RFID Helps Cordes & Simon Document Shipments

The German logistics provider is using a system that integrates bar codes, video surveillance and RFID to track the locations and movements of packages within its warehouse.

By Claire Swedberg

Aug. 24, 2007—Logistics provider Cordes & Simon (COSI), part of German transport network group System Alliance, has installed a tracking system that integrates bar codes, video surveillance and RFID to quickly locate a package while it's still in the company's warehouse or call up recorded images of it after it has left. The company installed the system during the construction of its newest warehouse in Villingen-Schwenningen, in southern Germany, which opened in May, one of six warehouses the company operates.

Cordes & Simon needed a system that would help the company automatically locate a missing package and document when a shipment arrived and left the warehouse. The company met with ESEG E.U.R.O. Security Group, which provided video recorders and systems integration, while Ubisense provided RFID technology. They spent about six weeks getting the system fully deployed, according to says Ubisense's sales and marketing vice president, Terry Phebey.

Each package arriving at the warehouse has a bar-coded label printed with a shipment ID number. Cordes & Simon warehouse employees use wireless handheld scanners to read the bar code. The devices transmit the date, time and shipment ID number via a wireless LAN connection to Cordes & Simon's warehouse management system. Each scanner has a Ubisense active RFID tag attached to it which transmits the tag's unique ID number via ultrawide band (between 6 and 8.5 GHz) to the nearest readers. The tag comes with a motion sensor, allowing the tag to go to sleep when it is motionless, and to send a transmission as soon as it senses motion. In that way, if the barcode scanners are not in use, they do not send location data, saving battery life. Barcode scanners are generally used when a shipment arrives and when it leaves the warehouse, however if a package is moved to or from a staging area, it is often scanned again.

The warehouse has 22 Ubisense 7000 Sensor readers, deployed at a height of 5 meters throughout the warehouse, for receiving the transmissions from a distance up to 160 meters (500 feet). They measure the elevation and azimuth (angle) of the transmission from the tags as well as the time distance of arrival (TDOA) of transmission between several readers, thereby determining the location of each tag within 15 centimeters. Transmissions are received and then sent to the system server about three times a second via an LAN cable.

There are dozens of video cameras deployed in the warehouse. Each camera's lens remains focused on one specific sector of the warehouse. Using the location information derived from the Ubisense system, the ESEG software then automatically associates the RFID read with the camera that recorded the worker in the act of scanning the package's bar code and stores the camera picture, shipment ID, camera ID, date and time. Cameras are connected to digital video recorders that store the picture data in the computer data storage system server hosted by Cordes & Simon. The storage capacity is about 15 Terabytes — enough to record all

the camera, shipment and location data for a month. Each camera is set to capture one picture per second.

Later, if a shipment is missing, Cordes & Simon or a customer can go to its Web site, enter the shipment ID and receive a picture of each related scan event that took place in the warehouse. They can then fast-forward the pictures recorded by the camera after the last scan to see what happened to the shipment. If the shipment moves out of range of one camera, the system can be set to switch automatically to the adjacent camera to continue reviewing the shipment's movement in the warehouse.

"Introduction of the system has reduced shipment losses," says Phebey. "COSI expects a return on their investment within 12 months." Although he couldn't specify how much cost in labor—spent searching for lost packages—the company is saving with the system, he added that there are other benefits as well. For instance, the system also provides an opportunity to resolve insurance claims for damaged or incomplete shipments by proving a package was not mishandled while in the warehouse, that it was in good condition at the time it was shipped out, or that it was shipped out appropriately and on time.

RELATED_ARTICLES According to Phebey, the Ubisense real-time location system (RTLS) costs around 10 € per square meter of a warehouse, including the sensor hardware, firmware and system software. Cordes & Simon did not provide the cost of additional features of the system such as video cameras, recording or software. "System cost is, of course, dependent upon the actual physical environment to be covered," Phebey says, "and we perform a site survey before issuing a quote to a customer. In addition we charge for installation services and any special integration software services."

Cordes & Simon is also considering an extension to the system by affixing RFID tags to forklift trucks that move shipments into and out of the warehouse. With the forklifts tagged, the company can monitor where a driver was at any given time, then refer to video recordings showing what shipments were moved with that forklift. The operator can then confirm that a particular forklift picked up the package, and the system displays the sequence of pictures capturing the forklift as it moves through the warehouse, finishing with where it deposited the shipment. "Now we have a new location of the shipment without it needing to be scanned [by a bar code reader]," Phebey says. "We can skip to the next instant in time when a lifting device was at that location and follow what happened and so on. This eliminates the need to manually search the picture archive between bar-code scan events."