Remote Management of Ice-Dispensing Kiosks Streamlines Operations and Speeds Expansion

A Sierra Wireless® Industrial IoT Solution

CUSTOMER CRITICAL CHALLENGE
• Suppliers of ice typically manage a number of ice-dispensing kiosks, installed in neighboring towns or counties, and need an efficient, cost-effective way to monitor operations and respond to issues

SOLUTION
• CSI-developed method for gathering operations data, based on access to kiosk’s programmable logic controller (PLC)
• CSI-developed backend monitoring dashboard and customer-accessible web interface for managing operations and analyzing machine data
• AirLink LS300 industrial gateway for cost-effective, reliable cellular connectivity and two-way communications between the kiosks and the backend software

BENEFITS
• Real-time alerts let kiosk owners respond quickly to operational issues
• Remote troubleshooting increases responsiveness and saves on overhead, with fewer technicians in the field
• Remote interaction with kiosks enables customization, so ice is produced at specified times to save energy and reduce cost
• Data analytics, based on real-time information about machine operation and sales, increases efficiency and makes it easier to identify trends

BACKGROUND
Based in Charlotte, North Carolina, Control Solutions, Inc. specializes in the development of automation and control systems. Working with dealers of standalone ice dispensers, CSI devised a way to gather operating information from the ice machines and make it available for viewing and analysis over a web interface. Building on their original landline setup, CSI wanted to save money and increase flexibility by transitioning to cellular connectivity.
The Challenge

Ice-dispensing kiosks are free-standing units, about the size of a standard shipping container, that produce ice and dispense it according to the customer’s selection. Located in parking lots outside shopping centers and gas stations, the kiosks give consumers 24/7 access to ice and can automatically dispense, at the push of a button, 16 to 20 pounds (7 to 9 kgs) of chipped ice in about 8 seconds – at roughly half the price of ice traditionally supplied by convenience and grocery stores.

The kiosks are complex machines that involve dozens of relays and motors. Several years ago, CSI worked with kiosk buyers to develop a method for remote monitoring and management. Building on their years of expertise in automation and instrumentation, CSI wrote an application that collected data about various operations of the machine, from ice-making to bag storage and inflation, to data regarding ice sales. CSI then built a web interface and designed dashboards that let customers monitor operations from a remote location. The original setup used DSL and cable connections, but that was expensive and often cumbersome to install and maintain. CSI wanted to go wireless, to lower the cost of installation, increase scalability, and reduce overhead.

They Started with Sierra

Working through a reseller, Simple Com Tools, CSI chose to start with Sierra Wireless for cellular connectivity. They selected the AirLink® LS300 industrial gateway, because it offered the right combination of ruggedness, simplicity, and smarts. Since then, CSI has deployed LS300-based monitoring kits and services in more than 625 ice-dispensing kiosks across the US and their business continues to grow.

- AirLink LS300 Cellular Gateway
  Designed for industrial IoT applications, the AirLink LS300 is a compact cellular gateway that uses a military spec design (MIL-STD 810) that withstands extreme temperature changes, humidity, shock, and vibration. CSI uses the LS300 right out of the box, so there’s no need to design special IoT hardware for machine connectivity. That saves time and makes it much easier to retrofit existing machines in the field.

CSI’s approach combines remote thermal sensors with AirLink LS300 cellular gateways. When mounted inside the kiosk, their equipment transmits data constantly over the cellular network to enable remote monitoring, predictive maintenance, and advanced data analytics.
The LS300 is equipped with ALEOS® software, which adds embedded intelligence to the gateway. As a result, the LS300 setup quickly provides two-way communications between connected machines, collects machine information through standard protocols, and communicates securely over cellular networks to CSI’s web-based interface.

Results

One CSI customer, Bayou Ice of Louisiana has used CSI solutions for more than a decade. “The CSI monitoring system enabled us to take our business to a whole new level,” said Steve Starnes, President. “Back in 2004, when we started in the business with 40 locations, we didn’t see a way to scale. Having to dispatch someone to visit each location every day just didn’t make sense. With the CSI solution, we know what is happening in real time, and this has enabled us to expand our distribution network across four states, and to do so in a profitable way.”

In addition to their monitoring service, CSI has developed a way for customers to program the time at which the machines make ice. “In a very hot climate, you don’t want to be making ice at noon. You want to be making it in the middle of the night,” said Marc Shomber, President of CSI. “Conversely, in colder temperatures, it makes more sense to make ice when it’s warmer outside as icemakers don’t really work well in extreme cold temperatures. This flexibility to make ice on a schedule is more efficient for customers – saving them as much as $1000 per year. Our monitoring services are less than that, so in essence, the monitoring is free.”

Nice Ice LLC of Columbia, South Carolina, also uses CSI’s solution to monitor their ice-dispensing kiosks. “CSI’s solution enables us to remotely monitor all our machines without additional resources,” said William Robinson, President of Nice Ice. “With CSI’s solution, our machines can be set up to make ice in off-peak hours which saves us hundreds of dollars in electricity bills. Without the solution, we would only know if there was a problem if we got a call from a customer and would have to dispatch someone to diagnose the problem. Being able to monitor issues, with priorities so we know how urgent problems are, we can easily ensure that any mechanical problems can be resolved before the machine is empty. If customers select to purchase bulk ice instead of bagged ice by accident, we would rather they be happy and can remotely select the system to vend bagged ice and they walk away delighted.”
Customer Benefits

By starting with Sierra, CSI was able to create a reliable, cost-effective system for remote monitoring. A cellular connection to the IoT makes it possible to monitor kiosks no matter where they’re deployed, from coast to coast, and manage them from a single location. By leveraging the IoT, the CSI solution helps save independent operators money and time in monitoring their machines. CSI continues to refine their solution, and was recently recognized for their innovative use of mobile technology in industrial equipment.

REAL-TIME ALERTS

Event-based messaging means the system can generate alarms or send an email based on predefined conditions, so kiosk managers know right away if something needs attention. Technicians can troubleshoot problems remotely and resolve them quickly, often from the main office, so there’s less need to send someone into the field. With customer-service issues, the system enables remote control of kiosk operation, so customer-service agents can change a mistaken order or generate a credit, all from the web-based system.

GREATER EFFICIENCY

24/7 monitoring means kiosk operators have up-to-the-minute information about all their machines, no matter where they’re located, and can make decisions based on the latest data. Instant access to reports, based on hourly, daily, or weekly performance, make it easier to know when machines are likely to need maintenance, so field visits are scheduled more efficiently.

Visit sierrawireless.com to learn more about IoT technologies for industrial equipment and the ways that real-time monitoring can create new, value-added capabilities for managed services, including predictive maintenance and advanced data analytics.

Better Decisions

Detailed reports make it easier to identify trends and pursue opportunities. Reports can highlight any inefficiencies in how the machines are operating, and can detail sales data, such as how much was sold and where, so kiosk managers can position themselves for future expansion.

About Sierra Wireless

Sierra Wireless is building the Internet of Things with intelligent wireless solutions that empower organizations to innovate in the connected world. We offer the industry’s most comprehensive portfolio of 2G, 3G, and 4G embedded modules and gateways, seamlessly integrated with our secure cloud and connectivity services. OEMs and enterprises worldwide trust our innovative solutions to get their connected products and services to market faster. Sierra Wireless has more than 950 employees globally and operates R&D centers in North America, Europe, and Asia.

For more information, visit www.sierrawireless.com.