Alan Pierce
pierceaj@optonline.net

Tamper-Resistant Embedded Controllers

New technologies are constantly being developed to monitor and secure the $2.23 trillion worth of goods imported or exported by the United States each year. Since 9/11, we must scrutinize and determine if Items In transit are what they arc said to be.

Today, most manufactured products move from manufacturer to retailer in sealed marine cargo containers. At this very moment, approximately 4 million cargo containers are in transit between ports or traveling on land, by train or truck. It is very possible that one or more may carry a product that doesn't match its shipping manifest. This doesn't mean that the few mislabeled products in these containers are necessarily dangerous. Still, what we don't know and don't determine can hurt us.

Everyone Involved in the global supply chain sees a major need for improved container tracking. Obviously, it is impossible to open and inspect every container In transit. Random searches are better than nothing, but not as good as a system that monitors all cargo container content from debarkation to delivery. Even such a system would still require some random on-sight inspections.

At this year's U.S. Maritime Security Conference & Expo. IBM and Maersk Logistics representatives announced their co-development of a new wireless tracking network for cargo containers. Their tamper-resistant embedded controller (TREC) system will allow constant tracking of products from the time they leave the manufacturer until they arrive at their final destination. This tracking will be performed using wireless electronic sensors.

The TREC co-developers each supplied research, engineering and business consulting expertise that was in line with their own business experience. This means that IBM developed the hardware and software. The equipment was designed based on Maersk's logistics experience and hands-on knowledge as to what will work and survive the extreme cargo container environment experienced on land and sea. The Maersk Group is one of the largest, and perhaps one of the oldest, shipping companies. Captain Peter Maersk Moller started the company In 1904.

When TREC is installed in a cargo container, it starts to collect data about the containers' contents. It does this by reading the individual radio frequency Identification tags (RFITs) that manufacturers now place on the packaging of most products. (My January 2004 column discussed how these tags work.) TREC combines information about the cargo manifest with real-time data that it gathers from all of its wireless sensors. Information about cargo container location, temperature, humidity, intrusion and other security threats are transmitted 24/7 to appropriate supply chain managers. If needed, more sensors can be added at any time. This Is significant since many new sensors are now under development.

TREC uses GPS technology to constantly monitor a cargo container's current location. Each participant in the supply chain owns the Information that is gathered about its own cargo. This arrangement protects manufacturers and retailers from having competitors illegally data mine information.

The prototype of this system is now being tested in the field. In coming years. TREC should become a viable defense against terrorists turning the world's global supply chain into a weapon. Some of my past columns are tangentially related to this topic. See "Operation Safe Commerce" (November 2004). "Improving Homeland Security" (March 2004), "Radio Frequency Identification Tags" (January 2004), "Safer Skies" (January 2002) and "Electronic Frisking" (November 1997). You ran find all of these at www.technologytoday.us.

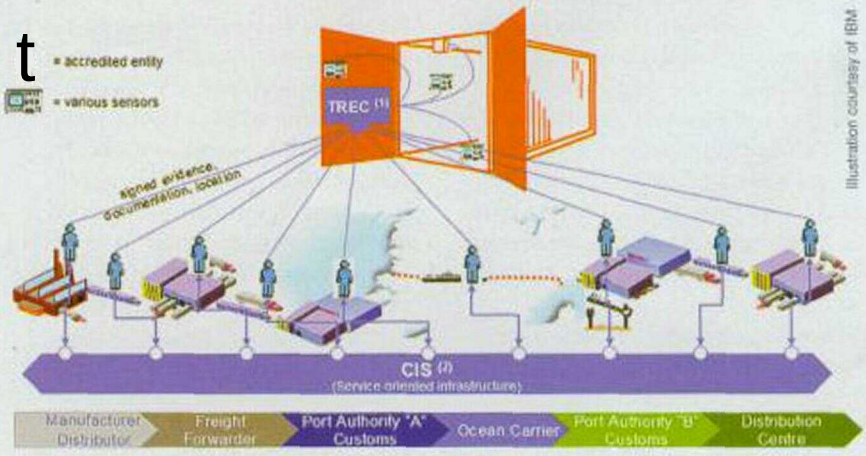

Illustration courtesy of IBM

Electronic sensors track containers from manufacturer to distributor.

Recalling the Facts:

1. What kinds of information would the TREC system gather?
2. What methods arc now used to determine the contents of a cargo container?
3. What kinds of dangers do you think could still slip through a TREC enabled cargo container?

Alan Pierce, Ed.D., CSIT, is a technology education consultant, technical writer, and public speaker on technology issues.