

DOD Tries Tags That Phone Home

The U.S. Defense Department is testing a tag that combines RFID, GPS and satellite communication, so that military personnel can know a tag's location at any time.

By Jonathan Collins

Mar. 21, 2005—Exploring ways to extend military supply chain visibility, the U.S. Department of Defense recently tested a new generation of active (battery-powered) RFID tags with satellite-communication capabilities that enabled the tags to give their precise location even when in the most remote and inhospitable areas.

"The prototype tags function just as the current RFID tags that can be pinged [read] at ports, depots and distribution centers by interrogators, but they can also phone home," says Larry Loiacono, an information technology specialist at the Defense Distribution Center, headquartered in New Cumberland, Pa. Part of the DOD's Defense Logistics Agency, the DDC oversees 26 military distribution depots worldwide.

In the first week of January, the DCC worked with the Defense Logistics Agency on a proof-of-concept trial of the prototype tags. At the Defense Distribution Depot in Susquehanna, Pa., they tagged each of four pallets with both one of the new tags and with one of the SaviTag ST-410 active RFID tags the DOD currently uses. (The ST-410 is a write-read tag that operates at 433 MHz and has a read range of up to 300 feet.) Then, the agencies tracked the pallets' progress from the Susquehanna depot to four overseas destinations.

Results from the trial were encouraging. "Every time a reading was taken from the 410 tag, a reading was also achieved from the new tag," says Loiacono.

The tag—dubbed the Third-Generation Radio Frequency Identification with Satellite Communications (3G RFID w/SATCOM) tag by the project—also successfully communicated data via the Iridium satellite network to several recipients, including the DOD's Global Transportation Network, which collects, integrates and distributes transportation information to military personnel. Using the Iridium network of global satellites, which the DOD already uses for other communications, the tags would transmit their unique identification number, the date and time, and their current position to within 3.5 feet. That capability, according to the DLA, will change the DOD's RFID network from providing information on where shipments of equipment have been and closer to a real-time understanding of where that equipment actually is.

The four pallets each had a different cargo and destination: automobile engines going to Tikrit, Iraq; camouflage netting bound for Kuwait; mixed freight, including Humvee parts, destined for Kosovo and Bosnia; and vehicle-repair kits and Humvee radiators heading to Kandahar, Afghanistan.

The prototype 3G tag was developed by three private companies. [Ocean Systems Engineering](#) was responsible for the tag's design and development; [NAL Research](#) integrated the components of the device; and [Savi Technologies](#), provided the trial with engineering support and the four base ST-410 tags that were integrated with GPS and Iridium equipment to create the 3G tags.

Adding satellite tracking to RFID tags promises to extend a shipment's visibility beyond choke points such as ports and distribution centers, where fixed readers have been deployed, and into locations where there is little or no infrastructure, not even electricity—the kinds of places that war fighters are in when they order and require materiel shipments. Currently, forces can track their shipments by computer by accessing the Global Transportation Network servers, but that visibility is limited to where RFID readers are deployed. By adding GPS and satellite communications to tags, war fighters should be able to check order status from the time of order fulfillment until delivery.

Extending that supply chain visibility is a key issue for the DOD, especially in the light of the recent performance of the military's supply operations. In a report on U.S. military logistics regarding the war in Iraq, the U.S. General Accounting Office (GAO) wrote that it found a catalog of expensive errors in getting materiel to the troops. These errors included a backlog of hundreds of pallets and containers of materiel at various distribution points, due to transportation constraints and inadequate asset visibility, as well as a \$1.2 billion shortfall between the amount of materiel shipped to the theater of operations and the amount of materiel that units acknowledged they received.

The GAO report noted that although the U.S. Central Command, one of nine Unified Combatant Commands assigned operational control of U.S. combat forces, issued a policy requiring the use of RFID tags to track assets shipped to and within the theater, these tags were not used in a uniform and consistent manner. In addition, units operating in the theater did not have adequate access to the DOD's logistics and asset-visibility systems.

At the start of the war in Iraq in March 2003, the region had only one RFID interrogation point, where RFID readers are deployed and tags are read. That was at a port in Kuwait. Since then, the number of RFID interrogation points has been expanded more than 175, in Kuwait and Iraq, but their deployment took more than a year, and in the meantime, there was no visibility of supplies as they traveled between that port and the forces that needed them. That led to more equipment shipped than required, further clogging the supply chain because, as fighters faced a longer-than-expected wait for materiel and limited visibility into where shipments were in the supply chain, orders were often repeated and reshipped from the U.S. two or three times.

The prototype 3G tag promises to end such confusion. "The tag can add confidence to our customers that materiel is on the way," says Loiacono.

According to the DDC, however, the trial was just an early proof of concept, and any full deployment of the new tag would not be for several years. The agency is planning a second trial, although no date has been set. That trial will examine the ability of the same four 3G tags to communicate on the other side of the globe by attaching them to shipments leaving the Defense Distribution Depot in San Joaquin, Calif., for destinations in Asia and the Pacific.

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