

AXCESS International White Paper



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Dual-Active Radio Frequency Identification (RFID) is Ideal for Integrators

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Contents

Contents	2
Background	2
RFID are Complete Systems Sales	4
Applications the Enterprise Needs	4
Integrator Skill Sets.....	5
Active RFID is Ideal for Integrators.....	6

Background

As a business supporting the enterprise, technology integration has arguably never been in such a state of flux.

Characterizing Active RFID

Active RFID systems tag people, assets and vehicles, as well as deliver sensor data from in and around the enterprise. They're used for identifying, locating, tracking, monitoring, securing and sensing enterprise "things".

The Many Applications the Enterprise Needs

- Vehicle, transportation and logistics
- Asset management
- Automatic Personnel and Productivity tracking
- Sensing with logistics

Active RFID is Ideal for Integrators

There are many benefits of having active RFID as a solution set. The technical expertise surrounding this technology carries with it a uniqueness that can be built upon to provide differentiation to further the firm's competitive advantage. The solution is robust and reliable as verified in the implementation of similar technologies such as toll tags around the world. The creative nature of the technology means multiple applications can be implemented with any given customer, ensuring a robust revenue stream of solutions that can be sold.

Background

As a business supporting the enterprise, technology integration has arguably never been in such a state of flux. What were once solid, defensible domains in system integration have morphed into a heavily contested landscape. Integration specialties in security, homeland defense, supply chain, IT, barcoding, automatic identification, etc. are all colliding at a single common point—the enterprise network. IT departments are now implementing a wide array of technologies to improve the business, and all are competing for the technology dollar. As a result, integration businesses have been forced to compete against new and sometimes more formidable adversaries. Dual-Active Radio Frequency Identification (RFID) is a technology that offers the ideal characteristics for integrators to establish, build and protect revenue sources.

Characterizing Active RFID

Active RFID is a technology not too dissimilar in concept to the passive RFID systems Wal-Mart and other consumer package goods retailers are implementing to improve their supply chains. Wireless tags automatically identify and account for goods as they enter the facility. In passive tagging, small and low-cost tags are attached to cartons or pallets and read via a portal-configured reader infrastructure at the dock door. Passive RFID systems run the risk of poor accuracy due to an unacceptably low tag signal strength, and poor reliability from signal interference. On the other hand, active RFID tags have batteries on-board, enabling them to be recognized over greater distances when placed on many different objects and therefore offer the enterprise a dramatically broad, diverse set of solutions.

Active RFID systems tag people, assets and vehicles, as well as deliver sensor data from in and around the enterprise. They're used for identifying, locating, tracking, monitoring, securing and sensing enterprise "things". The tags can be programmed to emit beacon signals, typically 50 to 75 feet indoors to small, palm-sized receivers connected to the network. Greater distances, up to 300 feet, are achieved outdoors as seen in toll tags. The choice of tag type, size, function and receiver placement is based on the solution to be architected. The variations are endless and initial active tag systems form a platform for scalability and for adding new applications as needed.

A variant of active RFID technology is "Dual-Active" RFID tagging, or activating tags to transmit their signal only when needed. Individual Radio Frequency (RF) activation fields are established at natural choke points or control points for the purpose of activating tags to transmit their location. This also enables the system to check for access control authorization and support cumulative inventory counts by location. With dual-active RFID, tags are automatically triggered whether on equipment or personnel, and offer reliable operations under virtually any setting. The robust long range signal from active RFID combined with dual-active location monitoring capabilities are solving problems that aren't possible with other wireless technology.

In the sensor area, active tags can have sensors embedded inside the tag or sensor inputs can be connected from outside. Temperature, , shock and humidity are common sensor

inputs, supporting multiple industries. Any two-wire digital sensor output can be connected into a tag to trigger an alarm condition. This means the sensor implementations are highly flexible and limitless. Inboard motion sensors can sense the slightest movement or vibration of equipment or assets designed to be stationary and stable. Anti-tamper circuits sense any kind of tampering with the tag, immediately sending an alarm signal.

RFID are Complete Systems Sales

Active RFID systems are typically sold as complete systems, ideal for the integrator business model. The various applications and industry uses are broad, but the solutions are specific. The systems are typically approved for all countries depending on the exact frequency ranging from 300MHz to 433MHz. However, a standard has not yet been defined for the technology. The Electronic Product Code group (EPC) that created the standard for passive systems supported by WAL-MART is now addressing prospective standards for active RFID. It'll take time to establish standards for active RFID, as the application solution set to be supported is currently very broad. For the benefit of the integrator, active RFID comes with middleware databases and application software, so a complete solution is easy to architect.

The complete solution may also include a link to the enterprise information system of choice. This occurs by having the vendor or customer's IT department write a simple adapter to capture the RFID tag data. Integrators can also provide this added value service. Active RFID vendor software is often set up as a platform, easily customizable to the end user's need and application demand. Dashboard displays include standard, yet user configurable displays highlighting alerts, real-time inventory counts, dwell times in each location control zone and map-based display graphics providing visual locations. Wireless alerting for user-specified alarms is also a standard feature. Again, this supports the theme of implementing a platform technology, one the integrator can grow and expand for the customer over time.

