



Cargo Tracking Re-Imagined

Improving Logistics with Passive RFID Technology

Concerns about supply chain efficiency and security have made cargo container tracking a top priority for both shippers and carriers. According to data from AMR Research, most carriers don't know where 10% to 15% of their container inventory is positioned at any given time, and this lack of visibility impedes supply chain operations, and creates security risks.

Governments around the world have placed heightened security requirements on international trade, so keeping track of inventory from the standpoint of security is paramount. Cargo containers that sit idle or that are misplaced for any amount of time are put at risk of both tampering and theft.

For the past five years, logistics and cargo companies have been adopting RFID to improve day-to-day accountability and overall accuracy in the supply chain. The ability to track not only cargo, but also the vehicle carrying it, allows for more sophisticated information processing by intelligence agencies and customs officials as goods cross international borders. Adoption of traditional RFID solutions has been slow because of high cost and proprietary technology, but new standards-based, passive RFID systems have provided a more affordable approach to cargo tracking.

Current Cargo & Logistics Engagements With RFID

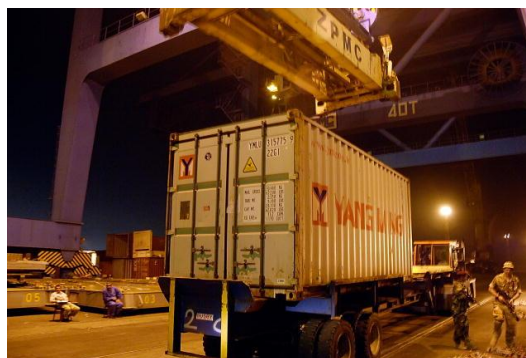
A number of government entities, manufacturers and logistics companies have deployed or piloted RFID solutions to track cargo containers, including the North Atlantic Treaty Organization (NATO), General Electric, Schneker, and DoD.



The U.S. Department of Defense employed 433 MHz active RFID on equipment deployments to Iraq and Afghanistan in 2008 with checkpoints installed along major equipment supply routes for real-time monitoring of shipment locations. Before the tagging program was implemented, cargo operations were frequently shut down out of fear that goods would be intercepted during a rebel attack. This created a tremendous backlog. With the introduction of RFID the RFID solution, the military was able to identify cartons and containers, and could flag high-priority shipments for immediate deployment.

Maersk, one of the military's top carriers, was able to identify a particular vessel manifest and the owner of the cargo within five minutes, in addition to shipment's current location along the delivery route.

The RFID solution has provided huge cost savings for the military, primarily by allowing them to return a core container within seven days and avoiding late fee penalties associated with not returning a leased container within the specified time period.



With RFID, both the container backlog and late fee charges have been substantially reduced. So far, some 5.5 billion gallons of fuel and 10.7 million tons of dry cargo have been successfully delivered during 107,000 aircraft missions thanks to the accountability provided by the RFID tracking system.

Challenges With Current RFID Solutions

When RFID cargo tracking systems were originally introduced, passive RFID technology was still in its infancy; passive tags were simply not able to provide the long read range and robust performance required for these applications. In addition, passive tags were difficult to use in environments where large amounts of metal were present. Since most cargo containers are made of metal, passive tags presented a significant readability challenge. As a result, most cargo tracking solutions were based on Active RFID technology.

Emirates, the Dubai based airline, adopted Active RFID for its SkyCargo freight division for automatic tracking of their unit load devices (ULDs), the containers used to hold cargo for air shipment. The majority of solutions deployed and piloted by the Department of Defense, other military organizations and private enterprise have also been based on Active RFID. The reason: comparable mount-on-metal passive RFID tags could not deliver the same consistent performance from both a read-range and sensitivity standpoint.

Active RFID, however, has also presented some challenges. First, many Active RFID



solutions are proprietary — the tags supplied by vendors are not cross-compatible with other similar systems, and are not necessarily based on an established technology standard. Second, the batteries that power Active RFID tags may last no longer than one year, depending on the mode of operation. The more frequently the tag has to broadcast its location, the shorter the battery life. Active RFID tags are also expensive, costing \$10 to \$50 per tag.

In many cases, cargo and logistics companies hesitated to adopt RFID because a robust, standards-based solution was not available. With proprietary solutions, there is a risk that the vendor could either raise the price or discontinue the platform in favor of new technology. This could render a widely deployed solution obsolete, forcing customers to upgrade or switch vendors at a significant cost.

Redefining Cargo Tracking with Passive RFID

Advancements in passive RFID technology have made robust, read-on-metal (ROM) asset tracking solutions possible. New UHF passive mount-on-metal tags are easily one-quarter the cost, or less, of a traditional Active RFID tag, providing much more bang for the buck. In addition, read ranges for these read-on-metal tags have now improved to the extent that users can expect at least 20 feet of read range when mounted directly to a metallic container.

With improved read range and a lower price, passive RFID presents an affordable way for logistics companies to retrofit the existing container fleet with reliable tracking technology.

The Micro^X from XERAFY, for instance, is a rugged, EPC UHF standards-based passive RFID tag with one of the smallest footprints (less than 2" square) that provides a 20-foot read range.



Using these types of devices, a cargo container can be tracked with a tag that will not only survive harsh shipping conditions and consistently perform at long ranges, but that can also be discreetly mounted to prevent would-be vandals or thieves from attempting to disable or remove the device. The Micro could even be embedded flush with the surface of the container, protecting it from accidentally coming in contact with other containers or foreign objects, particularly in a harsh application environment

Contact Us

For more information on this application, product overview or any other questions, please contact XERAFY.