

# Putting IIoT In Reach Of Every Industrial Company With Task-Specific Apps In A Digital Ecosystem

Every industrial company today is discussing the Industrial Internet of Things (IIoT). Experts say that IIoT enables companies to engage technology and expertise more than ever before. Managers know that instruments and systems they buy can be equipped with digital technology to gather real-time data at every measurement point.

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**T**HE DRAW is that implementation of IIoT can mean not having to collect data manually – a huge relief, especially on days when it's cold and icy, rainy and windy, or hot and humid. Companies want to receive reports pinpointing where maintenance is required, automatically. Professionals in the process industries say the main reasons they are collecting data are for process improvements (75 percent), diagnostics and predictive maintenance (68 percent), and quality control (51 percent).

The problem is that while the companies may be able to gather data, they don't necessarily have the expertise or technology to analyse that data and turn it into actionable intelligence on which critical decisions

can be made – decisions that can effectively improve safety, reliability, and efficiency of assets, people, and processes. Over 50 percent of businesses report that they have too much data to be able to analyse it efficiently, and 44 percent report that they could do a better job at analysing their data.

What's needed is a digital transformation with scalable technology and a strategy that matches even a smaller company's business goals. This is now possible with task-specific applications such as Emerson's Plantweb Insight, a component of the Plantweb Digital Ecosystem. These applications are all web-based and available on any device, allowing companies to start as small or as large as they need to be and continue to expand as the need dictates. This new technology is industry independent, so it can work in a huge variety of applications. The in-depth monitoring system can

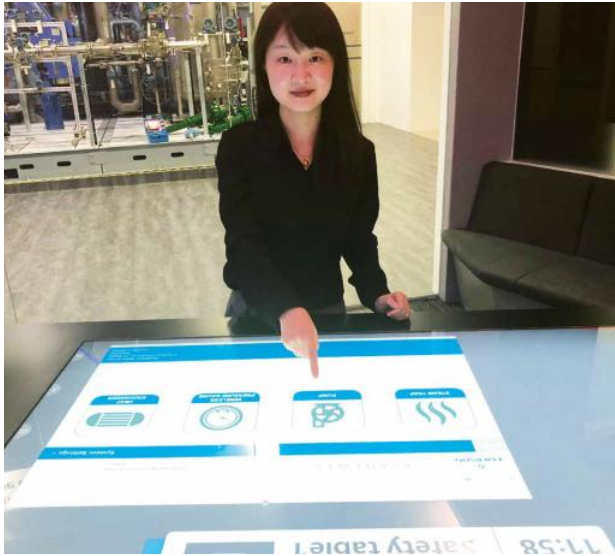
be applied to water and wastewater, oil and gas, chemical and refining, pharmaceutical, and more. Remarkably, this solution seamlessly integrates with a company's existing wireless infrastructure, allowing users to expand the capabilities of their current system. As a result, the cloud-based ecosystem solution can be used for any size operation.

Manual rounds and inconsistent data communication become a thing of the past. Plantweb Insight applications provide instant data interpretation of key asset health. Engineered with pre-built, industry-accepted analytics, this solution transforms sensor data into actionable insights. A web-based platform, this solution allows users to securely access data from anywhere at any time. Plus, the human-centred design interface offers consistent and intuitive navigation across the apps. With real-time visibility of key asset health, companies can avoid potential safety

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hazards, as well as better prioritise maintenance. When abnormal situations are spotted before they become potential failures, companies not only improve facility safety, but also ensure that operations meet compliance and regulatory standards.

There are a range of task-specific Plantweb Insight apps. Here are a few examples:

#### Steam Trap

Tight budgets and the need for improved efficiency mean it is essential for plants to take a closer look into their steam trap usage and steam trap health. Steam traps are typically only audited once a year, leaving plants vulnerable for long periods of time. Expected steam trap failure rates range from 12.5 percent to 25 percent every year, while 5–10 percent of total energy cost is typically lost through leaking steam traps.

The Plantweb Insight steam trap application determines the health status of steam traps by verifying if a trap is in failure mode.

With this app, the company can view trends of past health, emissions, and energy loss on a per trap basis, and track their impact set against key performance objectives.

The app utilises data from a wireless acoustic transmitter to continuously determine steam trap status. This includes identifying steam trap failures (blow through, flooded, plugged) and inactivity.

#### Pumps

Statistically, pumps will fail or suffer degraded operation every 12 months, and pump failures can cause process upsets and downtime, taking hours or days to recover to normal operations.

Using a multi-measurement approach, the app's continuous pump monitoring and analysis offers plants greater visibility into process and equipment conditions. It offers in-depth monitoring of fixed-speed pumps by providing an aggregated view into the health of all assets with status and alerts calculated by pre-built algorithms. The predictive diagnostics and alert weights of this solution enable better prioritisation of pump

maintenance, allowing users to mitigate recordable incidents and quickly identify any assets requiring attention.

