

Baggage-handling systems are switching to RFID to help track, store and route passenger luggage.

July 11, 2003 -- Crisplant, a division of Loughborough, England-based [FKI Logistex](#), is turning to RFID to upgrade the baggage-handling systems at two major European airports. One RFID tag will replace the four bar codes currently used to track each plastic tote.

"After testing systems in our labs, we have switched our tote transport identification system from barcodes to RFID," says Soren Kappelgaard, a project manager for R&D at Crisplant. This is Crisplant's first project using an RFID system, which the company finished testing earlier this year.

FKI Logistex is an international company specializing in integrated material-handling systems. Crisplant specifically deals with developing and deploying baggage-handling, parcel and freight, warehouse and distribution and self-service systems for airports, postal services and library systems. To deliver these systems, the company integrates products and technologies from a range of partners.

Crisplant is currently building out RFID-based luggage storage and sorting systems at Brussels' Zaventem airport and at Stockholm's Arland airport. Both projects are set to go into operation this fall.

In Brussels, Crisplant is deploying up to 100 RFID readers and attaching tags to about 4,000 totes. Each tote carries one item of passenger luggage. The Brussels implementation is expected to handle 25 million items a year. In Stockholm, Crisplant will roll out 10 readers and around 800 tagged totes. At both sites, readers are being deployed at key points along a system of conveyor belts, so that the totes can be routed automatically as they travel along the belts. The readers will be located just beneath the surface of the moving belts and centered so they can read the tag placed at the base of each tote.

In the past, barcodes had been used to do the same work, but RFID promises to improve accuracy and cut maintenance costs. "There are numerous advantages in now using RFID to track the luggage totes," says Kappelgaard. "Primarily there are no line-of-sight requirements or potential negative effects from dust or dirt as there are with barcodes."

At both airports, Crisplant is using FastTrack LRP-Series passive reader/writers from [Escort Memory Systems](#) of Scotts Valley, Calif. The RFID tags use I-CODE SLI chips from [Philips Semiconductors](#), which is headquartered in Eindhoven, The Netherlands. The tags and readers operate at 13.56 MHz.

Crisplant didn't consider a UHF RFID system (operating at 868 MHz) because of the greater expense



Kappelgaard points to the RFID tag on a tote

and because they didn't need the longer range that UHF enables. The baggage-handling system is designed with a well-defined reading distance (3 to 4 cm) between the RFID reader and the totes. According to Kappelgaard, the 13.56MHz LRP-Series readers were selected after 125KHz readers proved unable to cope with the tote speed as they passed on the conveyor belt.

"We needed readers that could cope with the 1.8 meters [5.9 feet] per second speed," says Kappelgaard, who adds that the readers they chose are not troubled by electromagnetic interference from the motorized conveyor system. But, Kappelgaard notes, aluminum cans had interfered with the readers' ability to read tags during early tests. Crisplant, however, was able to correct the problem.

Both the readers and the tags comply with the ISO 15693 standard, and the additional memory on the tags that the standard provides was essential to the project. "The tote tag has to hold information such as origination and destination for the specific piece of luggage it carries," says Suresh Palliparambil, marketing manager at Escort Memory Systems.

The tags are self-adhesive, making them easy to install, and they have the additional advantage of not showing up on the X-ray inspection that each item of luggage has to pass through. Each tag cost between \$1 to \$1.50. While that's more expensive than a barcode tag, the cost of deploying the two technologies is only slightly in favor of barcode systems, says Kappelgaard.

"The base price of the RFID tag is approximately a dollar more than a barcode label, while the cost of the RFID antenna is compatible with the a bar code equipment," says Kappelgaard. "This makes the RFID system slightly more expensive but it's justified by savings in installations cost and improved functionality." -- By Jonathan Collins

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