

# RFID Kanban System Pays Off for Bosch

The German car parts manufacturer says the RFID application could save it at least a million euros annually.

By Rhea Wessel

May 7, 2007—A factory that produces car parts sold by Bosch Fahrzeugelektrik in Eisenach, Germany, is using RFID-based kanban cards to speed its production process and better manage customer orders. The project, started as a pilot in 2006, is now operational and using about 60,000 tags.

Bosch estimates that the RFID application will save the company more than a million euros per year.

The Eisenach factory produces about 18 different parts for cars, including gas pedals, engine speed sensors, accelerator sensor modules, wheel-speed sensors and secondary-air pumps. Bosch has outfitted each production line with RFID readers and created an application in which the RFID tag embedded in a paper kanban card assigned to a particular container is interrogated four times so that the company can track each part's progress through production. It can also use the system to document each part's production path in case government safety officials were to request that information.

Bosch delivers car parts to its customers—major car manufacturers—on a just-in-time basis using the "pull" principle. This means that orders are triggered automatically as soon as a customer runs low on parts. The customer "pulls," or demands, new parts and wants quick deliveries since it doesn't keep many parts in stock. Such customer demands mean Bosch must be able to produce quickly.

"We have to be able to build every part every day," says Carsten Frost, who heads the IT department of the logistics division of Bosch Fahrzeugelektrik.

The company considered continuing with a bar-code system but rejected that option because it would take much more time to manually scan bar codes than to interrogate RFID tags, and it wanted to avoid bar-code stickers.

Prior to implementing RFID, the company had made an internal decision to switch to smaller lot sizes. In other words, smaller groupings of parts—to increase the efficiency of its own production by making parts on demand rather than filling its warehouse shelves with car parts. As a result of its decision, Bosch began to produce smaller batches and make more frequent shipments to customers. Before, when the company was using larger lot sizes on pallets, data entry was not too much of a problem; after the smaller lot sizes were introduced, more data was produced—that is, more production "events" occurred because of the smaller lot sizes. It could take more time to enter data about all the orders going into production than it would take to gather the parts that were needed on the production line. The RFID system would eliminate manual bar-code scanning of the smaller lots, thereby saving time and energy and helping it become more flexible in filling orders and eliminate mistakes. At one point, the company calculated that producing in smaller lot sizes would create the need for 12 million additional scans each year for which it would need to employ 50 workers.

"The flow of materials was faster than the information flow, and that was not acceptable. Accounting for things manually did not create value and lasted too long," Frost says.

Now, with the RFID system, a manager receives orders electronically on the PC in his office and takes a reusable, laminated RFID-enabled kanban card out of a storage cabinet, encoding information to it with a reader made by FEIG Electronic. The reader is constructed like a mouse pad and is kept on the desk to encode the RFID tags with two numbers. In addition to the tag's unique ID code, to which other information is linked in the computer system, the tag also holds a production order number and a storing unit number that allows Bosch to track the production processes of the part. The tags in the kanban cards are 13.56 MHz that conform to the ISO 15693 standard and are made by Texas Instruments.

The RFID-enabled kanban cards are then brought to the beginning of the production line where they are read for the first time when a worker waves the card in front of a Scemtec RFID interrogator and then places it in the sleeve of a container. Bosch chose different readers for different points in the application based on its judgment of which readers would work best at which junctures.

At this point, the information collected via RFID is transferred to Bosch's SAP system, updating records with the exact time that production began. This transfer of RFID data is accomplished via middleware provided by business integration solutions provider Seeburger.

When the finished goods come off the production line, the container's RFID tag is interrogated again, giving the company an exact record of its production. Such production information could be needed if a car's part failed and caused an accident

Other workers then transfer the container of finished products to the warehouse, at which a third reading of the tag takes place with a Data Logics handheld interrogator so that the system can be updated with information about which finished parts are stored in the warehouse.

RELATED\_ARTICLES Bosch prepares the parts for delivery and uses a fixed interrogator from Scemtec to perform a fourth and final reading of all outbound containers stacked on a pallet. The system is updated with detailed information on the parts and the time at which they were shipped to particular customers.

Bosch says the system has already paid for itself but declined to give further details.

Copyright ©2005 RFID Journal, Inc. All Rights Reserved