

Perfect Alternatives to RFID?

New technologies are being hailed as threats to RFID when, in fact, they are RFID.

By Mark Roberti

July 24, 2006—Over the past few weeks, I've read more than a few articles that have portrayed new technologies as threats to radio frequency identification. First, there was RuBee, which one publication said could spell the death knell for RFID. Then, last week, [HP Laboratories](#), Hewlett Packard's research arm, unveiled the Memory Spot, a wireless chip that was greeted with headlines such as "HP Unveils RFID's Future Competitor" and "HP Unveils Revolutionary Wireless Chip that Will Challenge RFID Technology."

Let's set the record straight. Both of these technologies *are* RFID.

RuBee is a protocol developed by [Visible Assets](#), a small firm in Miami. The [Institute of Electrical and Electronics Engineers](#) (IEEE) has announced that it is making the RuBee protocol a standard. RuBee tags function at a low frequency (132 kHz), giving them different capabilities compared with RFID tags operating at high (13.56-MHz) and ultrahigh (856- to 960-MHz) frequencies.

Existing LF RFID systems are backscatter and have a range of inches. That is, the tags reflect energy back to the reader so the read range is short. RuBee uses a power source to transmit radio waves and has a much longer read range. John Stevens, Chair of Visible Assets, says many installations exist that can read any tag in an area of 100 feet by 100 feet (10,000 sq feet).

RuBee works more like wireless mesh networks than conventional LF RF systems. "It's an IP-based networked transceiver system that is peer-to-peer and on demand," says Stevens. "We change network addresses just like 802.11 all of the time. We have DHCP and ARP in tags and routers, and many RuBee tags have a 4-bit processor capable of things like encryption and specialized functions. We can have lots of memory (5 kilobytes) and read and write to memory all of the time."

Some would not consider these systems RFID, but that doesn't make sense to me. Three key components are needed for something to be considered RFID in my book. The device must communicate wirelessly via radio waves. It must have a unique identifier that allows you to distinguish one device from the next, and one of its key purposes must be to identify something other than itself. A wireless router has an IP address that's usually used to enable communication between, say, a laptop and an RFID tag. That's not RFID. But if the same router is used to identify an active tag in a specific location, then it is part of an RFID system. If RuBee tags are put on devices to track their location, then it is clearly RFID.

HP Labs' Memory Spot is also RFID, but it is perhaps the mirror opposite of the Electronic Product Code concept. The EPC protocol was developed to create low-cost tags that could be put on packaging that would be thrown away. To keep the cost down, memory on the chip was kept to a minimum.

The Memory Spot is a passive 2.45 GHz RFID transponder containing a microprocessor able to hold up to 4 megabits (500 kilobytes) of data, with a 10-megabits-per-second data transfer rate (see [HP Spots New](#)

Opportunities for Passive RFID). It has a short read range, but can store a lot of information on the chip. This would not be appropriate for tracking cartons of cereal through the supply chain, but it could have many other applications. For instance, Memory Spots could be useful for storing the maintenance histories of medical devices, such as oxygen pumps and difribulators. They could also be embedded in patient wristbands to store medical information. Or they could be used to store biometric data in security passes.

Some might argue that given the ubiquity of networks today, it's unnecessary to store so much data on the tag. You can simply scan a unique ID on a tag, they might say, and pull a virtually limitless amount of information associated with that unique ID from a database. Perhaps. But it seems to me that the growing diversity of RFID products is good for the market, and good for end users.

Radio frequency identification is a broad term. There are different types of RFID technology for different applications. Some types of RFID systems are great for one application and terrible for others, just as a calculator is good for some math problems and not for others. You need to understand the differences among such systems to apply them correctly. But RuBee tags and Memory Spots are no more a threat to RFID than a Cray Supercomputer is a threat to the Palm Pilot.

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