

# Fiat Shows How RFID Could Help Recycle Car Parts

The Fiat-designed test system, part of the EC-funded PROMISE project, tracks components using an RFID-enabled computer built into a vehicle.

By Rhea Wessel

Nov. 6, 2006—Midway through a [European Commission](#)-sponsored research project to track products throughout their life cycle, Italian automaker [Fiat](#) has provided a demonstration showing how RFID could help the company create new revenue streams from scrapped vehicles.

A product's life cycle stretches from the item's inception to its disposal, and this demonstration focuses on the "end of life" phases of that cycle. In Fiat's case, it's the end of a car's life, according to Dimitris Kiritsis, a staff member at the [Laboratory for Computer-aided Design and Production](#) at the [Swiss Federal Institute of Technology in Lausanne](#) (EPFL). Kiritsis is the scientific coordinator of the [PROMISE](#) project, a 22-member consortium that includes Fiat. PROMISE stands for Product Lifecycle Management and Information Tracking Using Smart Embedded Systems. The project aims to develop the technology and information models required to trace and provide up-to-date information on each individual product manufactured in a factory. In addition to Fiat, PROMISE members include [Caterpillar](#), [SAP](#), [Infineon Technologies](#) and the [University of Cambridge](#). The project started in November 2004. When it ends in April 2008, PROMISE is expected to have cost an estimated 15.5 million euros (US\$19.8 million). About 8 million euros (US\$10.3 million) will come from the European Commission.

In the [European Union](#), laws mandate that 80 percent of each car be recycled, and this amount is expected to rise. Fiat designed a test system in which it applies RFID tags to certain car components and records the status of these components on an Electronic Control Unit (ECU), a type of RFID-enabled computer built into the car. When one of those components no longer functions, the servicing garage replaces it with a new RFID-tagged part, and the ECU interrogates the component's tag to upload information about the new part. In the event that a car must be scrapped, a driver can leave his car behind at a servicing garage without paying for disposal. System operators then read the information on the ECU by downloading it to the mechanic's computer—or, it could be interrogated via another RFID reader as the car enters the garage. The software in the back end of the system then assesses the residual value of each tagged component to see if it can be resold.

Fiat is conducting ROI studies, but has not yet published any information. The company has some positive indications, but these are based on estimations, Kiritsis told attendees at the [RFID Journal LIVE! Europe](#) conference, held in mid-October.

Kiritsis listed five business applications for the PROMISE system: product design, adaptive production, preventive maintenance, tracking and tracing, and effective recycling. To make these applications possible, he explained, technical elements of the systems will include such standard elements as a product embedded information device (PEID); middleware; product data and knowledge management (PDKM) software; and decision-support system (DSS) software.

Kiritsis described the PEID as a data-storage device able to identify the product from sensor data. It can be read or written with RFID and other standard interfaces, he said. PROMISE middleware enables both device management and communication between the PEID and back-end software. In addition, middleware acts as the networking layer of PROMISE systems, enabling the connection of information about the phases of life. The PDKM software integrates and manages information from all life-cycle phases of products. Finally, decision-support system software provides decision support for predictive maintenance, diagnosis and analysis of use patterns.

Infineon Technologies' Daniel Barisic says different types of PEID hardware may be needed to enable product life-cycle management, and that PROMISE members are evaluating passive RFID tags. Tests are ongoing with passive HF and UHF tags, he said, adding that no favorite has yet been identified. The project team will also evaluate low-cost active RF tags for attachment to sensors and other peripherals.

Another consortium member, machine-tool constructor Fidia, is working on a mid-life product-tracking demonstration to show how it can get direct knowledge of the components in its machines, as well as how they're being used. "Based on this, they want to develop preventive-maintenance systems," Kiritsis explained, adding, "They want to see in advance if there's a problem." Within one year, he said, the demonstrations should be ready for application to machines and cars outside the lab for wider testing.

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