IoT Retrofitting for Legacy Machines

Getting reliable OOE data from legacy machinery and plants

Machine operators need reliable data on the use and availability of their systems, including verifiable OEE key figures. In this case, an 18-year-old bending machine, a central element in the production of sheet metal parts, was a constant source of problems. Unplanned downtimes occurred, the supply of material came to a standstill, the number of rejects increased sporadically, and the machine had to be readjusted frequently. "There was a lack of reliable data on the availability, utilization, and efficiency of the machine. We were looking for a simple way to record and evaluate the machine data and to improve the system effectiveness," says Stephan Hofmann, Technical Manager at Häfele, explaining the requirement.

The HARTING MICA® Solution
Integrating modular edge computing, LTE and AWS analytics

Since the customer prohibited access to the machine controllers and the corporate network, sensors were retrofitted in the bending machine to measure oil temperature, the movements of the machine and how many workpieces are machined. All sensor signals are transferred to HARTING's Edge Computing System MICA® specially designed for harsh industrial environments. On the MICA®, the sensor data is linked with further metadata reported by the machine operators whenever there is a malfunction, maintenance, secondary activity or adjustment.

SiC! Implemented a solution that the processed data is then transferred via LTE to AWS IoT Core for analysis and visualization with Amazon QuickSight.

Benefits

HARTING MICA® and AWS are the quickest and most agile way to collect enriched OOE data from legacy devices.

Fast Installation
An entire monitoring solution can be installed in one day without affecting the production or IT network.

Data Fusion with Metadata
Automatic and manual inputs are correlated on the MICA® to drive deeper insights into the operation of the machine.

Wireless Connectivity
Most sensors and inputs are connected wirelessly minimizing cabling. Direct LTE connection bypasses the corporate network.

Modular Expandability
Over the course of the project, additional inputs like dash buttons can be added quickly and without disrupting the data collection.

HARTING MICA® on AWS

Combining the strengths of HARTING MICA® and AWS gives customers and system integrators the ultimate in flexibility, robustness, and convenience for brownfield retrofit and other industrial and transportation IoT projects. With an IP67 housing, MICA® enables customers to place data acquisition and preprocessing directly at the machine, and customize date inputs using the MICA® toolkit. At the same time, the management, data analysis, and reconfiguration of sensors can be handled conveniently from AWS without the need for site visits.

Features

MICA® and AWS marry local data processing and cloud-based management
MICA® and AWS let up pick the optimal combination of latency, bandwidth, and processing power for each aspect of your project: if you need a guaranteed turnaround time, for example to switch tooling, or in case to shut off water or pressurized air lines in case of leaks, you can run a quick analysis on the local edge device. If you are looking at AI-based learning, or factory-wide analysis of OOE, you can send the relevant data the cloud and use almost unlimited computational resources.

MICA® and AWS let you share KPIs without sharing your IP
Local data processing at MICA® lets you decide which data is passed on and which remains in the company network. You can even provide sandboxed dashboards to personal computers or dashboards for your own staff over WiFi or Ethernet. MICA® and AWS lets you set your own security policy instead of relying on service providers or cloud providers.

Case Study: Häfele

Problem

An 18-year-old bending machine had no obvious malfunctions but was a constant source of problems: unplanned downtimes, the supply of materials at a standstill, the number of rejects increased sporadically, and the frequent machine readjustments.

Solution

SIC! Software equipped the machine with a MICA®, various sensors, and a tablet that operators could use to enter error conditions and tasks performed. The preprocessed data was sent to a SiC! AWS site where the customer for analysis and visualization.

Results

"The IoT retrofitting has made it very easy for us to start evaluating machine data. For the first time, we now have facts about the use and possible disruptive factors for availability" to significantly reduce downtime.

Get started with HARTING MICA® solutions on AWS
Visit the [AWS Partner Device Catalog](#) to learn more about HARTING MICA®.