ACCELERATING PRODUCTION EFFICIENCY WITH SPARKMES®

A CASE STUDY FEATURING

BELDEN INC.

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BELDEN

Lead times increasing with little insight into troubled areas

Legacy equipment impeded real-time data

Flexware's **SparkMES®** implemented

Data acquired **without replacing legacy equipment**

Annual plant **performance increase of $500,000**

OEE improvement of 18% exceeded goal by 3.5 times

THE CHALLENGE

For more than 120 years, Belden has been a leader in the design and manufacturing of insulated wire, cable and connectivity products. Since then, Belden has transformed itself from a cable company to an end-to-end networking and data solutions provider with a comprehensive product portfolio including cable, connectivity and networking products.

While many of Belden's manufacturing facilities maintain world-class standards, leaders at one of their longest-standing plants acknowledged that outdated equipment and technology were hindering progress and productivity. With an **Overall Equipment Effectiveness (OEE) of just 57%**, this plant's reliance on manual processes and tribal knowledge raised concerns amid a tight labor market magnified by the pandemic. As demand for Belden's products spiked, productivity issues at the plant amplified further as lead times expanded. Troubleshooting processes were often based on trial and error while equipment maintenance cycles were time-based, leading to further down-time and inefficiencies. Overworked managers struggled to keep production lines running efficiently.

Belden values data-driven decision-making and continuous improvement, so their Customer Innovation Center™ (CIC) experts set out to modernize the company's line monitoring systems with real-time data collection and analytics. The Ignition platform by Inductive Automation was chosen as the optimal solution, offering both the best performance and cost-effectiveness for moving forward. The CIC team wanted an experienced partner who could help them create a complete solution. Belden turned to Flexware Innovation for their proven track record as a Belden partner and for Flexware's reputation as a top Ignition Integrator.

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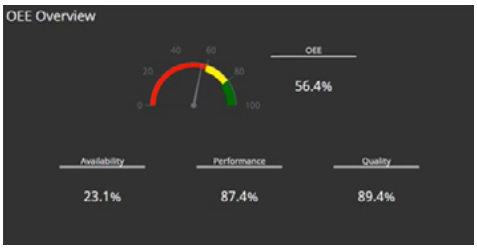
THE SOLUTION

With Flexware's help, Belden set out to transform the plant's operations from a "black box" to a "glass box," offering real-time data visibility into critical OEE metrics for operators and supervisors. Their goal was to establish a unified source of truth for both IT and OT, providing a data visualization and analytics solution. This solution aimed to help managers identify bottlenecks, minimize downtime, and increase productivity.



Belden evaluated several solutions and chose **Flexware's SparkMES®** solution. Developed on Inductive Automation's Ignition platform, SparkMES is scalable, flexible, and cost-effective. Flexware's solution simplifies development, accelerates deployment, and improves outcomes.

SparkMES improves manufacturing production through data-driven insights within a modern, easily configurable platform. It is equipment agnostic, enabling companies to easily add new production lines or equipment. SparkMES supports the management of manufacturing processes, tracks production data to understand quality issues and machine downtime and helps make data accessible at all levels of the organization, from the shop floor to production supervisors to the management suite. The product's OEE module was designed specifically to address the kinds of goals that Belden had in mind.

Belden naturally saw value in using their own connectivity products as part of the complete solution. Known for exceptionally high performance in industrial environments, the company's offerings were the perfect complement to Flexware's SparkMES solution. Belden's vendor-agnostic connectivity products enabled the team to feed data from the plant's dated equipment directly to SparkMES, without investing in new equipment.

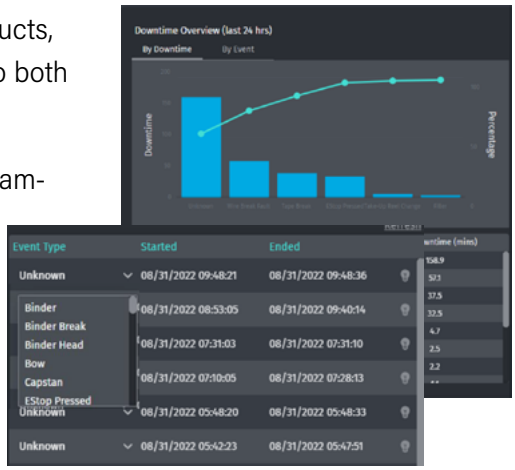
The two companies worked together to design and implement a solution that could offer real-time data for improved operational intelligence and better productivity at the plant.

The team at Belden was especially pleased with the ease of implementation. "With SparkMES, I quickly gained confidence in the proposed solution," said Aravind Kumar, manager of Digital Automation Consulting at Belden. "I was able to be much more hands-off than I would normally be. It was a much easier deployment than I expected because SparkMES offered a very effective pre-built framework. So much of what we wanted to create was already done for us."

