

RFID Asset Tracking and Management Hotter Than Ever

Passive UHF Generating Heat and Drawing User Attention

Michael Liard

Research Director, RFID & Contactless

In contrast to the more widely publicized, retail supply-chain pallet, case, and item-level tracking initiatives, asset tracking and management is a veteran RFID application that is experiencing a resurgence. RFID tags and assets are not strangers, but today more than ever, RFID-based asset tracking and management solutions are helping companies in multiple industry sectors solve strategic business problems and lower operating costs. The historical domain of active RFID technologies, the asset tracking and management landscape, is changing. Passive UHF alternatives now add to the scenery — offering viable, reliable, flexible, and cost-effective solutions.

From pilots to full deployments, activity has been brisk for both active and passive asset tracking and management solutions (including RTLS (Real-Time Location Systems)). According to ABI Research, end users increasingly are evaluating and installing RFID-based asset management solutions, particularly those that bolster visibility, optimization, and utilization of high-risk, high-value assets and provide a high ROI (return on investment). In recognition of the opportunity, RFID vendors and integrators from the passive and active RFID communities have been aggressively targeting the asset management space, with many specializing in vertical market approaches. Corporate IT assets, energy and utility meters, RTIs (Returnable Transport Items), reusable containers, spare parts, mission-critical assets, capital equipment, fleet vehicles, medical equipment, and documents are several examples of assets being tagged with RFID.

ABI Research believes the majority of activity is centered on closed-loop asset management applications within the “four walls” of an environment. However, open-loop applications such as MRO (Maintenance, Repair, and Overhaul) tracking are also being evaluated and deployed by several lead adopters. With new applications being routinely introduced, RFID has demonstrated a lasting and promising future in asset management. Users continue to identify strong value propositions and realize significant business benefits through the use of RFID. It is clear that RFID is solving critical asset tracking, management, and utilization challenges in both closed- and open-loop environments.

The underlying story is the emergence of passive UHF asset management. A new generation of passive UHF tags and readers offers enhanced data capacity, greater read distance, and reliable functionality on metal surfaces and in harsh environments. RFID tags are low cost and available for application on a variety of asset types. More powerful, wireless LAN networks and IT equipment complement the growth of RFID. In addition, mobile and handheld readers will also help enable RFID-based asset tracking and management in practically any workplace.

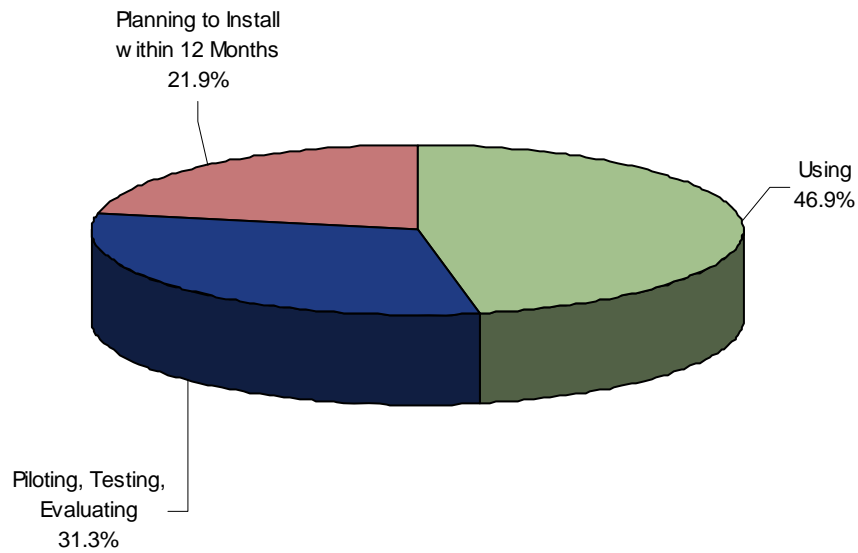
We expect additional solid ROI success stories to be revealed and new contract wins to be announced over the next few years for RFID asset management solutions in key verticals, including aerospace and defense, transportation, manufacturing, health care, and commercial services (i.e., education, finance, public utilities, libraries, etc.). Furthermore, ABI Research believes that both active and passive (UHF and HF) RFID solutions for asset tracking and management will experience some of the highest short- and long-term growth rates in the overall RFID market. However, according to our research, passive UHF solutions are expected to realize the strongest adoption and highest growth in the next few years.

