# Supercharge Your Assets with Embedded RFID

## INTELLIGENT ASSETS
## Embedding RFID to Improve Tracking, MRO and More

Asset tracking solutions built around RFID technology have traditionally leveraged the ability to identify and locate items easily, without requiring the line-of-sight needed for reading bar codes or serial numbers on a given asset. With the advent of embeddable passive RFID tags, companies now have the option of moving beyond simple identification into solutions that create "smart" assets that can carry important product specifications, pedigree, maintenance, installation, supply chain, and other data with them as they move from location to location.

In situations where an asset does not have guaranteed access to a network or when information can't be shared across organizations, high memory RFID tags provide a compelling value proposition. Manufacturers can get visibility into production demand and reduce parts inventory. Suppliers can improve manufacturing efficiencies and verify the authenticity of their parts. Airlines and maintenance companies can make maintenance, repair and overhaul (MRO) operations more efficient.

Xerafy is enabling the production of smart assets with its iN family of RFID tags for metal assets and high memory XL tags for data storage. With these two tag offerings, Xerafy has provided lower-cost, UHF-based solutions that can be easily embedded into a host of assets

In this whitepaper, we will take a look at how embedded RFID and high-memory RFID tags can be used to enable intelligent asset tracking applications and improve MRO, security, field service, and other applications.

# Embedded RFID

Embedding RFID tags within valuable assets can provide a number of benefits, including increased asset utilization, improved maintenance tracking, improved efficiency, reduced paperwork, and enhanced security. A number of vertical applications can benefit specifically from high-memory UHF tags that can be attached or embedded into metal items.

# Information Technology

Manufacturers of computer hardware, printers, high-tech medical devices, and other items have begun embedding RFID into their products for identification purposes, and to enable other types of applications.

RFID transponders can be embedded in the PCB board for electronics to allow manufacturers to track the product from the time the manufacturing process begins until the item is recycled.  A manufacturer would be able to track finished products as they are moved into inventory, monitor how long they remain in inventory and ensure the proper items are picked and shipped to the correct customers.



FIGURE 1: SERVER WITH EMBEDDED RFID TAG

In 2008, the Financial Services Technology Consortium published standards for tracking data center assets using RFID tags. Large banks like Wells Fargo and Bank of America have already used the technology to manage servers and other IT assets, allowing them to cut 80 percent to 90 percent of the labor and time required for these mandatory quarterly inventories. The tags also provide lifecycle tracking through the process of decommissioning, which also helps with regulatory compliance.

RFID tags can also be used to track mobile IT assets like laptops, hand-held computers, and even mobile phones for security purposes. In hospital environments, RFID can help administrators track the location of IT assets and medical equipment, thus improving availability of important equipment.

# Maintenance, Repair and Overhaul (MRO)

For maintenance and field service organizations, having a high-memory RFID tag on key equipment can increase asset value by providing pedigree information. The "network on a tag" availability of the data is also useful in situations where employees cannot easily access asset or maintenance history on a computer network.



FIGURE 2: CRIBMASTER MRO TOOL KIT

High-memory RFID tags in an MRO environment can reduce the time taken to document configuration for events such as initial delivery and off-lease return, and provide an accurate pedigree of proper maintenance that can maximize both the expected life and residual value of assets.

With embedded RFID, the various organizations involved in manufacturing, using, maintaining, procuring, installing and decommissioning assets across their lifecycle can access lifecycle information while avoiding the integration complexities associated with making that data

available over a network. In addition, because asset maintenance has become such a hyper-competitive market, manufacturers, service companies and end users that may otherwise compete with each other over maintenance contracts can share asset data without revealing too much information to competitors.
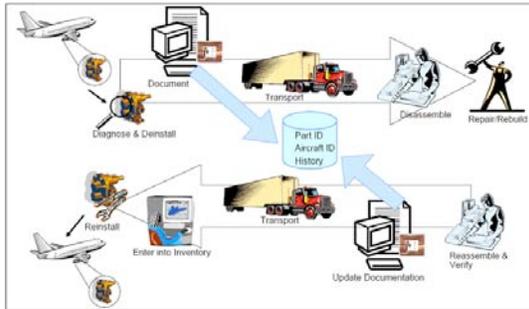


