

Scalable wireless infrastructure for warehouse automation

Case Study



Customer

A leading provider of automated warehouse solutions, this company partners with retail, wholesale and food and beverage brands to help them scale operations through intelligent automation. They redefined warehousing with a complete system that integrates AI-powered software and a fleet of autonomous robots.

Clients can either deploy the company's AI-driven automation technology in-house or opt for a warehouse-as-a-service model, where the company manages warehousing end-to-end. Known for achieving the world's fastest intake and retrieval times, the company continuously seeks to enhance system performance, reliability and scalability. These efforts are not just technical—they directly support business goals by unlocking new revenue streams, accelerating go-to-market timelines and ensuring scalable service delivery across a growing customer base.

Challenge

As the company's customer base and operational footprint expanded rapidly, so did the complexity of its automation systems. To maintain its competitive edge and meet strict customer uptime requirements, the company recognized the need to modernize its wireless network infrastructure.

Common connectivity challenges:

- Intermittent robot disconnections caused by the wireless network
- Network availability timeouts, leading to delays, system reboots and robot collisions
- Manual retrieval of disabled robots

The existing wireless solution was nearing obsolescence and could no longer support the high-speed, high-density demands of AMRs and AGVs. Frequent disconnections, network timeouts and manual robot retrievals were causing operational delays and jeopardizing service-level agreements (SLAs). These issues not only risked financial penalties but also hindered the company's ability to scale efficiently. For IT leaders, this posed a significant challenge: ensuring secure, reliable communication between control systems and enterprise networks, while maintaining compatibility with SCADA systems and enabling remote access.

The company needed a partner capable of delivering a robust, low-latency, high-availability wireless solution tailored to the unique demands of mobile automation—one that would reduce downtime risk and support rapid deployment across multiple sites.

What began as a wireless upgrade evolved into a strategic infrastructure transformation. Belden designed, tested and implemented a purpose-engineered wireless network tailored to the company's needs.



Discovery

Belden, a global leader in network and data solutions, brought deep expertise in warehousing and logistics environments. Upon engaging with the company, Belden's team conducted a comprehensive assessment of the existing wireless infrastructure and operational workflows.

Key issues identified included:

- Intermittent robot disconnections due to weak or inconsistent wireless signals.
- Network availability timeouts, leading to system reboots and robot collisions.
- Manual intervention required to retrieve disabled robots, increasing labor costs and downtime.

The team proposed a new network architecture that balanced safety and performance—ensuring continuous communication between robots without compromising fail-safe protocols. For engineering teams, this meant fewer hours spent troubleshooting and more time focused on innovation and system optimization.

To validate the solution, Belden deployed a pilot system at one of the company's facilities. The results were immediate and compelling. Stakeholders across engineering, service and deployment teams were brought into the process to ensure alignment and readiness for full-scale implementation.

Solution

What began as a wireless upgrade evolved into a strategic infrastructure transformation. Belden designed, tested and implemented a purpose-engineered wireless network tailored to the company's needs.

Belden experts engineered, validated and supported the deployment of a robust and dependable wireless network solution, specifically designed to ensure high availability and consistent performance for the company's mobile automation systems. The solution was customized by Belden's engineering team to incorporate essential features that streamline implementation, facilitating a faster and more efficient rollout.

Key features of the solution included:

- Vendor-agnostic integration, allowing seamless compatibility with existing warehouse systems and minimizing disruption.
- High availability and performance predictability, ensuring uninterrupted communication for AMRs and AGVs.
- Rapid deployment capabilities, supported by reliable supply chain partners.

To support the company's aggressive expansion plans—over 100 new distribution sites—Belden also developed a comprehensive technology roadmap. This included guidance on hardware, software and training requirements to ensure consistent, on-time launches. For IT teams, the vendor-agnostic design reduced integration complexity, while business leaders gained confidence in the scalability and resilience of their automation infrastructure.



By connecting people, information, and ideas, Belden enables a safer, smarter and more prosperous future for its customers – unlocking new possibilities through intelligent, reliable infrastructure.



Results

With a new wireless network solution in place, the company is confident that it can meet—and even exceed—customer commitments for the first time. According to projections based on current revenue and ROI from the network enhancements, the company can expect to see results like these along their digital journey:

The company is no longer focused on downtime and disconnections, but on what it does best: delivering advanced automation solutions that make the supply chain faster, more efficient and more profitable for manufacturers, distributors and retailers.

About Belden

Belden Inc. delivers complete connection solutions that unlock untold possibilities for our customers, their customers and the world. We advance ideas and technologies that enable a safer, smarter and more prosperous future. Throughout our 120+ year history we have evolved as a company, but our purpose remains – making connections. By connecting people, information and ideas, we make it possible. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia and Africa.

- > **A 99% reduction** in wireless disconnections and timeouts
- > **A 11% increase** in package processing rates per hour
- > **A \$3 million increase** in package processing in annual services revenue

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