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Tracking tools

Motorola nets immediate \$250,000 return for internal RFID tracking project

Problem:

Motorola's (formerly Symbol Technologies') Engineering Shared Services electrical lab in Holtsville, New York uses equipment worth more than \$3 million – oscilloscopes, function generators, multimeters, calipers, power supplies and other equipment – to design, develop and test Motorola's enterprise mobility products. The lab's oscilloscopes are worth over \$1 million alone. Keeping track of the lab assets is important.

To manage lab equipment, Motorola used to staff an equipment room; a person would maintain the inventory each day, manually signing equipment in and out with the engineers. When staff was absent – weekends and evenings, especially – the room was locked and the equipment was out of reach, hindering productivity.

And since lab equipment requires routine maintenance, hunting for equipment during use within the sprawling facility was a habitual hassle. Commonly, missing equipment was assumed to be lost – triggering replacement to ensure customer service – only to be found some time later.

“Lab stuff wanders,” said engineering manager Ray Madaia. “Our process was too cumbersome; manually tracking who was supposed to be using equipment was not working logistically or economically.”

Motorola, a company that works extensively with RFID technology, knew there should be a better way to manage lab assets, so they got to work designing a system that would automate the process – self-service issuance and return of lab equipment.

Solution:

RFID tags assigned to each piece of lab equipment are at the center of the automation process, and the equipment room doorway hosts the data exchange.

When a Motorola engineer meets the equipment room door, they are standing on a pressure mat that prompts them to swipe an HID badge on a reader – authenticating their ID in the lab's access control database and allowing them to validate entry on a touchscreen panel.

After the engineer gains entry and steps through the door, they are standing on another pressure mat that confirms their entry, and they are free to select whatever lab equipment they require.

With lab equipment in hand, the engineer reverses their path through the doorway hardware – pressure mat and touch screen inside, pressure mat outside. When exiting the room, the RFID tags on the equipment are read by antennas on both sides of the door and associated with the engineer’s ID. At that point, Motorola knows who has been issued lab equipment.

Returning equipment is simply a reverse of the process. “It’s very easy,” said Madaia. “The ID doesn’t slow you down much at all.”

Beyond the automated issuance and return of equipment, Motorola wanted to address maintenance. The system can schedule regular maintenance of the equipment and generate e-mails notifying users that their equipment is due for maintenance. The company’s mobile RFID handheld readers can also identify equipment in use within the lab as needed.

Much of the system was developed using in-house equipment – Motorola antennas, readers and more. WinWare software manages the data and provides the applications – room access, equipment issuance and return, assigning RFID tags to equipment and maintenance schedules. Metalcraft developed the tags using Motorola inlays.

“It was a challenge to place RFID tags on more than 100 pieces of equipment,” said Madaia. “There are so many shapes and sizes, and nearly all of the equipment is metal – a challenge for RFID.”

Metalcraft designed and produced hang tags to increase the range of attachment options and provide some stand-off from the metal equipment. The tags use layers of flexible Emerson Cumming polymer and are wrapped in polyester – printed below the surface with barcode and human-readable data – to promote durability and readability.

“Metalcraft’s engineers exceeded our required read range with their custom tags,” said Madaia.

Results:

Madaia says Motorola initially captured a \$250,000 return on the investment in this internal RFID asset tracking project – a number now far exceeded with boosted productivity and prevented asset losses.

The early calculation accounted for eliminating the staff hours required to staff the equipment room and the associated time engineers spent signing out, returning or helping to find equipment. Additional value comes from the hours and dollars saved by securing equipment for maintenance more efficiently – especially with the automated emails – and avoiding the cost of replacing expensive equipment.

Next, Motorola is looking at a new phase of the project – Last Point Read – as a means of tracking equipment as it wanders throughout their facility. The plan is to install fixed Motorola readers on stairs, elevators and doorways, especially building exits, to enhance visibility and prevent loss.

“Nothing lost is everything gained,” said Madaia. “RFID provides visibility, confidence and, most importantly, efficiency. Our engineers are very satisfied with what we’ve accomplished.”

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