



THE GLOBAL LANGUAGE  
OF BUSINESS

## INDUSTRY INITIATIVE CASE STUDY



# Auburn University RFID Lab



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RFID LAB

**“The omni-channel train is leaving the station, and in a few short years, ‘omni-channel retail’ will be just ‘retail.’ And EPC-enabled item level RFID is the key component for making end-to-end supply chain visibility possible in this new retail world.”**

— **BILL HARDGRAVE, PhD,**

Dean of the Harbert College of Business and Founder of the RFID Lab, Auburn University

## EPC-enabled Item Level RFID Transforms the Omni-Channel Shopping Experience

### EXECUTIVE SUMMARY

Retailers and brand owners are increasingly turning to Electronic Product Code (EPC®)-enabled item level Radio Frequency Identification (RFID) technology to deliver exceptional omni-channel shopping experiences. Through its series of retail studies, Auburn University’s RFID Lab team has uncovered and quantified a host of business benefits—upstream and downstream—that EPC-enabled RFID provides for retailers, brand owners and other supply chain trading partners.

With EPC-enabled RFID, retailers and brand owners both benefit from improved inventory visibility and accuracy. For retailers, this drives increased point-of-sale transactions, decreased out-of-stocks and reduced cycle count time. For brand owners, EPC-enabled RFID provides supply chain and logistics benefits through improved shipping/picking accuracy, reduced receiving time and the ability to implement granular (or serialized, item level) electronic proof of delivery.

In today’s hyper-connected consumer world, retailers and brand owners are looking for new ways to help them forecast trends more accurately, collaborate with global trading partners more efficiently and improve inventory management. Part of the GS1 System of Standards, EPC-enabled RFID takes item identification a step further to connect the digital and physical worlds that consumers continue to straddle in their browsing and shopping experiences.

“Omni-channel is creating a sense of urgency for retailer and supplier communities. EPC-enabled item level RFID is the transformational technology that enables the retail industry to meet the inventory demands of the omni-channel shopping experience.”

— **BILL HARDGRAVE, PhD**, Dean of the Harbert College of Business and Founder of the RFID Lab, Auburn University

## True Inventory Visibility

In 2014, retailers and brand owners alike expressed their growing support for EPC-enabled item level RFID technology as the foundation for delivering a successful omni-channel shopping experience.

That’s because RFID provides true inventory visibility from source-to-store. Its return on investment is delivered in the forms of increased customer satisfaction and improved data quality for tangible business benefits such as fewer handling errors, improved labor productivity and faster inventory counting.

By using item level tagging, retailers can achieve 95 percent accuracy<sup>1</sup> when tracking each piece of merchandise, in every retail stock location. With this level of inventory intelligence, they can gain quick insight and make speedier decisions about the type and quantity of inventory required at any specific retail or brick-and-mortar location. With this “last-item view,” retailers can respond quickly to optimize inventory location and maximize sales by providing the best “always-on, always open” consumer shopping experience.

Working with members of the retail industry and the [GS1 US Apparel and General Merchandise Initiative](#), Auburn University’s RFID Lab team conducted a series of studies to quantify the effectiveness of EPC-enabled item level RFID tags in retail operations.

The results demonstrate the many benefits item level RFID delivers to retailers, brand owners, logistics service providers and other supply chain trading partners. These benefits include automating processes, recording item location, identifying objects, providing increased network-wide inventory visibility and accuracy, and more.

“The omni-channel train is leaving the station, and in a few short years, ‘omni-channel retail’ will be just ‘retail.’ And EPC-enabled item level RFID is the key component for making end-to-end supply chain visibility possible in this new retail world,” says Bill Hardgrave, PhD, Dean of Auburn University’s Harbert College of Business and founder of its RFID Lab.

## Retailer Value: Driving Sales & Lifting Margins

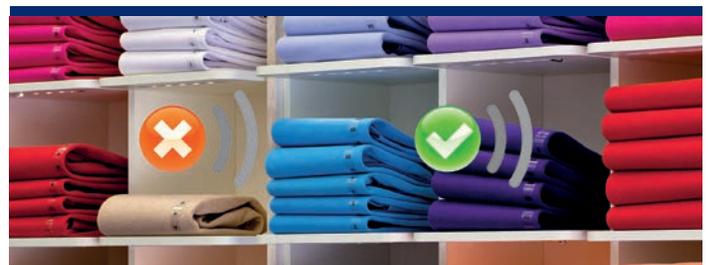
EPC-enabled RFID is driving visibility and efficiency throughout the entire supply chain. It’s playing a critical role in helping retailers create a seamless omni-channel customer experience. In fact, numerous retailers around the globe are using it to increase inventory accuracy, drive point-of-sale improvements, decrease out-of-stocks, improve loss detection, enhance stock conversion reporting, increase full-price sales, expedite the returns process and get more product into their customers’ hands.

