SIEMENS

Case Study

Eliminating Disruptions, Saving Money and Boosting Safety with SCALANCE Wireless Communications

Trutegra
Trusted. Reliable. Solutions.

Customer: Trutegra is a global full-service supplier and integrator of high-quality control and automation systems.

Challenge: Improve crane wireless communications.

Solution: Siemens SCALANCE wireless communications technology.

Results: Greater plant productivity, uptime and safety.

In heavy industry worldwide, bridge cranes provide the lifting capacity to hoist tons of materials at a time, whether those are going into production, moving through a process stage, or coming out, ready for shipment. With such massive loads in their grip – often moving high above a factory or warehouse floor – crane control and safety are critical. Slips, bumps and drops can cause costly disruptions and inflict irreparable damage to equipment and infrastructure. Consequently, accidents like these can have grave impact on nearby personnel.

To prevent such catastrophes from happening, heavy industries that use bridge cranes turn to Trutegra, a Charlotte, N.C.-based developer and integrator of comprehensive control and automation solutions. As a long-time user of Siemens components in these solutions, Trutegra is globally known for its sophisticated crane control solutions, especially those offering intelligent positioning of cranes and hoists. “With industrial cranes, control is everything,” says Mike Martin, Trutegra’s Information Technology Manager. “Our customers count on us to help them ensure their cranes operate efficiently and safely.”

Challenge: Enable continuous broadband wireless communications for real-time crane control, data collection and video surveillance.

In the U.S. Midwest, scores of large metal fabrication and treatment plants supply the increasingly demanding specifications for the auto industry for advanced high-strength steel. One of those plants specializes in the continuous annealing and galvanizing of thin steel sheeting that eventually gets stamped into auto body parts. After treatment, the steel gets rolled into coils weighing up to 40 tons for shipping.

To hoist and move these massive coils through the plant, the facility uses four giant bridge cranes. The bridge for each crane spans 120 feet, while it runs overhead on two rails 2,000-feet long. "In many plants, the overhead bridge can be as high as a six-story building and feature a bridge trolley with a powerful hoist system to lift loads," Martin explains. "Often the hoist is connected to a rotating mast, so loads can be turned. With this technology, crane operators can hook and move massive loads quickly around a facility with seemingly little effort."

Critical communications. While today's bridge cranes tend to be fully automatic, Martin says that older models can be manual or semi-automatic. Manual controlled ones can be operated from an onboard operator cabin or remotely from a control room via video cameras. "But no matter what their operating mode, real-time communications between the operator and the crane's components is vital to their efficient, safe operation," Martin says. "That's what prompted this particular customer to call us for help."

For years the plant's bridge cranes had been using 900 MHz leaky coax cable communications that ran along the rails to guide the bridge and trolley. "Although their cranes could operate automatically, they could also guide loads manually, if necessary," says Martin. "In that case, a worker would walk onto the production floor to use a belted set of wireless controls called a 'belly box.' But that puts the operator in harm's way."

Time to upgrade. Trutegra had decided the time had come to upgrade the facility with 802.11n wireless broadband. One reason was for the bandwidth needed to put cameras on the cranes and better see their operation from a remote control room, while also recording to a DVR in case of mishaps. The other reason was so they could also collect operational data that they couldn't with the leaky coax.

Problem was, Trutegra chose a vendor with a wireless solution that they couldn't get to work, even after a year of trying. "The crane's vehicles would lose communication with the shore long enough that it would stop production eight to twelve times per shift," Martin says. "When these outages occurred, they'd have to send someone out there with a belly box remote control, and manually drive the crane to a maintenance location. They'd then shut the power off the crane and reboot it, so the radio would reboot and come back on. The disruptions probably cost the plant hundreds of thousands of dollars in lost productivity."

Solution: Powerful 802.11n Siemens industrial wireless LAN, with SCALANCE W788 Access Points and W748 Client Modules providing 450 Mbit/s bandwidth

When Trutegra got the call, its engineers visited the plant to fully assess the situation. Clearly the plant needed a proven broadband wireless control system, one that would work flawlessly based on Trutegra's years of experience in designing the successful ones for its many satisfied customers around the world.

The team recommended an industrial wireless LAN comprised of Siemens SCALANCE W788 Access Points and W748 Client Modules.

> "We use the Siemens SCALANCE W product family in all of our wireless crane control solutions because of the simple fact that they work – always," Martin says. "Plus, they're easy to install and configure."

Rugged, versatile solution. The Siemens SCALANCE W family of wireless products offer a combination of capability, reliability and security in a solid-state, ruggedized aluminum package well-suited for industrial applications. Using MIMO (multiple-input, multiple-output) technology to multiply the capacity of their radio channels, they can achieve bandwidth throughputs of up to 450 Mbit/s, which was more than enough for the customer's requirements.

The access points and client modules can be rail or wall-mounted, with Power-over-Ethernet (PoE) to minimize cabling. Protection against unauthorized access is provided by modern standard mechanisms for user authentication and data encryption.

Easy installation. After the customer's nightmare experience with the other vendor, Trutegra wanted to prove that the Siemens SCALANCE W wireless LAN solution would work. So it designed a redundant system for one of the plant's cranes, placing one SCALANCE W788 Access Point high on the wall at each end of the plant's building.

Connected via Ethernet cabling and powered via PoE, they communicate back to plant's SCADA system as well as bring the video signals to the control room and DVR, all via PROFINET. The crane's vehicle control box was outfitted with a SCALANCE W748 Client Module. Trutegra set the units to their highest security encryption, which Siemens designs and engineers into every unit.

He notes that Siemens sent its top wireless network expert in the region to ensure the installation and configuration of the SCALANCE W wireless LAN went smoothly. "That's typical of the kind of support we get from Siemens," Martin reports. "Our installation took about eight hours to mount the units, hook them up to the network, and tune everything. It couldn't have gone better."

Results: Disruptions eliminated, safety enhanced and new crane control capabilities added

According to Martin, his customer is delighted. "They haven't had a single outage since the installation of the Siemens SCALANCE W wireless LAN," he says. "That alone has saved them the hundreds of thousands of dollars in productivity they were losing with their previous wireless system. And they don't have the safety issue of putting a person out on the floor 12 times a shift to manually drive the crane to its maintenance position and reboot it."

In fact, Trutegra's customer was so satisfied with its one crane's continuous operation and new control capabilities, including video, that it decided to upgrade its three other cranes at the first facility and five more in another location to the Siemens SCALANCE W system. Not only that, but they saw how easy the initial installation was and had the plant maintenance people do it.

"We documented the installation steps for them and their own staff took care of installing the units, connecting them to the network and setting them up," says Martin.

> "They were so confident that the Siemens SCALANCE W system would run out of the box like it did, they didn't ask us to be onsite but would call us, if they needed us. And they didn't call."

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Subject to change without prior notice.

Printed in USA
Order No.: NTCH-0TRTG-0815

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