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At-Home Product Life-Cycle Management

Ever since researchers and technology solution providers began studying RFID, they have considered product life-cycle management (PLM) in the consumer electronics industry a promising application. It would, for example, allow manufacturers to gather critical information on performance

issues, and it could help customers decide whether to repair or replace a damaged device. Potential benefits also include tracking parts and products to determine whether they can be reused or recycled.

But adoption of RFID for PLM has been delayed for two reasons: Consumer electronics manufacturers have not embraced item-level tagging, and RFID reader-writers are not marketed for at-home use. To accelerate this application, Auto-ID Lab Japan, with support from the Japanese Ministry of Internal Affairs and Communications and the Home Appliance Electronic Tag Consortium, developed a prototype for a total PLM system.



Each device would be embedded with a dual-interface EPC Gen 2 tag, developed jointly by the Auto-ID Labs in Japan and China. The tag contains both wireless and wired interfaces to access the tag memory. Companies can use the wireless interface to read and write information to the tags during manufacture and while products are in the supply chain. The tag also is connected to a microcontroller through the wired interface, to access consumer electronics data, such as service and warranty information.

The system uses a ZigBee-based home network, to which we added universal plug and play (UPnP). We put a ZigBee end device, or chip, on the circuit board that houses the dual interface tag. This end device communicates wirelessly with the home network, and when a user switches on an electronic product, the UPnP connects the device to the home network. This allows data to

be retrieved from the tag without an RFID reader.

The home network includes a coordinator that translates the ZigBee protocol to an Internet protocol, to connect the device to an EPC network, where information can be shared in real or near-real time. We employ Object Name Service, an EPCglobal standard that uses the Electronic Product Code to locate stored product information. Providers could offer Web sites related to their products, such as maintenance, energy control and social networking.

Consumer electronics manufacturers could use the system to monitor products, issue recalls and facilitate repairs. They could, for example, alert the consumer that a product needs maintenance. And when the product nears the end of its life, they could offer a replacement, and have the old product returned for recycling. Remote monitoring does raise privacy issues, of course, so manufacturers would have to explain the system and its benefits to consumers, and let them decide if they want to opt in to the service.

We are now working to solve some technical challenges, including data collection, speed of home network and locating mechanism. We also need to standardize on how to use the dual-interface tag to access tag memory through the home network.

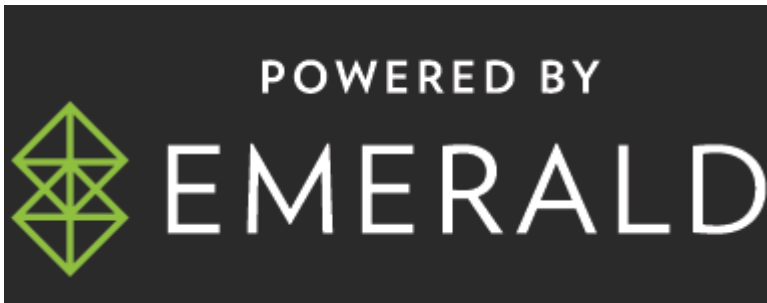
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