Moreover, in one major retailer’s case, its RFID-enabled departments outperformed controls by 10 percent, between September 2013 and May 2014, and their display rates improved from 70 to 95 percent.<sup>3</sup> Further, CEO Terry Lundgren of Macy’s reported that their “buy online/pick-up in-store results totaled 125 percent of intended order,”<sup>4</sup> demonstrating that consumers are adding to the basket when they come in the store to pick up an order placed online.

### REAL-WORLD PROVEN BENEFITS

In addition to improved fulfillment and out-of-stock reduction, EPC-enabled RFID adoption is exploding in retail because of its real-world proven benefits:<sup>1</sup>

- Raising inventory accuracy from an average of 63 to 95 percent
- Expanding inventory count rates from 200 to 20,000+ items per hour<sup>2</sup>
- Cutting out-of-stocks by up to 50 percent
- Increasing item availability to boost sales from 2 to 20 percent
- Improving inventory labor productivity by 96 percent
- Reducing cycle count time by 96 percent



Photograph courtesy of Smartrac Technology Group

## Brand Owner Value: Inventory Intelligence & Cost Savings

For brand owners, true inventory visibility starts at the factory, where value is first achieved in the inbound audit process at the domestic point of receipt. Further benefits are then derived by using EPC-enabled item level RFID through the entire supply chain for electronic proof of delivery (EPOD) as well as for improving receiving, pick/pack and shipping accuracy. Additionally, RFID helps improve supplier compliance, saves on operational costs, reduces obsolete inventory write-downs and increases margins.

### SUPPLY CHAIN AND LOGISTICS BENEFITS

EPC-enabled RFID tagging helps brand owners realize supply chain and logistics benefits:<sup>1</sup>

- Delivering an 80 percent improvement in shipping/picking accuracy
- Shrinking claims and returns
- Reinforcing authenticity/anti-counterfeiting for luxury brands
- Decreasing inspection costs
- Reducing loss prevention
- Lowering receiving time by 90 percent
- Enabling electronic proof of delivery
- Raising receiving accuracy

## RFID Enables Always-On, Always-Open Omni-Channel Shopping Experience

In the past year, there has been an unprecedented amount of positive discussion about the use of EPC-enabled RFID in the retail industry, as several top tier U.S. retailers began publicizing their RFID roll-out strategies and advocating the many business benefits of deploying item level RFID as an omni-channel enabling technology.

RFID's return on investment is delivered in increased customer satisfaction—helping to achieve the seamless, homogeneous consumer shopping experience across all channels. From end-to-end supply chain visibility to display audit compliance, and from multi-location customer order fulfillment flexibility to improved replenishment execution—these widely publicized decrees have shown the tangible results of item level RFID technology, proving its value by improving item level inventory accuracy and availability.



Photograph courtesy of Alien Technology Corporation

In today's always-on, always-open connected-consumer world, retailers and brands are looking for new ways to help them forecast trends more accurately, collaborate with global trading partners more efficiently, and improve inventory management.

The [GS1 US EPC Item Level Readiness Program](#) provides education, training, tools and community support that the apparel and general merchandise industries need to implement EPC-enabled item level tagging in their daily operations. It allows businesses to leverage their existing technology investments such as ERP, inventory management, point-of-sale and other enterprise systems, which translates to a more cost-effective deployment with less risk and an abbreviated return on investment.

Without EPC-enabled RFID, a retailer may be able to sell an item online but may be unable to find the item and fulfill the order. RFID enables better “last-item” visibility and the opportunity to sell that item at the best possible margin.

Retailers and brand owners are turning to EPC-enabled RFID technology to help them quickly and accurately identify, capture and share product information and location data. “In fact, EPC-enabled RFID is the foundation for actionable intelligence— if you can't ‘see’ something, you can't measure it—and if you can't measure it, you can't control it. And if you can't control it, then it's probably costing your business too much,” says Dr. Hardgrave.

Within the GS1 System of Standards, EPC-enabled RFID enables omni-channel retailing by taking item identification a step further to connect the digital and physical worlds that consumers continue to straddle in their browsing and shopping experiences.



Photograph courtesy of Nordic ID

Through automated identification, created by EPC-enabled RFID, electronic tags are capable of receiving, storing and transmitting digital information by means of radio waves. Without RFID, a retailer may be able to sell an item online, but may be unable to fulfill the order if it cannot find the item in the store.

