

A Shift to UHF Near-Field Predicted for Pharma

Andrew Nathanson, of the market research firm Venture Development Corp., says the pharmaceutical industry will increasingly adopt hybrid HF-UHF RFID solutions over the next five years, followed by near-field UHF technology.

By Claire Swedberg

Oct. 3, 2006—The pharmaceutical industry will migrate toward hybrid HF-UHF RFID solutions for the medication supply chain in the next five years, then shift to near-field UHF technology, according to Andrew Nathanson, practice director for AIDC and RFID technologies at market research firm [Venture Development Corp.](#) Nathanson addressed RFID's future for the pharmaceutical industry at the [RFID Journal Industry Summits](#) conference on Wednesday, Sept. 27.

Traditionally, pharmaceutical manufacturers and wholesalers have used HF RFID tags and readers, which do not have the fast read rate of UHF but which offer greater capacity to read in hostile environments, such as with liquids and metals. They are also more effective at reading multiple items in a small space, such as many bottles stacked in a carton passing through assembly lines at a fairly high speed.

Near-field UHF technology is capable of transmitting in the near-field, similar to HF, but is faster and works well around metals and liquids. [Impinj](#) demonstrated a prototype of its near-field UHF solution eight months ago, offering UHF technology with chips and readers designed especially for item-level tagging applications that perform like HF hardware.

Nathanson predicts that the availability of EPC Gen 2 near-field UHF hardware will change that scenario, since the technology operates well in liquids and metals and reads more items at a faster rate (about 500 percent faster) than HF. It can encode RFID tags at a rate 75 percent faster than HF, Nathanson said, but the technology has not caught up with science.

"The physics are there, but they have to work out the details," Nathanson explained. Some of those details include integrating the near-field and far-field capabilities, as well as bringing costs down for the technology. UHF interrogators capable of reading both near-field and far-field tags are expected to be 50 percent more expensive than current RFID readers, which are designed to read tags only in the far field. Moreover, the technology will require dual antennas and a dual software package to distinguish between transmissions from the two antennas.

In the meantime, as an increasing number of pharmaceutical companies seek item-level RFID solutions, Nathanson said, there will be a growing number of hybrid solutions. Those hybrids can be combinations of HF and UHF RFID systems, such as UHF for cases and pallets, and HF tags or combinations of HF tags and 2D bar-codes labels at the item level. They can also be combinations of RFID tags with sensors able to measure shock, temperature, humidity and other conditions, to track whether medications travel through the supply chain without damage. These semi-passive RFID tags, Nathanson said, are similar to passive tags in that they depend on the RF signal of an interrogator to transmit their data. However, they also contain a battery that allows the tag to monitor environmental conditions (see [Pharma Label Maker to Test Tags That](#)

Record Temps).

According to Nathanson, the use of HF alone for item-level tagging is not a long-term solution for the pharmaceutical industry. UHF's growth is making inroads in HF's popularity, even on the item level. Wal-Mart, for example, has already required most of its suppliers to affix EPC UHF tags to all cases and pallets of goods the retailers buys. In addition to the support that UHF receives from Wal-Mart, "there are three to five times more dollars being put into UHF research and development than in HF," Nathanson said, adding that pharmaceutical manufacturers still have not accepted UHF.

"We can expect a few years of debate, with the balance shifting toward UHF," Nathanson stated, with more drug manufacturers and wholesalers adopting hybrids until near-field UHF hardware becomes available and affordable. Nathanson maintained that once vendors are able to achieve an effective integration between the dual systems, as well as the antenna design intended to transmit around metal, such interrogators will become pervasive. This will happen, he predicted, "in about five years."

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