THE RESULTS

A key goal for this project was to deliver timely data that could benefit users from the shop floor to the C-suite. With the solution completed, front-line workers could get immediate feedback on machine performance, production levels, and more. Company executives had KPIs at their fingertips and on dashboards displayed around the plant. SparkMES was additionally linked to Tableau, the company's business intelligence solution, for even

further analysis of data. With SparkMES and Belden's data connectivity products, the CIC team and Flexware were able to successfully deliver required data to both audiences.



Throughout development, project leader Aravind Kumar recruited project champions to contribute ideas and communicate the benefits to their fellow employees. This led to widespread adoption and acceptance of the new tools throughout the plant.

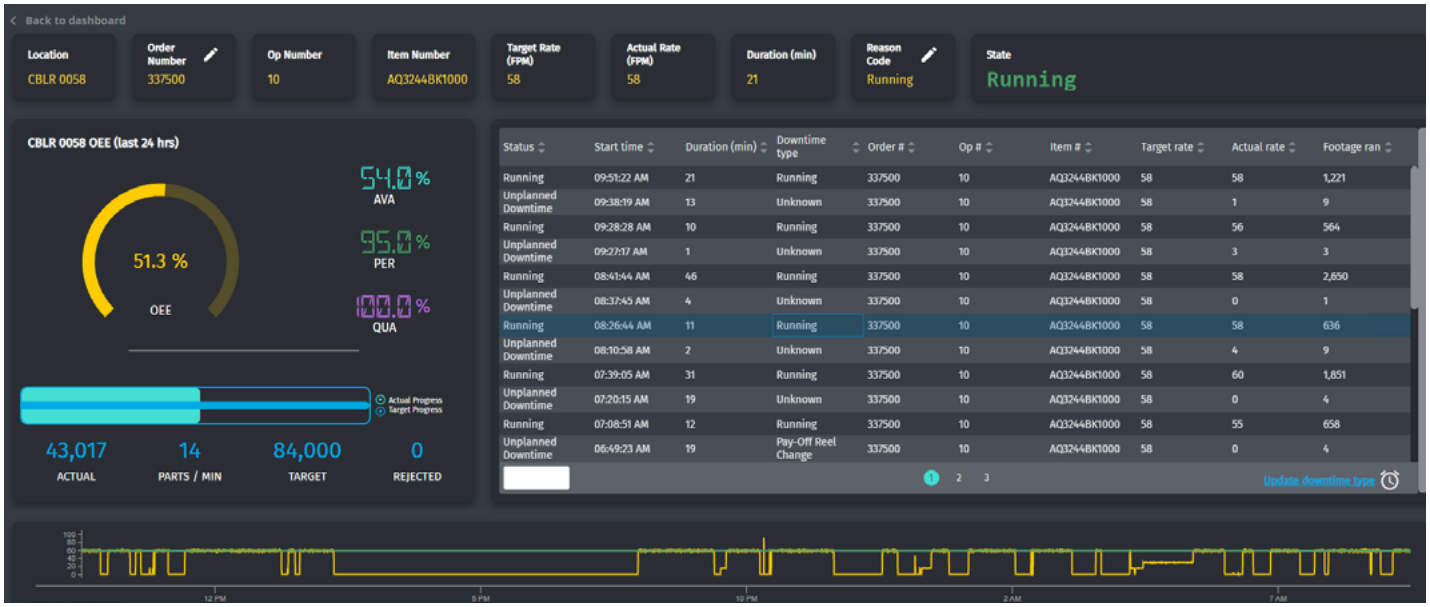
The results have been overwhelmingly positive. The project achieved an **84% internal rate of return** and an **annual performance increase of $500,000** for the plant. Although the initiative's **sponsors had tasked the team with delivering a 5% OEE improvement**, the actual **improvement came in at 18%**, over **3.5 times the initial target**.

Belden is now able to use predictive maintenance, enabling proactivity to address issues before failure occurs. Production managers can solve problems faster, further reducing downtime. The company's data engineering services have prepared the plant for future initiatives, including Industry 4.0, smart manufacturing, digital twins, AI and 5G deployment.

There has been a positive shift in the company's culture as well. Production managers at Belden see a host of new possibilities for data-driven decisions and have fully embraced digital technologies on the shop floor.

"That cultural shift is not a quantifiable metric," says Kumar, "but it goes a long way for us. Looking at the success at that plant, we've had other plants ask us for the same thing. We've done 3 more since that initial success, and a fourth plant is in the works. **This is a very big deal for Belden.**"

Corporate executives and plant managers throughout the company have taken notice and are asking the CIC team to take on similar projects at the company's 20+ other plants around the world.



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