As omni-channel increasingly defines the future of retail, businesses are finding they must adopt new standards and technologies or risk losing sales and their customers. Compared to just a year ago, the retail industry now has a resounding consensus about omni-channel—it is no longer just a trend; it represents the future of retail. However, there is still a lot of work that needs to be done on the back end to ready retailers for the demands of the consumer.

## References

1. Auburn University RFID Lab Studies, [RFID.auburn.edu](http://RFID.auburn.edu).
2. BT Americas, [www.globalservices.bt.com/us/en/products/trace\\_for\\_retail](http://www.globalservices.bt.com/us/en/products/trace_for_retail).
3. “Omnichannel Leaders Reaffirm The Value Of RFID,” Retail Touch Points, September 16, 2014.
4. “Macy’s Focused On Mobile, Gen Y, Private Label,” Marketing Daily, September 3, 2014.
5. “Barcode and RFID Convergence: Enabling Greater Visibility Through Standards,” VDC Research Group, November 2010.

## Delivering a Seamless Shopping Experience

For today's consumer there is only "one" retail channel—the one that brings the product home. Few shoppers care about "omni-channel" retail and how a product gets to them or where it came from—so long as it arrives. Simply stated: Consumers are creating their own personal supply chains and GS1 Standards can provide them with a consistent experience every time.

The consumer's journey starts with easy-to-find products that contain accurate and complete information. Each shopper weighs the delivery options against on-hand inventory across channels and expects flexibility in either pick-up or delivery options. Once the product enters the home, the consumer continues to expect access to extended and trusted product information—from recipes and instructions to returns and recalls—even for products and brands to which one is loyal.

## GS1 Standards in Action

Consumers expect to be able to purchase and receive goods in seamless and streamlined ways. GS1 Standards make it easy for people to discover and purchase products wherever they are.

By building on existing investments in GS1 Standards, retailers and brand owners can provide the product information needed by the new tech-savvy, omni-channel consumer. Greater consumer-facing inventory visibility is key; if a consumer cannot find the right product online it's a "digital out-of-stock"—the equivalent of an empty store shelf. Item level tagging via EPC-enabled RFID delivers near, real-time inventory visibility as well as inventory accuracy approaching 95 percent.<sup>1</sup>

GS1 Standards support different fulfillment options, whether delivery to home, work, pick up/drop off (PUDO) or collect-in-store.

- EPC-enabled RFID delivers product and location availability information
- A Global Trade Item Number® (GTIN®) ensures worldwide unique product identification
- A Global Location Number (GLN) helps identify pick-up and store locations
- A Serial Shipping Container Code (SSCC) and a Global Service Relation Number (GSRN) help customers locate and track their packages

By implementing RFID technology based on EPC and taking advantage of existing systems that are set up to process U.P.C.s and other GS1 Standards, companies can reduce their integration time by 25 percent.<sup>5</sup>



Photograph courtesy of Checkpoint Systems, Inc.

## About the Companies

### CONTACT US

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The GS1 US Apparel and General Merchandise Initiative is an industry group that is committed to defining business challenges and opportunities and organizing adoption plans for the implementation of GS1 Standards. The members of the initiative represent a broad cross-section of industry trading partners. The work of the initiative is driven by workgroups of industry stakeholders who are collaborating to develop standards-based guidelines, best practices, case studies and thought leadership. To learn more, contact us at [apparelgm@gs1us.org](mailto:apparelgm@gs1us.org) or visit our website at [www.gs1us.org/apparelgm](http://www.gs1us.org/apparelgm).

### ABOUT AUBURN UNIVERSITY RFID RESEARCH

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Thanks to funding provided in part by GS1 US, researchers at the Auburn University RFID Lab are studying the benefits of using EPC-enabled RFID technology in the apparel industry. Researchers are quantifying the effects of EPC-based tracking on improving inventory accuracy, traceability, productivity, costs and revenue. Access Auburn University's library of research papers at <http://rfid.auburn.edu/research-papers.cfm> to learn the benefits of leveraging RFID to enable the omni-channel consumer experience.

### ABOUT GS1 US

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GS1 US, a member of the global information standards organization GS1®, brings industry communities together to solve supply-chain problems through the adoption and implementation of GS1 Standards. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration and for maximizing the cost effectiveness, speed, visibility, security and sustainability of their business processes. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code (EPC®)-enabled RFID, data synchronization and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®). [www.gs1us.org](http://www.gs1us.org).



Photograph courtesy of Impinj, Inc.



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