1.1 Solid End User Support for RFID-Enabled Asset Tracking and Management

ABI Research’s annual RFID end-user survey results confirm that asset tracking and management solutions have captured the attention of businesses, with many respondents using or evaluating the technology. Among those surveyed, the vast majority is interested in RFID evaluated passive UHF solutions. Among those using the technology is a mix of active and passive users, with most using passive UHF Gen2/ISO 18000-6C and active UHF (433 MHz).

Chart 1.1 shows the level of adoption among 32 end-user survey respondents who indicated that they have used or evaluated RFID for various asset tracking and management applications. An additional 65 respondents (who were excluded in the chart) reported using, evaluating, or installing RFID for other applications. That means that one in three survey respondents were using or considering RFID for asset tracking and management.

Chart 1.1 *RFID End-User Respondents Using, Evaluating, or Planning to Install RFID for Asset Tracking and Management Segmented by Application Usage Plans (Percentage of Respondents)*



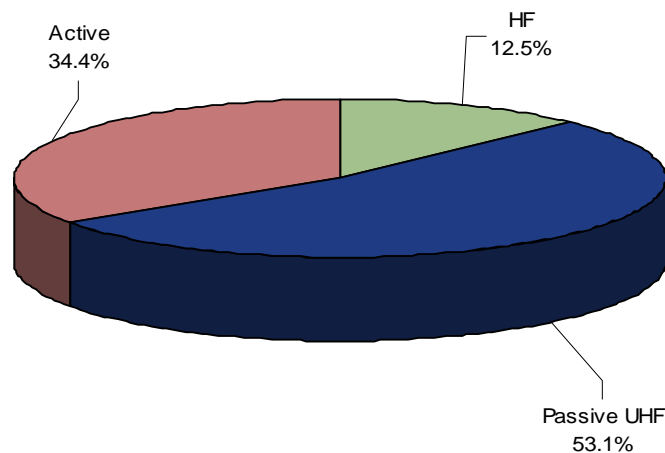
(Source: ABI Research)
S= 32

Some of the areas in which the survey respondents are employing or evaluating RFID within asset management are:

- People/personnel (HF, active)
- Fleet vehicles (active)
- Yard assets (passive)
- Spare parts management (passive UHF)
- Work-in-process tracking (passive UHF, active)
- Corporate IT equipment (passive UHF, active)
- Library books (HF)
- Documents (HF)
- Reusable containers, totes, and pallets (passive UHF)

In terms of supported frequencies, ABI Research’s RFID end-user survey results reveal that passive UHF leads among our respondents, followed by active technologies. Chart 1.2 presents the percentages. Among those respondents using RFID today, active was more dominant; however, among those evaluating and planning to install the technology, passive UHF was the most common response. ABI Research believes this data reflects the general momentum behind passive UHF solutions in the market today.

Chart 1.2 *End User Respondents Using, Evaluating, or Planning to Install RFID for Asset Tracking and Management, Segmented By Operating Frequency Support (Percent of Respondents)*



(Source: ABI Research)
S= 32

1.2 Where Does RFID-Based Asset Management Make Sense?

ABI Research argues that the user and the user's needs determine where RFID-based asset management makes sense. Each enterprise is unique in its operations and system requirements. Tracking corporate assets is a daunting challenge, but it is critical to improving an organization's financial and operational performance. Sarbanes-Oxley regulatory compliance now adds a new level of complexity to asset management and reporting. Many enterprises face similar business problems and inefficiencies such as asset visibility, utilization, and optimization — challenges that can be solved with RFID. If an organization operates a supply chain, it relies on a lot of internal assets. For example, tools, warehouse assets, reusable containers, and airline luggage bins can be saved from loss or misplacement and sent where and when they are needed with RFID.

