Three RFID Chip Makers Agree on Serialization Approach

The system should make managing serial numbers easier for end users, while providing advanced users with the flexibility they want.

By Mark Roberti

Tags: IT/ Infrastructure, Manufacturing, RFID Standards

Mar 28, 2012—Three leading suppliers of microchips for passive ultrahigh-frequency (UHF) radio frequency identification transponders based on EPCglobal's second-generation air-interface standard have reached an agreement regarding a coordinated method for end users to avoid duplicating serial numbers when using chip-based serial numbers from different RFID chip companies. This approach has been dubbed Multi-vendor Chip-based Serialization (MCS).

A 96-bit Electronic Product Code (EPC) format used for consumer products has 38 bits designated for the serial number portion of an EPC; the other 58 bits are utilized to identify the type of product being tagged, as well as the company that manufactured that product. The three vendors" Alien Technology, Impinj and NXP Semiconductors" have agreed to a common framework for assigning the 38-bit EPC serial number based on the Tag ID (TID), a unique 72- to 168-bit number burned into the chip during manufacture.

Each chipmaker will develop a formula for extracting 35 bits from the TID. These 35 bits, combined with a three-bit code used to identify the chipmaker, would be utilized to create a unique 38-bit EPC number for that chip. Each formula will be slightly different, but by agreeing to a prefix for identifying a particular chip manufacturer, the three companies are ensuring that there would be no duplication of EPC serial numbers created in this manner.

The proposal is not a standard, and end users will not be required to use this approach, according to Ken Traub, a consultant for GS1 US, who, along with Gena Morgan, GS1 US' program manager, facilitated a working group aimed at developing a serialization standard. The working group, however, has since determined that there was no one-size-fits-all solution for 96-bit EPCs. Guidelines being drafted by GS1 US indicate that brand owners are required to manage the serial numbers placed on their products.

But MCS offers end users a convenient option, if they wish to choose "chip-based serialization" with serial numbers managed by the chipmakers. Chip-based serialization refers to having the serial number determined by the TID on the chip. The alternative to chip-based serialization is "IT-based serialization," in which serial numbers are created and managed by software deployed by the end user. Such software typically utilizes a database to track which serial numbers have been used, so that the same number is not assigned twice.

The benefit of chip-based serialization is that an end user need not manage serial-number assignment software and an associated database. GS1 US plans to publish a guideline explaining both approaches to end users, so that they can choose one method or the other, or a combination of the two, to best suit their needs.

"A year ago, we began with thinking that we would need a standard for serialization," Traub says (see Chipmakers Seek Industry-wide Serialization Schema). "There was no consensus on what that would be, but we ended up in a great place. End users have a lot of flexibility, in that they can choose to use their own serialization schemes, have a service bureau do it, or use the chip-based serialization options being offered by Alien, Impinj and NXP. They can even use a combination of methods. It's an ideal outcome."

Last month, Impinj introduced its chip-based EPC-serialization method, which the company calls Monza Self-Serialization (see Impinj Seeks to Make Serializing Data Easy). To take advantage of Monza Self-Serialization, a company must employ EPC Gen 2 tags containing Monza 5 RFID chips, as well as Impinj's Source Tagging Platform on its readers. Brand owner will be able to use Impinj's Monza Self-Serialization, as well as self-serialization methods from Alien and NXP, to encode serial numbers that conform to the MCS scheme.

Allotting three bits to identify the chipmaker creates eight potential prefixes (000, 001, 010, 011, 100, 101, 110, 111), so the framework can accommodate additional chipmakers, if need be. There are more than 30 registered chipmakers, but many of these are focused on chips for specific applications, such as high-memory tags for the aerospace sector.

An end user might choose to use more than one serialization method for the same product. A company manufacturing the same goods in North America, Latin America and Europe might opt to utilize MCS at one location, IT-based serialization software at another and a service bureau at a third. For the IT-based serialization and service bureau options, it could use the unassigned prefixes so that non-MCS serial numbers would not collide with MCS-based serial numbers.

For instance, if a garment manufacturer were using the MCS method to generate EPC numbers for NXP chips, the tags might all be encoded with serial numbers starting with 111 (the exact prefix assignments for each chipmaker are still being finalized).

If that manufacturer wanted to use a service bureau to encode tags for the same product, using a method other than MCS, it could have them all begin with 000. As long as the apparel maker did not buy or generate other tags encoded with serial numbers starting with the prefix 000, it would not have to worry about duplicates, since the tag's Company Prefix (indicating that the firm is the tagged item's manufacturer) and the product identifier (identifying the type of product being tagged) would be different from those of other companies.

If the firm wanted to use an IT-based serialization application to generate EPC serial numbers itself, it could distinguish those numbers by assigning them a 001 prefix. In that way, the apparel company could avoid internal duplication.

The chipmakers plan to work with RFID label printer-encoder manufacturers, such as Zebra Technologies, so their printers will be able to read a chip's TID, determine the chip's maker (every TID includes 12 bits identifying the chip's manufacturer) and apply the proper MCS formula in order to automatically generate a unique serial number for a label being printed and encoded. The label printer would receive all of the information it required by reading the chip's TID. All the label printer has to do is employ the right formula to extract the correct bits from the TID to generate serial number, and combine that with the end user's company prefix and product identifier to generate a 96-bit EPC.

RFID transponders pre-encoded with serial numbers using the MCS method will be exhibited at the RFID Journal LIVE! 2012 conference and exhibition, being held next week in Orlando, Fla.

RELATED CONTENT

NEWS

- Chipmakers Seek Industry-wide Serialization Schema
- NXP Boosts EPC Gen 2 Tag Memory, Performance
- Seven Companies Sign Up for Savi IP License

OPINIONS

- Government Does Have a Role in RFID
- Collaboration Can Accelerate RFID Adoption
- A Year of Ups and Downs

CASE STUDIES

- A New Tool for Electronics Companies
- Siemens Practices What It Produces
- Portuguese Airline TAPs Into RFID

FEATURES

- Jumping on the NFC Bandwagon
- RFID Finally Cleared for Takeoff
- RFID Bookshelf

About | Terms of Use | Advertise | Privacy | Contact | Support