

RFID Vendors Unite to Promote UHF for Items

Six industry leaders have joined together to promote the use of UHF for drugs, and have issued a paper to argue their case.

By Beth Bacheldor

June 8, 2006—A band of vendors have joined forces to advocate ultra-high frequency (UHF) RFID technology for item-level tagging in the pharmaceutical industry. The companies, which include [ADT/Tyco Fire & www.adt.com Security](#), [Alien Technology](#), [Impinj](#), [Intel](#), [Symbol Technologies](#) and [Xterprise](#), have cowritten a paper entitled "[RFID and UHF: A Prescription for RFID Success in the Pharmaceutical Industry](#)," which outlines the benefits of UHF technology.

"We all felt that as the adoption of this technology is occurring, there is a lot of misinformation in the market, driven from competitive dynamics and the fact that the market is changing so rapidly," says Joe White, VP of engineering for Symbol's tag division. "This is an opportunity for us to update what UHF RFID is, and what it is capable of delivering today."

The 30-page paper, released today, is the vendors' counter to what they deem a long-held but misinformed opinion that UHF is not a viable option for item-level tagging. UHF tags have been the choice for case- and pallet-level tagging because the UHF frequency can operate over longer distances, such as ranges that span dock doors. UHF tags designed for case and pallet tagging, however, haven't seemed to work as well for tighter, smaller read ranges. The companies say they wrote this white paper to dispel the myths regarding UHF RFID tags, and to educate the pharmaceutical industry, in particular, on the advantages of using UHF RFID tags for item-level tracking. The vendors in the group all offer products related to UHF RFID and, of course, want to sell them to the pharmaceutical market, which has been identified as a likely revenue boost for RFID sales.

The vendors began working on the white paper several months ago. It can now be downloaded at the [Pharmaceutical Online Web site](#).

With item-level tagging gaining traction, especially within the pharmaceutical industry, there's been a growing debate among RFID users and vendors, pitting UHF tags against high-frequency (HF) tags. Both types are being tested and deployed within the supply chains of several pharmaceutical companies. [Purdue Pharma](#), for example, is using UHF tags in its item-level RFID implementation (see [Purdue Pharma Tags OxyContin](#)), and [Wal-Mart](#) has stated it also favors UHF tags (see [Wal-Mart Seeks UHF for Item-Level](#)). [Pfizer](#) and [GlaxoSmithKline](#), meanwhile, are both using HF tags (see [Pfizer Using RFID to Fight Fake Viagra](#) and [GlaxoSmithKline Tests RFID on HIV Drug](#)).

The paper refutes a recent report from [ODIN Technologies](#), a Dulles, Va., systems integration firm, which concluded, after various tests, that HF tags are better suited than UHF tags for item-level tracking (see [Study Says HF Rules for Pharma Items](#)).

According to Vinay Gokhale, vice president of business development at Impinj, the UHF Gen 2 specification

has gone a long way in ironing out some of the problems associated with early RFID trials using UHF tags on cases and pallets. Still, he says, many considered the UHF technology not the best for item-level tagging. About six months ago, therefore, Gokhale and his colleagues decided to look more closely at HF tags to learn why they appeared to work better for item-level tagging.

Their finding: magnetic coupling, the mechanism HF tags use to transfer energy between the RFID readers and RFID tags. Magnetic coupling works much better for close-range reads, Gokhale says, and is immune to RF interference caused by liquids. UHF tags, he notes, typically operate using electromagnetic coupling, which is better suited to long-range reads.

However, Gokhale adds, if UHF tags and reader antennas are designed to use magnetic coupling, they should be able to match HF performance in terms of short-range reads and immunity to RF interference caused by liquids. "Using existing Gen 2 chips and readers, but designing new antennas for both, Impinj has demonstrated that UHF operating in the near-field can perform as well—and, in most cases, *better* than HF solutions," he affirms.

"That fundamental issue of using magnetic coupling for UHF tags had not been analyzed," he adds. "When you use magnetic coupling (or near-field communications), you can overcome the commonly held myths people believe about using UHF in item-level tagging."

Using UHF in the near field doesn't affect a tag's or reader's ability to comply with EPCglobal's Gen 2 UHF RFID standard, either. "This is the same Gen 2 protocol that EPCglobal ratified back in December 2004," Gokhale explains. "The only differences are new near-field would be new tag antennas and new reader antennas, which are some of the lowest-cost elements that you can change. But the air protocol is the same."

Now that UHF tags can be designed to operate well for item-level tagging, the group argues, UHF tags are the optimal choice for any RFID implementation, case- and pallet- or item-level. The vendors—and other UHF proponents such as Wal-Mart—argue that by sticking with the same technology, companies won't have to support two different frequencies requiring separate infrastructures. Instead, companies can implement a single platform for numerous RFID applications, resulting in what the group says are significant efficiencies in cost and inventory visibility from the point of manufacture to the point of sale.

"At a very high level, what I try to convey is that technology is merely a tool to achieve an objective—and with RFID, that objective is visibility and the need to be able to identify a product," says Symbol's White. "And it is always beneficial to select the technology that can be applied more broadly across an organization. UHF allows the customer to use one technology to do item-, case- and pallet-level traceability."

If UHF tags can be made to use with magnetic coupling to operate in the near field, that does beg the question: Can HF tags be made to use electromagnetic coupling in the far field? The answer, according to Gokhale, is no. That's because lower frequencies generate weaker electromagnetic fields than higher frequencies do. HF tags operate at 13.56 MHz, while UHF operates in the 900 MHz range. "That is a 70-times multiple in frequency between the two—and why UHF can work with far-field antennas [antennas that have greater read ranges], and HF can't."

Copyright ©2005 RFID Journal, Inc. All Rights Reserved