BACKGROUNDER

RF Controls New Intelligent Tracking and Control System (ITCS®):
A key to enabling the "Internet of Everything"

As RFID technology continues to gain a solid foothold within the business sector, the acceptance of the technology represents the fruition of a long maturation process.

Many recent adopters of RFID refer to the technology as a "new" development. Yet, the technology can be traced back to World War II when it was first used to guide and identify airplanes in combat. The technology lingered without much development for years until it began to gain steam about a decade ago when retailers realized that RFID could help them to better track inventory, a longtime thorn in the side of the retail sector.

RFID's ramp-up was met by many challenges. The highly-touted technology showed promise for tracing and tracking assets, yet pricing and technical issues, such as read rate accuracy, were major stumbling blocks. In addition, RFID caused interference when paired with liquids and metals, limiting its effectiveness for certain products. In many cases, the technology resembled more of a science project than a legitimate business solution.

The technology finally looked ready for a hockey stick climb when Walmart issued its now famous RFID mandate in 2005 formally requesting that its major suppliers start to tag cases and pallets of goods shipped to the giant retailer's distribution centers. In the end, the technology wasn't ready for the initiative and many suppliers balked at the request to tag cases and pallets due to the cost of compliance and the lack of a clear business case.

Huge advancements in RFID technology, particularly on the tagging side, have made item tagging much more affordable. However, to date the technology has not existed to automatically scan hundreds of thousands of these tags simultaneously, from long distances, and with pinpoint accuracy. Industry has been forced to rely on costly hand-held readers, which require human intervention and don't provide true real-time visibility. As a result, the power of RFID technology to deliver transformational business benefits has yet to be fully realized.

RF Controls' ceiling-mounted smart antenna panel (circled in red) is monitoring the production line. Business rules allow RF Controls' technology to count, locate and track any item moving through the line.

RF Controls' Intelligent Tracking and Control System (ITCS®), provides an answer by addressing this core technological challenge. The system gives businesses the ability to easily and economically identify, locate and track RFID tags across a large area – be it a distribution center, a manufacturing plant, or a large retail floor. This patented technology promises to enable deployments across a wide range of supply chain applications that were previously impossible.

How significant are the opportunities for RFID in the supply chain? A recent white paper published by Cisco predicts that the "Internet of Everything" – a world where RFID tags and sensors connect all devices and items – represents a $2.7 trillion opportunity within the supply chain. It is estimated that, in the U.S. alone, more than one million commercial sites can enhance their supply chain operations by using RFID.

In fact, Cisco claims that the Internet of Everything represents a $14.4 trillion opportunity in increased revenues and decreased costs for businesses and customers over the next decade.
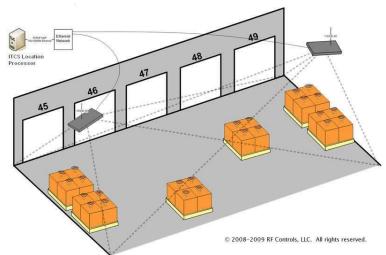
Ushering in the Internet of Everything

RF Controls is uniquely positioned to usher in the Internet of Everything era. Founded in 2006 in St. Louis, the company's revolutionary antenna technology allows for previously unforeseen advances in RFID technology by eliminating barriers to end user adoption while reducing infrastructure costs.

RF Controls' smart antenna hardware and software enables a revolutionary application of passive ultra-high frequency (UHF) RFID in real time location systems (RTLS). RF Controls' bi-directional electronic steerable phased array antennas, which are core components of its Intelligent Tracking and Control System (ITCS®), use patented antenna technology to send a signal to a passive RFID tag, excite the tag (wake it up), and capture and read data from the tag. RF Controls real-time location systems are the only products in the world capable of tracking UHF passive RFID tags in real time, with accuracy of 12 inches.

RF Controls has been awarded a foundational patent for its Intelligent Tracking and Control System. ITCS is best classified as a wide area RTLS rather than simply as a high-performance RFID reader sub-system, because ITCS provides much more than just tag identification data. By installing ITCS "smart antennas," end users can illuminate an area (or volume) in which tagged items move or are stored, and achieve real-time, perpetual monitoring of an entire warehouse or retail floor. ITCS solves the fundamental business process problem of automatically and accurately locating arbitrarily placed tagged items without the spurious read problems inherent to other RFID systems, which is crucial to inventory and asset management.

For data collection during dock door operations, overhead antennas (which look like flat-screen TVs) take the place of warehouse workers with handheld scanners. Processes are automated, allowing warehouse associates to transport products faster and more accurately.

What makes the solution so economically feasible is its read accuracy combined with its ability to read at long range. By deploying the system, end users can obtain precise read accuracy while reading, or locating, items to within 12 inches of their real-time location.

RF Controls' patented solution enables game-changing benefits in the supply chain sector. The solution is currently deployed in retail, military and logistics applications around the world.

Real-time data equals real business benefits

In a warehouse or distribution center environment, RF Controls' solution can help workers to move product faster and more efficiently. The company's antenna system, which can be mounted from a ceiling or on a wall (like a small flat screen TV), captures tag reads as trucks pull up to a dock door, and immediately relays information on the tagged items in real time as they move throughout the facility.

The system eliminates the need for portals at dock doors, which are often damaged by forklift trucks and can be expensive to maintain. It also eliminates the need for dock workers to scan incoming goods with handheld readers. ITCS integrates seamlessly with other supply chain management software programs.

RF Controls' smart antenna (circled in red) tracks product as it is loaded onto a truck, eliminating the need for manual scanning to record supply chain activity.

Aside from greatly reducing infrastructure costs related to purchasing handheld readers and reader portals, the RF Controls system enables dramatic reductions in labor costs as a result of faster data capture and the need for fewer warehouse workers to unload and process products.

At the retail level, RF Controls' technology, which can literally track the path of a Frisbee during flight, can tell store operators if a pair of jeans went through the point of sale process or went around the POS area and should be treated as shrinkage.

With an RF Controls smart antenna, seen here directly over the pallet, companies can track RFID-tagged items automatically as they move around the warehouse.

Retailers that install ITCS in their store operations gain real-time knowledge of what inventory is on hand and exactly where those items are located, leading to improved efficiencies in the replenishment process. ITCS keeps a time-sequenced record of the location of tagged items as they are read, providing the ability to track their movement in real time.

"Visibility is at the core of the overall value of our product; you can't manage what you can't measure and you can't measure what you can't see," said RF Controls' CEO, Tom Ellinwood.   Adds RF Controls' CTO, Graham Bloy, "Because of this unparalleled performance, our technology will serve as the key enabling element that will bring The Internet of Everything to life. Unlike others, our technology simply works."

Details on RF Controls' Intelligent Tracking and Control System (ITCS®)

RF Controls' Intelligent Tracking and Control System is a standards-compliant, advanced automatic data capture system. Products are integrated into systems for end-users by systems integration partners.

- Signal Acquisition and Source Location (SASL®) smart antennas are all type approved by the FCC under Part 15 regulations, and have been proven to be compliant with ETSI EN 302 208.
- ITCS features an ISO-compliant Application Program Interface (API) for easy integration into middleware applications. The API is compliant with the ISO/IEC 24730-1 standard for real-time location systems.
- RF Controls' range of ITCS-A-2xx smart antennas are compliant with CFR 47 Part 15.247, and ETSI EN 302 208
- RF Controls' Signal Acquisition and Source Location (SASL®) smart antennas are compliant with the stringent European regulations concerning the Restriction of the Use of Certain Hazardous Substances (RoHS) in electrical and electronic equipment.

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