Applications the Enterprise Needs

According to IDTechEx, a marketing analysis firm tracking active RFID developments, 225 new active RFID applications surfaced last year. The sector is expected to grow at double-digit rates through the decade to over \$3B in revenues by 2010. Some applications, all of which offer "automatic" functions that remove manual labor, include:

Vehicle, transportation and logistics tagging with automatic:

- Vehicle gate access control
- Driver identification for access control
- Tractor and trailer "custodial" matching
- Driver and tractor "custodial" matching
- Trailer electronic door seal

- Yard management
- Payload measurement and condition sensing
- Reusable container inventory control
- Driver authorization
- Forklift route monitoring.

Asset management with automatic:

- IT asset inventory, location and protection (e.g., laptops)
- Key protection
- Collectibles such as art
- Tool crib check-in/check-out
- Asset utilization measurement
- Medical device tracking and locating.

Personnel tracking with automatic:

- Access control for employees and contractors
- Real-time employee performance monitoring
- Secured area monitoring
- Time and attendance
- Patient protection, including infants and geriatrics
- Guest tracking (such as in demo rooms and trade shows).

Sensing with automatic:

- Perishable foods temperature (e.g., cold chain monitoring)
- General temperature sensing (e.g., for machinery, including IT equipment)
- Vibration, motion and shock sensing for condition monitoring
- Chemical and hazardous materials sensors for safety and homeland defense.

Virtually all industry verticals, from healthcare to military, have implemented active RFID solutions for more “visible” decision-making, greater efficiency or improved security.

Integrator Skill Sets

So what skill sets are required to take advantage of this rapidly growing marketplace?

- TCP/IP IT network integration expertise of a generalist nature, such as the ability to attach devices to the network, and test and implement a system application.
- RF communications expertise that comes from vendor training and includes basic principles of what works and what doesn't work with each RFID product.
- Application knowledge in areas such as business intelligence and security as well as the ability to create solutions for any given customer problem where RFID's vast potential lies.

- Systems sales experience to propose a compelling enterprise solution that should be targeted to save a significant amount of money in a short period of time. The selling process, therefore, requires professional systems-sales skills, including calculating the prospective savings or business case.
- Optionally, understanding security system interfaces such as the Wiegand protocol will provide an additional solution option for offering solutions that will open and close gates or doors and trigger alarms when interfaced to the existing security system.

For the integrator, active RFID is the proverbial business sandbox. To date, system integrators with backgrounds in security, auto-ID, business intelligence, barcoding and homeland defense have all successfully integrated active RFID systems. Virtually unlimited options open up for business once expertise is garnered for the automatic identification capabilities of the technology.

Active RFID is Ideal for Integrators

There are many benefits of having active RFID as a solution set. The technical expertise surrounding this technology carries with it a uniqueness that can be built upon to provide differentiation to further the firm's competitive advantage. The solution is robust and reliable as verified in the implementation of similar technologies such as toll tags around the world. The creative nature of the technology means multiple applications can be implemented with any given customer, ensuring a robust revenue stream of solutions that can be sold.

The margins are determined by custom solutions being sold, rather than by repetitive, highly competitive commodity solutions. In other words, many high value solutions are available and can be priced based on the value of the enterprise assets being tagged. Installation and recurring maintenance revenues can be also captured. Finally, there's a multi-industry nature to the technology, helping the integration firm avoid a dangerous industry concentration and providing a breadth of revenue opportunities in any given geography.

Getting started is relatively easy. Numerous Web portals supporting active RFID literature have sprung up and can be found via simple internet searches. Documents such as white papers, case studies and product collateral material are particularly helpful to understanding the skill sets, resource requirements and exciting potential active RFID has to offer the integrator.

Based on the momentum of RFID and the breadth of the applications across multiple industries, there's no doubt RFID will grow rapidly and become pervasive throughout the enterprise. In fact, with system costs declining and business opportunities exploding, one can envision a day when every person and every asset in the enterprise is tagged. That wave of business productivity, visibility and security improvements means the

experienced RFID integrator will have an important role to play—a role that means good business for the integrator beyond the foreseeable future.

About AXCESS International Inc.



AXCESS International Inc. (OTCBB:AXSI), headquartered in greater Dallas, TX, provides Enterprise Dot™, Dual-Active™ RFID (radio frequency identification) and Real Time Location Systems (RTLS) for asset management, physical security, sensing and supply chain efficiencies. The battery-powered (active) RFID tags locate, identify, track, monitor, count, and protect people, assets, inventory, and vehicles.

The patented technology enables applications including: automatic “hands-free” personnel access control, automatic vehicle access control and logistics management, automatic asset management, and sensor management. AXCESS is a portfolio company of Amphion Innovations plc. Additional information on AXCESS is available on the Company’s Web site at www.axcessinc.com.

About the Author



Allan Griebenow is president and CEO of AXCESS International Inc. (OTCBB:AXSI), which manufactures complete dual-active RFID systems for security, asset management, and supply chain solutions. Previously, he ran Prism Video Inc., a pioneer in compressed, digital video security systems. He was president and CEO of Vortech Data, which provided network-based medical image communication systems before being acquired by Kodak Health Imaging Systems in 1992. He started his career in the late '70s as a presidential management intern with NASA’s Office of Aeronautics and Space Technology. He holds a B.S. in Business Administration from the University of Maryland and

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