



RFID IN Metal: A Dream Come True For Asset Tracking

Introduction

Beyond the valley of RFID applications currently implemented in the vast supply chain atmosphere lays a new breed of applications for RFID that only several years ago was merely a dream. In the last several years, milestones have been reached and exceeded in the realm of mount-on-metal RFID. New applications from the sublime to the complex are now suddenly possible with the advent of RFID technology that not only works on metal, but works very well without the customer having to utilize make-shift and often silly modifications to their tags to get them to work (the image of the "37 business card" rule comes to mind in terms of spacing RFID inlays off metal to get them to perform outside of the signal null).

Now the industry has new doors to open and new avenues to explore. CTO's are eager to utilize this new technology in their data centers, thus streamlining inventory management of their server blades. IT peripheral manufacturers also jumped on the mount-on-metal bandwagon to now offer real-time logistics and accountability of their assets not only from a production standpoint but also for their customers to be able to manage their own assets for annual inventory accountability.

Many applications exist where a tag simply cannot be mounted on a surface. There is a growing need from customers for not only a tag that with exemplary performance on metal, but for a tag with exemplary performance IN metal.

Current Challenges

Damage to the tag, deliberate or through normal wear and tear, will eventually take its toll on the tag. At this stage time, money and resources must now be employed to investigate. This is the very stage that RFID is to prevent in the first place.



JOHN JOHNSON
EDITOR OF RFID 24-7

At stake is a potentially huge opportunity for the RFID industry to contribute to anti-counterfeit initiatives around the world. John Johnson, Editor of RFID 24-7 says, "RFID technology is playing a greater role in eliminating counterfeit products, from high fashion apparel to costly pharmaceuticals. Chinese apparel maker Jossy Jo says an item-level solution has pulled the plug on counterfeits that formerly accounted for as much as three percent of sales. And in Africa, more than a billion RFID tags and one million mobile readers could be in circulation within one to two years in an effort to curb the out of control drug counterfeiting that plagues many African nations, where counterfeit rates can reach 30 percent and higher."¹ Mount-on-metal tags will work when mounted below the surface of metal. While that statement may initially answer the question many customers are asking, it is a statement out of context. Within the context, a tag designed for exemplary performance on metal is specially tuned and built

¹ http://www.rfid247.com/news/010410_news.shtml

for that purpose. When surrounding a tag with metal, this drastically changes the physics of the tag's antenna and performance. Going back to the original statement of this section, the context for the statement to be true is the tag must have a trench or a "moat" surrounding it so the immediate area around the tag is devoid of metal and full encapsulation. The tag will now in most cases function with near to full performance.



FIGURE 1: DATA CINCH WITH XERAFY iN TAGSINSIDE

Let us now pose a question; when was the last time a person saw a bolt with only a thin wall serving as a head? If a bolt for example is to have a RFID tag embedded for WIP tracking, the head of the bolt must be strong enough to handle the torque of a socket wrench. The tag needs to occupy minimal area. Any tag designed for on-surface metal, will require much space around it to function. This application for bolts using on-surface metal tags is null and void.

The astute reader is now noticing a trend here: In order to embed a tag into metal and have it still work, one needs to have space around the tag in order for it to function. This statement is absolutely true...for a mount-on-metal tag.



FIGURE 2: XERAFY PICO-iN TAG EMBEDDED IN BOLT

Applications such as WIP tracking using RFID embedded bolts, MRO with RFID embedded zip-ties, wrenches that are keyed for specific areas/departments, anti-counterfeiting of high-end jewelry and consumer goods and even pharmaceutical authentication are in need of a tag that can be fully embedded into metal in order to provide a seamless and streamlined product from an aesthetics point of view but also from a practicality point of view providing the performance and protection needed for the tag to survive the harsh every day use-case environment.

Xerafy iN Family



FIGURE 3: XERAFY iN TAG FAMILY

An industry first, Xerafy has introduced the world's first line of UHF Gen2 RFID tags explicitly designed to be embedded into a metallic surface. The Pico-iN, Nano-iN and Micro-iN represent the first in a series of tags that are designed to be embedded in bolts, firearms, OEM IT peripherals, metal identification tags and a cornucopia of other applications. The Pico-iN is the smallest of the three at only ½ inch (12mm) wide and up to 2 feet (0.6 meters) of read range. The Nano-iN is around 1 inch (25mm) wide and offers up to 15 feet (4.5 meter) of read range. The Micro-iN which is the most powerful offering up to 15 feet (4.5 meters) of read range is around 1.18 inches (30 mm) wide.



FIGURE 4: RFID FOR QUALITY INSPECTION ON FRAC-JOB BY SHIPCOM WIRELESS

Using industry proven EPC Gen2 compliant technology, the iN family may be used with a wide variety of vendor equipment across multiple platforms. The 512-bit user memory available on each tag may be used for additional asset information that stays with the asset.



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“The ability to embed a small form EPC RFID transponder without sacrificing performance, particularly in metals and plastics, should create significant opportunity in a diversity of markets,” according to Drew Nathanson, Director of Research Operations at VDC Research Group. “From IT asset tracking to WIP to Consumer Electronics and beyond, a high performing

embedded EPC tag is expected to not only provide track-and-trace functionality, but also further enable source-tagging and authentication.”

With temperature resistance of up to +250C, these tags may be used in applications involving extreme heat (autoclave, painting, high heat metal form casting, construction etc.) without damage and sacrificing performance. Also for extreme cleaning regimens involving high temperature water baths and often solvents and acids, the iN family of tags is designed for the long haul.

Conclusion

Ever evolving as a technology from an innovation and practical standpoint, RFID reinvents itself again with mount-in-metal technology. When designing an application, including deciding the appropriate type of reader infrastructure and software platform, it is equally important to select the appropriate tag for the job. Having the ability to select the appropriate tag for the job involves selecting a technology that is designed to address the needs and challenges of the project without having to re-engineer the tag after the fact.

About XERAFY

XERAFY is committed to bringing our customers the world's smallest and most reliable passive UHF RFID-On-Metal (ROM) 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 & support offices in Dallas, Texas, Maryland and in Shanghai, China.

Learn more about XERAFY by visiting us at: WWW.XERAFY.COM.