

IBM, Maersk Developing Cargo Tracker

The two companies are working on a system using a variety of wireless technologies to transmit real-time location, sensor and security data from anywhere worldwide.

By Jonathan Collins

Sept. 22, 2005—IT giant [IBM](#) and global logistics company [Maersk Logistics](#) have jointly developed a system for tracking shipping containers around the world. The system bypasses the need for traditional active RFID tags and readers (interrogators), opting instead for a group of wireless technologies to transmit location and sensor data.

The technology mirrors nascent RFID container shipping systems from [Savi Technology](#) and other companies. Those systems use active 433 MHz RFID tags, integrated with sensors and read by interrogators deployed at ports and other key points in the supply chain.

The IBM-Maersk system will use real-time tracking devices called TREC's (Tamper-Resistant Embedded Controllers), fitted to cargo containers in the same manner as traditional active 433 MHz RFID tags. However, unlike those tags, this system will not require a network of interrogators to be deployed. Instead, the devices will transmit encrypted data using a combination of wireless technologies, depending on what is available at any given time: wireless data networking technology from [ZigBee](#), cellular phone systems or the [Iridium](#) satellite data network. Container-related data, such as physical location (derived from a GPS unit), temperature and humidity readings, and intrusion alerts, could be received instantly, sent via the wireless TREC devices and shared over a planned Container Information Framework network.

"What makes this credible in the marketplace is that it is something that everybody can connect into, and it uses already-existing infrastructure," says Derek Moore, associate partner in IBM's [Business Consulting Services](#), who deems the system "a more cost-effective approach" than using RFID at supply chain choke points.

IBM maintains that its TREC devices will be able to communicate data at all times, not just when an RFID reader is available. "RFID reads at choke points aren't enough. Shipping companies tell us that on the open sea, they have vessels and their containers under full control. But they need to know what happens before containers arrive [by land] at the port and after they leave—and they need to know immediately, not just when the container reaches the reader," says Stefan Reidy, leader of IBM's Intelligent Trade Lane Program, part of the company's On-Demand Information Services unit.

The system, Big Blue explains, will use ZigBee tags to transmit temperature, humidity and other types of environmental data to the TREC device from sensors on cases or items inside the container. A ZigBee tag is a small RFID tag that uses the ZigBee protocol to communicate and can be integrated with various sensors to detect environmental conditions. For example, explains Reidy, "Pharmaceutical companies could place ZigBee tags on each [case or bottle of] product, and the TREC could monitor the temperature and condition of each product."

IBM does not rule out incorporating passive RFID tags in its tracking system. The company says it is developing a way to use a handheld UHF RFID reader to interrogate passive UHF EPC tags on shipments and create a manifest for each container. The manifest would then be transmitted via a 2.4GHz wireless ZigBee connection to the TREC box.

IBM has yet to finalize its business model for the new system, it says. The computer giant could charge container owners for the TREC box, for instance, while providing free access to its planned Container Information Framework network. This network will share the data collected by the TREC boxes with participants. IBM sees the opportunity, however, as one in which it will primarily sell systems design and integration services.

The technology, developed in one of IBM's Zurich R&D labs, is scheduled for field-testing in early November. A total of 10 TREC devices, each about the size of a shoebox, will be fitted inside shipping containers being shipped to ports within Europe and between Europe and the United States over the course of a month. After that, the TREC box will be reengineered according to the trial results, after which 1,000 units will be manufactured for a four-month trial, starting in March. This trial will include commercial shipments to several large Maersk customers.

While IBM has designed the device, as well as computing and communications technology, the firm plans to contract with third-party manufacturers to produce the finished product. "We expect to be up and running commercially in 2007," says Moore.

The IBM-Maersk joint venture stems from IBM's initial investigation into developing a way to secure shipping containers, and its contact with a number of shipping and logistics companies. "Maersk was developing an approach parallel to our own," says Moore.

According to IBM, the Container Information Framework network will enable any participating company—which could include container owners, logistics companies, manufacturers, retailers and other interested parties—to access and share information instantly on container conditions and location. However, each participant will retain ownership of its own data.

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