With an increasing number of pilots and real-world deployments occurring across verticals and around the globe, RFID has emerged as a viable, reliable, and attractive alternative alongside other track-and-trace technologies such as bar codes and wireless solutions (i.e., cellular, GPS, and so forth).

Asset management is one of the RFID market's truly horizontal applications and casts a wide net of potential sub-applications. RFID aims to improve the way assets are tracked by eliminating the manual processes associated with existing methods which include bar codes, pencil and paper, or none at all. Passive HF and UHF as well as active UHF asset-tracking solutions have been successful in several industries:

- Corporate IT staffs can tag equipment such as data tapes, servers, and laptops to track them within a corporate environment. For example, asset managers could take physical inventory of server rooms and office spaces quickly by "sweeping" the area with hand-held readers. This provides real-time visibility of the asset and eliminates manual recording processes.
- Aerospace OEMs, integrators, and maintenance and repair shops can tag components or bins throughout assembly to track work-in-process and inventory. Specifically, manufacturers can tag either bins that contain parts or the parts themselves. As these items move throughout the assembly process, managers can monitor inventory, identify bottlenecks, and reduce waste.
- Maintenance is another application that can be built onto an asset-tracking system. Expensive machinery requires proper maintenance to maximize its life. Currently, most maintenance logs are recorded by hand, on paper — which leaves significant room for error. An asset management system enables maintenance records and schedules to be logged automatically and electronically: the system logs when equipment is brought in for maintenance, any maintenance testing results, and when the equipment leaves. The ability to write maintenance data to the tagged item instead of recording the information on paper offers a significant value proposition.
- Evidence bins can be tracked as they enter and exit secure locations in criminal justice facilities to prevent tampering while enabling non-line-of-sight inventory control.
- Leveraging short-range (up to 3 ft) 13.56 MHz solutions, librarians can quickly identify incorrectly shelved books by waving a wand across a bookcase.

- Rental equipment suppliers no longer have to struggle to read labels or barcodes that often become covered in dirt and grime over the equipment's life. Regularly, rental equipment sits at a facility without the renter realizing that charges are accruing for the unused equipment. An asset management system can monitor the equipment and log its use. This information will then be transmitted through the local area network back to the rental company. Using RFID will enable increased asset visibility and utilization in rental environments, perhaps resulting in charge-for-usage billing options.

Asset tracking and management applications can help companies in various markets lower operating costs. Monitoring assets will enable better use and management, which will reduce the number of new purchases needed annually. In many facilities, assets are misplaced, lost, and stolen; a tracking system would reveal unaccounted for assets. Determining the location of assets is only the starting point; many companies can then build on this information to gain additional value from such systems.

In a typical asset management system, various items are tagged with transponders or labels to identify them throughout a process. These processes can vary from tightly structured routes at manufacturing facilities to tracking a communal laptop computer at a corporation. In either case, the tagged asset provides feedback to better manage or perhaps even redefine the process.

Another factor that is contributing to the growth in asset management deployments is compliance with the Sarbanes-Oxley Act, the US federal law that requires companies to keep records of their assets. Sarbanes-Oxley has added compliance regulations for asset management. The law encourages companies to use asset-management systems to achieve that compliance, helping reconcile claimed assets with actual assets in possession. There are no specific technology requirements for compliance, but many companies are finding passive, semi-passive (battery assisted), active, and RTLS solutions helpful for record-keeping.

ABI Research believes that organizations require increased visibility of assets and actionable data on how they are being utilized to improve efficiency and reduce operating costs and capital expenditures. Traditional methods of securing asset location and ID information are often costly and labor intensive. As a result, many businesses do not have a comprehensive view of critical, high-risk, and/or high-value assets. RFID-enabled asset management solutions are enabling new ROI and total cost of ownership (TCO) models. Leveraging RFID, businesses are getting their first real look into their operations and assets within their four walls and beyond.