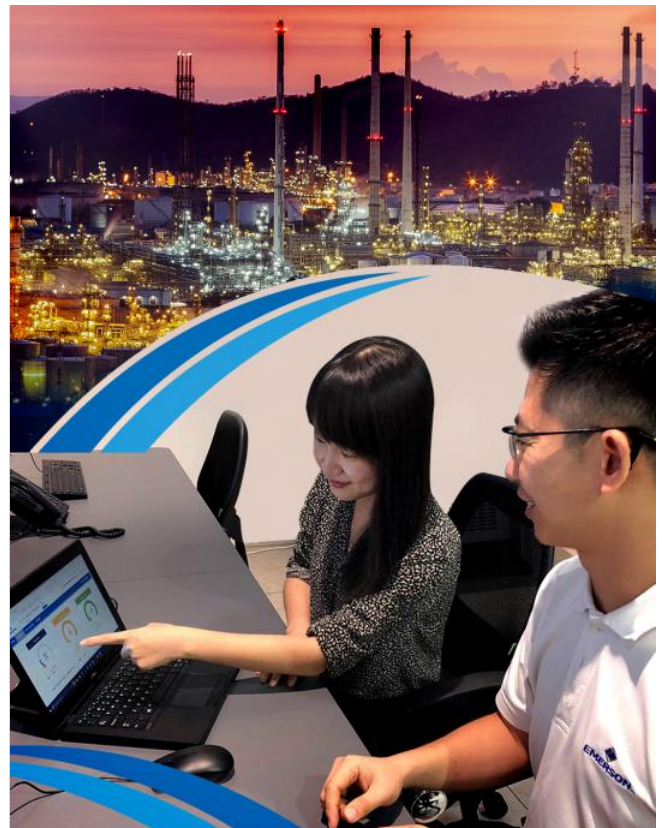
#### Heat Exchanger

Unnoticed or increased heat exchanger fouling causes degraded performance and reduced energy efficiency and can result in an unscheduled shutdown or process slowdown.

The Plantweb Insight heat exchanger app provides in-depth monitoring of shell and tube heat exchangers by analysing plant sensor data gathered through existing infrastructure. Leveraging pre-built algorithms, this solution delivers reliable predictive diagnostics. Fouling monitoring with the app provides early indication of fouling by comparing the current heat transfer coefficient with the baseline (newly cleaned). Heat duty monitoring quickly recognises when heating requirements change, and cleaning recommendations are based on high fouling and high differential pressure or lost energy costs.

#### Air Cooled Heat Exchangers

Limited cooling is an indication of exchanger fouling. This can result in reducing the cooling capacity of the exchanger, leading to throughput reduction, which can also cause products heading to storage tanks to be too hot or other process impacts. Increasing motor or fan vibration and bearing temperature can result in belt and coupling failure or cause fan blades to stop, reducing the cooling capacity and throughput of the exchanger.



The Plantweb Insight air-cooled heat exchanger app provides in-depth monitoring of air cooled heat exchangers (fin fans) by analysing wireless sensor data gathered through existing infrastructure and utilising pre-built algorithms. This solution delivers reliable predictive diagnostics. With access to pre-built strategic interpretation analytics, personnel no longer have to sort through large data sets.

#### Wireless Pressure Gauge

Global fugitive emissions regulations are increasingly stringent, including carbon emissions and rigorous monitoring of pressure relief devices (PRDs) and pressure relief valves (PRVs). A single release of a PRD/PRV can now result in a fine of up to US\$50,000. Traditional gauges routinely fail, providing unreliable information without any indication. Basing important maintenance decisions on these faulty gauges can negatively impact plant safety and productivity.

A cost-effective and reliable PRD/PRV monitoring system can not only help companies determine environmental and production losses, but also help better meet regulations.

Utilising wireless acoustic transmitters and the pressure relief device application allows companies to automate and eliminate the guesswork for PRD/PRV monitoring. The Plantweb Insight wireless pressure gauge app monitors these gauges in a single, easy-to-use interface. In addition to analysing data acquired through plant sensors and existing infrastructure to provide real-time pressure status of all wireless pressure gauges, it also features device health indicators, which help effectively manage maintenance.

The app gives an indication of PRD releases, including start time, end time, duration, losses, and more. Event log records with all these details are also automatically generated for one year of EPA reporting. The app enables users to remotely view pressure gauge readings and trends in order to stay updated on changing field conditions, so as to reduce manual rounds and keep personnel out of hazardous areas, improving facility safety. Manual

configuration of thresholds for alerts ensures users get the needed data.

#### Easy-to-Use Applications

The apps described above use graphical representation in the form of color-coded dial gauges and trend charts, which include health for the overall population of each type of equipment. These features let the user know at a glance how many of the apps have critical issues, warnings, or are in good condition. Equipment is identified by tag and location and specific tags can be sorted and searched, showing status, health index, problem description, alarm condition, and the length of time the equipment has been in this condition. The apps also provide plain text problem descriptions rather than requiring complex interpretation of charts, and early warning is given about developing problems.

Timely, relevant data is essential for any company when making decisions to ensure optimal operating conditions. When users are burdened with performing tedious manual rounds or unable to analyse data quickly, essential information remains out of reach. Without quick and accurate data analysis, it can be difficult to prioritise maintenance and identify potential hazards or failures, putting the safety, reliability, and compliance of a facility at risk. When companies have access to instant, easy-to-read analysis of key operational assets, users gain better understanding of data and the knowledge allows quick, critical decisions to increase operational efficiency, safety, and compliance. Scalable, web-based, asset monitoring applications can make this a reality for any industrial company. 