

QinetiQ and Crown Develop Item Containers With Antenna-less RFID Tags

The companies say the tags harvest power from the container itself, making them resistant to interference from adjacent liquids and metals.

By Beth Bacheldor

Nov. 6, 2006—U.K.-based defense and security systems specialist [QinetiQ](#) has teamed up with [Crown Holdings](#), a \$6.9-billion-a-year global supplier of containers and packaging products to consumer marketing companies. Together, the firms will develop metal containers, such as soft drink cans, with built-in EPCglobal Gen 2 UHF RFID tags specially designed to circumvent RF interference.

The RFID-enabled containers will leverage QinetiQ's Omni-ID chip technology, specifically created to overcome RF interference typically caused by metal and liquids. Unlike conventional RFID chips, the Omni-ID chip is neither electrically bonded nor wired to a large dipole antenna. Instead, the tag's substrate—which might be a metal container or a piece of metallic foil—serves much like a satellite dish, absorbing energy from the RFID reader and focusing that energy onto the chip to activate it. The Omni-ID design, according to Tony Kington, general manager of QinetiQ's Omni-ID business, "is a fundamentally different approach, based on a completely different set of physics, and robust enough for metal and liquids," he says.

QinetiQ got the idea for the Omni-ID tags from observing optical effects in nature, according to Will Damerell, technical sales manager at QinetiQ. Having worked for years with camouflage systems for the military, the company's engineers thought a tag could be developed that acted similarly to the way certain butterflies' markings appear so brilliant by reflecting light and transmitting that light back.

"We thought we could develop an antenna that would collect the RF energy and then reflect it directly to the chip, which would, in turn, emit the RF signal to the reader. The chip just sits in the electric field, but is not electrically connected to the antenna," Damerell says.

"This is the first practical solution for metal packaging," says Daniel Abramowics, president of Crown Corporate Technologies, the research, development and engineering arm of Crown Holdings. The Omni-ID tags can circumvent the interference, eliminating the need for the typical workarounds used today. Those workarounds include near-field communications (NFC), which limit the read ranges, and layers of insulators that create a barrier between the tag and any liquids or metals.

Insulators make the tags bulky and more costly—and, thus, not very compatible with item-level metal containers, Abramowics says. "There are going to be some intrinsic cost benefits [with the Omni-ID technology] over other solutions," he explains. Crown will mount the Omni-ID tags, which measure substantially less than 1 mm in thickness, directly onto the metal containers.

Initially, Crown and QinetiQ are codeveloping the RFID-enabled metal containers for use with perfumes, tools and other higher-end items. However, as RFID prices drop and demand grows, the technology could be

integrated into soft drink cans, aerosol cans and other metal containers, Abramowics says.

QinetiQ and Crown will co-own the RFID-enabled metal containers. Trials are expected to begin soon, though no dates have yet been set. Crown's Abramowics says at least two companies have indicated they would like to participate in the trials. "We've also had interest from quite a few other customers," he says.

Each company has already worked on several other RFID initiatives. QinetiQ deployed an active RFID system for the U.K.'S Royal Air Force, which tested the technology to see if it could cut costs and streamline maintenance operations for Harrier jump jets (see RAF Tracks Parts for Harrier Jets). Crown, meanwhile, has been working with several customers on RFID implementations.

Thus far, QinetiQ has sold about 70,000 Omni-ID tags to a number of companies that are testing the devices. These clients include a company that's using the tags to monitor and manage telegraph poles in Alaska.

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