**FIGURE 3: AVIATION SUPPLIER PART TRACKING**

The aviation industry is using RFID tags to record maintenance information for critical aircraft parts, and other industries are turning to intelligent tags for asset management and other business applications, including:

- Remote assets in renewable energy
- Valves and maintainable items in process industries
- Manufacturing equipment at CPG plants
- Trains and other transportation assets
- Foreign Object Damage Control in the nuclear and aviation industry
- Tools and equipment in the aviation industry
- Work-in-process quality assurance

These industries share several common problems in asset management and MRO. Studies have found many examples where only 20 percent of a technician's time involved productive work. Eighty percent of repair time was spent gathering information and tracking parts and tools to set up the job.
Similarly, lifted assets or assets requiring periodic maintenance are regularly either taken out of service prematurely (reducing their economic life) or miss key maintenance events,

creating potentially hazardous situations and exposing organizations to liability issues.

Other MRO applications that would benefit from high memory tags include oil and gas exploration, military vehicle and material maintenance, utility pole configuration, and railroad maintenance.



**FIGURE 4: FLANGE WITH EMBEDDED RFID TAG FOR OIL INDUSTRY**

# Xerafy iN Tags

Xerafy was the first tag manufacturer to develop an ultra-high frequency RFID tag that can be embedded into metal. The -iN Series was a breakthrough in read range performance for embedded products with a small size that allowed manufacturers to embed into items as small as a bolt.

The Xerafy iN family allows for embedding of RFID during pre- or post-production of metallic assets. These passive RFID tags provide long read ranges, a relatively small footprint, and rugged construction. Because they don't rely on a battery, the tags can be relied upon for asset identification over several years or even multiple decades, depending on the application.

The Micro-iN, with a read range of up to 20 and operating temperatures of -22°F up to 185°F, is suited for mission-critical applications in harsh conditions that require high performance.

The Pico-iN is small enough to fit in tools and ID tags. It can provide permanent identification of very small metal assets. The Nano-iN can be embedded in metal objects and other assets, providing an additional level of protection, and still achieve read distance of up to 10 feet.

## Xerafy XL Tags

Xerafy's high-memory XL RFID tags can withstand time, temperature and radiation that would otherwise degrade the performance of typical RFID devices. Accelerated aging tests indicate expected memory retention of as much as 100 years under benign conditions. These types of RFID tags provide a safe solution for long-life assets in any environment, greatly reducing the risks of an expensive field recall or maintenance activity to address tag memory issues.



FIGURE 6: XL TAG SERIES

High memory tags have a lower cost of ownership compared to more expensive active RFID tags or pure identification only license plate tagging solutions. The tags also have a greatly reduced infrastructure cost, and advantage in terms of support. The tags are also battery free, making disposal far easier process than is the case with active tags.

## Conclusion

Intelligent asset management applications can be enabled using embedded RFID tags. Manufacturers now have a choice to store data on the tag or on the network, depending on the product being made. Both approaches require tags that are more durable and reliable than traditional offerings, and can last the lifetime of the asset.

By allowing asset data to travel with the asset itself, free of any reliance on network connectivity, companies across a variety of vertical markets can increase efficiency, reduce paperwork, and increase asset visibility and utilization. Companies are starting to take advantage of the opportunity to use it to track their electronics products throughout their lifecycle.

Xerafy provides proven RFID tag technology with its iN, and XL tag families that can allow companies to track assets from the point of manufacturer through decommissioning, while providing a platform for enabling new asset-centric applications.

# About Xerafy

Xerafy is committed to bringing our customers the world's smallest and most reliable passive UHF RFID-on-metal and iN metal tags that are qualified and tested to meet extreme conditions over the lifetime of the asset. Xerafy's innovative technology offers the industrial, manufacturing, defense, IT, and supply chain markets, an affordable, durable, high temperature smart tag that can be easily attached to or embedded to metal assets. Xerafy enables packaging solutions for automatic check-in / check-out tools, work in progress, IT auditing, product authentication and asset management with a competitive advantage in size, cost, design, quality, and performance of tags. Xerafy is headquartered in Hong Kong, and maintains sales and support offices in Dallas, Texas, Gaithersburg, Maryland and in Shanghai, China.

### Contact Us

For more information on RFID tag applications, product overviews or any other questions, please visit www.xerafy.com.