

Wireless IoT solution for Industrial Hand Valve Monitoring

Stora Enso develops and produces solutions based on wood and biomass for a range of industries and applications worldwide, leading in the bioeconomy and supporting customers in meeting demand for renewable eco-friendly products. Stora Enso's digitalisation initiatives aim to enable and accelerate the journey towards a renewable future by making full use of the opportunities enabled by new technologies and trends. Stora Enso and Haltian have been co-operating on a digitalisation project to create a new retrofit IoT sensor for hand valve position monitoring



The process piping system of a paper mill is large and complex. There are hundreds or even thousands of manual hand valves of different types. The position of each valve should be known to maintenance personnel to carry out maintenance operations safely and efficiently.

Usually the positions of the valves are checked manually, which is time-consuming and prone to human error. If even a single valve is in a wrong position it can cause accidents, production losses or undesired leakages.

The hand valve position issues usually occur after a maintenance break. Since many manually controlled valves are opened or closed during the break, it's challenging to keep track and return them into the right position when the production is ramped up again. It takes time to go through all the hand valves and double check their correct positions.

Safety is very important for us. The retrofit IoT hand valve sensors help us improve safety whenever we have maintenance shutdowns at our mills, Raimo Miettinen, Digitalization Development Manager at Stora Enso explains.

Existing retrofit solutions for hand valve monitoring are very limited: most solutions are wired and difficult to install, leading to high investment costs. An alternative solution to retrofit sensors is to replace manual valves with automatic ones. This requires even higher investments, as well as a production stop during installation.

There were some key requirements for the new IoT sensor at the beginning of the project:

- It should be wireless
- It should endure the harsh production conditions
- It should be cost efficient to install and use
- The backend IT system should be easy to integrate with Stora Enso's production automation and IT systems.

The co-developed solution's core is the Thingsee ANGLE sensor which is simply attached to a manual valve with a purpose-built bracket. The sensor detects the hand valve's angle. The sensors are battery powered with several years of battery lifetime. The operators and maintenance personnel at the mill can then see the hand valve angle in the process automation system. Moreover, the solution can be configured and kept up to date through a device management system.

A mobile application for easy field operations belongs to the solution. The application includes:

- Device installations and replacements
- Valve and sensor pairing
- Device status checks
- LED indicator light control

The entire solution is easy and quick to install without time-consuming on-site configuration and device installations can be executed by the regular maintenance staff at mills.

Maintenance work at mills is safer and the production can be ramped up faster after a maintenance shutdown. The real-time data enables better visibility to hand valve positions during production processes increasing safety further.

Stora Enso started working with Haltian thanks to Haltians approach to co-developing a solution to Stora Ensos needs.

We have a problem focused agile approach to digitalization. We work in close co-operation with many innovative companies and Haltian is one of them. Haltian was the most suitable partner in this project because they had previous knowledge of wireless IoT sensors for different purposes, Raimo Miettinen adds.