

The researchers compared RFID-based theft-deterrent applications with traditional electronic article surveillance technologies, both RF and acousto-magnetic.

By Claire Swedberg

March 11, 2008—The [University of Arkansas' RFID Research Center](#) has completed a research project to test the viability of RFID as an electronic article surveillance (EAS) technology for security in the apparel and footwear industry. The results, says Bill Hardgrave, director of the RFID Research Center, which is part of the [Information Technology Research Center](#) (ITRC), indicates that RFID works in theft-deterrent applications, as well as current EAS technologies. "It's a preliminary investigation of RFID as an EAS. We established the baseline tests using common EAS technologies to establish how well RFID works," Hardgrave says. A white paper describing the project and its results will be available free on the RFID Research Center's Web site in April, says Hardgrave.

The project included [ADT's Sensormatic](#) EAS division and [Checkpoint Systems](#). The companies contributed EAS technology, as well as consulting services. Researchers tested both RF and acousto-magnetic (AM) EAS technologies, as well as EPC Gen 2 tags and readers from a variety of vendors. They compared the results and found that RFID and traditional EAS offered equivalent read rates.

"Overall, we were pleased with what we saw, but the research is far from over," Hardgrave says. He adds, however, that "RFID did well against [traditional] EAS."

EAS is a common shoplifting deterrent used in stores to sound an alarm or alert the staff when it senses tags that have not been deactivated at the point of sale. The difference with RFID, however, is the ability to display specific data about an item as it passes readers on the way out the door. In deployments where the RFID tags are already in use for tracking inventory, the store is alerted not just that items are being taken from the premises, but also what those items are and how many of them there are.

The center is now beginning testing at retail locations, both by simulating typical shoplifting scenarios using RFID portals and RFID tagged items in the store, and also tagging some items that shoppers will purchase to test in a real-world setting. That research will be completed at the end of summer 2008, Hardgrave says. He declined to name the participating retailers.

In the recently completed study, researchers at the University of Arkansas laboratory used EAS technology for comparison sake, against a variety of RFID readers and tags that the laboratory already owned. Both ADT and Checkpoint provided information about shoplifting methods and how to test EAS technology in a "noncooperative environment," such as individuals trying to shield the EAS or RFID tags as they leave the store. Often thieves will hide tags under their arm, in a hat or in a foil-lined bag. The researchers replicated those scenarios with the study.

Armed with the results of the preliminary testing, ADT is now seeking input from its retailer customer base about the use of RFID in conjunction with existing EAS. Randy Dunn, director of RFID sales and marketing at ADT says the study proved that RFID could be used as a security option for retailers when tagging items in the store. However, he says, the redundancy provided by an RFID solution, with alerts sent both through the EAS system and the RFID system, makes a combined solution a good choice. He adds that when an RFID chip is embedded in a plastic EAS card, it is much less vulnerable to tampering while in the store.

"I think we will see combinations of those technologies at least in the near term," agrees Hardgrave, in part because EAS systems are already so prevalent in the retail environment and stores may be more inclined to add RFID technology to an existing solution than replace the EAS system entirely. What RFID offers, Hardgrave says, is knowledge not just that something is being stolen, but what that item is. With existing EAS systems, Hardgrave says, "When something is stolen, the store gets a double hit. They know something is being stolen but, they don't know what it is," he says. Without that knowledge—what is being stolen and how much of it—stores not only lose an item, but also don't have the knowledge they need to replenish their stock. RFID, combined with a traditional EAS system, would provide that data.

A year ago, Checkpoint released its Evolve hybrid system, which incorporates an RFID inlay and a traditional EAS inlay in one tag (see [Checkpoint Combines EAS Tags With RFID](#)). Within the past few months, [UPM Raflatac](#) began selling EPC Gen 2 tags with a built-in electronic article surveillance (EAS) function that retailers could turn on or off (see [Raflatac Releases RFID Tags With Built-In EAS](#)).

At the [RFID Journal LIVE! 2008 conference and exhibit](#), which will be held in Las Vegas on April 16-19, Dunn says ADT will release prototypes of combined EAS and RFID solutions, with an RFID chip embedded in a plastic EAS tag and an RFID reader in the store's EAS deactivator at the point of sale and in the exit pedestals, which detects when live labels pass through its field and then sound an alarm.

Overall, Dunn says, while RFID measured up to EAS, one area that was not tested was the probability that a tag would make it—without being disabled or otherwise tampered with—to the detection zone at the doorway where readers were installed. Retailers need to ensure a tag can't be defeated before it reaches the detection zone, Dunn says.

He recommends the solution to that problem is burying the RFID chip in a plastic EAS tag. In that way, not only would it not be possible for a thief to access and disable it in the store, EAS offers redundancy so that either the EAS or RFID tag will be read as the customer leaves the store.

The study also included discussion about where the tags should be read. "There is a lot of talk about location. Is the exit the right location or is there a better model of protection within the store?" Dunn says. Locating the reader at the exit, he says, serves as a deterrent and guarantees that there won't be misreads of people who might be moving an item without intending to steal it. "The exit is the strongest

inference of intent. They are leaving a private space and heading into a public space with the item," he says.

"Our approach at ADT is we would like to do whatever makes sense," Dunn says. "The question is, what does EAS add to RFID?" The answer, he says, is added security. He points out that while RFID offers item-level visibility that allows retailers and vendors to track out-of-stocks and store performance, EAS provides a security coverage that is already deployed at a majority of retail locations.

"I think one of the things we're trying to ask in apparel is what is the appetite for RFID item-level tagging. Is there a business case?" If there, is, Dunn says, the use of RFID tags as an EAS would be a desirable option for retailers.

The research was sponsored by the [Council of Supply Chain Management Professionals \(CSCMP\)](#), and the [Voluntary Interindustry Commerce Solutions Association \(VICS\)](#), a retail and consumer-goods industry organization.