and louver/pitch detection.

AIR COOLED HEAT EXCHANGER

Pressure Relief Valve

The Plantweb Insight Pressure Relief Valve application determines when and where an event has occurred within your relieve valve fleet. Utilizing analytic techniques, this application can identify abnormal situations affecting operations allowing users to easily identify problem assets and areas. Within the software interface users can view a consolidated event log, and view information regarding production losses and emissions caused by pressure relief events.

PRESSURE RELIEF VALVE

Cooling Tower

COOLING TOWER

The Plantweb Insight Cooling Tower application uses process data to determine the overall health of this critical asset. This application utilizes key temperature, flow, level, and analytical information to identify abnormal situations that affect the long-term reliability and efficiency of cooling water systems.

Inline Corrosion

INLINE CORROSION

The Plantweb Insight Inline Corrosion application is designed for continuous analysis and corrosion monitoring trends for installed wireless corrosion probes. The application delivers insight into instrument health and provides alerts on pre-set thresholds for severe corrosivity, probe life-span, low battery level and more. An intuitive heatmap is displayed with intelligence on corrosivity of fluid levels based on the NACE standard.

Non-intrusive Corrosion

NON-INTRUSIVE CORROSION

The Plantweb Insight Non-Intrusive Corrosion application provides superior understanding of the condition of your assets, enabling predictive maintenance, and increased plant optimization. Improve decision making and meet the evolving demands of the process industry with continuous monitoring designed to assess the impact of corrosion and erosion. The application securely delivers Rosemount Wireless Permasense corrosion data to users through best-in-class visualizations and analytics.

Pressure Gauge

WIRELESS PRESSURE GAUGE

The Plantweb Insight Wireless Pressure Gauge application monitors all Wireless Pressure Gauges in a single, easy-to-use interface. The "Know Before You Go" strategy allows users the flexibility to view important pressure readings and trends, keeping operators and maintenance updated on changing field conditions remotely. Other benefits include reducing or supplementing manual rounds and improving safety by keeping personnel out of hazardous areas.

Network Management

NETWORK MANAGEMENT

The Plantweb Insight Network Management application is designed for continuous, centralized monitoring of wireless networks across industrial facilities. To ensure operations adhere to network best practices, this application offers strategic analysis that enables teams to prioritize maintenance and make informed decisions fast. This solution includes a network mesh diagram for a consolidated view of network health and diagnostics to quickly identify issues and areas for improvements.
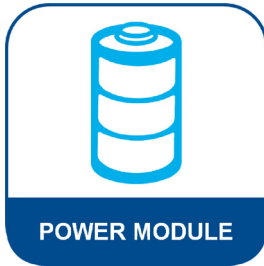
Power Module Management

Streamline power module monitoring across multiple networks with the Plantweb Insight Power Module Management application. This application centralizes and consolidates power module data and analysis in one place, enabling users to view calculated insights of power modules for an entire facility. Providing enhanced visibility of device status, this monitoring solution includes estimated life calculations and alerts of high-consuming modules for effective maintenance and replacement planning.

POWER MODULE

Location Awareness

Emerson's Location Awareness is a comprehensive location monitoring system that enables industrial facilities to keep their personnel safe and address up to 70% of recordable injuries through the digital transformation of safety practices and systems. Use cases include geofencing, safety mustering, safety alerts, and workforce management.

LOCATION

Connected Lighting

Save energy and extend lighting fixture life in harsh and hazardous environments with the Plantweb Insight Connected Lighting application. This application commissions groups of connected lighting on an uploaded image of your facility. Utilize pre-programmed controls or create custom controls to keep lights on when operators are present. Device health indicators and analytic tools deliver actionable insights which help to simplify maintenance planning and prioritization of the connected lighting system.

CONNECTED LIGHTING

(Emerson has more applications in development.)

Gain strategic data and actionable information to improve operations with Pervasive Sensing technologies from Emerson.

For more information go to Emerson.com/PervasiveSensing

Emerson.com

Facebook.com/EmersonAutomationSolutions

LinkedIn.com/company/Emerson-Automation-Solutions

Twitter.com/EMR-Automation

EMERSON.