1.3 Sempra Energy and SoCal Gas Tap into the Power of Passive UHF

With roughly 1.3 million electric and 5.5 million natural gas meters installed, Sempra Energy has the largest customer base of any energy utility company in the United States. An internal audit revealed that 3,300 meters were not billed in one year. Southern California Gas (SoCal Gas), an arm of Sempra's utilities division installs 250,000 meters each year. The company did not bill 1.3% of the product (rather its asset) that it installed, effectively taking \$1 million off the bottom line.

Sempra lacked complete visibility of its meters, not knowing how long they were on trucks or which specific meters were being delivered or received. This results in unaccounted for and unbilled meters. The inventory and accounting process was completely manual, non-automated, and inefficient. The non-line-of-sight capabilities of RFID were an immediate lure over bar codes. And, the solution was cost justifiable. The meter manufacturers shipping to SoCal Gas tag the pallets of meters with RFID tags. The pallets are then scanned as they enter the warehouse through a portal reader. Workers then break down the pallets to prepare shipments of the appropriate meters for each district warehouse, using the handheld RFID readers to rewrite the tags with the new shipment information. Sempra expects to recoup \$500,000 annually in lost revenue. And, there is more good news. SoCal Gas plans to extend the application to include the potential use of RFID readers in the inspection process to update history, meter accuracy, and other key data points.

1.4 Maintenance, Repair, and Overhaul: A Compelling Example for Asset Tracking and Management

Aerospace agencies face the daunting challenge of reducing operation and maintenance costs. Over the last few years, advances in IT have leveraged the development of ERP, business process management (BPM), corporate process management (CPM), and computerized maintenance systems (CMMS). Although these solutions have been designed for general purposes, some of their features can be applied to very specific organizations.

Currently only a few computerized maintenance systems can be used specifically in the aerospace industry. CMMS or MRO systems for the aerospace industry have evolved. They now include modules or applications that can provide reports containing summarized data or that can communicate with other systems. The requirements of the MRO events — standard maintenance activities, problem resolution, and directives — are generally the same:

- Identify the problem
- Access the log book
- Locate the required part(s)
- Retrieve the proper documents
- Locate appropriate or certified personnel
- Locate the required tools
- Complete the checklists/history log
- Send a completion notification or obtain a release certificate

This is where RFID comes into play, fulfilling many of these MRO event requirements by enabling real-time track-and-trace and unique identification. With up to 70% of a mechanic's time spent locating parts and required tools, the process is strewn with inefficiency. Solutions that incorporate RFID can greatly reduce these inefficiencies and ensure due diligence in terms of maintenance.

When an RFID tag is attached to a component or part to record every stage of its repair work, the tagged object's progress can be tracked from its removal from the aircraft to its subsequent reinstallation. By linking the RFID-enabled system to an organization's CMMS/MRO, the system can leverage real-time location information to enable engineers to locate it and to know exactly what type of repair work was performed, and by whom.

RFID tags can also be attached to materials (rotational and consumables) for their distribution to work stations, warehouses, or maintenance bases. Information regarding what components were sent or received, or are in transit, as well as their description and part/serial/lot number can be maintained and recorded and RFID tags can control who is using which tools for the disassembly process and when the tools are in use. For example, RFID-tagged gauging tools are used in a system that will associate the ID on their tags to their description, manufacturer, and the date of their next gauging. This enables automatic maintenance and repair anticipation and alerts as well as real-time inventory control. The use of RFID would solve the problem of tools being left on planes by enabling the tracking of these tools in rigid environments.

The key to an integrated MRO supply chain is documentation. Significant documentation is required to meet regulations in the aerospace industry, most notably for safety compliance. Most record keeping remains a manual process with limited automation among disparate systems. Links between RFID and document management systems are in their infancy today; however, interest in building in both aerospace and defense markets.

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PO Box 452
69 Hamilton Avenue
Oyster Bay, NY 11771 USA
Tel: +1 516-624-2500
Fax: +1 516-624-2501
<http://www.abiresearch.com/analystinquiry.jsp>

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