

The debate over whether high-frequency or ultrahigh frequency tags are best for tracking items is now in full swing.

By Mark Roberti

April 3, 2006—Last week, I wrote in this column that the issue of which frequency is best for tracking items was going to be the next great debate in the radio frequency identification community (see [The Great RFID Debate: HF or UHF?](#)). The debate is already in full swing and, as expected, it's very intense.

In an *RFID Journal* [Webinar](#) last week, sponsored by [Impinj](#) (a company that provides chip designs for silicon used in UHF RFID tags), Richard Ulrich, solutions architect for [Wal-Mart Stores](#), made it very clear that Wal-Mart would like to see UHF used at the item level. He said using a single frequency to track pallets, cases and items lowers the total cost of ownership for the RFID system (see [Wal-Mart Seeks UHF for Item-Level](#)).



In the same Webinar, Chris Diorio, chairman, founder and vice president of RFID engineering at Seattle-based Impinj, laid out a compelling case for why UHF tags based on EPCglobal's second-generation Electronic Product Code standard could be used to track items. Diorio said that most of the common assumptions about UHF—that it doesn't work around water and metal, that tags can't be read when they are stacked one on top of another, and that tags are too big for many small items—are wrong.

HF and UHF tags use different methods of “coupling”—establishing a radio link for communicating—with the interrogator. HF tags operate in the near field, or from within one wavelength, while UHF tags use the far field. But Diorio explained that by changing the design of the UHF antenna, it can also communicate in the near field. In effect, it can operate like an HF tag and enjoy some of the same advantages HF has for item-level tagging. If you didn't have a chance to attend the Webinar, it's worth viewing the archived version when it's posted on our [Webinar site](#) in a few days.

On the day of the Webinar, [ODIN Technologies](#), a Dulles, Va., systems integration firm, announced the results of a battery of tests the company conducted using three commercially available UHF EPC Gen 2 tags and four commercially available HF tags compliant with the ISO 15693 standard. ODIN ran the tags through five performance tests and against three pharmaceutical use cases, for a total of eight test categories. Its "Battle of the Frequencies" report said HF tags beat UHF tags by a “technical knockout.” HF tags performed best in five of the categories, while UHF tags won in two. In one category, the two frequencies performed equally well (see [Study Says HF Rules for Pharma Items](#)).

A week earlier, EPCglobal did its own test of HF and UHF tags on items being read under a variety of

simulated scenarios, such as reading several different items placed randomly in a tote or reading DVDs on a shelf. EPCglobal did not declare which technology was better, but said it would analyze the results and use them to inform the development of any additional features needed on tags used to track items (see [EPCglobal Puts Item Tagging to the Test](#)).

Vendors that offer either HF or UHF tags and interrogators have a lot at stake. Not surprisingly, players on both sides of the issue are gearing up to promote their technology and clarify technical issues. [Magellan Technology](#) has produced a white paper, "[A Comparison of RFID Frequencies and Protocols](#)," which examines some of these issues. You can download it from our [RFID White Paper Library](#).

It's important for end users to communicate their needs and views. This year's [RFID Journal LIVE!](#) conference, to be held May 1-3 in Las Vegas, will feature a breakout session, entitled "[Is HF or UHF Best for Item-Level Tagging?](#)" Representatives of [Pfizer](#), [Wyeth Pharmaceuticals](#) and [Purdue Pharma](#) will discuss how well RFID technology at 13.56 MHz (HF) and 915 MHz (UHF) each address the technical and business needs of pharmaceutical retailers.

It's vital for end users to have information about the business and technical merits of choosing one frequency over another, but there will be spinning on the part of some vendors. *RFID Journal* is fully committed to representing the issues as fairly, clearly, openly and objectively as we can. A full and robust debate is healthy for the RFID industry and will benefit end users, who ultimately will be investing large amounts of money in whichever technology they choose.

Mark Roberti is the founder and editor of RFID Journal. If you would like to comment on this article, click on the link below.